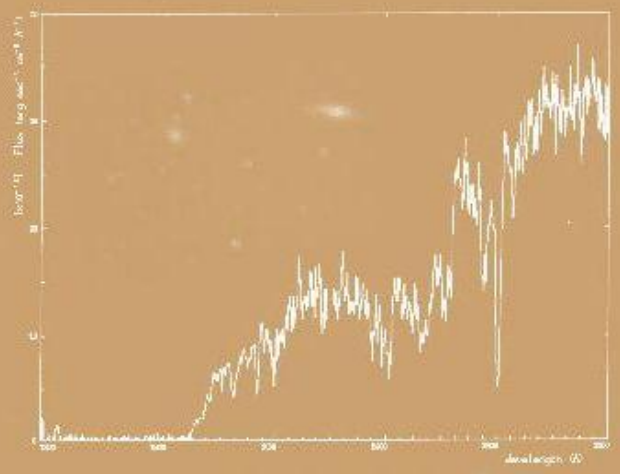
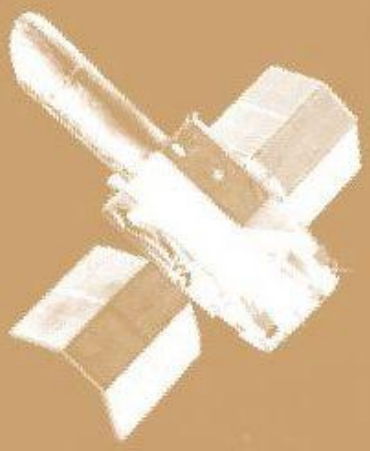




Joe Hube

45 Years of Heck in Professional Astronomy





Venngeist

45 Years of Heck

in Professional Astronomy

by Joe Hube

Venngeist

Joe Hube

Het papier is geduldig meer dan mannen[1].
(Frank 1942)

The past is a foreign country.
They do things differently there.
(Hartley 1953)

[Un des] principaux inconvénients du système [français est]
une prime aux diplômes "franco-français" des grandes écoles par rapport
à des universités étrangères pourtant de fait plus prestigieuses à l'international,
mais que les Français ne connaissent pas et reconnaissent trop peu[2].
(Attali 2016)

[1] The paper is more patient than men.

[2] [One of the] major drawbacks of the [French] system is a bonus given to the "Franco-French" degrees of the *Grandes Écoles* [Elite Schools] relatively to foreign universities however *de facto* more renowned internationally, but that the French ignore and do not appreciate enough.

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Foreword

This volume is devoted to the itinerary and professional activities of Astronomer André Heck. His international career spanned the period 1969-2014, in various countries and at a time many scientists were still happily spending their whole career at a single institution. The vagaries of life decided otherwise for Heck.

This is the story of a Belgian scientist of humble origins whose name was assigned to a comet he discovered at the age of 26 at Haute Provence Observatory, who was in charge at 31 of the science operations on the then most advanced astronomy satellite from a European Space Agency station in Spain, and who later ended up at the top level for astronomers in France after pushing forward new fields and acting as a catalyst for novel approaches.

His activities touched quite a variety of observational and theoretical matters. These ranged from meridian astronomy to space spectroscopy via ground-based photographic, photometric and spectroscopic collection of data, and from studies in stellar evolution to pioneering facets of astronomical information handling and applications of advanced statistical analysis. Time-consuming routine service for the benefit of his professional community should not be forgotten, be it at manning observing instruments or at shaping databases of world-wide usage.

Along the way, he became a prolific author of papers and reference books, both for a specialized audience and for the public at large. He also produced quite a number of edited volumes, including the prize-winning series *Organizations and Strategies in Astronomy* tackling many facets of the way astronomy-related activities are conducted round the world, the "sociology of astronomy". Towards the end of his professional life, Heck set up his own non-commercial publishing venture *Venngeist*.

Specialists in bibliography consider Heck as one of the most published authors in the history of astronomy[3].

He also devoted a good chunk of his time to historical research and to public outreach, some of it under a pen name. He used to say that these two components of his activities – digging into the past and retaining close contacts with the society at large – were complementary of the exploratory ones, be it at the level of the sociology of astronomy or of the evolution of astronomy communication, the future of which he investigated with two colloquia he inspired in later years, at the Royal Academy in Brussels in 2007 and at the Harvard-Smithsonian Center for Astrophysics in 2010.

[3]See for instance the note by M.J. Kurtz in the references section (p. 353).

The present volume has been compiled thanks to material put at our disposal by Heck himself. The reader will find a pretty exhaustive compilation of his astronomy-related publications together with extensive indices enabling to move around the dense forest of matters tackled, places mentioned and people he interacted with.

We also included, from Heck's personal file, a brief curriculum vitae summarizing his professional highlights together with a couple of published biographies, citations and letters of reference, followed by lists of collaborators, missions and meetings attended. Elaborate scientific considerations have been left out as interested readers can find all details in the quoted papers.

This book remains as factual as possible while leaving out many anecdotes and secondary events in order to stay within a reasonable size for this volume. Do not expect private ruminations here, even if we are saying a few words of the vagaries of life alluded in the opening of this foreword, such as the sudden ministerial decision to fire about 200 members from Liège University in the mid-1970s – forcing Heck to pursue his career abroad while he was in the process of getting a tenure at that institution – or the cerebrovascular ailment that hit him in the late 1980s, leaving him with a partial permanent disability. This triggered his resignation from the directorship of Strasbourg Observatory and a reorientation of his activities, basically at his own expenses in a not-always-easy local context.

Our biographee has put together, essentially for the benefit of historians of astronomy, private memories the release of which will be authorized only *post mortem*. He is expressing and documenting there personal views and comments on key turns of his career, on various incidents he experienced or witnessed, as well as on some colorful and problematic characters he met. The names of these have been deliberately omitted in the present volume, rather putting the emphasis on those Heck takes pleasure praising.

We owe to the biographee the authorization to use an abundant iconography in which we digged virtually at will. We thank all those who assisted us along the redaction of this book to clarify specific points or who provided us with additional pictures.

We hope we succeeded in illustrating through this volume the many professional facets of a man who spent a significant part of his activities pioneering new fields and developing original approaches – a dedication repeatedly commended in the evaluation processes he had to go through in France[4] – and whose view on the noble mission of astronomy was depicted in several of his books as "understanding the universe, as well as the place and rôle of man in it", an expression sometimes reproduced verbatim by others without quoting its source.

Joe Hube,
June 2016.

[4] See *e.g.* p. 277.

Coming to Astronomy

André Heck's coming to astronomy dates back to his third year at Liège University. He was born some twenty years earlier, just after WWII, in Jalhay (Djal'hê, in Walloon, Fig. 1), a village of proud and tough but generous people on the Northern edge of the Belgian marshy high-plateaux, the *Hautes-Fagnes*[5]. Hence he spent his youth in full contact with Nature. The village was still relatively isolated then; public lighting was scarse and switched off well before midnight. Some reminiscences from this time can be found in his columns under pen name: *Potins d'Uranie*[6] and *Échos des Hauts-Plateaux*[7].

Being the first elevated ground from the sea under prevailing winds, the area was the rainiest of Belgium and with really high stacks of snow in Winter. When the skies were clear under sometimes deeply freezing temperatures, the stars were strikingly shining in dark surroundings. When the Moon was up, the kids learned naturally to recognize its phases. Occasional celestial phenomena such as eclipses or rare Northern Lights were skilfully explained by the teachers at the local school – those marvelous countryside teachers of the time. Nothing seemed more natural than dark skies then, contrary to what it is today with light pollution and backgrounds so high that the Milky Way and the Andromeda Galaxy are not visible anymore to unassisted eyes.

At the time of Heck's youth, motor vehicles were not many in the village. Most goods were moved around through horse traction. People used bicycles, some motorbicycles, but mostly their feet to go around. Heck saw the arrival of the first television set in the village, soon followed by a couple of others. The happy owners were welcoming visitors to watch special events. Earlier, families used to pay visit to each others in the evenings and to spend a couple of hours chatting, ladies knitting or exchanging recipes (those unmatchable waffles), men discussing farming or lumbering business, or working together on spare-time hobbies such as assembling bird cages. Kids were following their parents then. Those *sîses*[8] were unique opportunities to hear a lot of stories from elders when not falling asleep with the head on the table or in an armchair next to the roaring stove. On the way back home on good nights, the stars would be their companions, silent watchers from a seemingly peaceful world, far, far away.

[5] *High Fens* in English, *Hohes Venn* in German.

[6] http://www.potinsduranie.org/

[7] http://www.hautsplateaux.org/

[8] *Sîse*: Walloon word for such evening gatherings, especially in Winter, for chatting while working together, or just enjoying company.



Fig. 1: That aerial view of Jalhay (with North roughly towards the upper left corner), taken some time in the late 1970s, shows also the hamlet of Herbiester (upper right, where the parents were both born) and the (artificial) Gileppe lake (upper left). Far on the horizon are Germany (center) and the Netherlands (left). The road in the lower left corner leads mainly to Verviers, but also to Spa. The marshy high-plateaux are on the right. They have been often used as setting for stories published in the "Potins d'Uranie" column. Today they are the central reference for the "Échos des Hauts-Plateaux" column.

When not helping in the hay making or required for some other domestic work, the kids were spending their free time and holidays in the meadows and deep forests around. Their intense proximity with Nature and wildlife might sound weird to today's young people permanently diving into their electronic devices. This deep immersion with Nature was not without danger, far from that, and far from what one could believe nowadays from television games.

But since this was a rainy region, the kids had also a lot of indoor activities, including reading, especially cartoon strips or graphic novels from the two major magazines, *Spirou* and *Tintin*. The famous Belgian schools of *bandes dessinées*[9] *(BD)* entertained a real love story with a whole population.

[9]Drawn strips, literally. The American term of 'comics' implies some humorous connotation that was not necessarily present in the BD stories.



Fig. 2: This is the oldest photograph found of the biographee, with pen in hand at six, taken on 20 October 1952 at the primary school for boys in Jalhay.

A huge number of stories (compared to the small size of the country) were produced. They were read and re-read by kids, analyzed, discussed, parodied in the games and in the everyday life. For instance the adventures of Tintin towards and on the Moon, published page after page in the early 1950s, had their own distinguished success.

Of course, kids were also absorbing lots of books of their age, such as the novels by Jules Verne, one of the fathers of science-fiction, or the many stories with Bob Morane, written by Henri Vernes and printed in the nearby city, Verviers. One should never underestimate the influence of context and of readings on brains in the making.

Heck was pretty good at the communal primary school (Fig. 3), regularly ranking first of his class, something that decided his parents to grant him secondary schooling in Verviers. To better prepare him for the transition, they wisely decided he would spend the last year of primary schooling – the $6^{\rm th}$ year – at the same establishment.

But, before we get there, a few words are in order on Heck's parents and on the languages spoken in the area.

Heck's grandparents were modest farmers, as was apparently the case for earlier generations[10]. A dozen cows, a horse or two, perhaps a couple of sheep and pigs, a few hens and rabbits, allowed people to barely live from a not especially fertile land. Some lumbering activity provided, if no additional income, at least firewood for the harsh Winters. There were few other needs then. The consumer society was not yet born. *Indispensable-Necessary-Superfluous* was the ruling triad in the households.

[10]Genealogist Jeanine Schnitzler (1940-2015) traced the family back to the $15^{\rm th}$ century in the Hautes-Fagnes plateau area (private communication).

Heck's parents left the farming business. His father got a job as a maintenance worker on the tracks of Verviers streetcar company. He would commute with the old village bus and later with his own light motorbike. He was also quite active as secretary of a couple of village associations: a music band organizing concerts and taking part in parades and cortèges in the region, especially at carnival celebrations; and another society sponsoring the Christmas dramatic performance by the village troupe followed by a ball.

Heck's mother was a seamstress who hosted a few pupils at a time when it was still highly recommended that girls to be married knew a thing or two about knitting. Heck confides that one of his earliest memories is the view of his mother and all those girls singing together while working in the main room of his birth house with a bright sunlight entering through the large windows.

The language spoken in the area was Walloon. It never made it as an official language in Belgium, but it is a fully mature language [11] and can be considered as Heck's mother tongue. But the schooling language was French and the kids – who were naturally fluent in Walloon – were quarrelled when not using French by both parents and teachers who, between them, were talking in ... Walloon.

Jalhay was a border village before WWI, which means that right beyond the then border that was crossing the marshy High-Plateaux, the official language was German, with mainly Walloon as the communication language between the villages on each side of the border. With the annexation of three cantons after the conflict, the border with Germany receded by a few kilometers, but German remained the official language in the annexed area. The border with the Netherlands was not far either to the North, as was the Flemish (officially Dutch-speaking) area of Belgium.

A reader living in the middle of a large territory might not realize that we are speaking here of a village closely surrounded by borders and different languages: Germany at some 10km from the Southeastern tip of the commune and the Netherlands at about 20km to the North of the Northern edge; the Grand Duchy of Luxembourg lying less than 40km to the South and the closest point of France, the bulge of Givet, being distant by only slightly more than 80km Southwest. And these were real borders at the time, with tough checks by suspicious customs officers [12].

Such a geographical configuration has definitely influenced the choices made by Heck when growing up, as we shall see in the next section with his option for his first foreign language, German, plus perhaps instilling that definite love he always had for crossing borders and for communicating with the rest of the world ...

[11] See Publ. 409, pp. 210-217, or <http://www.potinsduranie.org/potins_250_201404.pdf>.

[12] Crossing into Luxembourg was somehow easier thanks to the Belgium-Luxembourg Economic Union dating back to the early 1920s. The Benelux arrangements signed in 1944 and involving also the Netherlands were just taking some momentum. The Treaty of Rome initiating European agreements between six countries (Benelux with France, Germany and Italy) – that would later lead to the current European Union with 28 countries – came into effect only in 1958 when our biographee was already twelve years old.



Fig. 3: Jalhay boys' primary school was located behind that house inhabited by the teacher of the younger boys. The playing ground was on the left. The covered part in the right background included the toilets and urinals. Notice the fountain on the right foreground. Just further to the right was a key house for the village: a small restaurant specialized in chips, selling also magazines and sweets for kids. For years, the old gentleman was distributing magazines in the village with often a drink at each stop – and with the consequences one can imagine. The magazines for kids, mostly the celebrated Belgian 'bandes dessinées', made of cartoon strips, played a key role in their upbringing. An upgraded version of the wall on the left foreground surrounded the war memorial inaugurated during Heck's time at that school. The school children had to attend all commemorating ceremonies. In the 1950s, endless NATO convoys were passing in front of the school during manoeuvers in the area. A military camp was located at the other side of the Hautes-Fagnes plateau and heavy guns were often heard. The boys were sometimes let out to watch those convoys from where kids are standing in the photograph. The teachers were also taking advantage of the countryside for great field trips. City kids had no idea of what was a childhood in such an open and unspoiled environment (see Nath 2015a). For their fundamental rôle in that critical first educational step, the two teachers highly deserve to be mentioned here: Georges Grégoire for the first three years of primary schooling and Constant Vitrier for the following two years.

Verviers

When turning 11, Heck entered the *Athénée Royal de Verviers (ARV, Fig. 4)*, a State-run school. This was quite a different world as pupils were so many in that last primary year (post-WWII baby boom) that several sections were needed to accommodate all of them, contrary to what was happening at the village school where a single teacher was dealing with several classes in the same room. Our biographee was in the section run by Jacques Otten.

The old ARV *Préfet* (Director) had some encouraging words to Heck's mother when she registered him. "Kids coming here from up there, he said meaning the High-Plateaux, are bright and hard workers." And, looking at Heck straight in the eyes, he added: "I am pretty sure he will not disappoint us." The tone was set for the next seven years ...

If the learning context was substantially different, so was it too for the rythm of life. So far the school had been at a short walking distance from home through the village alleys. Now it was necessary to get up quite early to catch the bus to the city, to walk down to the school that was lying with its back to the Vesdre river, and to spend some time in the study room – working, reading or catching up with some sleep – before starting the courses for the day. And the process worked reversely in the late afternoon, heading back to the village by bus with the homework being done after an early supper.

The trips to the city were especially entertaining in Winter, with people getting off the bus and pushing it through the high snowdrifts, jumping back into it while it was moving on its own until it got stuck again.

These little events were something the city kids did not enjoy, a gentle revenge against a generally contemptuous attitude towards a countryside kid. A prosperous city in earlier times thanks to the textile industry, Verviers was now in steep decline. More than ever, its citizens needed to assert their pride and outsiders were misnamed as peasants. Some kids would be more respectful when, at the end of that last primary year, Heck made it second in the overall ranking amidst high competition.

A choice had then to be made for the orientation of the secondary schooling, the so-called humanities (*humanités*, in French), a slot of six years following the kids from roughly the age of 12 to 18.

Heck chose the "Latin-Maths" branch, mixing classical and scientific education where he fared pretty well, especially in maths and other scientific matters. As to languages, he had got already some lessons of German in the last year of the primary curriculum, which turned out to be a welcome introduction to the full-blown teaching he had now with German as second language (French being called the first language). English became the third one from the third humanities year on.

The main ARV building (next to the Vesdre river) had been bombed during WWII and one wing was still unusable. With the affluence of pupils from the post-WWII generation, another distant school located on the city heights near Heusy had to be used for most of the tuition during the first humanities years. With the arrival of a new Director with good political connections, the money started coming in to refurbish the main building where all activities were ultimately gathered for the last years.



Fig. 4: Current view of the Athénée Royal de Verviers (ARV) where seven years were spent: the sixth and last year of primary education, followed by the six years of 'humanités', i.e. secondary studies. The picture shows only part of the front building that has several wings extending towards the rear until the river Vesdre. The monumental steps have been remodelled, obviously to avoid direct access onto the street. Memories from the place are mixed ones. Some kids from the city (then hosting a decaying textile industry – cf. the movie "Australia" with Jeremy Irons and Fanny Ardant) were snobbishly considering, sometimes verbally abusing, the young guy with good marks coming from the countryside. At that time, the Athénée was a boys-only school and employing only a couple of female teachers. Girls were educated in another equivalent establishment located elsewhere in the city and called Lycée Royal de Verviers. There were also a couple of secondary catholic schools in the city, run by clerics – quite a different universe!

The building basement was hosting a number of Ali Baba caves where all kinds of complementary activities could take place, such as woodcarving, molding, acting – either on stage or via puppets that the teenagers could learn how to make with their own hands. They could even help in constructing a real sailing boat. All these and other activities had been introduced in the curriculum to get the pupils out of their books during a few hours per week.

The gentleman in charge of the boat building, Georges Vanbreuse, was a somehow original physics teacher. Instead of treating the pupils like sponges, pouring things into their brains and then pressing them at the exams to check how much and how well they had absorbed the matters, his technique was rather to get those brains working and rolling on unusual themes through unconventional approaches. He also offered, during the complementary activities, a course on Esperanto, the international language. As this was part of a package with other activities in which Heck was primarily interested at the time (such as practicing declamation to fight some stuttering), he started following those Esperanto courses and quickly understood what he could make out of that language.

Remember the isolation of his birth place and the modest conditions of his parents. Travelling had been limited to the immediate vicinity, mostly to the next villages, first via public transport, then with the car his father decided to buy and learn how to drive the best he could in his mid-forties. Esperanto-speaking people round the world were organized in such a way that it was easy to correspond with them, something they were keen of, just because of their limited numbers. And this included the Eastern block as well as the Western one in those Cold War times.

So instead of physically travelling, Heck started doing it by mail, exchanging stamps, cigar rings and all kinds of things kids happen to collect at that age. The village postman could not believe all those letters with magnificent stamps he had suddenly to deliver, including coming from countries he had never heard of.

All this had a cost, of course, and Heck had to negociate with his thrifty parents how to finance that hobby. This was the start of an original holiday "business" that he would continue into the university studies to fund these: collecting bilberries and selling them to groceries and mainly pastry shops[13]. He would collect hundreds of kilos per season, an all-weather activity in that rainy and marshy region often infested by clouds of mosquitos, gadflies and all other kinds of nasty flies happily biting and stinging, when not simply overstressing with their permanent surrounding buzzing. Heck became an expert in repellents. Back home he had devised a system to efficiently remove leaves, damaged berries and other foreign bodies. His deliveries would be brought downtown to the buyers the next morning while he would go collecting another bunch, reaching several quintals per season. He still keeps as relics the combs he was using.

The money, his first money earned the hard way, would not only pay for the postage of his mailings round the world, but would also enable him to buy books, getting whatever he could find at affordable prices, especially from pocket editions.

[13]Although the season for collecting ripe bilberries conflicted partially with the first session of university exams. See Nath (2015b) for a detailed description of the activity. See also Fig. 5.



Fig. 5: Silver or golden tools: those combs were used for collecting bilberries during Summer holidays. The sales to groceries and pastry shops partially funded Heck's studies.

What he was reading had significantly changed: available biographies of world leaders and historical figures, introductions to philosophies and political ideologies of all kinds, books by great scientists including Einstein, even the three volumes of Charles de Gaulle's freshly published *War Memoirs*, on top of literature masterpieces from Hemingway to Chekhov.

Keeping the financial burden on his parents was a constant worry. No cent could be spend on disks or on other amusements most teenagers of his age were now having. No way to entertain a girlfriend either, something that was actually not quite fashionable yet in the local context. In the old tradition, his father would have liked, once the mandatory schooling period was over, his unique son find some job in order to improve the household income instead of digging into it. The mother was more in favor of letting the son continue studying as long as the results were satisfactory.

What was less satisfactory actually, was the increasing bickering between the parents on private issues, sometimes turning really violent and degrading dramatically the atmosphere at home – something Heck had to cope with the best he could in his loneliness. Ultimately the father would leave wife and son to live with another woman, when our biographee would be at the university. But before we reach that next slice of life, a couple of points should still be mentioned about the ARV time.

Some teachers of Latin or French had a tendency to consider those guys in the Latin-Maths cursus as lost sheep, showing a clear preference for the purely classical sections (Latin-Greek). Later on at the university, Heck would experience a similar attitude from pure mathematicians speaking ill of those they considered with dirty hands in applied maths. One teacher of French literature, a lover of the bottle near retirement, would really give a hard time to Heck and to some of his companions, being especially obnoxious and sometimes totally unfair, kind of punishing them for their scientific inclination.

He was fortunately replaced by Louis Comblain with a much more tolerant acception of life, understanding that people could have other tastes than French poetry while nevertheless enjoying writing properly about scientific themes, or simply about experiences from the everyday life. Thanks to that teacher who read aloud several of his compositions, Heck realized that he had a kind of gift to write in a way others would appreciate and that actually he loved shaping stories, something he had already done as a young kid with his puppet theater when inventing short plays for his village friends – a gift that the clumpsy earlier teachers of French had meanwhile anesthetized and almost killed.

The secondary studies corresponded also to the time Heck started to distance himself from catholicism that – more by tradition than by conviction – was the *de facto* religion of the village and the region. While at the primary school, Heck had been occasionally an altar server, essentially taking turns with other kids to assist the village priest at funerals or other special services. He had also – in line with the gullibility of the time – accumulated then so many plenary indulgences that he could be free from damnation for the rest of his life!

Being an establishment run by the State, ARV was totally neutral religion-wise, *i.e.* all religions and philosophies were accepted with separate religion courses for the main currents (or mandatory civic education for those who did not wish to attend the established religion classes).

If he was following the catholic courses at ARV, Heck was in fact, during the last years there and while his schoolmates were copying his maths homeworks, having endless discussions with the priest on the relationships between God and Science – a theme he would actually bring again among those of his prize-winning series of volumes *Organizations and Strategies in Astronomy*, half a century later [14].

The toleration of that *Abbé* Remacle had done more for the respect of his faith than stricter attitudes by other priests-teachers who were considering themselves as the exclusive holders of the Truth and who would be called integrists today. They were hitting hard the kids who would deviate from their line of thought, Heck included.

Religion was then a much less sensitive issue than it has become nowadays, but Heck always considered that the mixture of religions and philosophies at ARV made a superb melting pot, a school of tolerance and a forum of exchanges, preparing adequately future adults to confront other approaches of life and to build together a common future in a spirit of mutual understanding. And all those kids were calling themselves by family names rather than by first names that they found childish.

Each time it could be awarded to someone of his section (at the end of the third and sixth years), and to his authentic surprise, Heck received a prize (Victor Quoilin) in consideration of his general behavior towards his schoolmates.

Finally, if we want to assess what might have triggered Heck's interest in astronomy later on, it should be recalled that the space race materialized on 4 October 1957 with the launch of *Sputnik 1* by the USSR, just after Heck had joined ARV for his last primary-schooling year.

[14] See for instance Coyne (2004).



Fig. 6: EXPO 58, Brussels World's Fair, has been the first post-WWII "universal" exhibition. It turned out as a real hit with some 42M visitors between 17 April and 19 October 1958. Mockups of the first satellites launched by the USSR were on display in the country pavilion, such as Sputnik 3 pictured above.

The premières in space would steadily follow: first animal in space (USSR, 1957), first picture of the Earth from space (USA, 1959), first impact on the Moon (USSR, 1959), first pictures of the hidden side of the Moon (USSR, 1959), first return on Earth of a living animal (USSR, 1960), first manned spaceflight (USSR, 1961), first telecommunications satellite with television broadcast (USA, 1962), first woman in space (USSR, 1963), first team of two in space (USSR, 1964), etc. – just to mention of few of those that took place while Heck was studying at ARV. People started searching the starry skies for those new wandering heavenly bodies.

Heck could see mockups of soviet satellites at the USSR pavilion when visiting EXPO 58 in Brussels (Fig. 6) with his parents and a couple of their friends – quite an expedition for them and the furthest away from his village Heck had ever been by then [15]. Also dubbed Brussels World's Fair, that world exhibition remained in history through another spectacular popularization of science in the form of a 102m tall representation of a unit cell of an iron crystal magnified 165 billion times, the Atomium.

In those years, young people as well as adults were counting the points between the two superpowers racing for space, trying to guess what would be the next step. Mankind's eyes were looking outwards towards new horizons, far away towards the limits of the universe ...

[15] Even if he had already crossed a few times the nearby German border.

Liège

During his last year at ARV, Heck had been accumulating documentation on possible higher education tracks. He perused the programs from the various faculties at Liège University, a State-run establishment. He investigated other places, such as the Royal Military School [16] or the Free University of Brussels that was closer to his philosophical approach of critical thinking. In spite of his best marks and his easiness with maths, Heck was very much attracted by studying psychology, but he had mixed feeling about the mandatory biology courses and their practical exercices.

However it turned out quickly that, if Heck had to continue his studies at a university, his mother would impose the closest one geographically (Liège) and his father would insist on the safest track career-wise, which meant mathematics, leading logically four years later to a position as maths teacher in a secondary-schooling establishment somewhere in Belgium – and finally to an additional income for the household. The crucial accommodation issue in Liège would be solved not by staying at a university dormitory, but with the inhabitant at the lowest possible cost.

Thus Heck ended up in the attic of a house located in the upper part of one of the steepest streets (14%) of the city, on its Western hill, Cointe (Fig. 7). The street, *rue de Joie*, was then said to derive its name from the joy of couples walking down from the gallows up on the hill, the girl being generally a prostitute (*fille de joie*) together with the man she just saved from being hanged by offering to marry him. But today's historians relate the street name to a 15th-century gentleman, Nicolas Joye, who had an important property in the area.

The room [17] was simple and rough. The wallpaper was depressing. A screeching metallic bed and rudimentary furniture had seen better times, long ago. The heating was ensured by a coal stove, which required to leave permanently the window slightly open to avoid possible intoxication. There was no bathroom, Heck having to wash and shave at the sink in the toilet two floors down. The breakfast was served by the landlords, an old couple of immigrants. The gentleman from Poland was sick with silicosis as a retired pit worker and the lady from Czechoslovakia was making houseworks around after having sorted out for years the extracted material in local coal mines. They were charging at reasonable price the coal they were getting virtually for free, and it was certainly easier to bring it up from the house basement than to carry coal bags upstreet from a shop several blocks away.

The physical shape was naturally maintained by the long walks to the university campuses. But Heck added soon two swimming sessions weekly at the *Sauvenière* by getting up early and taking advantage of time slots with reduced entrance fees. This provided also access to good showers compensating for the rudimentary hygiene facilities he could get at his lodging.

[16] Heck's parents were renting a couple of rooms to city dwellers during the Summer and it so happened that, that specific year, relatives of a high-ranking officer were staying in the house and our biographee could talk at length with him.

[17] A student room with the inhabitant in Liège was called a *kot*.



Fig. 7: The first kot (student room by the inhabitant) of Heck in Liège was located in the attic of the house at the level of the car at the middle left of this picture taken on 02 September 2014. The appartment building on the right of that steep (14%) "rue de Joie" [Street of Joy] was built during Heck's first year there, causing much nuisance for a student used to the relative calm of his High-Plateaux village.

Securing the financial aspects of Heck's new life was paramount. Fees had to be paid here and there. Books, syllabuses and tutorials – either new or second-hand ones – had now to be bought, while earlier they were lent free of charge by the schools during the primary and secondary studies. Lots of notebooks and other accessories such as drawing equipment had to be acquired. Heck's Summer bilberries business alone could not finance a full year, far from that. Due to his modest conditions, a grant from the National Fund for Studies (*Fonds National des Études*) could be obtained and the University social service could provide tickets for free lunches at the university canteens. But the golden rule was to keep the spending to a strict minimum, in line with the old *Indispensable-Necessary-Superfluous* pragmatic trinity.

On Saturdays, in the late afternoon, he would take the train to Verviers and the bus to Jalhay with his cardboard suitcase carrying laundry to be cleaned and notebooks for doing some work the next morning. After a long walk in the forests on Sunday afternoon, breathing the pure air of his native High-Plateaux, he would take the bus to Verviers and the train back to Liège, carrying up the steep street his suitcase with clean laundry and often heavier with a few things brought from home. The winding railtrack following the Vesdre river between Liège and Verviers was electrified during Heck's student years. Completed in 1966, this was a lengthy undertaking given the many tunnels that needed to be heightened and properly reshaped for accommodating the overhead wires.



Fig. 8: The Guillemins main train station of Liège is shown here as it appeared in Heck's times as student and when working at IALg (top left) and under its now world-famous architecture due to Santiago Calatrava (bottom right).

Living in Liège had the advantage of taking him away from the always heavier atmosphere between his parents whose discussions had been turning increasingly violent. He could witness the continually degrading situation when visiting home on weekends. The mother threatened to kill herself several times, making several impressive attempts, fortunately more demonstrative than efficient. All in all, she did nothing to restrain her husband for trying to find elsewhere what he was looking for, quite the opposite. She ruined her health and made indelible marks on her son who had to unhang her and to pull her away from the edge of the house well several times. Heck used to say that those events, plus the fact he had to ensure financial autonomy from the age of about 18, brought him straight from boyhood to adulthood, skipping adolescence.

If this and the numerous novelties to which he had to tune himself in his new life were not enough, he was confronted to another kind of nuisances: the property right in front of his *kot* window was excavated and a large apartment building started to take shape. The noise was such that it was impossible to work in his room during the day. At that time the university buildings were not offering quiet places where students could work. And happened what had to happen: Heck did not succeed all his exams at the end of the first year, a fate shared by many, but this was no solace.

Like a number of fellow students he had befriended, Heck decided to repeat that first year. The time spent had not be vain: he had learned how to organize himself and how to work properly and progressively. Some of the courses had received new professors, a couple of them coming straight back from the States.



Fig. 9: The Liège Institute of Mathematics, located on the Val Benoît campus, is visible from the South in this picture from a 1964 inauguration document, the same year Heck started his University studies. Most lectures were attended in that building. Its lower wing was mainly housing auditoriums, as well as, in its basement, the university computer center where our biographee spent many nights for completing his PhD thesis and papers when working at the Institute of Astrophysics on the Cointe plateau. The tower housed the offices of the various departments. The building was sold in the last decade of the 20th century when the university transferred progressively its sections to the Sart Tilman campus.

Their way of presenting things suited better Heck's own approach of the matters. The appartment building in front of his *kot* was now completed and the surroundings were significantly quieter. He and his friends interacted in a much more mature way with the professors and their assistants. They knew that now they absolutely had to succeed all exams or to foresake the idea of getting a university degree in maths.

The financial situation however was critical. The failure at the end of the first year meant that the grant from the National Fund for Studies could not be renewed. Even if the expenses were lower because a number of books could be re-used, the everyday life had to be funded. Heck negociated a loan with the university social service: if he was going to be successful at the end of the year, he could keep half of the money; if he was also successful the following year, then he would have nothing to pay back. This is actually what happened more than satisfactorily. A couple of small subventions from private foundations eased also the overall finances.

On the contrary, the situation did not improve at home. It was obvious that the father could not stand his wife anymore and the warnings Heck was getting from neighbors during the weekend visits at home were increasingly worrying. Heck learned one day that his mother was now in a nursing home in Bilzen, 30km North of Liège in Dutch-speaking territory where she would receive a quieting treatment against the dreadful state in which she was now.

At least this was what the father had convinced physicians to do. With his son studying in Liège and his wife placed in the nursing home, he could now lead the life he wanted. Every other Sunday, he would collect the son at his *kot* and they would pay a visit to the mother. The nursing home was for women only, women with all sorts of psychiatric troubles. Heck's mother was called "the kind one" as she was appreciated by both the other patients and the personnel. Her ailment was mild compared to most cases dealt with there.

At that nursing home, Heck could get a taste of what could be the human distress with screams and disturbed behaviors sometimes so violent that the agitated women would have to be isolated in locked rooms. It was clear that this was not the place for his mother. Taking advantage of upcoming holidays, he decided to bring her back to her home and to confront his father about the issue with some assistance from a girlfriend.

In order to enjoy the life he wanted, the father did not come back home one evening in February 1967, nor the following ones. The next Saturday evening at Verviers central train station, the father met his son on his way home for the weekend. The discussion was brief. He would not change his mind and refused also to pay for a coat the son needed in that harsh Winter weather. They never talked to each other again. The father had made a choice. The son would make his. In spite of scenes he could not forget during the previous years, he sided with his mother, as this was definitely a matter of survival for her, ensuring her psychic fragility could find some comfort – for the moment – in the success of his studies.

At least now the situation had been clarified, albeit far from blooming financially. But there would be no violent discussions, no direct verbal abuses anymore, no desperate actions from the mother. The story between the parents became a classical one of separation leading ultimately to a divorce, with the sale of the common house, not to forget the mean tricks from the father against his ex-wife such as not paying regularly the alimonies he had been condemned to by a judge.

The University Studies

We devoted some space to the context of Heck's first university years to show how he had to find the discrete strength to handle those difficulties and to put them in perspective – the best way he could – in order to remain focussed and to be able to move forward. It is now time we say a few words on the curriculum and about the university life itself.

The studies were organized along four years: two called *candidatures*, followed by other two called *licences*. In practice, the *candidatures* were leading nowhere although some gateways could be devised with so-called *normal schools* producing the teachers for the primary schooling. The outcome of the *licences* was a degree equivalent to today's Master of Mathematics. It was needed for teaching in the secondary schooling system, and it had to be seconded by another degree, the *Agrégation de l'Enseignement Secondaire* (Master of Education) that students were generally securing in parallel during the second *licence* year.



Fig. 10: The main (administrative) building of Liège University is visible at the center of this picture. Courses of physics and chemistry were given in the building right of it, plus some other lectures at the Institute of Zoology, the neoclassical building visible across the river Meuse towards the right edge of the picture. Outremeuse, the birth place of the writer Georges Simenon, is the quarter beyond the river, flowing right to left.

All the courses during the *candidatures* were mandatory and several were shared with the students in physics and some with the students in chemistry too. The post-WWII baby boom was propagating through the university classes. The auditoriums had never been so crowded, with many students sitting on the stairs. It was obvious that most would not make it to the second year. A significant change from the earlier boys-only primary and secondary studies: there were numerous girls, even majoritarian in maths. Fortunately, in the good Belgian egalitarian way, there were no prejudices in a sense or another.

The professors had all their personalities, some excellent pedagogues, others just repeating aloud what could be found in their syllabuses. The terror during the two first years was impersonated by Henri-Georges Garnir (1921-1985), in charge of the most important course: mathematical analysis. He was brilliant, excellent teacher, and his exposés were full of puns and jokes while being absolutely rigorous. His requirements were strong and merciless. His green, red and grey books (Garnir 1963 & 1965, Garnir & Gobert 1965), splendidly printed and bound, were bibles to be known and understood thoroughly. His squad of assistants, some of them freshly graduated, were maintaining the pressure, but, at the same time, were always ready to spend time with querrying or arguing students, who – very seldomly – could find a crack in a reasoning.

Heck has missed the entrance key to the course during his first year. The story was quite different when he repeated it, scoring the best marks, also the following year. Given the disappointment of Garnir's team members when they learned Heck was going towards astronomy, it is quite possible they were hoping he would join them later on. They barely talked to him anymore ...

The physics courses by Henri Sauvenier were also quite interesting, with a lot of experiments. While most courses were taking place at the Institute of Mathematics on the Val Benoît campus in the Southern part of the city (Fig. 9), the physics lessons and practical exercices were held at the central group of university buildings, right downtown Liège (Fig. 10). The time between courses here and there was sometimes barely enough to commute. The so-called *Tram Vert* (Green Streetcar), the only remaining streetcar line in Liège, was then literally assaulted by hords of students. The panicked controller often did not dare checking the tickets. Most of the time, he was simply unable to move around. Records have probably been beaten on those trips as to the number of people the streetcars could accommodate.

It was often more practical – and healthier – to walk fast the couple of kilometers between the premises, something Heck often did with his good friend Pierre Houbart when the weather allowed it, frequently arriving before the streetcar throng. When they were delayed by traffic lights or other obstacles, their problem was to find a seat in an already packed auditorium.

Houbart also quickly transformed in recitals the practical exercices of the descriptive geometry courses that were taking place in a spacious drawing room. He had taken up a passion for singing and was quite good at it with a broad repertory. He did not always see the chief assistant coming in his back to calm him down. As the tables were manned alphabetically, Houbart, also a repeater of the first year, was standing at Heck's right while on his left was Léon Hauregard, a successful rookie who had also graduated from ARV. The three became good pals and would share many walks led by Heck through the marshy High-Plateaux (Fig. 14), sometimes at night, just for fun, or even weirder at night with the snow in Winter, starting or ending in Germany. Heck also undertook with Houbart a number of climbs in the Bavarian and Austrian Alps during Summer holidays.

A course of astronomy and geodesy was part of the second candidature program. The lecturer, Léo Houziaux, had a magnificent idea: the first lesson was fully devoted to a slide show with the most beautiful astronomy pictures, quite a few of them taken with the largest telescope of the time, the 200-inch reflector on Mount Palomar. The subsequent course itself was definitely less attractive with pages and pages full of equations of all kinds, for instance to explain coordinate systems and how to switch from one to another. Heck studied it only a couple of days before the oral exam, entered the last one in the exam room and was the first one to get out with a high mark. He did not really expect that. And obviously Houziaux was pleased.

The slide show had triggered something else. In spite of his financial constraints, Heck started buying astronomy books. He still has some of them today: a voluminous updated edition of Flammarion's *Astronomie Populaire* (1955), a translation by Meeus of De Vries & Ernst's *Encyclopédie de l'Univers* (1960) with about half of the volume



Fig. 11: A course of astronomy and geodesy was part of the second 'candidature' program at Liège University for the students following the maths and physics curriculum. The lecturer, Léo Houziaux, devoted the first lecture to a slide show with the most beautiful celestial pictures of the time. This picture of the Orion Nebula (M42/NGC1976) taken in 1959 with the 200-inch telescope on Mount Palomar was part of the show.

made of full-page pictures, and the thick volume on astronomy in *La Pléiade* collection (1962). More reference volumes would follow later on, some of them found with the help of Georges Vanbreuse's daughter, Rita, who was holding a bookshop in Verviers, *Le Fil d'Ariane*. Before falling asleep in his screetching metallic bed in his depressing *kot*, Heck would, evening after evening, read a few pages of those volumes. Those cosmic escapades were also serene moments helping to put in perspective his own problems. While his family was collapsing, everything up there was moving and evolving impervious to difficulties of humans on their little dust grain lost in space ...

A change was actually in the making for his lodging in Liège. The old couple of miners had a girl who had married a Polish expat living in the US and who was a helicopter pilot in the US army. The Viet Nam War was raging. To avoid he be sent in Southeast Asia, they were using family reasons (remember the old man was ill with silicosis) to obtain his transfer to an American base in Germany. They were successful and this ultimately meant that Heck's room was going to be needed for accommodating the family's girl as she was going to stay with her parents. But she recently had a baby. Both actually arrived during the exams, with the baby crying all nights long because of the time difference, change of context, and whatever else. Heck almost failed the last exams for sleep deprivation, but overall succeeded with a good mark.

For the reader unaware of the Belgian university system of the time, at least the one in practice at the Faculty of Sciences of Liège University, detailed ratings from the exams were not released. A deliberation was taking place between the professors at the end of the session, each coming with his/her appreciation of the individual students. A final decision would only be known: success or not. In case of a success, a "grade" could be granted. Heck got a grade at the end of each successful year.

Back to the *kot* story, Heck looked for a new residence during the Summer and found a convenient one, again in a steep street escaladating the hill of Cointe (*rue Saint-Maur*), but closer to the Val-Benoît campus and to the train station. Now free from the constraints set earlier by his father, he could choose whatever *kot* he thought more appropriate, even if more expensive. The house was more recent, the room at the first floor was larger and much nicer, better furnished, with in-room washing facilities and a toilet nearby. The recently widowed landlord was a retired police inspector from the vice squad. Heck knew quickly all the details about the night life, the prostitute regulations and the handling of the city brothel rows. The two last years as student, the *licences*, were spent from that base.

The specialization was taking place – towards astronomy for our biographee – during those years. Léo Houziaux was teaching there again, now with a much more sexy course: an introduction to astrophysics. There was also Paul Ledoux whose reputation as excellent teacher and for being a fair, patient and thorough examiner had preceded his first contact with the students. André Monfils was giving a course on astronomy-related activities in space. Most of those professors and their assistants had spent time in the US and were frequently visiting institutions abroad.

The Institute of Astrophysics on the *Plateau de Cointe* where those courses were taking place was welcoming many foreign visitors, including Nobel Laureates. Some people were involved with experiments on the TD1 satellite, on rockets launched from Kiruna in Sweden or hanging from balloons released from Palestine in Texas. A couple of scientists were virtually living at the Junfraujoch Observatory in Switzerland. Observers from Liège Institute of Astrophysics were carrying out their programs at various places round the world. The Institute was obviously dynamic and with an international notoriety.

The space race premières had multiplied during Heck's university studies: first team in orbit (USSR, 1964), first spacewalk (USSR, 1965), first Mars flyby (USA, 1965), first orbital rendezvous (USA, 1965), first Moon landing (USSR, 1966), first impact on Venus (USSR, 1966), first in-orbit docking (USA, 1966), first Moon orbiting (USSR, 1966), first Moon orbiting by a manned spacecraft (USA, 1968), first in-orbit crew exchange (USSR, 1969), first man on the Moon (USA, 1969), ...

Beyond those achievements and accompanying dramatic images, recent astronomy discoveries were also making their way to the auditoriums.

For instance, the quasars, star-like radio sources discovered in the late 1950s, were interpreted by Maarten Schmidt as active distant galaxies; the cosmic microwave background radiation had been accidently discovered by Arno Penzias and Robert Wilson in the early 1960s; and the first pulsar had been discovered in late 1967 by Jocelyn Bell and Antony Hewish. Astronomy was a modern living science with appealing promises



Fig. 12: Excellent music for pennyless students was available at the city 'Conservatoire' through reduced-price tickets from the university social service. The best soloists of the time were performing with an orchestra directed by Manuel Rosenthal and later by Paul Strauss. Sound-and-lights shows on the 1500m^2 glass wall of the local 'Palais des Congrès' and nearby 'Tour Spatiodynamique Cybernétique' (right) were the introduction to more modern compositions such as those from Karlheinz Stockhausen.

for the future. Being part of it would certainly be more exciting than teaching maths in a secondary-schooling establishment.

In late April 1968, Houziaux organized a trip across the German border to Hoher List Observatory (depending from the University of Bonn) for a few of his students and collaborators. For the students, this was a first and not-to-be-missed opportunity to witness live observing at an active observatory. They visited the various facilities and were briefed by the astronomers on duty that evening: Waltraut Seitter (cf. p. 295), Wilhelm Seggewiss, Edward Geyer, and others. This was much more interesting than the daylight visit of Uccle Royal Observatory near Brussels organized yearly.

Heck was enjoying all those astronomy-related courses and activities. Ledoux's style of teaching consisted in asking many questions to his audience. From his readings, Heck could answer most of those questions, but had to refrain himself in order to leave some room to his classmates, often to no avail. But the curriculum also contained those mandatory big courses, including one on mathematical analysis by an aged renowned scientist, albeit very poor pedagogue. A pleiad of small mandatory courses (such as philosophy) had also to be coped with, leading to a dispersion and a waste of energy. The few hours devoted to those matters were insufficient to fully apprehend them, yet enough for not being able to dismiss them.

As far as languages were concerned, Heck took on learning Russian through the unrivaled book by Nina Potapova (1961), completing it with evening courses at the university central building.

This at least allowed him to be able to read scientific publications in Russian. Accessorily he ended up giving a few private maths lessons to the son of the Russian teacher, a welcome income.

Completing the *licence* required also the presentation of a memoir. The students had little influence, if any, on the subject and on the assistant professor they would be working with in order to put together that memoir. Heck was not particularly lucky neither with the theme of the memoir (Apsidal Motion and Internal Structure of Stars[18] – see Fig. 220), nor with the person he had to work with.

Thus that first contact with astronomy research told him that it could be far away from the beautiful deep-sky images or the general properties of celestial objects conditioning cosmic perceptions. The many hours he had to stay sitting next to that assistant professor waiting for an outcome of the gentleman's ponderings while he was rolling a piece of paper between thumb and index, those many hours made him doubt about having a future in professional astronomy if it had to turn out that way.

But that memoir gave birth to a number of small publications in the subsequent years on the internal structure of stars and mass exchange in double stars (Publ. 132, 134, 141 & 142).

Before closing this chapter, a few words are in order about the second degree Heck obtained in parallel, the Master of Education. It implied following a reasonable load of additional small courses and going through a number of practical exercices before a final exam in front of a real class of teenagers. Heck took this opportunity to pay a visit to his former teachers of mathematics at ARV and to follow a couple of their lessons. Henri Xhonneux was especially pleased to see him sitting again in his classes, now in the back while he used to sit in the front row a few years earlier.

But the real things were taking place at the equivalent school in Liège, the *Athénée Royal de Liège (ARL)*. And a lot would be depending of the classes faced. If the kids did not like the teacher-to-be, they could ruin easily the whole exercice. Panicking candidates could either collapse or try to exert excessive domination. Beyond the knowledge of the matter taught and its clear exposé, the key resided in a tactful handling of the situations, between sufficient authority and respect of the pupils, especially the less gifted. Heck must have been good at it since, at the beginning of the final and decisive lesson with the examiners attending, the shop steward of the class, while passing next to Heck, whispered in his ear that all the kids were "with him". What a boost for a young man barely five or six years older than his pupils!

Thus, on 15 & 18 July 1969 respectively, Heck was bestowed two degrees from Liège University, the Master of Mathematics and the Master of Education, both with a "grade" (cf. Fig. 201 & 202). He would be mentioned to subsequent student generations as an example of someone who completed brilliantly his studies after repeating the first year. Heck would follow more courses and obtain additional degrees and certificates from Liège University, but then as an active scientist.

[18] Original title in French: Mouvement apsidal et structue interne des étoiles.



Fig. 13: Aerial view of "Cointe Observatory" showing the old building with its three towers, the meridian room with its white roof, the modern wing and the annexes in the gardens. The house on the street is the concierge unit. Professional astronomers have now vacated the place with the transfer of IALg to the Sart Tilman university campus in 2002.



Fig. 14: With his university pals Pierre Houbart (left) and Léon Hauregard (right) during one of their regular hikes through the Hautes-Fagnes (11 June 1972).



Fig. 15: This cover was issued to commemorate the 150th anniversary of the founding of Liège University (French-speaking). Another university, in Ghent (Dutch-speaking), was also founded in 1817 when Belgium was under Dutch rule. Both were run by the Belgian Ministry of Education at the time of our story. There were then two other major universities in Belgium: Louvain founded in 1425 (Catholic, first university in the Low Countries) and Brussels founded in 1834 ("free", in other terms independent from State and Church). A Dutch-speaking offspring of the latter was formed in 1970 while a French-speaking component for Louvain took its quarters in 1968 in Louvain-la-Neuve.

Liège Institute of Astrophysics

On 4 July 1969, a telegram was delivered in the late afternoon at Heck's *kot* (Fig. 16): Liège University Rector Marcel Dubuisson was informing our biographee of his appointment as Junior Research Associate (*Stagiaire de Recherches*) by the Belgian National Fund for Scientific Research (FNRS), starting next October at the Institute of Astrophysics (IALg) in the group of Paul Ledoux (Fig. 17).

This can be considered as the official start of Heck's career as professional astronomer. It would end 45 years later, on his birthday in 2014, as Exceptional-Class Astronomer at Strasbourg Observatory, after being based in various countries. This chapter is covering the period when Heck was officially affiliated to Liège Institute of Astrophysics.

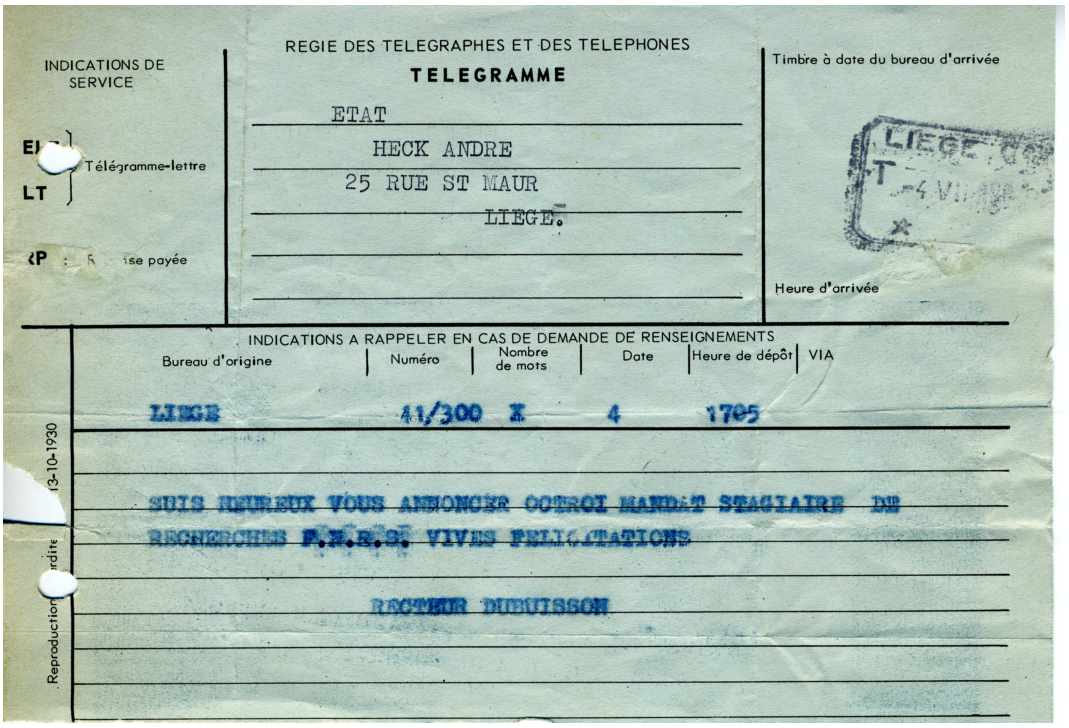


Fig. 16: Telegram received on 04 July 1969 from Marcel Dubuisson, Rector of Liège University, notifying Heck's first professional hiring as Junior Research Associate of the Belgian National Fund for Scientific Research.

Students have all kinds of wrong ideas about the job profile of scientists working at universities and, first of all, on how they got their position. This is even more complicated if people with different statuses are mixed within one group (*service*). At Liège University, a *service* was headed by a Professor. It could be made – by decreasing seniority – of Associate Professors (*Professeur Associés*), Lecturers (*Chargés de cours*), Chief Assistant Professors (*Chefs de Travaux*), and certainly Assistant Professors (*Assistants*), all hired by recommendation of the boss.

Other scientists could be part of the group, on positions funded by various foundations, the most important one in Belgium being FNRS as far as astronomy was concerned. Contracts with agencies and the industry could also provide finances for hiring people on specific projects, especially space-related ones. Some discretionary money, generally provided by the university, also allowed heads of *services* to hire helpers, including so-called students-assistants on modest allowances.

Heck having graduated in the maths pipeline with a specialization in astronomy, the established system wanted him to be logically associated with the theoretical side of that science. In practice, at Liège University, this meant the group of Paul Ledoux.

Being more interested in research activities than in teaching (in spite of his Master of Education), Heck had investigated how to obtain an FNRS position, approached Ledoux thereabout, applied, informed the other members of the national selecting commission and hoped for the best, not knowing exactly how the decision would be taken. He was successful and obtained that Junior Research Associate position, a one-year grant, the first step for a possible career at FNRS. He was given an individual small office on IALg ground floor, opening into one of the library rooms and right under Ledoux's office on the first floor (Fig. 18). Their windows would be often the only ones lighted at night in the upcoming years.

Now that the studies were completed, the situation regarding the compulsory military service had to be clarified. Like most male university students and in line with the practice of the time, Heck had been granted a military deferment for the time of his studies. In principle he had no problem with serving in the army. He had been playing soldiers all his youth with the village kids and he had even considered entering the Royal Military School instead of going to a university. But, as he grew up, Heck had increasingly taken conscience of the world miseries.

His father had a stepbrother living with his wife and sister-in-law in a farm located in Raeren-Weck and touching the German border. The family links were cut in the 1960s, but Heck retained some strong kid memories from the early 1950s there: crippled German men (quite likely soldiers having survived WWII carnage) visiting the farm, taking off their artificial limbs, filling them with coffee beans, wearing them again and, with their precious load, walking back to Germany on their crutches along a field path while trying to avoid customs patrols. Controls were strict at that time and nobody was allowed to cross the border without being thoroughly checked. Yes, those guys were smugglers, but nobody could be offended that they would take advantage of lower prices in a neighboring country, especially because all these people across the border certainly knew each other before the war.

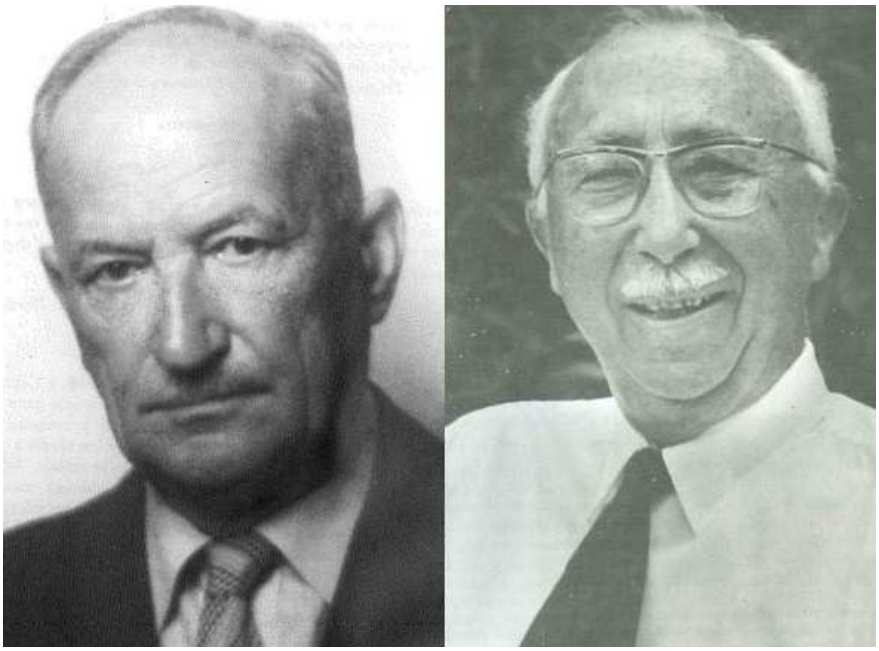


Fig. 17: Paul Ledoux (1914-1988, left) and Pol Swings (1906-1983) were Heck's bosses at Liège Institute of Astrophysics, in 1969-1970 and 1970-1975 respectively.

Heck remembered also seeing lots of ruins, especially in nearby Aachen, and walls heavily marked by impacts of firing or shelling. The fierce battle of the Hürtgen Forest had taken place not far away. The Battle of the Bulge had been raging South of his native village towards the end of the conflict. The stepuncle, a gendarme, had spent all WWII in an attic, hidden by a relative in Verviers to avoid being conscripted against his will or simply being shot by the Nazis.

Heck had also read a lot of war stories from both actors and victims. He believed that human catastrophies such as what happened in Hiroshima and Nagasaki – barely more than one year before his birth – should be avoided whenever possible.

Through his own painful family experiences, he had also touched human grief and felt how people could dramatically need assistance and comfort. All in all, Heck decided he would prefer spending time learning how to care for his fellowmen than being trained at killing them. He discovered that the Belgian laws actually allowed that.

The duration of the Belgian military service was 15 months in the country or only one year if served in the zone occupied by Belgium in Germany. But there was also the possibility to carry out a civil service instead, lasting two years, by helping in hospitals, nursing homes or serving in disaster and emergency services. There was also the option of working as a volunteer overseas.

Because of his mother's status, Heck preferred staying in Belgium. To enter civil service, he had to be recognized as conscientious objector for which he had to collect testimonies certifying the sincerity of his approach. This was his first "military trial" that granted him the status without difficulty while he was still a student.

In view of the separation and ongoing divorce procedure between his parents, a second "trial" waved totally his need to serve, whatever be the way to do it. The high-rank officers manning the military court ruled that Heck was more useful to the country by carrying out research activities. Strangely enough, all military certificates delivered later on bore the mention "has satisfied the military obligations" or even "has completed his military service".

As far as lodging was concerned, Heck had to move again. When coming back from a Summer climbing session in the Bavarian Alps with his pal Houbart, Heck heard of the unexpected death of the retired vice squad inspector from the *rue Saint-Maur*. He was buried already and the children wanted Heck cleared the room he occupied in the house as soon as possible, in spite of the fact he had already paid the rent for the full Summer.

Now that he was going to earn a real salary, Heck could improve again his accommodation. He found a nice room on the top floor of a house *rue du Chéra*, on the Cointe plateau itself, a stone throw from IALg. Three "students" were sharing the floor, including a kitchen-toilet (*sic*). Heck's room was the largest one, used as common dining room. It was looking towards the rear of the house, away from the street noise, and with vistas far away over the city and beyond the valley of the Meuse river. Heck was actually going to observe soon Comet Bennett 1970 II/1969i[19] right from his very bed.

To complete his training, Heck registered for third-cycle certificates in general astrophysics and celestial mechanics. During the Summer holidays, he had absorbed McCracken's (1965) book on Fortran programming as it was obvious that language was going to be of an intensive usage. A couple of technical books from Schaum's Publishing completed his Summer readings.

He was by far not the only one to be hired at IALg that year. Somehow the post-WWII baby boom was rippling through, helped of course by the affluence of money for fundamental research in what was still the golden sixties in the middle of the Cold War[20]. Six newcomers rejuvenated the personnel. Two of them, perhaps resenting Heck's firmer position, were continually playing college-level jokes at him with tricks such as sticking all kinds of things on his door. They would leave soon.

Quite different was the attitude of Jean Manfroid who showed up one day in Heck's office wondering about the usage of the hybrid Schmidt telescope housed in the Eastern tower of the building. This was the beginning of a series of collaborations on various matters spanning decades while the two scientists would follow separate careers from different locations. At that time, Manfroid was living on a grant from Belgian National Committee for the International Geophysical Cooperation (CNBCGI) followed by a income as student-assistant, before initiating a full career at FNRS. He would also spend two years at the European Southern Observatory (ESO) in Chile, and subsequently more time at ESO Headquarters, then in Geneva.

[19] C/1969 Y1 in current nomenclature.

[20] "Give them some money: whatever they could find might be useful one day," was a common saying of the time.



Fig. 18: The Institute of Astrophysics of Liège University (IALg) was located on the Cointe plateau, the top of a hill in a curve of the river Meuse, Southwest of the city center. The place was commonly called Cointe Observatory, but no professional observing was carried from its towers anymore, be it only because of active blast furnaces at the bottom of the hill. Heck's office window was the lower left one in the central module during virtually all his stay at IALg.

Heck's parents had made an exceptional trip to Liège when he was in his teens. The parents were mainly interested in visiting the famous open market taking place on Sundays along the *quai de la Batte*, but they also went up the hill of Cointe hoping to visit the 75m-high Inter-Allied War Memorial located there. As it was closed, they wandered a bit around and stumbled against the gate of a medieval-looking building with towers that seemed weird to them. They did not realize what it was and, of course, Heck could not imagine he would be based there later on for a few years.

The ancient IALg building visible in Fig. 18 was boasting three towers and a meridian room (under the semi-cylindrical roof visible on the right of the picture). The platform of the central tower supported a couple of meteorological instruments. The dome of the Western tower (left tower on the picture) harbored an equatorial table to which instruments were provisionally attached for tests before being shipped to their final destination. As seen on the aerial picture (Fig. 13), on the left and in the back of the ancient building was located a more modern wing with auditorium, meeting room, offices, labs and a large mechanical workshop. Two separate annexes were also installed in the gardens with offices, small auditoriums and labs, the larger one hosting a vacuum tank essentially used for calibrating spacefaring equipment.

An unusual telescope inhabited the Eastern tower: its 62cm spherical mirror and 43cm correcting lens shaped it as a Schmidt telescope with a field of roughly $5°40'$. Adding mirrors could transform it into a Schmidt-Newton and even as a spectroscopic instrument. Heck and Manfroid would spend numerous nights in the Eastern tower – and up and down the long spiral staircase to develop films in the institute basement – trying to get something out of that instrument, the usage of which turned out to be most awkward. They started an observation log, the only one known for that instrument. It is listing no more than fifty plates dated from 1970 and 1971, with Image 1 being the field of η UMa taken in the night 11/12 February 1970[21].

Those nights were for Heck exciting applications of the instrumental theory learned from the university courses and the other books he had absorbed. In comparison, investigating stellar secular stability, suggested as a research slot by his boss, was much less palatable. Ledoux was even far away for a long stay in the US. In a premonitory connection with one of his later fields of interest, Heck started exploring SDI, the Selective Dissemination of Information (cf. Publ. 137). With an IALg colleague, he visited on 12-13 May 1970 the CNRS documentation service, staying for a couple of nights in one of the guest rooms at Paris Institute of Astrophysics. He wrote to his boss still in the US about setting up an astronomy-oriented SDI service at Cointe, but Ledoux was not interested.

When came the time to apply for an extension of the FNRS appointment, his boss explained that unfortunately he had to make a choice and felt obliged to back another person who had also requested his support. Ledoux added that Heck "would always be able to manage life on [his] own". A poisoned compliment if one at all!

Heck spotted a vacancy at Laborelec, the research lab of the Belgian electrical industry. He applied for it, was interviewed, passed a couple of tests and was offered the job. Back in 1970, the problematics there was already to investigate how what was coming out of the smokestacks of thermal power stations could pollute regions sometimes far away, and how this could be modelled taking into account seasonal atmospheric conditions – a first step towards improvement.

But the day he was going to sign the Laborelec contract, Heck was called to Pol Swings' office.

Joining Pol Swings' Group

There were then three major components at IALg: the observational one headed by Swings, the theoretical one headed by Ledoux and a spectroscopic one headed by Marcel Migeotte. Swings' *service* was by far the largest one, encompassing also the space group. Swings (Fig. 17) had been instrumental in putting IALg as a center of excellence on the world scene and the other *services* were in fact his own creation, Ledoux and Migeotte

[21] See Manfroid (2010) for a history of that instrument and to Houziaux (1981) for a more general paper on IALg.

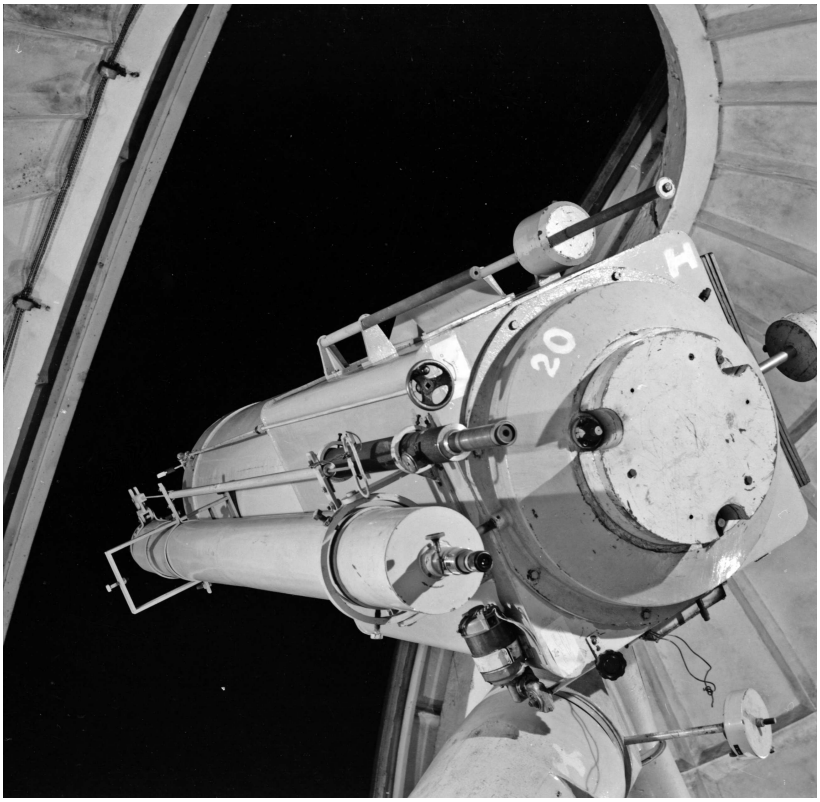


Fig. 19: "Désiré", the hybrid Schmidt telescope at Liège Institute of Astrophysics, is shown here in a picture taken by J. Manfroid at the beginning of the 1970s.

having been members of Swings' *service* before being independent full professors[22]. At the time of our story, Swings was turning 64, suffering bouts of Parkinson's disease forcing him regularly to Switzerland for treatment, but he was still quite active and dynamic. He had been President of the International Astronomical Union (IAU) from 1964 to 1967.

After asking Heck about his situation and plans, he was direct: "Would you like to be part of my group as Assistant Professor? Your first assignment will be to dismount and to repatriate the meridian instrument we lent to the French and currently in the Pyrenees. Your contact will be Jacques Lévy at Paris Observatory. And while there, look for a PhD supervisor. Lévy mentioned a recently graduated young man with whom you should be able to work." This was generous and most appealing. Things turned out even much sexier when Swings explained that before all that, Heck and Manfroid would be sent in September to Haute Provence Observatory (OHP) for a stint at the Big Schmidt telescope jointly operated by IALg and CNRS. And even before that, the two would attend in August, like many scientists from IALg, the XIVth IAU General Assembly that was going to be held at the University of Sussex.

[22]See for instance the biographies published by the Belgian Royal Academy for Ledoux (Houziaux 1999), Migeotte (Biémont 2001) and Swings (Houziaux 2003).

The Laborelec contract was never signed.

Thus on 17 August 1970, a rocky hovercraft "flight" took the young scientists from Calais to the white cliffs of Dover. Most faces became dark green during the crossing over a particularly rough Channel. That XIV$^{\rm th}$ IAU General Assembly was officially declared open on 18 August 1970 by a freshly appointed Secretary of State for Education and Science who was going to stay in History as the Iron Lady after three terms as British Prime Minister (1979-1990): Margaret Thatcher (1925-2013).

For Heck, this was the first of a number of those triennial astronomical high masses. This was still a modest one with only 2300 attendees[23]. Many big names to put a face on, many meetings in parallel sessions, many features to be discovered and to get tuned to for someone just starting in the field. The last issue of the *Assembly Times* daily contained a short text on communication written by Heck in collaboration with Michel Hénon. This was his first note in English (see Publ. 133 on p. 415). During his studies, Heck had already published a few public outreach papers here and there, including in university outlets, about astronomy, maths, as well as on communication issues[24].

Barely back from England, Heck and Manfroid packed again, this time heading for Haute Provence Observatory (OHP) near Forcalquier in Southern France. A first train brought them to Paris where they had to switch stations from *Gare du Nord* to *Gare de Lyon*. After a dinner at *Le Train Bleu* in this latter station, a night train brought them in Avignon the next morning. The line bus to Forcalquier dropped them at the Lincel stop where an OHP car showed up shortly afterwards. Everything had been arranged by telex from Liège.

The OHP car left them at what was called the *Gîte Liégeois*, a modest lodging, half a bungalow made of a couple of sleeping rooms, a kitchen-living room and a shower-toilet. They would be using it regularly in the following years. For the time being, they could only rely on their feet to cover the distance between the village and OHP, some 2.5-3.5km, depending on the exact destination within the observatory domain. If this was pleasant enough in the afternoon by fair weather[25], this was less enjoyable at dawn after a full night of work. So our young scientists, after walking up to OHP and checking the overall situation, walked all the way back to the Lincel stop, took the bus to Avignon and rented a Hertz car (Fig. 20) with which they could move around much more easily during their stay, exploring also a bit the area. They took the opportunity to drive down to the Mediterranean Sea, the furthest South Heck has been travelling so far.

The Big Schmidt telescope, operated jointly by IALg and CNRS at OHP, has been described by Heck in various papers (see *e.g.* Publ. 586 & 589). It had become fully operational in May 1970. With an 85cm spherical mirror and a 60cm corrective lens, it recorded 5° fields on 17.5cm circular films. It could also be used for objective-prism spectroscopy by adding a 60cm prism (6° angle) to the corrective lens. This was quite another machine than Cointe's Désiré!

[23] More than 3000 participants attended the XXIX$^{\rm th}$ IAU GA in Hawaii (03-14 August 2015).
[24] See the Public Outreach Papers section (pp. 453ff).
[25] Optical astronomers are not observing when it rains.



Fig. 20: Very first observing run at Haute Provence Observatory (France) with Jean Manfroid (9-27 September 1970) at the IALg-CNRS Big Schmidt telescope. This Fiat 850 was a Hertz rental car, needed to move between the IALg bungalow in the village (Saint-Michel-l'Observatoire) and the Observatory, but also used for some exploration of the countryside.

Visiting the various OHP domes was an opportunity to make oneself familiar with the various instruments and to meet French astronomers – more names and faces. Heck and Manfroid were shown around and introduced by a prestigious guide: Pol Swings himself happened then to pay a visit to his friend Charles Fehrenbach, the OHP Director. On the return trip at the end of their stay, Heck and Manfroid gave a lift till Avignon to Giusa Cayrel, squeezed with the suitcases at the rear of the small Fiat 850 that had virtually no boot. "You saved my life!", repeated Cayrel, so happy to be able to catch her train back to Paris.

Over the next years, Heck returned regularly to OHP, taking his turn of service at the Big Schmidt. Being a photographic instrument, it was used only during half a lunar month, centered on the New Moon, and this time was split equally between IALg and CNRS users. The Liège program was essentially to track the known comets with an ingenious system allowing to follow them while pointing a star, leading to stellar trails on the plates, but neat images of the comets-targets (see *e.g.* Publ. 598 & 607). As we shall see hereafter (p. 50), Heck discovered a comet with that telescope. The instrument technology evolved over time. The guiding system was upgraded. Films were replaced by glass plates. Heck was also the first observer to test experimental color plates, trying to fight the reciprocity factor default (Publ. 608).



Fig. 21: Marcel Golay (1927-2015), then Director of Geneva Observatory had a strong influence on some of Heck's centers of interest and activities. Their long conversations during unexploitable nights at OHP (where Geneva Observatory was also operating a telescope) were an inspiring human experience for Heck. Golay's book on photometry was permanently as a reference on Heck's desk.

The weather at OHP was not always good, seemingly even degrading over time. Nights were unusable either because of clouds or strong wind, the famous *mistral*. It was wise to take some homework for those idle nights. They were also an opportunity to talk longer with the other visitors, otherwise met only briefly at the midnight meals. Heck had especially long talks with Marcel Golay, then Director of Geneva Observatory, operating another 'foreign instrument' on OHP grounds. Those conversations with Golay were an inspiring human experience and strongly influenced some of Heck's centers of interest and activities. Golay's (1974) seminal book on photoelectric photometry has been for years a reference work on Heck's desk. Decades later, Golay contributed with two chapters to Heck's prize-winning OSA series [26].

The trips from Liège to OHP (roughly 1000km) were done by private cars. Freeways were available only part of the way. The roads were sometimes dangerous in Winter, occasionally forcing a 200km detour via Paris to avoid crossing the Ardennes. The Winter nights at the telescope were long and cold as the observer had to stay in the dome, sometimes for long exposures by freezing temperatures[27]. This is when down jacket and pants, together with warm shoes and flexible gloves, were especially welcome.

[26] See the tables of contents of those volumes at pp. 502ff.

[27] The inside temperature has to be equal to the outside one in order to avoid some turbulence caused by warmer air slipping through the dome slit that would degrade the images.

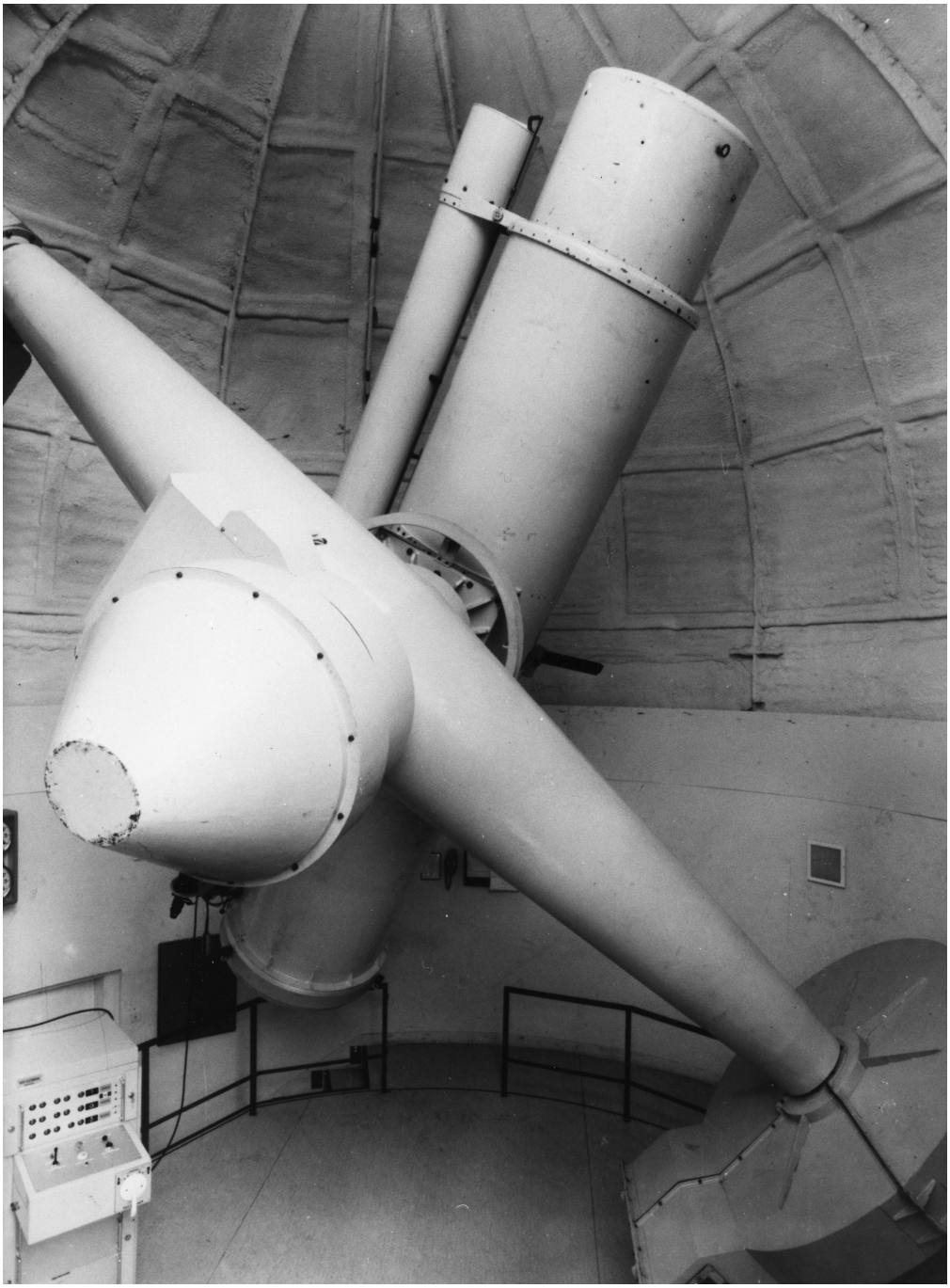


Fig. 22: The "Big Schmidt" telescope of Haute Provence Observatory was jointly operated by the French CNRS and Liège Institute of Astrophysics.

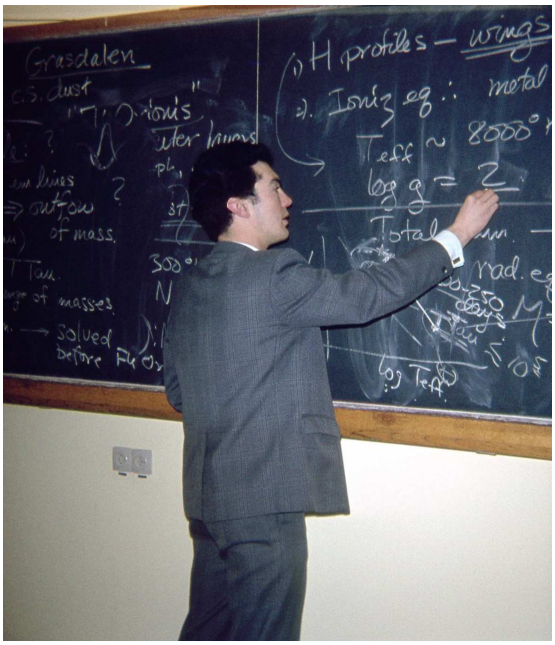


Fig. 23: Teaching at IALg (04 March 1973).

Some of the trips were made with students. Heck had convinced the lecturers he was reporting to that bringing students to a professional observatory – at least those who opted for a specialization in astronomy in the last *licence* year – would provide them with a unique experience that they could echo to their pupils when teaching later on in the *Athénées* and *Lycées* of the Kingdom. Comet 1973a was actually discovered during one of those observing runs with students.

As Assistant Professor, aside from the main assignment outlined above by Swings, Heck had of course to direct practical exercices with students who were barely younger than he was. During his first year in Ledoux's group, he had to assist them in practicing theodolite exercices since the corresponding course involved also geodesy. Heck himself had to bear those useless sessions three years earlier. He had also to lead daytime visits to Uccle Royal Observatory South of Brussels, with occasional anecdotes[28].

There were also those exercices, the same ones year after year, for a lecturer of spectroscopy who never understood they were of little interest for future teachers of mathematics. Facing such an obstinacy, Heck, also year after year, expedited those applications of Saha and Boltzmann equations, then sat on a table amidst the students and explained how astronomy was carried out round the world, what were the latest news, discoveries and challenges, and ultimately what was bringing astronomy to mankind through its perception of the universe. All this could also be echoed to the students' future pupils in the secondary schooling.

[28]Once on the way back, the cars overtaking the bus had to use their wipers: the bus driver did not want to stop and some students had to relieve themselves by opening the windows ...



Fig. 24: Heck's temporary base from February to June 1971: Paris Observatory as show from the gardens (South) in this faithful photograph for the time (28 April). One of the domes would indeed quickly disappear.

Heck had also to suggest themes for *licence* memoirs and then to supervise the work by students. When these were good and hard-working, showing interest and initiative, in one word meritorious, Heck had sometimes to fight for their recognition as such at the final deliberations within the *service*.

Paris Observatory and the Gestation of CDS

Heck arranged a short visit to Paris Observatory on 05-06 November 1970. The academic year had started the month before in Liège and things had been put in place as to the educational activities for the term. It was now time to establish the contacts required by the assignments set by Swings during their first encounter.

Heck was welcome by Jacques Lévy who quickly let him understand that he had probably better things to do than meridian astronomy. The only avant-garde research in the field in France was carried out by Yves Réquième at Bordeaux Observatory. He would get an idea by himself since a stay in Bordeaux would be in order: the meridian instrument from Liège had been installed in the Pyrenees by a team of mainly people from Bordeaux Observatory and quite naturally they would help dismantling it.

Lévy introduced Heck to several scientists around, including Suzanne Débarbat who would also contribute decades later with a couple of chapters to the books produced by our biographee (see pp. 497ff). Lévy also called in the 'young man' Swings had been referring to: Jean Jung, a pupil of Jean Delhaye, himself at the end of his term as Director of Paris Observatory and becoming soon Director of INAG (now INSU).

Jung obviously had not been prepared and was somehow upset by the *fait accompli* he had to face, *i.e.* everyone else had agreed he would supervise the PhD work of that chap disembarking from Liège. An embarrassing situation for our biographee too.

But Jung appreciated that Heck himself had no responsibility in all this and kindly accepted him as PhD "student". The two agreed on an extended stay by our young scientist at Paris Observatory during the first semester of the following year, giving Heck time to arrange the accommodation issue and other practicalities.

Heck would then be put on an official leave, with salary, by Liège University for a mission abroad in the interest of the *service* and lasting from mid-February to the end of June 1971. Swings advised Heck to secure a room at the Fondation Biermans-Lapôtre, the 'Belgian house' of the *Cité Universitaire*.

Well, except for its size, that room was no better than Heck's first *kot* in Liège! As the linguistic problems had been raging in Belgium during the previous years, Heck is still wondering whether he might have been somehow ostracized by the proud Director, obviously Flemish by his strong accent, and accommodated in one of the lousiest rooms of the house. So the best attitude was to stay the strict minimum needed in that place.

Heck would regularly go back to Liège using the fast connection offered by the German Diesel-powered first-class-only *Trans-Europ-Express* (TEE) train linking Cologne and Paris. Weekends in the City of Lights were quiet as many dwellers were staying in their suburban home or were out in the countryside. And the observatory was deserted. Well, almost.

As Heck was reading one Sunday afternoon on a bench in the observatory gardens, Vladimir Kourganoff passed by and offered him, in exchange for a postage stamp he urgently needed, to visit his small office on the observatory roof. He had from there a magnificent view onto Paris with right ahead the Luxembourg Gardens and Palace (seat of the French Senate). This was apparently an exceptional favor to be allowed up there. At least, so he said.

The quality of life in Paris at that time was however not exactly at the level one would have expected for that attractive city. The hygiene, especially in official buildings, was far from what Heck had been used to in Belgium. Toilets were generally in a repugnant state and paper a rare commodity to be found in them.

The telephone system was far from being an up-to-date one, as Heck had already experienced it from Belgium when he needed sometimes half a day to get a call through to someone in France.

Public transport was in a dreadful situation, the equipment being overaged, overused, overnoisy and overpacked with aggressive people, often cursing at each other. This was especially true for the line linking the *Cité Universitaire* to *Denfert-Rochereau*, near the observatory.



Fig. 25: Then at Paris Observatory, Jean Jung agreed to supervise Heck's PhD work. Jung was to become the first Director of the Centre de Données Stellaires (CDS) officially founded in 1972 and installed at Strasbourg Observatory.

Heck quickly decided to walk instead of using it, slaloming between the dog droppings to be found everywhere along the way, on the sidewalks as well as on the roads through the Parc Montsouris. The *motocrottes*[29] had not been invented yet. More than once, Heck noticed than the people who seemed really happy among those met on the streets, were those going to demonstrations, carrying flags, banners and so on.

The life at the observatory itself was pleasant enough. Lunches would be taken with other young astronomers either in nearby restaurants or on the lawns in the observatory gardens whenever weather conditions allowed it. Quite a few of those young astronomers would become Heck's collaborators later on. For the time being, through their conversations, Heck got a pretty good panorama of the French astronomical system and how it was then functioning in a post-1968 mood.

As far as work was concerned, Heck had to split his time between his PhD preparation and the meridian instrument story that had still to unfold. Thus he spent a significant amount of time reading and familiarizing himself with the peculiarities of meridian astronomy, from the observing and recording techniques to the smallest details of all kinds of corrections needed, such as the tiny movements of plate emulsions, and so on. All this turned out ultimately to be wasted time.

The subject proposed by Jung as PhD work was the generalization of his own algorithm for determining the absolute luminosity of stars, with obvious impact on the galactic distance scale.

[29] Motorbikes collecting dog droppings by aspiration.

This meant for Heck working on various fronts: absorbing what had been published on the principle of maximum likelihood, on which was based the methodology he had to generalize; learning whatever he could on the stellar catalogues; and initiating a complex computer program leading to calibrated values for both the average luminosity and the kinematic properties of samples of stars. He would fully developed this when back to base in Liège and the resulting algorithm would know quite a range of applications[30].

Initially Heck had a desk in the attic of the so-called Lévy's Wing (Eastern wing) of Paris Observatory, then in Jung's office in the main Perrault building. From time to time, an aged stylish gentleman was showing up in that office: Pierre Lacroute, Director of Strasbourg Observatory. Our biographee had of course no idea he would become some fifteen years later one of his successors in that capacity[31].

Jung and Lacroute were discussing the modalities of installation, at Strasbourg Observatory, of a new unit dealing with catalogues and astronomical data, *i.e.* exactly the material Heck was primarily using for luminosity calibrations. All those plans were also in line with his own SDI project conceived one year ago for IALg and not followed by Ledoux (cf. p. 32).

The new center was going to be called *Centre de Données Stellaires* (Stellar Data Center, CDS as known by its acronym). Later on Heck would decisively contribute to the CDS world-wide recognition and usage. He would also suggest the name be changed to *Centre de Données astronomiques de Strasbourg*, retaining the acronym but allowing the meaning to encompass also non-stellar data. See Publ. 123 on the CDS genesis.

For the time being, Heck was *de facto* the first CDS user, even before its official existence. Jung was to become the first CDS Director and therefore had to move to Strasbourg. Heck's first visit to Strasbourg Observatory took place on 23-26 April 1972 when attending the inaugural CDS meeting. From then on, he would become a regular visitor (see *e.g.* Publ. 14).

Over those years, Heck frequently commuted between Liège, Strasbourg and still Paris where he was involved in various collaborations based on the calibrating algorithm he was developing. Freeways were not yet available everywhere and there were still strict border controls with customs officers sometimes very suspicious at the punched cards and magnetic tapes in the boot of the car or in the bag when travelling by train.

One day, when disembarking from the TEE at *Paris-Nord* station, Heck was stopped and his bag searched. The customs officer from the French Antilles pulled out a box with IBM punched cards that were used at that time for computing. He was obviously going to shuffle them like playing cards. Heck stopped him in time and, when asked what was the commercial value of that material, replied with typical Belgian humor that the most valuable part of it were the holes. Not knowing which attitude to adopt, the officer brought Heck to his boss in the station customs office.

That gentleman was definitely more aware of the realities of modern world. Heck explained that, had he wanted to smuggle the information on the cards, he would have

[30] See the the section on the PhD degree pp. 64ff and summaries of main publications on pp. 475ff.
[31] See Publ. 282 for a short obituary of Pierre Lacroute by Heck.



Fig. 26: Heck attended, on 23-26 April 1972, the inaugural ceremony of the Centre de Données Stellaires (CDS) held in the Big Dome building of Strasbourg Observatory. At that time, Heck was de facto the first CDS scientific user, even before the official founding of the facility as he was already a heavy user of computer-readable catalogues of all kinds that would be distributed by CDS. Strasbourg Observatory hosting CDS would become a familiar place later on.

hidden a piece of magnetic tape carrying it in the lining of his jacket. All this ended with a good laugh, a handshake and the recommendation to carry an official-looking piece of paper certifying the non-commercial value of the material carried, specifying its usage only for scientific purposes. This is why, for years, Heck carried for each of his trips abroad a certificate he himself typed, signed and stamped ...

From now on, Heck's life would be typical of a scientist's, with missions here and there, attending meetings, presenting papers, publishing his results, not to forget observing runs essentially in Haute Provence and in Chile[32]. Heck took the opportunity of being in Paris to visit the *Vieux Campeur* and to buy his warm down jacket and pants that would be most welcome during cold nights in the domes.

[32]See the second part of this volume for the details on missions (pp. 369ff), meetings and communications (pp. 383ff), as well as on the publications by Heck (pp. 401ff). Some of those earlier trips were financed by grants from the Foundation Agathon de Potter managed by the Belgian Royal Academy.



Fig. 27: On the future CERGA site (Calern plateau near Grasse) on 14 May 1971.

Dismantling and Packing the Meridian Instrument

Before the end of his stay in Paris, Heck had taken advantage of a lift by car to visit the still very embryonic *Centre d'Études et de Recherches en Géodynamique et Astrométrie (CERGA)* on the Calern plateau where future astrometric research would be conducted (Fig. 27). The site would also host a new Schmidt telescope. The French had borrowed the IALg meridian instrument in a vast campaign exploring possible locations for a new astrometric observatory and the Calern plateau near Caussols had been selected. The facility, inaugurated officially in 1974, has been merged in 1988 with Nice Observatory and is today part of the Côte d'Azur Observatory.

Heck spent the Summer 1971 in Liège, partially busy on private matters as he was moving again, this time to settle in a flat on the top floor of a house in the same street on the Cointe plateau, *rue du Chéra*.

At the very beginning of September, he travelled by train to Bordeaux. For the next couple of weeks, he was based at the observatory located on a hill across the river, in Floirac. He was welcome by the Director Jean Delannoy and spent days and evenings familiarizing himself with local activities and observing programs, such as those of Guy Soulié and mainly Yves Réquième who was carrying out photoelectric meridian astronomy.

Together with a team of scientists and technicians, Heck headed then for Dorres in the Pyrenees in order to dismantle and pack the meridian instrument lent by IALg. A couple of people from Paris joined them. They were accommodated at a hotel held by the family Marty. It used to be the residence of some observers during the exploitation of the telescope.

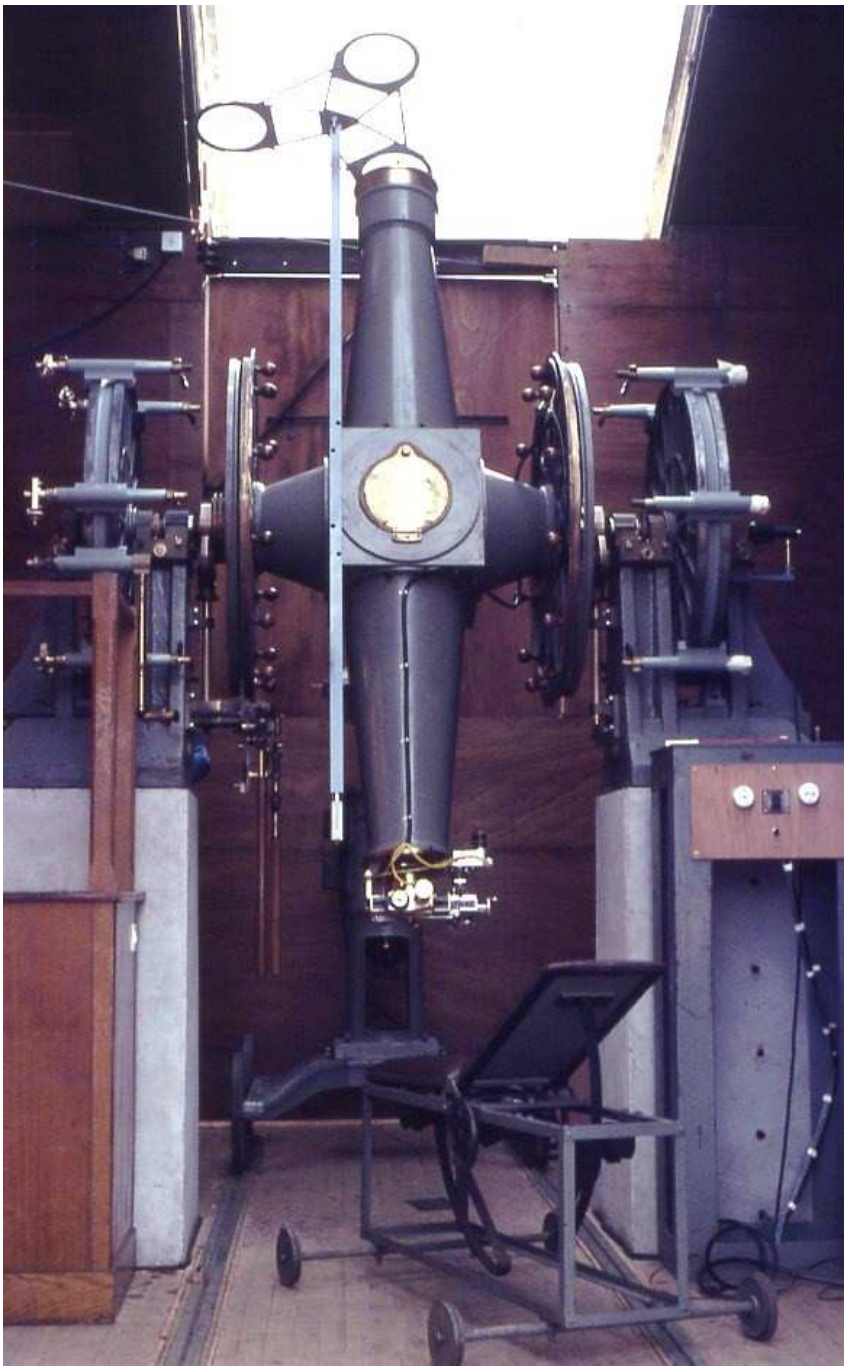


Fig. 28: The Liège meridian instrument is seen here in its Belloch shelter. Delivered and installed in Liège in 1931-1932 by the Parisian firm Gautier-Prin, it has a 19cm objective lens with a 2.35m focal length. The optics is signed André Couder. (Courtesy J.M. Rousseau)



Fig. 29: Bordeaux Observatory, located at Floirac, was a temporary residence in September 1971. (Courtesy Bordeaux Obs.)

As recalled in Publ. 666, the move to France of that meridian telescope had been initiated in December 1965 with a visit to IALg by Jacques Lévy and Jean-Michel Rousseau. They wanted to assess the possible problems linked to the dismantling and the transportation of the instrument. The trip itself to the Pyrenees had started a year later after complying with all the insurance and customs requirements in the wake of a treaty between Belgium and France stipulating that the loan was for 99 years ...

The instrument had been carried to the snowy top of the Belloch near Dorres (1688m) and put together in February 1967. The Winter conditions had rendered every operation difficult. In addition, the pillars of the instrument had been made of bricks fastened with cement mixed with gasoil, a recipe supposed to counter the negative temperatures, but that was ill-inspired. The fixations turned out too fragile and the instrument had never been perfectly stable – a calamity for a meridian telescope. Some people had been tempted to blame the instrument, but it had become impossible to hide its desastrous installation.

Refer to Publ. 666 paper for more details on the observations that lasted from May 1967 to April 1970 and for comments on the overall evaluation that had been rated as scientifically nil. A paper by Gosset (1997) provides additional details as to the history of IALg successive meridian instruments.

After helping disassembling and packing the telescope, Heck headed back to Liège. He left Bordeaux Observatory charmed by the kindness and generosity he had met there, from the Director to the scientists and the most humble personnel members.

As to the meridian instrument, it made its way safely back to Liège and remained for years in its crates. Heck had fulfilled his initial assignment when joining Swings' group and nobody was interested in using anymore the telescope for scientific purposes. It has been reassembled much later, in 1997, and is visible on occasions such as open-door events or special visits.



Fig. 30: General view of the Belloch facility near Dorres in the French Pyrenees, just before dismantling and packing the Liège meridian instrument in September 1971. From left to right: shelters of the astrolabe, of the meridian instrument and of the electricity generator. The van from Bordeaux Observatory gives the scale. The upper right picture shows the instrument in its dormant position, wedged and with the optics removed.



Fig. 31: 38 years later: Heck surrounded by Mr and Mrs Marty in front of their hotel in Dorres on 20 September 2009.

First Contact with the Observatories in Chile

In 1971, the now defunct Belgian airline Sabena[33] opened a route to Santiago de Chile. A promotional agreement between the company and the *ad hoc* ministries in both countries allowed several groups of Belgian university students to visit Chile during a fortnight.

Astronomers from Liège had an excellent motivation to apply for such an opportunity with the establishment in Chile of several large observatories, one of them being the European Southern Observatory (ESO), the formal creation of which dated back to October 1963[34]. The first ESO telescope had become operational in 1966 on La Silla in Northern Chile. Even more, an IALg scientist, François Dossin, had been an ESO staff astronomer, first at the European Office in Hamburg from 1966 to 1968, then in Chile. He was back at IALg since mid-1970.

Hence a group of some fifteen people, students and accompanying scientific staff under the leadership of Dossin, boarded a Sabena B707 in the evening of 02 November 1971. Scheduled stops took place in Dakar/Yoff (Senegal) and Buenos Aires/Ezeiza (Argentina) before heading West over Mendoza, crossing the Andes while flirting with the Aconcagua (6960m), with the machine finally gliding majestically to Santiago Pudahuel airport. Be it not for the group from Liège and the cabin crew, the plane would have been empty for the last leg.

For Heck, this was his first flights, his first steps on different continents, his first crossing of the Equator and hence his first change of hemispheres. He would do it again many times in the following years. This was also an opportunity to see his pal Manfroid since he had joined ESO in Chile a couple of months earlier.

The first days were devoted to visiting the observatories near La Serena. The group had been assigned a chartered bus with two drivers and a guide. Long hours were spent covering the 500km or so along the Panamerican road to the capital of the IVth Region, then the additional 150km or so to the area where CARSO's Las Campanas and ESO's La Silla observatories are located. The group was shown around the facilities and spent a night at ESO's Pelicano base camp after admiring the sunset over the Pacific Ocean from La Silla. Back via La Serena with the *Hotel Francisco de Aguirre* as a base, they went up to AURA's Cerro Tololo Inter-American Observatory, before heading South.

On 10 November 1971, the country capital was expected to be seething with excitement as Fidel Castro was visiting his comrade Salvador Allende. The two statemen passed actually in an open car only a couple of meters away from the Liège group, surprized to see the sidewalks almost empty, with only schools lined up, in spite of all the hype that had been going on for days.

The confused situation of the country could not be missed as the group had already witnessed demonstrations after demonstrations in the streets of Santiago. Strikes were continually taking place here and there. Some basic goods were starting to be scarce and serious clouds were hovering over the economy with the currency loosing its value.

[33] In full: Société Aérienne Belge d'Exploitation de la Navigation Aérienne. For some disgruntled customers: *Such A Bad Experience, Never Again*.

[34] For a detailed history of ESO's early times, see the excellent book by Blaauw (1991).



Fig. 32: François Dossin (1927-1998) lecturing a group of students and assistant professors from IALg on the practicalities against the omnipresent fleas in a rented bus on the Panamerican Road to Northern Chile (05 November 1971). Dossin had stayed in Chile for quite a few years during ESO's pioneering times. The group was on its way to visit the then three large observatories near La Serena (AURA's Cerro Tololo, ESO's La Silla and CARSO's Las Campanas).



Fig. 33: ESO office in Santiago de Chile (04 November 1971).

All this was increasingly sensitive as they were travelling South of Santiago, an area much more populated and industrialized than the desertic North of the previous week. The local guides even became a nuisance as some turned out to be activists lecturing the group, attempting to win them openly to their cause. Obviously those guys had not been briefed about the legendary independent-minded character of the people from Liège. At the University of Concepción, Dossin had to tell clearly one of them that the group did not come to Chile to be indoctrinated into communism nor castrism.

The group had been accommodated quite decently so far, but, in what they suspected being a kind of punishment, they ended up the day after in a bottom-of-the-barrel hostel where fleas were happily hopping around everywhere and most of the toilets were clogged. That night, nobody could sleep at that place: the students organized one of those fierce Liège-style celebrations that must have been echoed by the walls long after their departure.

From then on, the group was again accommodated properly, the activists were unseen and the rest of the trip went on satisfactorily, if we except a boat breaking down in the estuary of the Calle-Calle river near Valdivia and a night train return to Santiago with a jolting dining car worth of the Lucky Luke cartoon strips. The lights were going off continually and nobody understood how no soup tureen landed on someone as the waiters continued serving around in darkness and moving grounds ...

For Heck, beyond another facet of professional astronomy, that trip had been an introduction to hispanicity in which he would totally dive later on. He would come back many times to Chile, both professionally and privately, by air, car and ship, going over the whole country well before the touristic invasions, from the Peruvian border in the North to the Southern tip of Cape Horn, staying overnight at the Tatio mine camp near the geysers (at about 4300m of altitude), slaloming between icepacks in the Southern fjords in order to approach the feeding glaciers, not to forget the volcanoes nor that memorable arrival by boat into the Valparaiso harbor – a youthtime dream.

As he had lived in Chile, François Dossin had not only been a perfect group leader for the November 1971 tour, but also an ideal initiator. Through him, the country, as well as the omnipresent kindness of its people, had been perceived naturally.

Discovering Comet 1973a

During 1972, Heck went on with the preparation of his PhD memoir and his collaborations with French teams applying statistical-parallax algorithm to various groups of stars. He was involved in the organization of Summer university courses unrelated to astronomy, hence not detailed here. He also registered for additional third-cycle certificates: Modern Techniques of Documentation, Modern Techniques of Astrophysical Observations, and Structure and Dynamics of the Galaxy.

Heck initiated a series of observing runs at the OHP Big Schmidt telescope within the framework of his routine servicing. In agreement with his fellow observers, especially Dossin who was supervising the activities at the instrument, students were brought

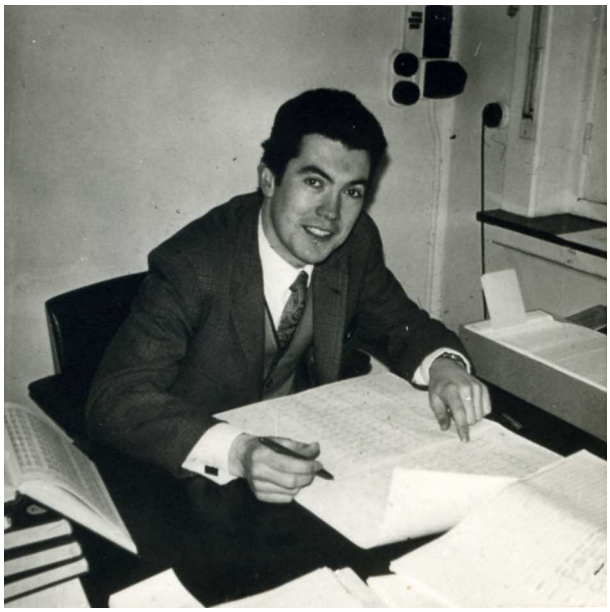


Fig. 34: Decks of punched cards, piles of catalogues and computer listings surround our biographee in this picture taken in his IALg office (04 March 1973).

along for some of those runs. And something unusual happened during the January 1973 observing run: the discovery of a comet.

Discovering a comet has various facets. For Comet 1973a[35], the most important factor was certainly the practice polished over successive runs, not only in the observing technique itself (such as "perfect" guiding and optimal exposure time), but also in the subsequent perusal of the plates, or films in the case of the OHP Big Schmidt telescope.

The eyes of each team member had to be trained to spot unusual nebular objects. These had subsequently to be checked against existing reference fields, such as the prints from the Palomar Sky Survey (PSS). This implied that, after an observing night and some rest in the morning, hours and hours had to be spent – in this case at the OHP library – comparing carefully with a magnifiyng lens virtually each square millimeter of the Big Schmidt films with the PSS prints.

A quick check was already carried out when the film was taken out of the developing bath in the dark room. If something suspiciously new was spotted, the comparison with the PSS prints had to be carried out immediately while subsequent exposures were taken. A solar-system object such a comet could move appreciably fast across the sky and it is paramount to determine as quickly and as precisely as possible the direction of the movement and its amplitude.

[35]Comets were first designated sequentially as they were discovered in a given year. Thus Comet 1973a has been the first comet discovered in 1973. Once their orbit had been calculated, the comets were relabeled according to their passage at perihelion, *i.e.* the closest point to the Sun. Comet 1973a then became Comet 1972 VIII, *i.e.* the eighth comet passing at its perihelion in 1972. This means also that it was moving away from the Sun when discovered.

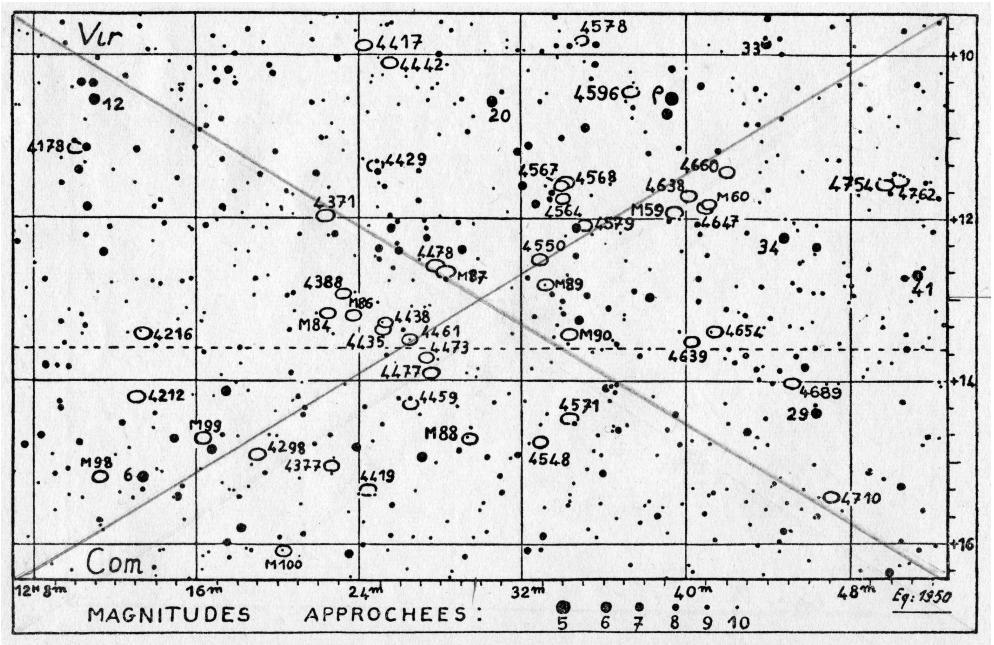


Fig. 35: This map from p. 118 of Sagot & Texereau's (1963) 'Revue des constellations' still carries the markings drawn by Heck on 10 January 1973 for determining roughly the coordinates of the center of the cluster of galaxies in the constellations Coma Berenices and Virgo.

As said earlier, the IALg program at the OHP Big Schmidt was to track the known comets, picturing the evolution of the tails and possible eruptions occuring while the hairy objects were travelling along their orbits. When this was done, the time left over could be used for personal investigations or for touristic pictures. As Heck was with students during that observing run, the latter option prevailed during the last night (10/11 January 1973).

One of the fields selected was the Virgo cluster of galaxies. Heck determined roughly its center (Fig. 35), selected a guiding star and launched the exposure. A trail by a nebular and rather bright object was noticed when developing the film. The IALg team had a list of all visible comets at that time and none was supposed to be amidst those galaxies. A quick check with the corresponding PSS print revealed nothing there. Additional exposures were hurriedly taken before the sky brightened with dawn coming. The object was still there and moving. A double-check was made via a phone conversation with Dossin in Liège. A telegram was then drafted for the Central Bureau of Astronomical Telegrams (CBAT) hoping this would be the first spotting of the object.

It was then decided to extend the observing run. Heck computed the most likely position of the object for the end of the following night from the various exposures obtained. The Moon was indeed setting late now. The suspense was running high when the first film came out of the developer and ... bingo! The object was right in the middle of the field. Another telegram was drafted after calculating roughly the new

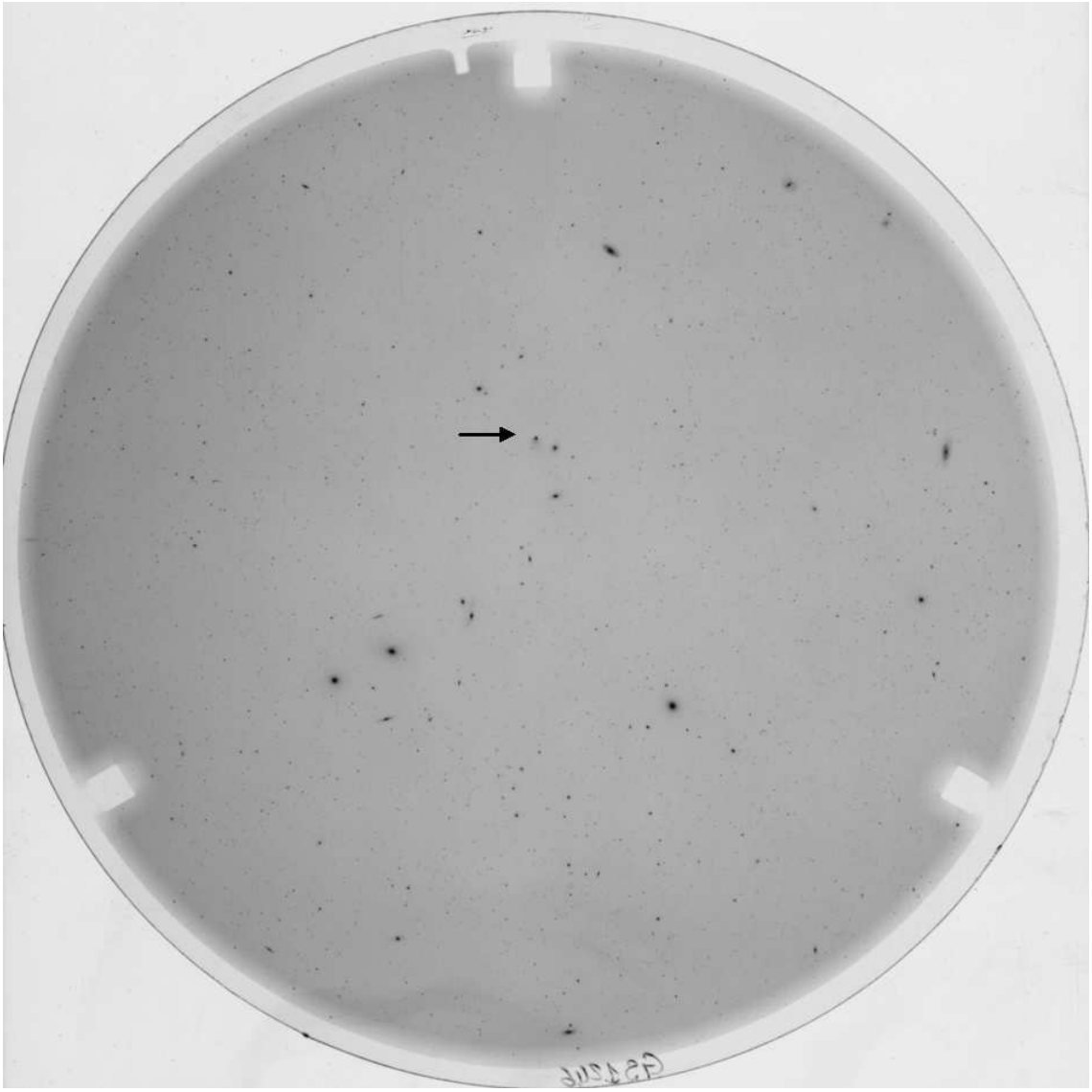
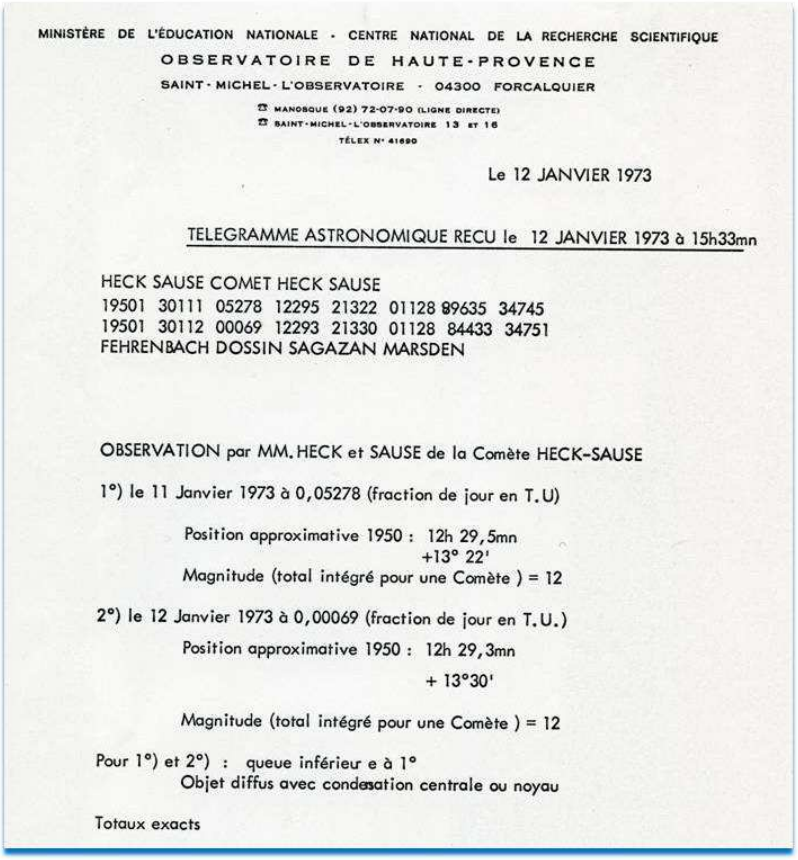


Fig. 36: Discovery plate of Comet 1972VIII/1973a (arrow) taken on 11 January 1973 at the IALg-CNRS Big Schmidt telescope during an observing run with students at Haute Provence Observatory (cf. pp. 50ff and publications listed). The field selected was the dense Virgo cluster of galaxies, making a comet identification particularly not obvious, as confirmed by several post-discoveries. The episode was particularly exciting for the students. See also Fig. 38 & 219.

position of the comet. Meanwhile the CBAT had requested other observers to confirm independently the observations.

The official confirmation of the comet discovery came within the next 24hrs: a coded CBAT astronomical telegram broadcasted the news world-wide by telex on 12 January (Fig. 37). Precise positions and other relevant details would then follow via the IAU Circulars on paper[36]. For more on the discovery, refer to Publ. 3, 149 & 588, as well as to the excellent review by Manfroid (2012) putting it in a historical perspective.



MINISTÈRE DE L'ÉDUCATION NATIONALE · CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
OBSERVATOIRE DE HAUTE-PROVENCE
SAINT-MICHEL-L'OBSERVATOIRE · 04300 FORCALQUIER
☎ MANOSQUE (92) 72-07-90 (LIGNE DIRECTE)
☎ SAINT-MICHEL-L'OBSERVATOIRE 13 ET 16
TÉLEX N° 41690

Le 12 JANVIER 1973

TELEGRAMME ASTRONOMIQUE RECU le 12 JANVIER 1973 à 15h33mn

HECK SAUSE COMET HECK SAUSE
19501 30111 05278 12295 21322 01128 89635 34745
19501 30112 00069 12293 21330 01128 84433 34751
FEHRENBACH DOSSIN SAGAZAN MARSDEN

OBSERVATION par MM. HECK et SAUSE de la Comète HECK-SAUSE

1°) le 11 Janvier 1973 à 0,05278 (fraction de jour en T.U)

Position approximative 1950 : 12h 29,5mn
+13° 22'
Magnitude (total intégré pour une Comète) = 12

2°) le 12 Janvier 1973 à 0,00069 (fraction de jour en T.U.)

Position approximative 1950 : 12h 29,3mn
+ 13°30'

Magnitude (total intégré pour une Comète) = 12

Pour 1°) et 2°) : queue inférieur e à 1°
Objet diffus avec condensation centrale ou noyau

Totaux exacts

Fig. 37: Before the invention of fax and e-mail, the announcements of astronomical events took place via telex and coded messages. The above reproduces (under an OHP header) the original CBAT coded message received on 12 February 1973 for the discovery of Comet 1973a, followed by its decoding. Charles Fehrenbach was the OHP Director, François Dossin was managing IALg observing activities at the OHP Big Schmidt, Huguette Sagazan was an OHP administrative assistant and Brian Marsden was then in charge of CBAT. The object was commented as fuzzy with central condensation.

[36]IAUC **2479**, 2481, 2482, 2483, **2485**, 2489, 2494, 2495, 2511, 2519, 2529, 2543, **2545**, 2552, 2581, 2612, 2638, **2642** 2650 & 2673 (in bold, those with personal measurements by our biographee – Publ. 143, 144, 145 & 150 – beyond of course the rough discovery measurements).

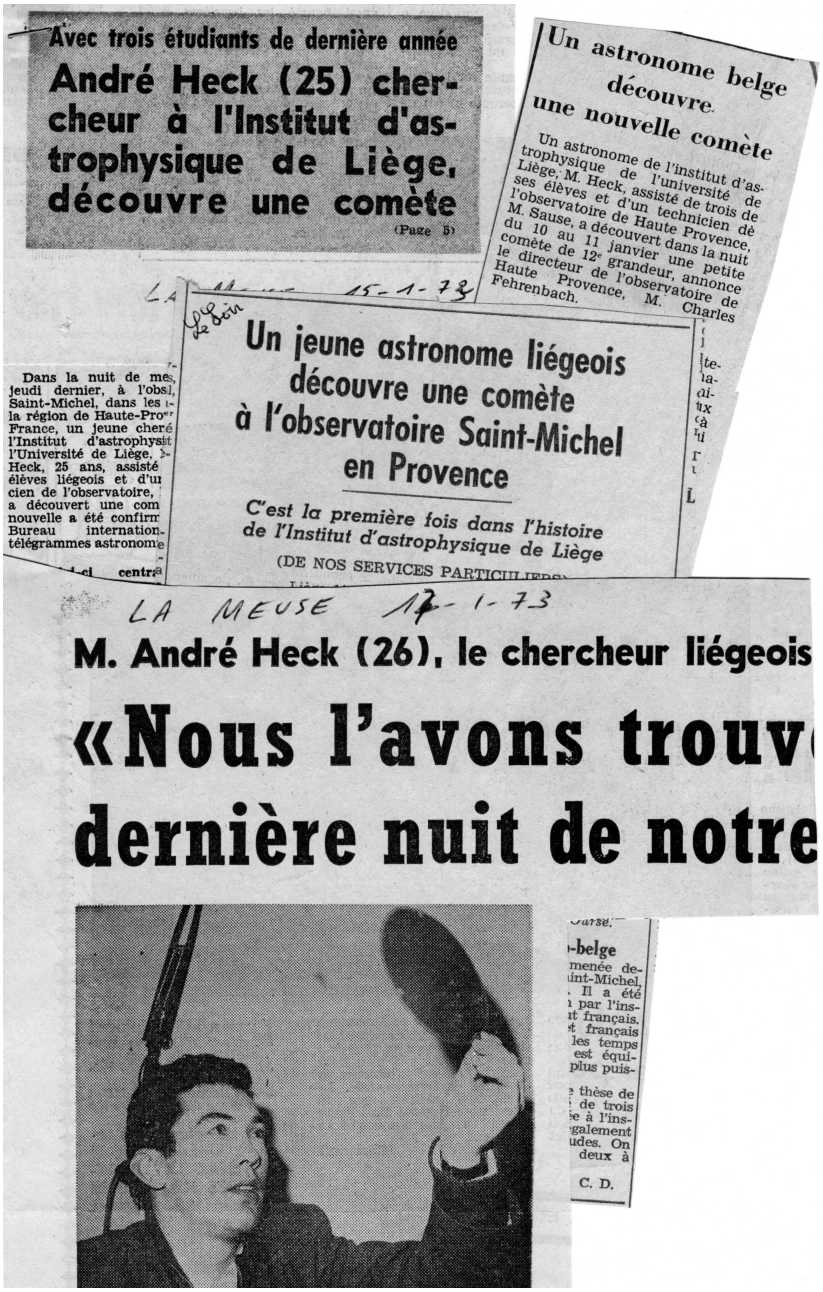


Fig. 38: The discovery of Comet 1972 VIII/1973a made the headlines in local and national media, including radio and television in spite of their state-owned-style rigidity of the time. Fortunately Heck's phone number was unlisted. Notice how he grew older by one year in a couple of days on the clippings from the same newspaper (he was in fact 26).

This was still the time when only a few comets per year were discovered with the names of discoverers were assigned to them, actually the only celestial objects with which this was possible. Heck had decided to associate the night assistant Gérard Sause in the comet denomination. Charles Fehrenbach, then the OHP Director, did not appreciate at all the initiative and let clearly understand that, in other times not so far away, the comet would have borne his own name together with that of Heck's boss in Liège. Some old-fashioned scientists had obviously not yet assimilated the consequences of the 1968 events in universities and research institutions. The IAU rules then limited to three the names of co-discoverers, which made impossible adding the names of the three students.

For them, the event was the experience of their university studies. As they entered high-school teaching afterwards, they would describe enthusiastically to their own pupils, year after year, what was the real life at a professional observatory, the routine of the observations, the phases of a discovery, including the doubts, the requirements for verification, the excitement of the public announcement, not to forget the subsequent hassle by the media and by disturbed people.

Indeed, beyond the fun and excitement of the discovery itself, the experience was most interesting sociologically: weird behavior of colleagues, pressure from media, mail from all kinds of cracked people, also invading Heck's IALg office unannounced, simply asking for money or wishing to sell something, from lousy theories to talismans ...

Total Solar Eclipses in Africa

As explained for instance in Smiley's (1972) paper, the total solar eclipse of 30 June 1973 ranked second in duration among 3374 solar eclipses taking place between 14 June 717 (Julian calendar) and 24 June 2150 (Gregorian calendar), in other words over an interval of 1433 years. Its duration of seven minutes and four seconds was beaten by an eclipse lasting only four more seconds on 20 June 1955 et equalled by an earlier one on 8 June 1937. Many media called the June 1973 event the "eclipse of the [20$^{\rm th}$] century" and they have to be forgiven for that minor exaggeration.

The path of the totality was especially favorable since it was crossing the African continent in the full width of its Northern part (Fig. 40). Unprecedented means were planned to follow the totality: Concorde 001, for instance, was going to be adapted to follow the shadow at supersonic speed over the Sahara desert during nearly 74 minutes, that is about ten times the longest duration of totality on the ground[37].

In Belgium, a group of interested amateurs and professional scientists set up an association, the National Foundation for the Organization of Scientific Expeditions (FNOES[38]) with the purpose of having an entity entitled to receive official subventions. The first expedition was called the Belgian Astrophysical and Geophysical Expedition 1973 (EAGB73[39]) aiming at observing the June eclipse.

[37] See for instance *Air et Cosmos* **481** (5-V-1973), p. 17.
[38] French name: Fondation Nationale pour l'Organisation d'Expéditions Scientifiques.
[39] French name: Expédition Astrophysique et Géophysique Belge 1973.

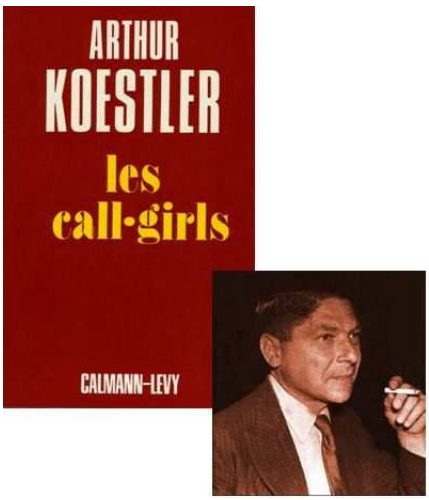


Fig. 39: On 02-07 April 1973, Heck attended an advanced course on 'Dynamical Structure and Evolution of Stellar Systems' in Saas-Fee. A couple of months later, he happened to read Arthur Koestler's 'Call Girls' and was struck by similarities between the geographical setting of the book and the one around Saas-Fee, plus of course between the characters and some frequently met in scientific circles. His subsequent letter to Koestler got a happy answer. See also Publ. 698 written as an obituary after Koestler's death.



Fig. 40: Path of the totality for the solar eclipse of 30 June 1973. The marker indicates the point of longest duration. (Courtesy Fred Espenak, NASA)

The choosen site was the Loyengalani Catholic mission near the Southern tip of Rudolf Lake[40] in Northern Kenya where the duration of the totality would still be of about five minutes, with the Sun quite high in the sky. Beyond its title, the expedition was broadly open, for instance to meteorologists, but also to amateurs. All in all, some forty people were involved, including a few spouses. The leader was Colonel Paul Louis Baetslé from the Royal Military School and the logistics was ensured by a group of Belgian militaries under the command of Major Camille ("Milord") Tulpin. The scientific programs set up by the various teams covered a broad spectrum: Einstein effect, solar corona polarization, infrared observations, 50cm radioastronomy, atmospheric potential variations, meteorological parameters, etc., and comets in the vicinity of the Sun.

The latter program was designed by Dossin and Heck. An avid comet hunter to say the least, some people speaking even of an obsession, Dossin always dreamed of having his name assigned to a comet. The scrapbooks found in desk drawers at the OHP Big Schmidt dome were full of computations and drafts of astronomical telegrams in his handwriting for supposed discoveries. But Comet Dossin had been elusive so far, an *arlésienne* in French[41]. It must have been a frustration for him when his junior colleague Heck discovered Comet 1973a at the instrument he was supervising, but he did not show it, quite the opposite. Dossin was the goodness itself, tolerant, always generous, and willing to share his experience with a contagious enthusiasm for whatever concerned astronomical instrumentation.

As the vicinity of the Sun is darkened during eclipses, stars become visible in that area. Comets happening to be there could be visible too, all the more since those objects reach their maximum brightness when approaching the Sun. Dossin and Heck decided to explore the area by using two recycled USAF K24 cameras loaded with 103aF and Tri X films respectively and with exposure times from 5 to 20 seconds (Fig. 41). The fields centered on the Sun covered 40°.

The trip included an East African Airways (EAA) flight out of Oostende with a stopover in blacked-out Cairo airport due to Arab-Israeli tensions. The transit room was protected by walls of sandbags. From Nairobi, a caravane of bus, trucks and jeeps made its way towards Lake Rudolf. The expedition went on ground from South to North of the Equator it had been crossing by air in the opposite direction the day before. The bus was a source of problems on some dirt roads and tracks. The participants had to get off several times and to shape properly the slopes to avoid the bus belly get stuck.

As this was delaying the trip, they had to spend a night in a mission on the way. The experience they lived that evening could have shattered a number of white men prejudices. The teacher of the mission asked several members to come and explain to his pupils what they were doing and why they were coming to their country. That magnificent teacher was repeating everything in English and in Swahili, and then getting the school to repeat. The intelligence of the questions asked subsequently by the kids at the light of an oil burner could have made ashamed some of our university students.

[40] Today called Lake Turkana.

[41] See for instance Publ. 795 where the unnamed character could be Dossin.

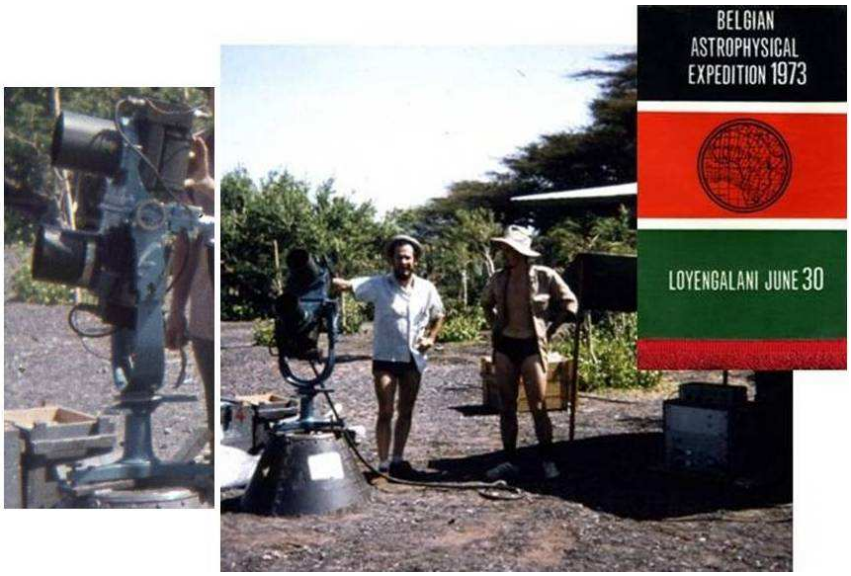


Fig. 41: With François Dossin (left) during a solar eclipse expedition in Loyengalani (Kenya) on 29 June 1973. The two K24 cameras detected an object close to the Sun, also recorded on a small Kodak Instamatic (cf. Publ. 146 & Fig. 42). The picture on the left is a closeup of the two USAF K24 cameras on their altazimuth mount with the electrical feeding from the expedition generator.



Fig. 42: Picture taken by a Kodak Instamatic camera during the totality on 30 June 1973 and showing the overexposed eclipsed Sun, together with Venus, Mercury and an unidentified object (arrows).

Finally the expedition arrived safely at the Loyengalani mission on 27 June and the installation of tents and equipment could start.

It is interesting to reproduce here what was said on the IALg pair by an independent observer, member of the expedition, Jacques Vandievoet[42]. He published an account as five full-page installments in the Belgian daily *Le Soir*. Here are the relevant excerpts (Vandievoet 1973):

> [before the eclipse] ... Heck and Dossin are also experienced ... Heck, before setting up with Dossin their double K24 camera, is offering a helping hand [for installing a radiotelescope]; this is rather symbolic, Liège and Ghent together, the assistants of Professors Swings and Dingens in the same venture ... Dossin and his pal titular-discoverer Heck (Comet Heck-Saive[sic] 1973) take all this very well; they are swell; this is true and this is not the distance or isolation that lead us to think so; we feel like standing together ...
> [during the eclipse] ... one of Dossin's cameras jammed and he had to switch to 'manual'; terrible instant when one must decide against any logics, gamble and succeed against any probability ...
> [after the eclipse] ... it is not excluded that Heck and Dossin send a telegram to Professor Marsden [at CBAT] for identification of an unknown object and official recognition of their discovery; the exposures could be excellent; one must wait for their examination ... we have here a nice row of comet hunters; Heck relates his discovery, Heck-Saive [sic] 1973, or how writing one's name on immortal tablets ... Dossin, who is somehow Heck's boss, narrates memories; boss, let's get this clear; be it when evoking Liège Institute of Astrophysics or the European Observatory in Chile from where he just came back, the style is the same: Heck is his comrade; one could not distinguish between the chief assistant and his junior colleague behind those two student beards; Dossin, who is 46 years old, appears actually as being 30; Heck is kidding him, with sidelong glances ... Heck and Dossin, by covering the whole eclipsed region of the sky, examined a zone that is generally overlooked; the long eclipse duration allowed numerous exposures of different lengths; comets have already been located near the Sun during previous eclipses; would our friends bring some more? were they dreaming of an object with their names on it? ...[43]

[42] Jacques Vandievoet (1923-1993) was a teacher-geographer, but also a poet under the pen name of Jacques Oriol.

[43] Original text in French: [avant l'éclipse] ... Heck et Dossin aussi ont de l'expérience ... Heck, avant d'aider Dossin à mettre leur caméra double K24 en batterie, donne un coup de main [pour installer un radiotélescope]; c'est assez symbolique, Liège et Gand réunis, les assistants des professeurs Swings et Dingens dans le même coup ... Dossin et son copain Heck découvreur en titre (la comète Heck-Saive[*sic*] 1973) prennent cela fort bien d'ailleurs; ils sont épatants; c'est vrai et ce n'est pas l'éloignement ou l'isolement qui nous inclinent à le penser; nous nous sentons solidaires ... [pendant l'éclipse] ... une des caméras de Dossin s'est enrayée et il a dû passer 'en manuel'; instant terrible, où il faut décider contre toute logique, parier et réussir contre toute vraisemblance ... [after the eclipse] ... il n'est pas exclu que Heck et Dossin envoient un télégramme au professeur Marsden [au CBAT] pour identification d'un



Fig. 43: In this picture taken on 31 March 1974, Heck is seen (at right) next to the 24-faced sundial of Mount Saint-Odile.

Dossin & Heck drafted a communiqué about their observations. When back in Nairobi, they visited the Reuters office, but the gentleman there seemed to be more interested in the bottle on his desk than in what those astronomers could tell him.

When developed back in Liège, twenty K24 films revealed a rather bright object that could not be identified with any star in the vicinity of the Sun at the moment of the eclipse. This object was also present on pictures taken by a small Kodak Instamatic camera that Heck was using in parallel as a notebook.

As a consequence, the IALg team did what has to be done in such circumstances: a position and a magnitude of the object were evaluated; a telegram was sent to CBAT which echoed the announcement (Publ. 146). This triggered a sociologically interesting sequence of reactions where people went much beyond what they should have done, ultimately mocking Dossin because of his well-known lifelong search for comets, instead of blaming themselves for their own overexcitement and subsequent frustration.

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objet inconnu et reconnaissance officielle de leur découverte; les clichés pourraient être excellents; il faut attendre le dépouillement ... il y a là une belle brochette de chasseurs de comètes; Heck raconte sa découverte, Heck-Saive [*sic*] 1973, ou comment on inscrit son nom sur des tablettes immortelles ... Dossin, qui est en quelque sorte le patron de Heck, égrène des souvenirs; patron, il faut s'entendre; qu'il évoque l'Institut d'Astrophysique de l'Université de Liège ou l'Observatoire européen au Chili, dont il revient, le style est le même: Heck est son compère; on ne pourrait pas reconnaître le chef de travaux et l'assistant sous ces deux barbes d'étudiants; Dossin, qui a quarante-six ans en paraît d'ailleurs trente; Heck le charrie, l'oeil en coulisse ... Heck et Dossin, en couvrant toute la région du ciel éclipsé, avaient ausculté une zone qui échappe généralement aux regards; la longue durée de l'éclipse avait permis de faire de nombreux poses de longueur différentes; des comètes avaient déjà été situées près du Soleil, lors déclipses précédentes; nos amis en préciseraient-ils quelque aspect? rêvaient-ils d'un objet qui porteraient leurs noms? ...

After a CBAT announcement, the normal procedure would require a couple of observers to check the presence of the suspected object on exposures of the same field. Negative reports were received and published[44] – and the story should have stopped there. Obviously the object recorded on Dossin & Heck's exposures was an atmospheric one, not a celestial one, the most likely explanation being a meteorological balloon released by one of the teams positioned at the edge of Lake Rudolf.

Some people felt obliged to elaborate into novae and even supernovae theories. The worst came from an unsigned paper in *New Scientist*[45], scoffing at Dossin in an unpleasant style too frequent in that magazine and blaming the cameras. Forty years later, this is still echoed by Wikipedia pages on Dossin in Italian and in Esperanto[46] speaking of an (optical) aberration.

This is nonsense since, as mentioned earlier, the object was recorded on three different cameras, including the small Kodak Instamatic, the design of which was totally different from the K24s. *New Scientist* discarded bluntly Dossin & Heck's explanation, the meteorological balloon, contrary to Scagell (1973) taking it as quite plausible, a possibility also retained by Seargent (2010, p. 74).

We detailed a bit that story, not only because it has never been published, but also because it is worthwhile to show how a magazine that boosts that "If someone in the world has a good idea, you'll read about it in *New Scientist*" [47] can be superficial and guided by a sensationalistic tone, far away from a real scientific approach.

As another total solar eclipse was going to be visible in October 1976 from about the same area as the June 1973 one, a similar expedition was set up, EAGB76[48].

The landing place was also Nairobi airport, but the teams had to move Southwards and to cross the border into Tanzania to be near the central path of the totality.

The camp was initially planned at Mkata (hence the name on the flag, cf. Fig. 45), but was ultimately settled in Mkaja on an Indian Ocean beach where the Eastern horizon was totally open.

The expedition was much 'lighter': jeeps and vans only, no truck, no bus. The heads were the same ones, Baetslé as leader and Tulpin for the logistics, but there were only 17 participants, all men. The mixity of the group during EAGB73 had indeed created some problems, leading to at least one divorce at the outcome of the trip.

Dossin was not around anymore as he had taken up a temporary professorship at the University of Bujumbura (Burundi). Heck teamed up with his friend Émile Biémont. No cumbersome equipment this time either: just good photographic cameras.

The prospective eclipse conditions were also much less favorable than three years earlier: the totality would last only about two minutes and the Sun would be only about 10° above the horizon.

[44] IAUC 2559 & 2566 (17 & 31 July 1973).

[45] Issue dated 3 August 1973, p. 310.

[46] https://it.wikipedia.org/wiki/François_Dossin & https://eo.wikipedia.org/wiki/François_Dossin (examined in July 2015).

[47] http://www.newscientist.com/subscribe (July 2015)

[48] French name: Expédition Astrophysique et Géophysique Belge 1976.



Fig. 44: Path of the totality for the solar eclipse of 23 October 1976. The marker indicates the point of longest duration. (Courtesy Fred Espenak, NASA)

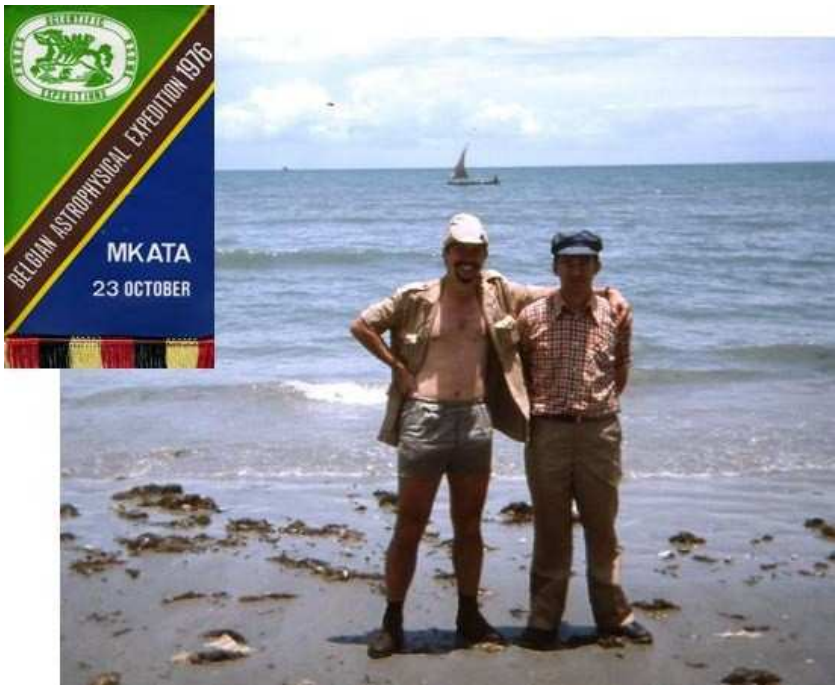


Fig. 45: On 21 October 1976, with Émile Biémont (right) on the Indian Ocean shores during a total solar eclipse expedition at Mkaja (Tanzania). Biémont would become a profilic author of books (cf. e.g. p. 447) and would contribute to one of Heck's volumes some three decades later (see p. 505).

Even the meteorological forecast was pessimistic for that time of the year at that location between ocean and forest. Preparing for the worst, the organizers had wisely planned an after-eclipse touristic program including Arusha near Mount Kilimanjaro, Lake Manyara and the Ngorongoro crater.

In the evening of 21 October, when Biémont and Heck were already in their sleeping bags in their tent, they heard a VW minibus arriving on site, its doors slamming and a well-known voice saying "The head of the Belgian expedition from Bujumbura is happy to greet the head of the Belgian expedition from Belgium!"

Dossin was shaking hands with Baetslé. Together with a colleague mathematician from Liège, also teaching temporarily in Bujumbura, they had crossed the whole country. Heck had kept Dossin informed by telex of all the arrangements and he could not resist joining. After all, Burundi and Tanzania had a common border.

On the eclipse day, the situation was bad: clouds were almost everywhere. Biémont and Heck ran as fast and as far as they could along the beach, hoping to get a glimpse at the solar disk. They could perceive the diminution of luminosity, but the two minutes of the totality were quickly gone and no picture could be taken. That was it. An all too frequent frustration known by observers.

The PhD Degree

Back to the thread of our story in 1973, barely home from Africa, Heck was instructed by his boss Swings to attend in September with Manfroid a commemorative meeting for students in astronomy in Toruń: *Copernicalia '73*. This was a Nicolaus Copernicus year (500th anniversary of his birth) and celebrations were taking place everywhere, especially in Poland and *a fortiori* in his birth town.

That trip to Poland made in Heck's Volvo car turned out somehow as an adventure, with numerous telltale facets, typical of the Cold War time. A full chapter would be needed to narrate all the details of a story involving refused crossings of the Iron Curtain while being threatened with machine guns at a Czechoslovak border point, a dash on a WWII German highway transformed into a Polish landing strip near Stettin, a stressing official car ride ("The Confession" style) towards Toruń city suburbs, the mystification of a politicized female Polish escort, and other anecdotes. As the scientific contents of the meeting were close to zero and the cultural activities mainly focussed on anti-Nazi shows, the stay was shortened and our young scientists could not avoid feeling relieved when emerging into West Germany.

During the following months, and including 1974 and the beginning of 1975, Heck shared his time between multiple missions in France – preparing his PhD thesis and pursuing his collaborations on luminosity calibrations with his algorithm – and service observing runs at the OHP Big Schmidt telescope, some of these with students.

On 10-11 January 1974, Heck visited, again with Manfroid, the Carl Zeiss factory in Oberkochen. They could see there the polishing room, various instruments such as the spectro-stratoscope used by Karl-Otto Kiepenheuer (1910-1975), but mainly the 2.2m

Cassegrain telescope that the Max Planck Institute for Astronomy was going to install at the Calar Alto Observatory in Spain (Publ. 151 & 597).

Later, Heck was again involved in the organization of Summer university courses unrelated to astronomy, hence not detailed here.

There was also, in January-February 1975, a one-month stay in Chile where Heck and Manfroid teamed up for photometric observations at La Silla. We shall come back to this hereafter in a separate section. Seminars, lectures and meetings with short communications were also at the menu as it suits to a normal scientific activity.

As said earlier, Heck's PhD work (see Fig. 220) was an generalization – with applications – of an algorithm developed by Jung (1970), itself generalizing an earlier work by Rigal (1958).

It is not the place here for long scientific developments nor for a circumstancial description of the results obtained. Interested readers can find all the details in the quoted papers and in Heck's own publications. See more particularly the abstracts under the header "Distance Scale" on pp. 475ff.

In a few words, Rigal's (1958) "simple" algorithm – based on the principle of maximum likelihood – allowed the determination of the average absolute magnitude of a sample of stars, in other words its average luminosity, as well as its average motion compared to the Sun. If its solution was analytical, the method however assumed that there was no dispersion in absolute magnitude and no error in the stellar proper motions used by the algorithm.

Jung's (1970) generalization took into account the dispersion in absolute magnitude and investigated effects from errors on the proper motions. The solution was no more analytical and numerical simulations were used to correct possible biases.

Heck's own generalization allowed the determination, not only of an average absolute magnitude of a sample of stars, but also of the individual absolute magnitudes through the calibration of a relation linking these and a set of observable quantities such as photometric indices, periods of variable stars, and so on. In addition, the dispersion in absolute magnitude as well as the components of the average velocity and their dispersions were calculated.

Difficulties in obtaining trigonometric, spectroscopic and cluster parallaxes led to the development of statistical methods to determine the absolute magnitude (hence the distance) of stars[49]. And statistical parallaxes are definitely not outdated by the advent of astrometric satellites.

As shown by numerous discussions at the *Hipparcos Venice '97* colloquium, the availability of more trigonometric parallaxes and better proper motions only pushed back the sphere of applicability of statistical parallaxes that remain quite valid for estimating extreme galactic distances and for confirming independent distance determinations.

Among the statistical estimators, the advantages of those based on the principle of maximum likelihood are well known: better statistical behavior and optimal usage of the information, hence better precision.

[49]See *e.g.* the review published by Heck in 1976 (Publ. 403).

Heck developed his algorithm mainly at IALg with a heavy usage, often at night and during weekends, of the IBM 360 (later 370) located in the basement of the Institute of Mathematics on the Val Benoît campus. Multiple trips to France maintained contacts with his thesis supervisor (Strasbourg) and collaborators (Paris, Meudon, Besançon, ...).

On 21 November 1974, the Faculty of Sciences set up the jury for the *Doctorat en sciences mathématiques* (PhD in Maths): P. Swings (Chairman), P. Ledoux, H. Breny, R. Simon and J. Jung, in other words Heck's current and previous bosses, a professor of statistics, another one of rational mechanics, and the thesis supervisor.

Jung was mentioned as belonging to Strasbourg University of which he never was a member *stricto sensu*. He was part of the French astronomical corps, his place of work being Strasbourg Observatory belonging to the French network of astronomical observatories and functioning (then) independently from universities. But those subleties were too much for the administration of Liège University. By the time of the PhD examination, Jung would actually be leaving astronomy.

The PhD "defense" took place on 01 July 1975 under the title *Applications du principe du maximum de vraisemblance à la calibration de critères de luminosité stellaire"*[50]. The degree was awarded unanimously with the "highest distinction" (Fig. 204).

Heck's algorithm, that himself called 'RJH algorithm' with reference to the successive generalizations from Rigal's and Jung's earlier developments, received a number of applications, not only for the PhD work, but also during the following decade, well into the 1980s. As summarized in a short paper entitled "Fifteen Years of Statistical Parallaxes by the Principle of Maximum Likelihood" (Publ. 227), quite a number of star samples underwent calibration.

Here is a short list of the studies and applications carried out:

• Statistical parallaxes
– general studies (Publ. 4, 5, 32, 38, & 103),
– lectures and review papers (Publ. 26 & 403),
– summaries at pp. 475ff.
• RR Lyrae stars
– luminosity calibrations and its variation according to metallicity, period, etc. (Publ. 1, 2, 6, 25, 103, 148 & 156),
– compilation of bibliographical catalogues (Publ. 21, 68, 411 & 416),
– summaries at pp. 476ff.
• Calibration of the Hertzsprung-Russell Diagram
– Mira Ceti, B, A, & F stars (Publ. 8 & 24),
– stars from Strömgren's 'intermediate' and 'late' groups (Publ. 7 & 19),
– so-called 'normal' stars (Publ. 59),
– so-called 'late' stars (Publ. 15, 17, 43, 48, 158, 172 & 179),
– Hg-Mn and Ap stars from other categories (Publ. 31 & 42),
– Am stars (Publ. 40),
– Barium stars (Publ. 232),

[50] Applications of the maximum-likelihood principle to the calibration of stellar luminosity criteria.



Fig. 46: The Jussieu university campus downtown Paris (5th district) – where our biographee followed probability and statistics courses in Spring 1971 – takes its name from one of the surrounding streets and the nearby underground station, themselves called after a family of botanists from the 17th to the 19th centuries. The prominent feature of the campus is the Zamansky tower, nicknamed the "bite à Zam" [Zamansky's phallus] by the students during the 1968 events. Mathematician Marc Zamansky (1916-1996) was the last Dean of the Sorbonne's Faculty of Sciences (from 1961 to 1970) before the reorganization of the Parisian faculties in 1970. Jussieu is now the main seat of the Pierre & Marie Curie University (Paris VI). It is infamous for been plagued by asbestos and for the necessary, still ongoing, rehabilitation works.

– δ Sct and δ Del stars (Publ. 190),
– SMR stars (Publ. 85),
– syntheses of various applications (Publ. 162 & 227),
– second annex thesis for the ProfDsc degree (see p. 157),
– summaries on pp. 476ff.

Since this is also related to the realm of cosmic distances, refer to p. 86 for a few words on Heck's involvment with the astrometric satellite Hipparcos.

The 'Modern' Statistical Methodology

When awarding a PhD degree, the Belgian system had to make sure that the applicants knew something else than their own narrow pet fields of specialization where the PhD works had been developed. Therefore a second "thesis", the *thèse annexe*, was required from the applicants.

While at Paris Observatory in 1971, Heck had digged into new fields of probability and statistics creeping in at that time in France. He even followed several courses at Jussieu. Back to Liège, he had developed contacts with Henri Breny's *service*, especially with Gisèle Mersch (1944-2002).

Heck had become increasingly attracted, not to say fascinated, by multivariate data analysis (MDA) methodologies, such as cluster analysis, discriminant analysis, principal-component analysis, etc. So far, none of such algorithms had been applied to astronomical data and it would have been interesting to see what kind of information such methods could squeeze out of, say, a photometric catalogue.

Hence, for his PhD *thèse annexe*[51] and the subsequent validated paper (Publ. 10), Heck decided to investigate how MDA methodologies could explore the relationships between photometric indices and spectral classifications. In particular, how reliable could be the predictions of spectral types and, through them, of effective temperatures obtained from uvbyβ photometric indices with a strict minimum of physical considerations?

Heck always insisted on the fact that MDA methods are not intended – and should not – replace the physical analysis, but they "can be usefully applied preliminarily in order to clear up the problem" (Publ. 10, bottom of p. 134).

Pushing further, Heck set up a collaboration with Mersch and two other statisticians from Liège University, Adelin Albert and Daniel Defays, working respectively at the Institute of Medical Chemistry and at the Institute of Psychology. The idea was that, when applying MDA algorithms to stellar data, the intellectual processes were identical to those when dealing with data from mices in a laboratory or from patients in a hospital. This remarkable example of interdisciplinary collaboration led to Publ. 20 (Fig. 47) exposing discrepancies between spectral types and photometric indices, suggesting re-examination of the data for the stars concerned. See also Publ. 159.

In the following years, Heck maintained a high interest in MDA capabilities. One of the first things he did when arriving at Strasbourg Observatory after his stint at the European Space Agency was to organize a colloquium on *Statistical Methods in Astronomy*, followed by other meetings and edited volumes on methodologies applicable to databases, on knowledge-based systems, on artificial intelligence, etc. A successful tutorial on MDA methods was also produced (Publ. 405) and several schools arranged. We shall come back to all this in due time.

Photometric Observations

A few months before his PhD presentation, Heck travelled to Chile with Manfroid for a one-month observing run at the Danish 50cm telescope (Fig. 48) located at ESO's La Silla Observatory (Fig. 49).

[51] Title: "Multivariate statistical analysis makes possible to obtain indications on the [physical] meaning of photometric indices" (original title in French: "L'analyse statistique multivariée permet d'obtenir des indications sur la signification [physique] d'indices photométriques").

Astron. Astrophys. 61, 563—566 (1977)

ASTRONOMY AND ASTROPHYSICS

Detection of Errors in Spectral Classification by Cluster Analysis

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Summary. Cluster analysis methods are applied to the photometric catalogue of *uvbyβ* measurements by Hauck and Lindemann (1973) and point out 249 stars the spectral type of which should be reconsidered or the photometric indices of which should be redetermined.

Key words: MK spectral classification — *uvbyβ* photometry — cluster analysis

I. Introduction

Numerical analysis methods have been shown reliable when applied to astronomical data. In a previous paper, Heck (1976) has shown the applicability of multivariate statistical analysis to a photometric catalogue, in order to relate a photometric index or a group of photometric indices to a fundamental physical parameter, using a strict minimum of physical considerations.

We are dealing here with the application of cluster analysis methods (described in Section II) to a photometric catalogue. Such methods are free of any physical hypothesis and perform the grouping of the stars only on the basis of the numerical values of the photometric indices through a dissimilarity measure to be defined between the stars.

We will see (Section III) that this grouping of stars corresponds to a repartition in spectral groups and allows to point out some errors of spectral classification.

The photometric catalogue considered here is that of Hauck and Lindemann (1973) for the stars with *uvbyβ* measurements. It is specially interesting because of the great amount of stars it contains and because of the homogeneity of the data (Lindemann, 1974).

We have only retained the stars for which all indices $(b-y)$, m_1, c_1 and β have been measured, and which have received a MK spectral type by Oblak et al. (1976a).

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The resulting sample contained 3430 stars but we have also eliminated all peculiar stars (emission-line, magnetic and metallic-line stars), in order to deal only with "normal" stars. The final sample contained 2849 stars.

II. The Methods

a) General Considerations

Different methods may be used to perform the clustering of a set of elements (taxonomy problem), and often the resulting classifications will differ. Thus the best strategy is to compare the results of different methods applied to the same data set.

Keeping in mind the great size of our sample, we chose an euclidian cluster analysis method and two hierarchical algorithms (single linkage clustering and a variant of the complete linkage clustering).

b) Euclidian Cluster Analysis

This method is fully described in Sparks (1973, 1975). It requires to provide preliminarily the desired number of clusters and the initial cluster centers. The method consists in a reassignment of the stars to the clusters in order to minimize the sum of the squared deviations of the stars from their respective cluster centers.

We worked in the principal component space of the data, what was equivalent here to use a Mahanalobis distance, taking into account the dispersion matrix of the data.

It should be noticed that the solution is not unique and depends on the initial cluster centers.

c) Single Linkage Clustering (Slink)

This is one of the oldest methods in cluster analysis; we used here the algorithm developed by Sibson (1973) which makes the application of the method feasible for a number of stars well into the range 10^3 to 10^4.

This method requires the definition of a dissimilarity measure $s(0^{(i)}, 0^{(j)})$ on the sample $\{0^{(1)}, \cdots, 0^{(m)}\}$, assigning smallest numerical values to the most similar pair of

Fig. 47: Exemplary collaboration between four statisticians from different fields (astronomy, mathematics, medicine, psychology) applying multivariate data analysis methodologies to stellar data (Publ. 20).

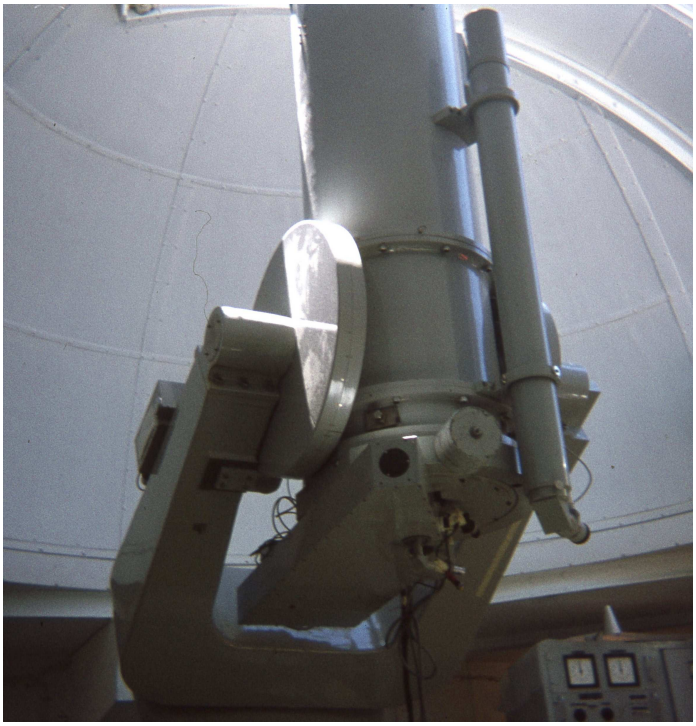


Fig. 48: This picture of the 50cm Danish telescope at La Silla Observatory has been taken on 04 February 1975. The 50cm ESO telescope is quite similar, with a different photometer. Those two telescopes were operated directly by the observer, without night assistant. Technical help was however on call, if needed at all.

This was for Heck an efficient introduction to photometric observing – in this case in the uvbyβ system – as Manfroid had himself built up expertise during his stay in Chile from 1971 to 1973.

Heck returned quite a few times to La Silla during the next couple of years, generally for long stays, sometimes over Christmas, observing again at the 50cm Danish telescope, otherwise at the 50cm ESO telescope or at the 1m telescope.

The trips to South America were overnight ones, starting in the afternoon as it was necessary to catch the intercontinental flight in Frankfurt or at another major European airport. The flights were increasingly packed, a long way from the empty Sabena plane in November 1971. Astronomers had to satisfy themselves with a seat in the Economy class, where the pitch between rows was always narrower.

Occasionally, they could spot an ESO head officer in First Class. One of these said once gracefully that this was quite normal since they were going to Chile to work, while the astronomers were going to the observatory to enjoy themselves. The reader will appreciate.

There were generally one or two nights spent at the ESO Guesthouse (or at a hotel) in Santiago before travelling to the observatory and reversely at the end of the observing run before flying back to Europe.

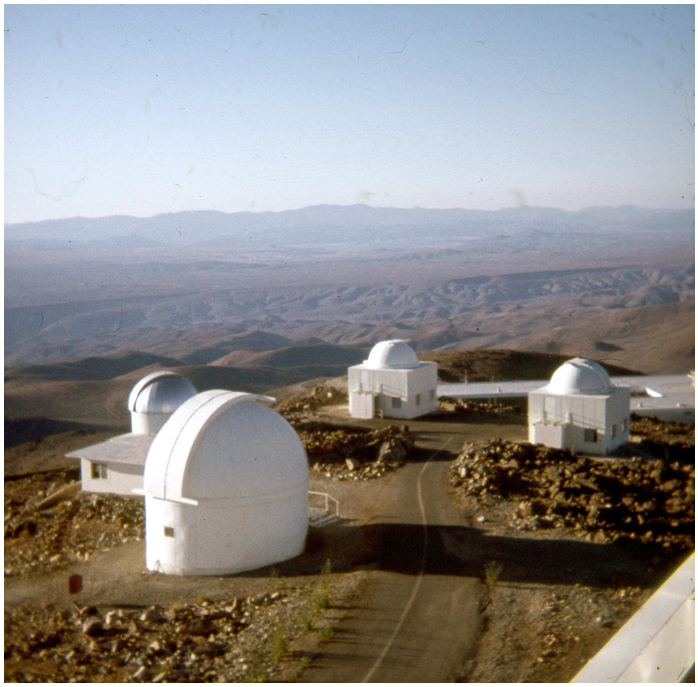


Fig. 49: This picture taken from the walkway of the dome hosting the 1.52m telescope shows the "small domes" of La Silla Observatory: in the foreground, the 90cm Dutch telescope, then from left to right, the 60cm Bochum telescope (partially hidden), the Danish 50cm and the ESO 50cm telescopes (09 February 1975).

Heck has experienced all kinds of transportation between Santiago and the observatory: cars, vans, buses and planes, including when the latters had all kinds of problems (loss of engine power, radio not working, door jumping open, etc.).

Once, when seating in the cockpit, Heck found himself with the commands in his hands while the pilot was busy on his side with some urgent matter. No way to protest. "Just hold it, man, and steer properly."

To travel back to Santiago at the end of an observing run, the transportation means that Heck most appreciated was what was called the "Pullman Coach", running from La Serena to the capital city along the Panamerican Highway, with only a few people on board and a service at the level of an airplane First Class: hostesses, large reclining seats, great food, drinks at will, newspapers, etc. What a cosy situation to fully enjoy the setting Sun over the Pacific Ocean!

The accommodation at La Silla was confortable and efficient. Erich Schumann had to be commended for that. Hygiene was excellent, at least when the janitor did not leave the door open for too long, enabling scorpions, spiders and vinchucas to sneak in. The vinchuca *(Triatoma Infestans)* was especially worrisome as this insect could suck the blood of a sleeper and possibly contaminate him/her with the Chagas disease against which there was no cure at the time.

The accommodation at the ESO Guesthouse in Santiago could be excellent, but Heck found himself much too frequently accommodated in the small room giving into the office, continually disturbed by phone calls and conversations when he needed to recover, either from the night flight when arriving, or from the observing run before departing back to Europe, given the time differences between the locations and the day/night lifetime swaps.

Christmas time is Summer time in the Southern hemisphere. The nights are short, but of excellent photometry quality, hence quite busy. Just to break a month-long run, observers would sometimes take advantage of the ESO shuttles to go down for a few hours to La Serena, watching people on the beach with occasionally the amazing view of a Santa Claus with warm Northern red clothes disembarking from a small boat and distributing candies to kids in swimsuits. Imported Northern-hemisphere habits – or the nostalgia of European immigrants – was pushed to the point that Christmas trees with artificial snow could be seen here and there.

At La Silla Observatory itself, the atmosphere around Christmas and New Year was unusual as this was the only time of the year when the families of the Chilean personnel on duty were allowed on the summit, providing observers with joys and cries of kids running around. While alcohol was strictly prohibited at the observatory (publicly at least), visitors could have the pleasant surprize to receive a bottle of wine or pisco at the Christmas Midnight meal.

Heck remembers with fondness the excellent relationships building up between observers staying for long runs on the mountain. This would change with the availability of the 3.6m telescope. The pressure was so high on that instrument that the accepted programs were granted only a few nights, sometimes as little as one half night.

As a consequence, the 3.6m observers did not stay long at the observatory. They were often still jetlagged by the trip from Europe and frequently busy tuning an auxiliary instrumentation with high turnover. It is owed to the full truth to add that, being granted access to the largest European telescope of the time[52], some observers behave like astronomy aristocrats contempting the users of smaller instruments with whom they would rarely mix. Excellent science could be carried out with modest equipment though, and this was too often forgotten.

Like many ESO observers of that time, Heck could spend hours telling stories linked to the place or to some of its characters. We shall retain here only one anecdote involving Heck himself and his Belgian colleague Chris Sterken.

The two were in the middle of a month-long observing run with all excellent nights, each at one of the 50cm telescopes, and both wished to have a break, an opportunity to go down to La Serena in order to change their mind and to buy a few things.

An ESO employee overheard their conversation at dinner and offered to lend them his car. "I do not need it, he said, as I am leaving for Europe. When you'll finish your night to-morrow morning, the car will be [at that place] with the keys hidden [at that other place]."

[52]Together with the 3.6m Canada-France-Hawaii Telescope on Mauna Kea.

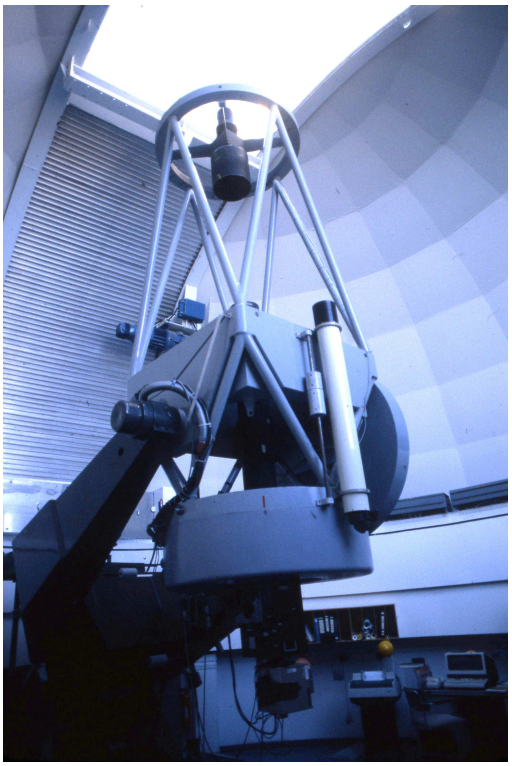


Fig. 50: ESO 1m telescope at La Silla Observatory (02 September 1980).

And indeed, after working a full night, when the Sun was coming up over the Andes, the two fellows found the car and the keys as announced. They drove to La Serena, did their shopping, had a good lunch at the *Hotel Francisco de Aguirre*, spent half an hour or so walking out their meal on the beach and drove back the 160km to La Silla for preparing the next night of work.

They arrived at the observatory in the late afternoon when most people were still having tea at the cafeteria, and they immediately sensed that something was wrong: everybody was looking at them. They were barely sitting with a piece of cake and their cup of tea that an ESO administator joined them, saying gently in Spanish: "Gentlemen, please allow me an advice: when you take a car, you should ask for permission or at least tell someone where you are going."

It came out that the chap who had offered the car had indeed left for Europe, but the car was not his: it was the service vehicle of his best enemy in the place. The whole ESO personnel had been searching for the car during the whole day, over the whole site and all along the long access road, looking down every ravine in case whoever took or stole the car had had an accident. The *Carabineros* [police] were going to be called in.

When in Chile, Heck took every opportunity to learn Spanish, or rather the Chilean version of *Castellano*. He would go daily through the national newspapers, especially *El Mercurio*, and put his hands on whatever other publications in Spanish he could find, looking up the unknown words in a dictionary he carried along.



Fig. 51: With Hans-Michael Maitzen (right) at La Silla Observatory (Chile) on 29 December 1975. The dome at the 3.60m telescope is in the far background, with the 1.52m telescope at closer range. The dome of the 90cm Dutch telescope is partially hidden by the lab of 60cm Bochum telescope in front of which the two astronomers are standing. (Courtesy C. Sterken)

As far as English was concerned, Heck had no difficulty in reading it, but the automatisms for speaking it were not yet fully acquired. And the exchanges with IALg visitors with strong accents were sometimes quite laborious, mainly with those who did not care about making sure they could be understood by foreigners.

Heck purchased fifty private lessons at the Berlitz School in Liège, following the "total immersion" scheme and having requested that the teachers rotate as frequently as possible in order to get used to as many different accents as possible. He actually ended giving astronomy lectures in English to all of them and even guided for them a tour through IALg at the conclusion of the courses.

Quite naturally, Heck intended to do the same with Spanish. Not only the language was phonetic and more regular than English, but there was only one teacher of Spanish at the Liège Berlitz School, an Italian gentleman in fact. So getting used to a variety of accents would not work for Spanish.

Being again in Chile after only a handful of lessons, Heck realized he could understand what he was overhearing in the streets of Santiago. Hence there was no need to go on with the lessons. It was only a matter of building up the vocabulary and this could be done by practicing the language.

Heck became quickly fluent in Spanish, speaking with whoever he could, especially ESO's Chilean personnel. His excellent knowledge of both English and Spanish would proved to be an appreciable asset when hired by ESA for working in Spain.



Fig. 52: Picture of a rare sight (22 July 1985): a snow storm had engulfed La Silla Observatory.

Heck got quickly used to the almost daily tremors of the terrestrial crust in Chile, and to bigger quakes too, to the point that, like many people, he would not always rush to a safe place when a really strong wave would pass through.

For mild events, he always admired the elasticity of the ground, of the observatory buildings and of the telescope mountings when coming back to the instrument and finding again the guide star right at the center of the eyepiece reticle. The real danger when guiding[53] was to get the eye hit by the eyepiece for not moving away fast enough when the Earth started shaking.

The various photometric missions at the ESO telescopes led, over the following decade, to a number of papers gathering together observations in the uvbyβ system (Publ. 9, 16, 39 & 208), more particularly on CP stars (Publ. 11, 12, 18, 22, 23, 52, 58, 66 & 224), on Be stars (Publ. 13, 194 & 214), on the W UMa system ϵ CrA (Publ. 64), in addition to objects such as V348 Sgr and RR Tel on which we shall come back later (pp. 160ff & 160ff respectively).

Standard stars from working lists were checked and suspected variable stars were monitored (Publ. 195 & 207). Passbands from filter sets were also investigated. A reduction method based on a multinight approach was developed by Manfroid and its robustness tested by simulations (Publ. 50, 54, 208 & 211, with summaries at pp. 479ff).

[53] At that time, guiding was still performed in the dome itself, with the eye at the eyepiece of the guiding refractor.

In the early 1980s, the homogeneity of photometric data would be studied (Publ. 229 & 252) and a comparative study of period determination methods undertaken in collaboration with Manfroid and Mersch (Publ. 56, 189 & 210) with the formalization of underlying statistical criteria, including a later application to Tycho data (Publ. 248). Heck also took part in the long-term photometric program for variable stars at ESO (Publ. 80 & 421).

A couple of photometric missions were attempted later at the OHP 1m telescope located on Chiran, but they turned out to be a waste of time, none being productive because of instrument failures, bad weather, or the poor photometric quality of the site.

President of the Liège Astronomical Society

The space premières had been going on since Heck joined IALg professionally. Since the first human steps on the Moon in Summer 1969, there were for instance the first automatized return of a sample of lunar soil (USSR, 1970), the first motorized robot on the Moon (USSR, 1970), the first soft landing on Venus (USSR, 1970), the first space station (USSR, 1971), the first object in orbit around Mars (USA, 1971), the first impact on Mars (USA, 1971), the first soft landing on Mars (USSR, 1971), the first flyby of Jupiter (USA, 1973), the first flyby of Mercury (USA, 1974), and so on.

Heck's gifts for communication and willingness to share made him a natural contact at IALg for all questions coming from the outside world, either about those space ventures or on astronomy in general. As he was often working at the Institute in the evening, the concierge was passing the calls every time he was seeing the light in his office.

Heck had also been issuing, often co-authored with Manfroid, internal IALg notes on remarkable celestial events such as comets, eclipses, occultations, etc.[54]. They were opportunities for some of their colleagues theoreticians – especially those who boasted they had never put an eye at a telescope – to become more familiar with the real things "up there".

Manfroid had constructed a telescope following the model designed by Texereau (1961). As this 21cm Newton on an altazimuth mount could be moved around rather easily, they were going to the countryside to escape the high sky background in Liège. They could see more with that instrument than with Cointe's Désiré, albeit bigger. They were often accompanied by colleagues and/or outsiders, amateur astronomers or parties just interested in "having a look".

Seeing, at the end of an observing session, the satellites of Jupiter at a different position from where they had been spotted at the beginning was a proof that those celestial objects were actually moving. Likewise when the Moon was passing in front of the Pleiades. Of course, some of the attendees needed to understand why what they were observing through the small telescope was not as spectacular as the dramatic color pictures they could find in the books and magazines.

[54]See *e.g.* Publ.135, 136, 138 to 140 & 153 to 155.



Fig. 53: Snow again, but in the Northern hemisphere: with Jean Manfroid (left) moving down from Chiran observing station of Haute Provence Observatory on 21 December 1979, dressed in mountain gear of the time (also used for observing), radio in backpack, luggage on sledge topped by snowshoes needed over deep snow-drifts. Located at an elevation of about 1900m on the first ridge of the Alps from the West, that station was built in 1974 by French CNRS and decommissioned from professional observing in 1986.

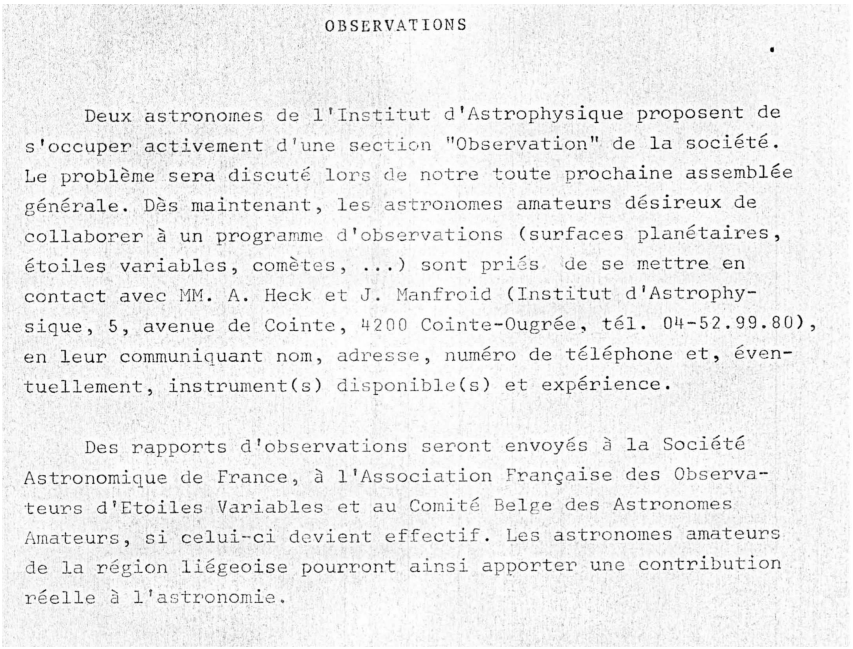
At that time, the Liège Astronomical Society (SAL[55]) was largely dormant since Armand Delsemme – who had founded it in 1938 – had taken up a professorship at the University of Toledo (Ohio) and Dossin had left the presidency when leaving for ESO in the early 1960s. But there was obviously a demand from amateurs and from the public at large to have a more active entity.

Instead of setting up a rival society, something they actually considered at some stage, Heck and Manfroid proposed to set up an "Observations Section" within the SAL and convinced its secretary to publish an announcement thereupon (Fig. 54). They personally visited every person who expressed interest.

The SAL Observations Section took shape with 14 registered members in the first months of 1971. Outings in dark areas were regularly organized and individual observations encouraged. Activity reports were regularly published as dedicated leaflets (*e.g.* Publ. 584) and these bulletins became *de facto* the only SAL-linked regular publication.

Heck started publishing educational notes answering queries, a kind of FAQ before such columns became fashionable (*e.g.* Publ. 585). An inventory was made of what was left from the library.

[55]In French: Société Astronomique de Liège.



OBSERVATIONS

Deux astronomes de l'Institut d'Astrophysique proposent de s'occuper activement d'une section "Observation" de la société. Le problème sera discuté lors de notre toute prochaine assemblée générale. Dès maintenant, les astronomes amateurs désireux de collaborer à un programme d'observations (surfaces planétaires, étoiles variables, comètes, ...) sont priés de se mettre en contact avec MM. A. Heck et J. Manfroid (Institut d'Astrophysique, 5, avenue de Cointe, 4200 Cointe-Ougrée, tél. 04-52.99.80), en leur communiquant nom, adresse, numéro de téléphone et, éventuellement, instrument(s) disponible(s) et expérience.

Des rapports d'observations seront envoyés à la Société Astronomique de France, à l'Association Française des Observateurs d'Etoiles Variables et au Comité Belge des Astronomes Amateurs, si celui-ci devient effectif. Les astronomes amateurs de la région liégeoise pourront ainsi apporter une contribution réelle à l'astronomie.

Fig. 54: This announcement was an offer by Heck & Manfroid to gather together active amateur observers in an "observing section" of the then moribund Liège Astronomical Society (SAL) – rather than setting up an independent association. The call was successful and, in hindsight, this document could be seen as the basis of the SAL renewal in the 1970s, lasting to this day (cf. Fig. 56).

It became more and more obvious that the Observations Section was the only active kernel of the society. Its membership had more than doubled with 35 members by February 1972. Links were established with foreign societies such as the French association of variable stars observers AFOEV[56].

In June 1972, Heck had become SAL Vice-President, running most of the everyday life, signing meeting calls and agendas, with the complicity and blessing of Dossin, back from ESO and as SAL President. Lectures or conferences were becoming monthly events. The SAL legal status was upgraded, enabling the receipt of subventions. Reinstalling the old telescope of the society was an ever more pressing concern as it was in a decaying shelter near one of those Belgian brightly illuminated freeways.

In December 1972, the SAL old guard stepped down peacefully and younger people from the Observations Section were elected to the key functions of Secretary and Treasurer, thus completing the renewal of the Committee.

Activities were then systematically planned, with monthly talks not only by local or visiting scientists (thus providing public visibility to IALg activities), but also by outsiders enticed by Heck diplomatic skills. A monthly bulletin, later called *Le Ciel*, was published. A presence in the local, regional and national media was ensured.

[56]Association Française des Observateurs d'Étoiles Variables.



Fig. 55: On 12 June 1976, Heck (center left, with the goatee) inaugurated, as President of the Liège Astronomical Society, the new SAL observatory at Horion-Hozémont (cf. e.g. Publ. 609).

Group purchases of books were organized, as well as excursions, such as those to the MPIfR Effelsberg radiotelescope or to Paris and Meudon Observatories. The library was continually enriched. "Observing cases" containing small instruments were offered on loan.

A new site was finally found for the society telescope, on top of a communal school in the outskirts of Liège. The instrument and its 27cm mirror were upgraded and a new dome was made by a team of society members. The facility was inaugurated on 12 June 1976 (Fig. 55) by Heck who had become the society President in 1975.

Such multiple and diversified activities resulted in a strong increase of members (Fig. 56) and grounds had been laid for this to continue for many years ahead. When Heck left for new horizons, there were more than 300 members, in other words a 2000% increase compared to the initial membership of the Observations Section! Heck had also managed to introduce the first women ever in the SAL administration council.

In June 1977, Heck initiated in the SAL bulletin a series of articles that would last 37 years, in fact until his retirement (cf. pp. 461 to 471). The title *Potins d'Uranie*[57] could be translated as *Gossips by Urania*. If the series started with a humoristic note, the *Potins* progressively evolved from short anecdotes to more and more substantial contributions, of diverse styles and on varied matters, with an always richer iconography.

[57]See also http://www.potinsduranie.org/

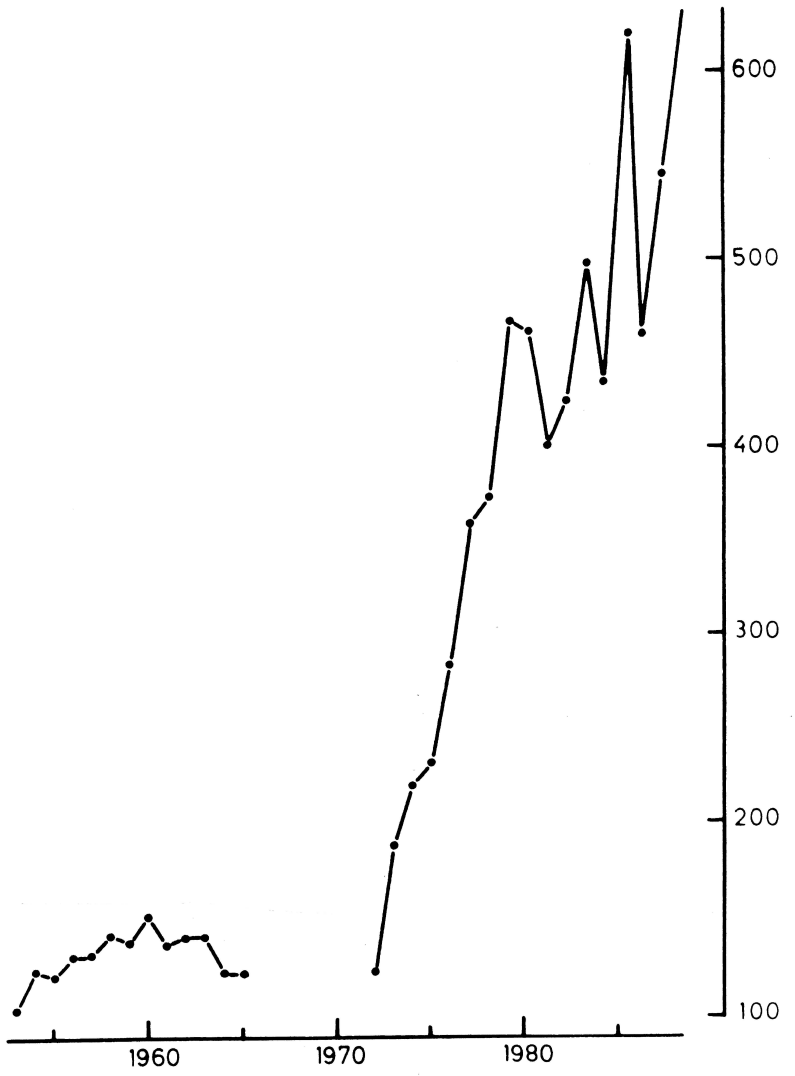


Fig. 56: This curve showing the membership evolution of the Liège Astronomical Society (SAL) during the second half of the 20th century has been extracted from an unsigned article in the December 1988 issue of "Le Ciel", celebrating the society's 50th anniversary. Heck's vice-presidency and presidency correspond to the period 1972-1977. The straight line drawn in the original figure between 1965 and 1972 has been removed here as no statistics were available for those years. Actual figures in that period would have probably been closer to zero than over a hundred as a line joining the two edges of the gap would let to believe.



Fig. 57: Books gathering together papers from the "Potins d'Uranie" column under the pen name Al Nath: the upper one published by SAL in 1985 (Publ. 925) with the 50 first articles, the lower one published by Venngeist in 2014 (Publ. 409) with another batch of 50 articles from this century and dealing with constellations.

Some 255 *Potins* have been published by various magazines from different countries, some of them translated into German and Dutch, dealing with themes ranging from news to historical notes, via legends of the world, societal considerations, anecdotes, biographies, astro-related art, etc., not to forget articles involving original characters.

Heck also found inspiration from his birth area when telling stories – true or fictional ones – about his marshy High-Plateaux. A book gathering together fifty *Potins* centered on the constellations has been recently produced[58].

In all this, Heck used a pen name, *Al Nath*, the Arabic name of the star β Tauri. Its first and last letters are Heck's initials.

Before closing this section on public outreach, a few words should definitely be said on the *Astronomical Photographic Atlas* in five languages[59] put together by Heck & Manfroid (Publ. 410 and Fig. 58 & 232).

[58]See Publ. 409, Fig. 57 and http://www.venngeist.org/const_book.htm.
[59]English, French, German, Spanish, Esperanto.

This was still the time when all original astronomical pictures were recorded in black and white, those appearing in colors in the magazines being in false colors or resulting from rough and tedious combinations of pictures taken with different filters (but not digitally obtained as done today).

A complimentary copy of the atlas was sent to the Royal Palace in Brussels and King Baudoin's secretary wrote a warm letter of thanks. The King was indeed an active amateur astronomer. Pol Swings, Heck's boss, who had written the book foreword, had been among the King's teachers. IALg scientists occasionally served as advisors for the royal telescopes. The King had also visited the observing facilities at OHP.

In June 1975, a fortnight before Heck's PhD presentation, the King attended the opening ceremony of the 20th Liège Astrophysical Colloquium, a renowned scientific gathering, routinely attended by Nobel Laureates and other astronomy grandees. Heck's Volvo car was part of the royal cortège, moving the brass around, escorted by police motorbikes with sirens and flashing lights. Heck never crossed the city so fast again.

The atlas itself is not so much important for what it represents, but for what it triggered over the next decades.

As explained in Publ. 73, the local publisher for the atlas needed to run a proper advertizing campaign to distribute the masterpiece to the astronomical community and, possibly, in the outside world too. The authors started gathering lists of essentially amateur organizations around the world. They were indeed the prime marketing targets since they could have bought the book for their libraries and/or let it know to their members. Lists of journals were also set up for taking advantage of the reviewing system.

Then, the intrinsic interest of such compilations became obvious: beyond their historical value by giving a snapshot of the amateur world in those years, they could also not only improve or make easier the establishment of national and international relationships in amateur astronomy, but also provide professional institutions with lists or groups they could approach for *e.g.* complementary observations of variable objects.

And since it was then appropriate to inform professional institutions and organizations world-wide about the availability of such lists, compiling their addresses became in turn a natural consequence.

Thus came to light a number of directories of astronomy-related organizations, both professional and amateurs (pp. 441ff). Beyond these, Heck would develop organizational databases that would be adopted by institutions such as ESA, ESO, CDS, CfA (p. 473). These resources in turn would lead to societal studies and publications.

We shall come back to this in dedicated sections (pp. 207ff & 227ff).

A Career in Full Momentum

As it can be seen from the above as well as from the lists of publications (pp. 401ff), missions (pp. 369ff) and meetings attended (pp. 383ff), Heck had built over the years a successful career along three axes:

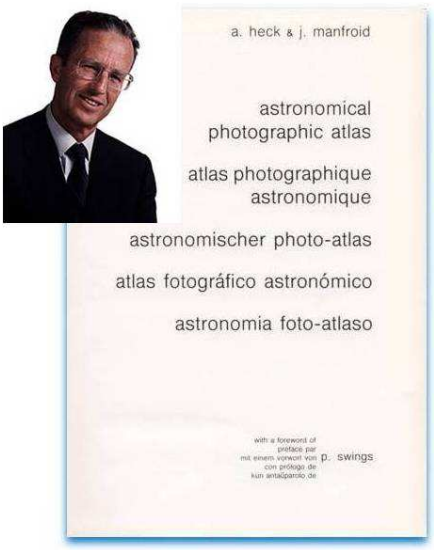


Fig. 58: King Baudoin – an accomplished amateur astronomer – sent via his secretary a warm letter of thanks for the complimentary copy of this multilingual "Astronomical Photographic Atlas" compiled with Jean Manfroid.

• observational astrophysics, with expertise in photometry and photography (including putting his name on a comet);
• theoretical astrophysics, with multiple collaborations using the algorithm he had developed for distance determinations, as well as with quite promising perspectives from the application of multivariate analysis methodologies to astronomical sets of data;
• public outreach, with a full range of facets going from publications and lectures to the revival of the Liège Astronomical Society as explained in the previous section.

In 1976, beyond shorter visits, Heck had two long stays at Strasbourg Observatory: first, as Associated Astronomer during the full month of May at the invitation of Carlos Jaschek, the new CDS Director who had succeeded Jung in 1975; then in August, in the framework of grants awarded by France to young foreign astronomers as the International Astronomical Union (IAU) was holding its triennial General Assembly in Grenoble at the end of the month. Just before that conference, a meeting of direct interest to Heck's work was held in Strasbourg: IAU Colloquium 35 on *Compilation, Critical Evaluation and Distribution of Stellar Data*.

The more he was visiting Strasbourg, the more congenial Heck was feeling with that city, the mixed culture of the surrounding region, Alsace, and its quality of life. In March 1974, on his way back from an observing run at the OHP Big Schmidt, he had stopped for lecturing on cometary observations[60] at an SAF[61] conference. The participants were essentially amateur astronomers and people from the public at large.

[60] See Publ. 605 released two years later.
[61] Société Astronomique de France.



Fig. 59: The various domes of La Silla Observatory, as well as the roofs of some dormitories and of the hotel-restaurant, are visible behind Heck sitting on top of the slit opening the 3.6m dome, then under construction (05 December 1975). The horizon is made, beyond the pre-Andes ridge, by the Pacific Ocean.

Being the last speaker of the day in a meeting already running late before his talk, Heck was interrupted in the middle of his scheduled time by an organizer bringing him a big jug of beer: "That's how one could try to get a Belgian shortening his speech ..."

The following day, an excursion was organized through the area for discovering its many sundials, including the quadrifaced one at Dorlisheim road crossing and the 24-faced one on Mount Sainte-Odile (Fig. 43). On that trip, Heck drove unknowingly through the village where he was going to buy a house ten years later.

At the time of Heck's childhood in his High-Plateaux village, packages of processed cheese were delivered with images of typical Alsatian houses that could stand on their folded cardboard bottoms. Thus the kids could progressively shape an Alsatian village with all its half-timbered buildings and inhabitants in traditional clothings. This was a real pleasure for Heck to discover in real life these neat villages decorated with flowers.

The situation sounded less impeccable in the regional capital. Heck was sometimes wondering, when invited by some local colleagues, how these could live in houses where the staircases and other places were deteriorated, as if not concerned by their living context, as if "I-don't-care" attitudes were pervasive among some young intellectuals. Or was it a way to pretend being someone else? To disown middle-class origins?



Fig. 60: Carlos Jaschek (1926-1999), whose his real first name was in fact Rüdiger, had succeeded Jean Jung as CDS Director in 1975. He invited Heck for lecturing on distance indicators in May 1976.

For his accommodation in May 1976, Strasbourg Observatory people had found a studio in one of the towers near the university campus. Here again, the dwelling condition was depressing, reminding his 1971 stay in Paris. And the surroundings were weird. Many studios in the adjacent towers were inhabited by students still in the libertarian spirit from the late 1960s, living in community, making love in all positions from dawn to dusk and from dusk to dawn without bothering to pull the curtains.

There was also that young Asiatic lady, right in front of Heck's studio, who was cleaning her windows almost every morning. When extending her arms to reach the top of the panes on her balcony, everybody could see she was wearing nothing but her tiny nightgown. Perhaps a silent call from a lone soul ...

For the short stays, Heck could benefit from a room at the observatory itself, small, rough, with a thin jet of cold water and a toilet down a monumental staircase, but its location was most convenient and, last but not least, it was free of charge. Not all observatories were so generous: at Besançon Observatory for instance, Heck was asked one morning to pay 100 French Francs for having been able to sleep on a mattress put on the floor of an empty room.

During his stay in May 1976 at Strasbourg Observatory, at the suggestion of Jaschek, Heck gave several seminars on distance (or absolute magnitude) determination methods. This led to a couple of review papers (Publ. 26 & 403).

Pierre Lacroute, whom Heck had met in Jung's office during his stay at Paris Observatory in 1971 (p. 42), was still Director of Strasbourg Observatory (Fig. 61). Heck was always impressed by his kindness, although Lacroute was molded in the old-style, somewhat authoritative, managerial approach, so typical of the elder generation. Lacroute never missed an opportunity to discuss his ideas (scientific or general) with young people.

One morning, entering the office where Heck was preparing his May lectures, he dropped on the desk a document on which he almost shyly requested comments. This turned out to be a draft of his space astrometry project that became the Hipparcos satellite[62].

A couple of decades later, Heck's own involvment with Hipparcos would take the shape of an edited book on the satellite impact (Fig. 241, Publ. 389) and the co-organization of a colloquium on the post-Hipparcos distance scale (Publ. 108 & 464), in addition to an application from data of an approved Hipparcos program (Publ. 320).

When Belgian Politics Meddles In

While Heck was efficiently developing his activities, the consequences of the events that took place in Europe in the late 1960s – and especially those involving the university population – gradually changed the way universities were functioning.

Services (cf. p. 28) had to be accommodated within a *department*. The professors were still heads of their groups, but not quite as much as before. A council gathering representatives from the various layers of personnel was spending hours and hours caring from problems arising from the old struture while reflecting on the future. Heck had been acting as representative of the non-permanent scientific personnel since 1972.

Belgium is known world-wide not only for its beers and fries, but also for its infamous linguistic "problems". It would however be a mistake to blame what follows on that latter facet only, even if it interferes somewhere up the ladder.

The proliferation of "universities" or "university faculties" in the country played a much more important rôle. The local dynasts wanted indeed to have a university in their province capitals and this was granted generously by governments not assessing the cost this would have in the long term on the nation finances.

In the traditional Belgian egalitarian way, and both forcing and simplifying the image to the extreme, this meant indeed that, if a cyclotron was granted to a French-speaking university, another one had to be conceded to a Dutch-speaking university, likewise between state universities and so-called "free" or confessional universities. One can easily imagine the impact of such a dispersion of resources. All this has to be coupled to the fact that politicians do not quite comprehend the complexity of research funding nor the dynamics of science.

At the time of our story, well before Belgium became a federal state, the national governments used to result from coalitions between several political parties. As went the general understanding, the Minister of National Education was the last one to be chosen, this being done to optimally adjust the coalition of the moment. Never mind if that person had no expertise in the educational problematics nor scientific research. And it so happened that a wood dealer was put in charge of the Ministry of National Education from 1974 to 1977.

[62] Refer to the obituary written by Heck for the American Astronomical Society (AAS) in 1993: Publ 282 or http://aas.org/obituaries/pierre-lacroute-1906-1993.



Fig. 61: Pierre Lacroute (1906-1993, right) who was Director of Strasbourg Observatory from 1946 to 1976 is considered like the "father" of the astrometric satellite Hipparcos. With the collaboration of Pierre Bacchus (1923-2007, left, earlier in Strasbourg, then in Lille after 1973), he also tackled the challenge of the data reduction. The picture has been taken at the Aussois Hipparcos colloquium in June 1985. (Courtesy C. Turon)

Acknowledging he was not coming from the academia, he claimed however to be an excellent manager, criticizing the educational system for squandering. He was credited with an infamous quip accusing in particular the researchers: "You are gold diggers, not because you are finding gold, but because you are costing gold" [63].

He then made a mistake that can also be seen in other countries and in other systems: looking for "objective criteria" to fund universities on a balanced basis, the criterion retained here being the number of students, totally disregarding the research activities developed over decades and decades by the main universities. Such activities were virtually absent in the new university centers created here and there only a few years earlier. According to that criterion, Liège University, a state university founded in 1817 when Belgium was under Dutch rule (Fig. 15), was heavily overstaffed.

The appointments as Assistant Professors were by two years. Heck was initially appointed from 01 October 1970 to 30 September 1972, then renewed till 30 September 1974 and 1976.

[63] The pun works better in French as both *digger* and *researcher* can be translated by the word *chercheur* : "Vous êtes des chercheurs d'or, non pas parce que vous trouvez de l'or, mais parce que vous coûtez de l'or."

Interestingly, Assistant Professors in Belgium, even under temporary terms, were considered at that time as civil servants. Hence they were obliged to take an oath of fidelity to the King and the laws of the Belgian people[64] according to a decree from ... 20 juillet 1831, *i.e.* the day before the first King of the Belgians, Leopold Ist, was crowned. Heck's oath ceremony (together with many other employees) had taken place on 10 December 1970 (cf. Fig. 203).

Heck's boss, nearing his retirement in 1975, was anxious, especially under the pressure from his wife, to orient his succession as much as he could in favor of a person to whom he was especially attached. His illness had of course made him weaker over time, as was becoming his care towards Heck's career.

For instance, just before the obtention of his PhD degree, when the events described above were looming larger and larger, with a real threat that no more tenures would be allotted to Liège in the near future, Heck suggested that his boss initiated the procedure for transforming his position into a permanent one. Such a step was normally taken after the PhD graduation, but this was not mandatory. Other professors had seen the danger of loosing their assistants and had launched the procedure for their permanent nomination. But Swings told Heck to wait.

What Heck feared happened: as a consequence of the regulations issued by the wood dealer/minister, appointments at Liège University could not be extended, nominations to tenures were blocked, tens and tens of scientists (some say up to 200 researchers) had to look for a job elsewhere, in many instances abroad. One day, the story of that diaspora of brains from Wallonia will have to be fully told and its impact on the regional economy and dynamism in the 1970s/1980s properly evaluated.

Ironically, according to biographies available on the web[65], that wood dealer/minister ended his life as president of an association defending the heritage in Wallonia, after having had to resign earlier from an important position because his managerial methods were not accepted anymore.

It is never too late to understand that people's life and careers, and especially scientific ones, cannot be handled as wood lots, log shipments, more generally batches of goods or columns of figures in an accountant worksheet.

Heck would meet again later this type of behavior and he will certainly have more to say on this critical episode of his life in his announced personal memoirs that should be available *post mortem*.

For the time being, the harm was done. Although he has been recognized qualified and eligible for a permanent position by the University Council, he was only granted an exceptional term till the end of September 1977. His stay at Liège University could not be extended beyond that date. If he wanted to pursue his research activities, he had to move abroad. That expatriation towards an uncertain future meant also a number of unfortunate consequences in his private life.

[64] "Je jure fidélité au Roi et aux lois du peuple belge."

[65] http://connaitrelawallonie.wallonie.be/fr/wallons-marquants/dictionnaire/humblet-antoine and https://fr.wikipedia.org/wiki/Antoine_Humblet (July 2015).



Fig. 62: Towards the end of his stay at IALg, Heck's office was moved a couple of times because of some internal restructuring, especially for the library. This postcard corresponds to the view from his third (and last) office (Summer 1977), located in a one-floor annex across the garden and visible in Fig. 13.

A hunt for positions here and there was then initiated. Via the Interministerial Committee for European Migrations[66], Heck secured an offer to join a university in La Serena which had the advantage of positioning him near the large observatories in Chile.

But all this was going to change after meeting by chance Léo Houziaux one sunny day in April 1977 ...



Fig. 63: IALg had a major involvment in the S2/68 experiment carried by the TD-1A satellite launched on 12 March 1972. It produced a fundamental catalogue of ultraviolet stellar fluxes between 1350 and 2740Å.

[66]Comité Interministériel pour les Migrations Européennes (CIME).

The International Ultraviolet Explorer

At the end of April 1977, Heck happened to meet his first professor of astronomy, Léo Houziaux (see p. 20 & Fig. 64) who was now based at the University of Mons-Hainaut.

As Heck was telling him about his current situation and that the best he could secure was a firm offer to join a university in La Serena, Houziaux mentioned that the European Space Agency (ESA) was setting up a ground observatory for exploiting the International Ultraviolet Explorer (IUE). That spacecraft was going to be launched in January 1978 as a joint venture between ESA, NASA and UK's SERC. The European ground observatory serving both ESA and SERC would be located at a satellite tracking station near Madrid as a return for Spain membership in ESA. The label of the place would be "Vilspa" – a contraction from the name of the closest inhabited place, "Villafranca del Castillo", and "Spain".

Heck enquired by ESA, received some documentation and, on 18 May 1977, applied for a position at what was already called the ESA IUE Ground Observatory. Before going further, it is interesting to peruse that application as it reviews Heck's education, publications and other assests at that turning point of his career.



Fig. 64: Marcel Migeotte (1912-1992, right) handled the administrative matters of the 'service' after Pol Swings' retirement in 1975 and was de facto Heck's boss for his last months at IALg. Léo Houziaux (b. 1932, left), whose courses had awaken Heck's interest in astronomy (p. 20), had meanwhile taken up a professorship at the University of Mons-Hainaut. Meeting Heck by chance, his advice to approach ESA determined the next step in Heck's professional career.

Heck's degrees – secondary schooling, Masters of Maths and Education, PhD – have been described in the previous chapters. The application provided a full list of the post-graduate certificates secured while at IALg, all with the mark "very good": Problems of Celestial Mechanics, General Astrophysics, Modern Techniques of Documentation, Modern Methods of Astrophysical Observations, Structure and Dynamics of the Galaxy.

Other courses were also mentioned: Computational Methods of Stellar Evolution (Liège), Statistics (Paris), Stellar Statistics (Paris), Resolution on Computers of Computational Problems (Liège), Dynamical Structure and Evolution of Stellar Systems (Saas-Fee), plus "several courses on the use of computers and auxiliary devices".

The scientific activities were split between theoretical research (stellar statistics, data analyis) and observations, themselves divided between photometry (Ap and field stars) and Schmidt photography (comets, emission-line stars, nebulae, fields of the galactic plane). The comet discovery was mentioned without any comment.

The list of publications gathered 18 refereed papers (mainly published in *Astronomy & Astrophysics* and its *Supplements*), 10 secondary scientific papers, one monograph (distance indicators) and one photographic atlas, plus "numerous popular papers".

Additional assets when applying for a European organization could be seen in the languages mastered (French, English, Spanish, German). The professors listed as possible references were Léo Houziaux, Carlos Jaschek and Paul Ledoux (in that sequence). In a later letter to Duccio Macchetto (whose name had been mentioned by Houziaux), Heck suggested to add André Monfils who was heading IALg's space section.

Another name appeared in the application: Marcel Migeotte (see Biémont 2001 & Fig. 64) who was, since Pol Swings' retirement, in charge of handling the day-to-day matters of the *service*, pending the settlement of Swings' succession. Migeotte was then *de facto* Heck's boss for his last months at IALg.

Ultraviolet astronomy was not completely foreign to Heck. An IALg team had indeed been involved in the S2/68 experiment aboard the TD-1A satellite launched by ESRO[67] on 12 March 1972[68] from Vandenberg Air Force Base. Heck had attended quite a few talks about this experiment and had himself organized some of them via the Liège Astronomical Society, providing visibility towards the grand public for the achievements of the IALg space team.

The TD-1A satellite was a three-axis stabilized spacecraft in a low geocentric orbit (525-544km) with 97.5° of inclination and a period of 95.32min. During its 26 months of operating life, it had mapped about 95% of the sky. The S2/68 experiment (see Boksenberg *et al.* 1973) produced a catalogue of absolute ultraviolet fluxes between 1350 and 2750Å for point sources down to roughly the $10^{\rm th}$ visual magnitude for unreddened early B stars (see Thompson *et al.* 1978).

Heck also had written programs for determining observing conditions of celestial objects (Publ. 152), as well as for selecting guide stars for rockets (Publ. 147).

[67]The European Space Research Organization (ESRO) was founded in 1964. It merged with the European Launcher Development Organisation (ELDO) in 1975 to form the European Space Agency.

[68]Still 11 March in the US.



Fig. 65: New place of work for Heck as of September 1977: The European Space Agency (ESA)'s scientific and technological establishment ESTEC in Noordwijk-aan-Zee (Netherlands), before moving to Spain in November 1977 to set up the European ground observatory for the International Ultraviolet Explorer (IUE).

Heck was called for an interview at ESTEC on 24 June 1977 at 11:30 with the recommendation to travel First Class by train to Leiden where an ESTEC driver would wait for him. Heck started gathering documentation on the IUE project, but little was available. He was also expecting his linguistic capabilities would be tested.

Upon arriving at ESTEC, as other interviews were under way, Heck was led to the office of one of his future colleagues, Piero Benvenuti, who had been hired earlier. They had a long conversation about astronomical catalogues, continuing even on the phone with Pierre Estaria, a computer man already working at Vilspa. Benvenuti introduced Heck to him as someone knowing "everything about catalogues". A good point.

As to his interview itself, our biographee remembers the presence, among the panel members, of Duccio Macchetto (who would be his direct boss), Brian Fitton (Head, Astronomy Division), D. Edgard Page (Head, Space Science Department), together with someone from the personnel section and one or two scientists from other divisions within SSD.

The interview went glitchless. Heck had to describe his scientific research and especially his observational expertise, what he knew about ultraviolet astronomy, what were his possible private and professional constraints, how he was feeling about dealing with users of different nationalities, etc. At some stage, Macchetto took off at full speed in Spanish, which Heck gladly followed likewise. They were stopped by the other panelists who did not understand anymore what was being said. Another good point.

Then Fitton took Heck around for a visit of the ESTEC labs. This was a clever way to check out another facet of the potential employee. Heck understood later that this gentle Englishman was perhaps also fearing too much Italian influence in the IUE European team and was making sure that the Belgian candidate was up to standing it. All the candidates were then brought for lunch to some place in Noordwijk – an old well-proven peasant method to find out the cleanest and most efficient laborers ...

Fitton took Heck in his car on the way back to ESTEC and told him he would recommend him for a position as Resident Astronomer (R/A) starting next September. This would be for two years, being understood that, if the January launch was a disaster, they might end all on the street.

A number of launches had indeed failed over the previous months, ruining the destinies of the teams who had worked for years on the experiments to be lifted into space. In some cases, there was a duplicate spacecraft, but this was not the case for IUE.

Heck was willing to take his chances and, let's face it, he had little choice: the job in La Serena was no real match.

The positions offered at Vilspa were called "Research Fellows". As ESA had reached its quorum of regular staff, this was a trick to hire additional personnel for specific tasks. The IUE Research Fellows would however be granted a number of staff benefits, but not all of them. If some social security scheme was provided via the firm Van Breda, nothing was provisioned for a retirement or a pension scheme. This kind of precarious hybrid situation would be straightened only much later, for the third and later generations of R/As, well after Heck left the project.

In another weird decision, ESA's administration had not seen the need to provide individual offices for the R/As in spite of the fact that these were also expected to carry out their own research. The initial distribution of rooms at Vilspa had packed all of them in one office, while the visiting astronomers would each benefit from an individual office for their ultrashort visit. This was reversed once they were based at Vilspa and all offices had a view onto the Villafranca castle on the adjacent hill.

Some titles used in the project might have been confusing for outsiders. The "Observatory Controller" (initially Macchetto) would have been called the Observatory Director in any other place, but the term "Director" meant something specific in ESA's jargon and was not applicable here.

In the evening of the interview day, Heck arrived back at Liège-Guillemins train station with a much brighter picture of his future. This was a Friday when the Liège Astronomical Society (SAL) had its monthly conference in the IALg large auditorium.

As President, Heck should have introduced the lecturer. That evening, the speaker happened to be the SAL founder himself, Armand Delsemme, back from Toledo (Ohio) for his yearly visit to his local friends and relatives. Heck had requested one of his Vice-Presidents to introduce Delsemme whose talk was dealing (already!) with the 1986 rendezvous with Halley Comet[69].

[69] "Un rendez-vous avec la comète de Halley en 1986" was the title of a talk describing various plans already considered by NASA for meeting the comet on its next visit.

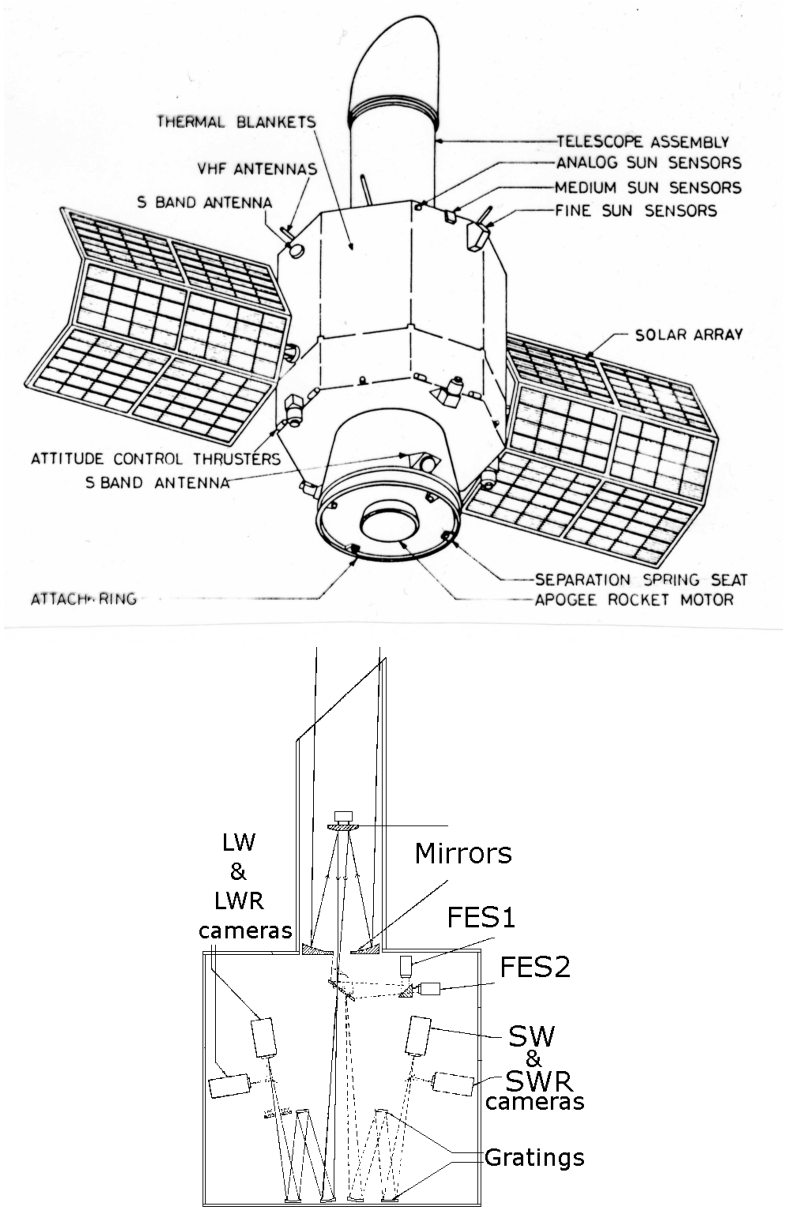


Fig. 66: The major IUE components are pointed out in these schematic views. The Ritchey-Chrétien telescope had a 45cm mirror open at f/15 and provided 3″ images in a 16′ field. The wavelength range covered was 1150-3200Å splitted between short wavelength (SW, ∼1150-2000Å) and long wavelength (LW, ∼1900-3200Å), in each case with a prime (P) and a redundant (R) camera. There were two resolution modes: low dispersion (∼6.1Å for SW and ∼9.2Å for LW) and high dispersion via an echelle grating (∼0.1Å for SW and ∼0.2Å for LW). Two entrance slits could be used for the spectrograph: a ∼3″ circle (50% throughput for point sources) and an ∼10″×20″ oval. The Fine Error Sensors (FES) were used for guidance. In short, beyond its much more flexible exploitation (à-la-carte observing versus survey), IUE covered a larger wavelength range than TD1 and, even at low dispersion, its resolution was about five times better.

Showing up in the back of the auditorium when the conference was already reaching its conclusion, Heck informed discreetly his fellows from the SAL Council of the need to find soon a new President. The society was usually shutting down its activities during the Summer, but, this time, they would be busy rearranging the steering responsibilities.

Heck's successor as President would be Maurice Gabriel, an IALg colleague from Ledoux's group. He would later speak of Heck as "a President especially dedicated and sympathetic who had largely contributed to the society renewal" [70].

Leaving this SAL team would be saddening for Heck, as would be the absence of contact with students, so rewarding was the happiness noticeable in their eyes when discovering astronomy in real life, far from the equations and university syllabuses – an enchantment he could also see in the public at large through the SAL activities, even if some people had sometimes to be brought down on Earth from fancy romantic heights.

Quitting IALg was not entirely negative though. On one hand, there is a danger to be always considered as a greenhorn when staying at the institution of graduation. On the other hand, the period was a difficult one with the ongoing discussions on Swings' succession. Some pretenders to his chair, or to parts of it, were having a tendency to put forward claims, not to say demands, they were not yet, and might never become, entitled to formulate towards junior members of the personnel.

Last but not least, the uncertainties about the extension of Heck's position in Liège had lasted too long. Had they initiated a process in his mind that had been maturing over the last couple of years? Whatever be the catalyst, Heck was now deeply feeling he was at a critical point of his life. Turning the IALg page might be in order.

The formal job offer by ESA, dated 01 August 1977, required taking up duty at ESTEC on 01 September. A period of training in Holland (at ESTEC) and in the US (at NASA/GSFC) was needed before moving to Spain.

But till then the Summer would be busy for Heck with, for instance a month-long observing run at the 50 Danish telescope on La Silla, from the end of June to the end of July. He had of course to arrange all the practical aspects of his move, such as clearing his office at IALg, something that had been made easier as he had had already to change offices a couple of times because of internal rearrangement at the Institute, especially for making more room for the library (cf. Fig. 62). At each of those transfers, the volume of documents, boxes of punched cards, piles of computer listings, stacks of magnetic tapes, etc., had been decreasing.

Our biographee had also to fix a formal leave from Liège University for the duration of September 1977 since his appointment there lasted until the end of that month. Later, in one of those surprizing decisions such administrations are able to take, he would be offered a one-year extension. Heck would gladly accept it since the spacecraft was not launched yet and nobody could predict how it would go, in other words whether there would be a life for the IUE people after 26 January 1978. Heck was thus awarded one third of his Belgian salary on an "honorary basis" till 30 September 1978.

[70] "Un Président particulièrement dévoué et sympathique qui a grandement contribué au renouveau de la société" (SAL Bulletin, September 1977, p. 4).



Fig. 67: The future European IUE R/As having a Sunday break in the Blue Ridge mountains during their training at NASA's Goddard Space Flight Center (30 October 1977). From left to right: J. Clavel, P. Benvenuti, A. Cassatella, P.L. Selvelli (front), P. Gondhalekar (SERC representative), and A. Heck.

Thus, on 31 August 1977, Heck took his Volvo car, the one that had been in the Royal cortège a couple of years earlier, with the trunk filled with whatever might be useful, and drove to Noordwijkerhout where a room had been booked for him by ESTEC at the *Hotel van der Geest*.

This was a jump into an unkown future, in fact into a slice of life made of the most exciting years of his professional career – with a pioneering space project.

Building an Observatory from Scratch

Part of the unknown for Heck came from the teams he was going to work with. The first circle would be group of R/As and a second one would be made of the other categories of personnel at Vilspa and involved in the IUE project[71]: administration and logistics, spacecraft control and antennae specialists, as well as computer section including image processing people. The third circle would consist of their counterparts in the other agencies, especially at NASA that had the upper hand on the operations.

[71] Vilspa was dealing with a number of other satellites.



Fig. 68: The historical value of this poor-quality picture is to show some initial IUE Resident Astronomers (R/As) together with their hierarchy at Vilspa in November 1977: D.E. Page (Space Science Department Head), second standing from left; B. Fitton (Astronomy Division Head), first standing from right; F.D. Macchetto (then IUE Observatory Controller), second squatting from right. Four IUE R/As are in the group: P. Benvenuti and A. Heck (third and fourth standing from left), P.L. Selvelli and J. Clavel (standing behind, resp. left and right). The fifth initial R/A, A. Cassatella, is taking the picture (see Fig. 67). A. Ripoll, Vilspa administrative Director, is standing on the left. The other persons are SSD scientists unrelated to IUE, as is the MARECS antenna visible in the background.

It is not the place here to recall the genesis of the IUE satellite as a facility observatory. Interested readers could refer to the special issue of *Nature* published after the commissioning phase[72], especially to the paper by Boggess *et al.* (1978). The first chapter of the "IUE Book" (Boggess & Wilson 1987) is an excellent synthesis of the history of the project. A recent paper by Willis (2014) reviews the IUE origins and legacy in a historical perspective. The satellite itself is schematically described in Fig. 66.

As said above, this project was a collaboration between three agencies. The US National Aeronautics and Space Administration (NASA) supplied the satellite itself including the optical and mechanical components of the scientific instrument, plus a ground observatory together with the spacecraft control software and a participation in the Image Processing Software (IPS). The UK Scientific and Engineering Research Council (SERC) provided the cameras and a participation in the IPS. The European Space Agency (ESA) contributed with the solar panels and the European ground observatory at Vilspa.

[72] *Nature*, Vol. **275**, 5 October 1978.



Fig. 69: The man behind the IUE: Robert Wilson (1927-2002) was "the intellectual driving force that eventually led to the outstandingly successful International Ultraviolet Explorer (IUE), which was the first satellite to be easily accessible to the astronomical community" (Jordan 2004). (Photograph courtesy UCL)



Fig. 70: Two gentlemen with class: Ferdinando (Duccio) Macchetto (left), the initial IUE Observatory Controller, remained based at ESTEC. After the successful IUE launch on 26 January 1978, he fully devoted his time to the Space Telescope. Then Michael V. Penston (right), till then Macchetto's deputy, became the Observatory Controller. Heck would later become Deputy Observatory Controller and Acting Observatory Controller. (Photographs courtesy ESA & M.C. Penston)

In view of the respective contributions, NASA was granted two thirds of the observing time, *i.e.* 16hrs/day, managed from a ground observatory located at Goddard Space Flight Center (GSFC) in Greenbelt, MD. The other third of the satellite observing time – the remaining 8hrs/day or a "shift" – was operated from Vilspa alternating shifts between ESA and SERC astronomers. Well-defined handover procedures were set up for passing the satellite control from one ground observatory to the other. Exceptional deviations happened to be due to bush fires around Vilspa forcing shutdown of air conditioning and computers, or snowstorms in Maryland delaying the arrival of observatory personnel[73].

The satellite was put in a geosynchronous orbit[74] that had the advantage to make accessible a large part of the sky with the Earth under an angle of about 17° only. The satellite was continually above the GSFC horizon, but only 10hrs/day above Vilspa's with a gradual shift that moved operations sooner by two hours every month.

Each ground observatory was operated as a classical one with successful applicants for observing time expected to be present at the respective stations: applicants to NASA at GSFC, applicants to ESA and SERC at Vilspa. Strict procedures required however discipline to ensure the spacecraft safety. This was valid for the chain of operations at the observatories themselves, but also implied a proper preparation on the part of the visiting astronomers who were not allowed to deviate from the list of approved targets.

The visiting astronomers had to remain "hands off" during operations. *i.e.* they had to talk to an R/A who – after verifying the feasibility of their intentions and their conformity to the approved list of targets – would translate them in technical terms for a telescope operator with "hands on" to issue the *ad hoc* commands.

We shall come back in the following section to the science operations since they became the peculiar slot of responsibilities for Heck. When joining the project, all R/As had to familiarize themselves with all aspects of the project, from the satellite itself to the methodology of exploitation. This would take a final shape during the commissioning phase after launch, some of the procedures actually evolving along the life of the spacecraft. As to the IPS to be applied to the spectra that were going to be collected, it was still largely uncompleted in Fall 1977.

The group of R/As was a Latin one (Fig. 67): three Italians (Piero Benvenuti, Angelo Cassatella and Pierluigi Selvelli), one Frenchman (Jean Clavel) and our Walloon biographee. They were initially based at ESTEC, formally at least as they travelled intensively, splitting on Friday evenings to gather on Sunday nights at another place. Together with the professional challenge ahead, this kind of life – sharing training sessions, meetings, meals, hotels, rental cars, etc. – quickly brought good understanding and complicity between the R/As enabling them to function as a close-knit team.

If they could talk, the walls of the *Plaza del Ayuntamiento* in Toledo could perhaps recall how a choir of IUE R/As sitting on the monumental stairs spent one late evening of Fall 1977 singing under the direction of Cassatella ...

[73] The snowstorm of 19 February 1979 with 23 inches falling in 24hrs was the heaviest since 1922.

[74] Apogee: 45887km, perigee: 25669km, eccentricity: 0.239, inclination: 26.63°. Those initial values slightly changed over the lifetime of the spacecraft. All details can be found in "IUE Spacecraft Operations: Final Report", **ESA SP-1215** (September 1997) vii + 158 pp.

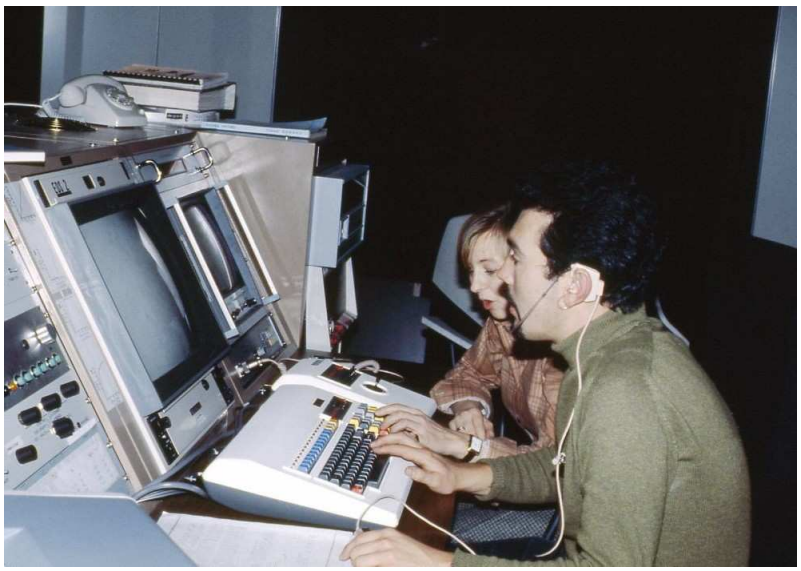


Fig. 71: Piano à quatre mains: Heck is training countryfellow Françoise Beeckmans de Westmeerbeeck (background) at the IUE commanding consoles (03 March 1978). Beeckmans had also graduated from IALg. She later joined ESA's SSD at ESTEC and briefly served at a "spare wheel" for the IUE team at Vilspa.



Fig. 72: Claude Nicollier graduated in astrophysics from Geneva University in 1975 while having in parallel an extensive experience as pilot. In 1976, he joined ESA's SSD at ESTEC where he had frequent contacts with the group of IUE R/As. Selected in 1978 within the first group of European astronauts, he later flew four Space Shuttle missions. The above picture carries a dedication when Nicollier visited Heck at Strasbourg Observatory in 1994 during a European tour. He also contributed with a chapter to the OSA 3 volume (Nicollier 2002, cf. pp. 248ff).

The joyous dynamism of the group contrasted with the seriousness of the engineers, technicians and administrators at ESTEC. From one stay there to the next between trips abroad, the R/As were constantly moved from one office to another. They ended up one Monday morning on the top floor of the building, in the large Council Room. It was equipped with all most modern sound and image devices of the time, including what was necessary for paging the whole facility.

Not realizing the mike was open, an R/A grabbed it and greeted the arrival of one of his colleagues. The "Ladies and gentlemen, please a big applause for Mr. [So-and-So.]" was heard by everyone present at ESTEC that morning. Imagine the rush of irritated officials entering the Council Room by all doors within the next couple of minutes ...

In parallel with the excellent atmosphere and occasional jokes, hard work was on the daily menu, be it at ESTEC where they were briefed by Macchetto and where they had to digest amounts of technical documentation, or while training at GSFC with their colleagues from the other agencies from 23 October to 06 November 1977[75], and even when meeting the future IUE users at a conference in Madrid as early as mid-September 1977. They were asked then many questions, but could not yet offer all the answers as some territories had not been chartered yet.

The scientific life was also going on. While being at GFSC for the IUE training, Heck managed to present a paper at IAU Symposium 80 in Washington, DC (Publ. 162), dragging also his colleagues at a USNO reception. Later at mid-November, he attended a CDS Scientific Meeting in Geneva, emphasizing the needs of ground-based data for space astronomy (Publ. 163 & 164).

Right after an evening talk at Brussels planetarium on the investigation means of modern astronomy, he flew to Chile for a three-week-long observing run on La Silla starting at mid-December and going over Christmas well into January 1978. Flying back to Belgium, Heck settled a few matters in Liège, picked up a new car and drove this *Alfetta* to Spain on 16 January 1978, readying himself for the launch.

Meanwhile new people had joined the group. Michael V. Penston (Fig. 70) would serve as Deputy Observatory Controller, becoming *de facto* their local boss. SERC had also sent a representative, David J. Stickland (cf. Fig. 75). Both would take their share of the R/As routine activities that started to take shape, in their planning at least.

For all procedures had to be devised from scratch, an exciting task as whatever in existence for classical observatories was not necessarily applicable in the IUE context: precise instructions with explanation of constraints were needed for helping potential observers to shape properly their applications for time; forms had to be drafted; scheduling methods had to be conceived; policies had to be formalized for welcoming successful applicants, including briefing them on the observing practice, checking that their observing intentions were consistent with the approved programs and that they were adequately prepared; strategies had to be planned for optimizing the observing sequences; and finally an agreement had to be reached on how would be processed the raw data and what would be delivered to the observers before they leave the station.

[75] First trip to the US for Heck.



Fig. 73: The IUE launch on 26 January 1978.

On 26 January 1978 in the late afternoon, everyone had gathered in the control rooms to follow remotely the IUE launch by a Delta rocket from Cape Canaveral in Florida (Fig. 73). Heck kept trace of the event on his professional Uher cassette recorder. For months afterwards, the R/As would listen to the tape with the comforting "All conditions are good" issued regularly by the NASA speaker. Too many earlier launches had failed at one stage or another, but everything went glitchless for IUE. A two-month-long commissioning phase could now begin, where the satellite equipment would be thoroughly checked and ground operations rehearsed and polished.

Now that the launch had been successful, the IALg page was definitively turned for Heck, although he would still receive till September 1978 his third of salary on an honorary basis from Liège University. There had been no talk of extending this further. A Belgian politician building up clientelism had one day offered to help him finding a position in the higher technical education system, something Heck simply ignored. By principle, he was antagonistic to such canvassing. And this was certainly not the kind of future he was looking for, be it only for the increasing violence in those establishments as reported by his past fellow students now teaching there.

With a successful launch, the R/As could also take care of their long-term settlement in Spain. So far, their accommodation had been in hotels such as the *Principe Pio* or the *Don Quijote* for their first short visits, then, from November 1977 on, in small studios at the *Centro Norte* near the Chamartín railway station – an apartment hotel also used by escort girls as revealed by the occasional touting in the elevators and by unmistakable noises through the thin walls of such housings.

As Heck had already had enough of Madrid with its chronically jammed traffic, its permanent acoustic aggressiveness and its dreadful air contamination, he investigated the availability of flats outside the city, and especially near the mountain ridge roughly 30km West of Vilspa, itself at about the same distance West of Madrid.

He quickly found a nice furnished flat in an urbanization at a stone's throw from the big Monastery-Palace of San Lorenzo de El Escorial and started living there as from February 1978. Apart from some weekends and the Summer months when the area was invaded by *Madrileños* looking for some cooler surroundings, the place was quiet, the roads were largely empty. Heck could also hike to the nearby mountain top, the *Abantos* (Fig. 74).

The flat was nicely furnished and most things immediately needed such as bed linen, towels, etc. could be purchased from elegant department stores such as *El Corte Inglés* or *Galerias Preciados*. Heck got ESA to move down to Spain a couple of trunks with personal belongings as well as his personal library with collections of journals such as *Astronomy & Astrophysics* and its *Supplements*, *Annual Reviews*, *Sky & Telescope*, etc. He put all these in the station meeting room. This was the start for an observatory library otherwise inexisting.

Years later, at the time of leaving Vilspa, Heck would be treated as a liar by ESA's administration head claiming that the agency had never paid for this removal down to Spain while ... that gentleman himself had to countersign the execution order!

This illustrates how big organizations such as ESA were complex, loosing track over time of their own decisions within tons of paperwork generated between their various centers. The R/As had frequently to complain, urging the settlement of unpaid missions or the rectification of allowances, contentious issues that could sometimes last over a year or two.

Schematically speaking, ESA's overall administration resided at the Headquarters in Paris where, for instance, decisions over the R/As' status were formalized. But the astronomers were paid (salaries, missions, etc.) by ESOC in Darmstadt, while they were depending from ESTEC scientifically speaking, including for their job profile.

If the spacecraft engineer and several senior computer people were responding to ESOC, many employees at various levels – such as logistics, maintenance, antennae and computer people, but also the spacecraft controllers, telescope operators and image processing people with whom the R/As interacted on a daily basis – were answerable to the Spanish areospace agency INTA[76] acting as a contractor here as it did for a couple of NASA stations in the area.

[76]Instituto Nacional de Técnica Aeroespatial.



Fig. 74: Near Heck's home in Spain from 1978 to 1983, the Escorial Palace-Monastery ("El Monasterio" as locals say) has been photographed (upper picture) from a rock halfway up the Abantos mountain that Heck used to climb on free mornings to enjoy the view over the place and over the Old Castille scenery as far as Madrid. The daily "El País" was bought at a kiosk on the way up and read on the rock. Food was purchased at the covered market on the way down. That road up the hill in the far background center was the one used to reach Vilspa, some 30km away. The bottom picture shows a reverse view with the Abantos in the background. During his primary schooling, Heck had a history textbook illustrating the floor plan of the Escorial Palace (shape of a gridiron, linked to St. Lawrence martyrdom) that always attracted his attention. He never imagined then he would be living next to it. Refer to similar coincidences about IALg (p. 31) and Alsace (p. 84).

IUE Science Operations

The R/As' activities were taking place well upstream of the real-time (R/T) operations on the satellite. Adequate information had to be made available to enable the potential users[77] to properly prepare their application for observing time . Once the proposals were received, the R/As' expertise was required for assisting the selection committee. And once the successful programs had been selected, the shifts allotted had to be scheduled, taking into account a number of constraints, be they astronomical, technical, human, or others.

The visiting astronomers (V/As) had to be "trained" before their observing session. The strict observing procedures had to be explained, including the behavior expected from visitors in the control rooms such as keeping their hands off the equipment and talking only to the R/A on duty. The list of intended targets had to be checked, as well as their consistency with the approved program. Finder fields had to be properly prepared to allow unequivocal identification of the targets and of their guide stars.

The R/A in charge of "training" had to fill in (and pass to the R/A in R/T) a training report certifying the validity of the target coordinates, finder fields and observing intentions of the users.

During R/T operations, the R/A on duty translated in technical terms the observing wishes from the V/As to the Telescope Operator who issued the appropriate commands to the satellite: slewing to the target position, preparing the cameras, etc. After displaying the arrival field, the target had to be identified and moved to the small or large spectrographic aperture according to the wishes of the observer. A guide star had to be selected.

During the shifts, V/As could perform a quick-look analysis of the collected spectra, at the expense of their time if they were keeping the satellite inactive. But this was generally done while the telescope was slewing to the next target and/or while preparing the cameras for the next exposure. All operations were supervised by the spacecraft controllers, monitoring not only the technical status of the satellite, but also the behavior of the antennae and ground computers.

At the outcome of their observing session, V/As were requested to stay an extra day in order to collect their processed data on magnetic tapes, plots and photowrites[78].

The efficiency of the operations depended heavily on their optimization, such as preparing a camera for recording the next spectrum while slewing the satellite to the next position or while exposing another camera.

The limiting factor on the life of the satellite had been assessed to be the onboard hydrazine whose jets were needed to load or unload the inertial wheels coupled to the gyroscopes used to modify the spacecraft pointing. The less hydrazine was used, the longer the satellite could be operational.

[77] See *e.g.* Publ. 161, 167, 168, 192 & 198, just to quote a few signed or cosigned by our biographee.

[78] Photographic representations in 256 discrete gray levels (*i.e.* in an 8-bit format) of the IUE two-dimensional spectral images on 8"×10" sheet film, using as input magnetic tape files containing the images in digital form.



Fig. 75: The initial group of astronomers who set up from scratch and managed the European IUE ground observatory, here with the Villafranca castle in the background in December 1978. From left to right: A. Heck, P. Benvenuti, J. Clavel, Fr. Beeckmans de Westmeerbeeck (based at ESTEC), M.V. Penston, A. Cassatella, P.L. Selvelli, and D.J. Stickland (as dedicated UK Resident Astronomer).



Fig. 76: Looking like royalties with Luciana Bianchi at Vilspa in September 1981. Bianchi belonged to the second generation of IUE R/As initiating an influx of female R/As at Vilspa. The IUE downlink antenna, visible in the background, collected all the Vilspa IUE spectra and is pointing towards the satellite – not towards the objects observed as many first-time visitors believed!

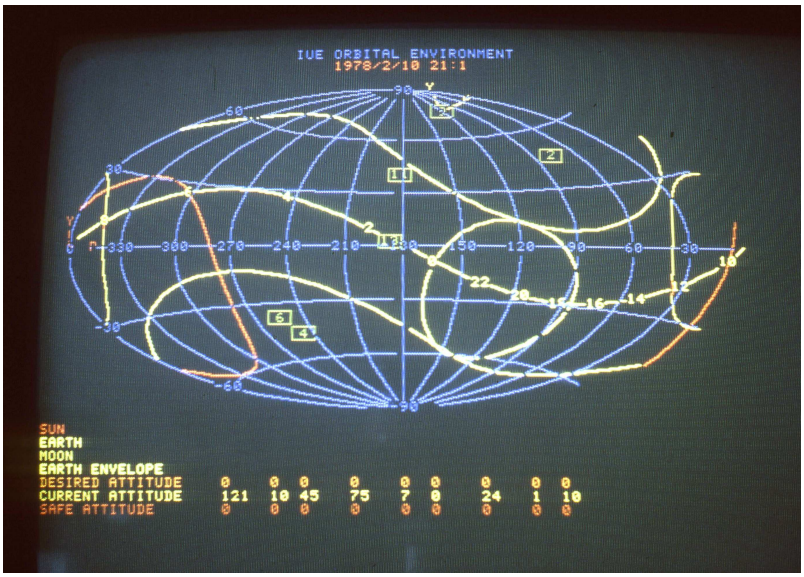


Fig. 77: The EDS screen displays here the sky accessible to IUE on 02 October 1978 by positioning the user's targets of that shift (rectangles) relatively to the Sun, the Earth and the Moon areas that had to be avoided. The brightness of the latters would have indeed blinded the scientific instrument and even damaged the cameras in case the onboard security systems would have malfunctioned.

The teams involved in planning operations were particularly successful in optimizing the satellite movements since, when the mission was terminated for financial reasons after almost 19 years (instead of the anticipated 3 to 5 years), there was still hydrazine on board for many more pointings ...

The commissioning period of the spacecraft took place after its launch, consisting in a thorough check and a technical evaluation of its performance. This was also the phase when the R/As would finally dive into the pool of real things, test the spacecraft handovers, optimize their procedures, find their respective slots and common language with the telescope operators and spacecraft controllers, push for the finalization of the image processing system, and so on. On all this, see Publ. 27, as well as the papers by Fälker *et al.* (1987) and Claros & Ponz (2002) covering related issues, including on the rôle of ground stations for space observatories.

The historically first shift with V/As took place on 05 April 1978 with Heck in command for the R/T science operations (Fig. 78).

The seriousness of the "training" as a preliminary step to observations can be assessed by the following reminder issued by Heck on 04 July 1982 for the benefit of new R/As:

> "This is to remind that the fundamental function of a "training" is to ensure the safety of the satellite during the operations, *i.e.* essentially by keeping a safe attitude during the Vilspa shifts. Therefore verifying the coordinates of the targets V/As intend to observe must be a basic activity of all "trainings". A check of the finder fields is also mandatory. This must be sanctioned by communicating

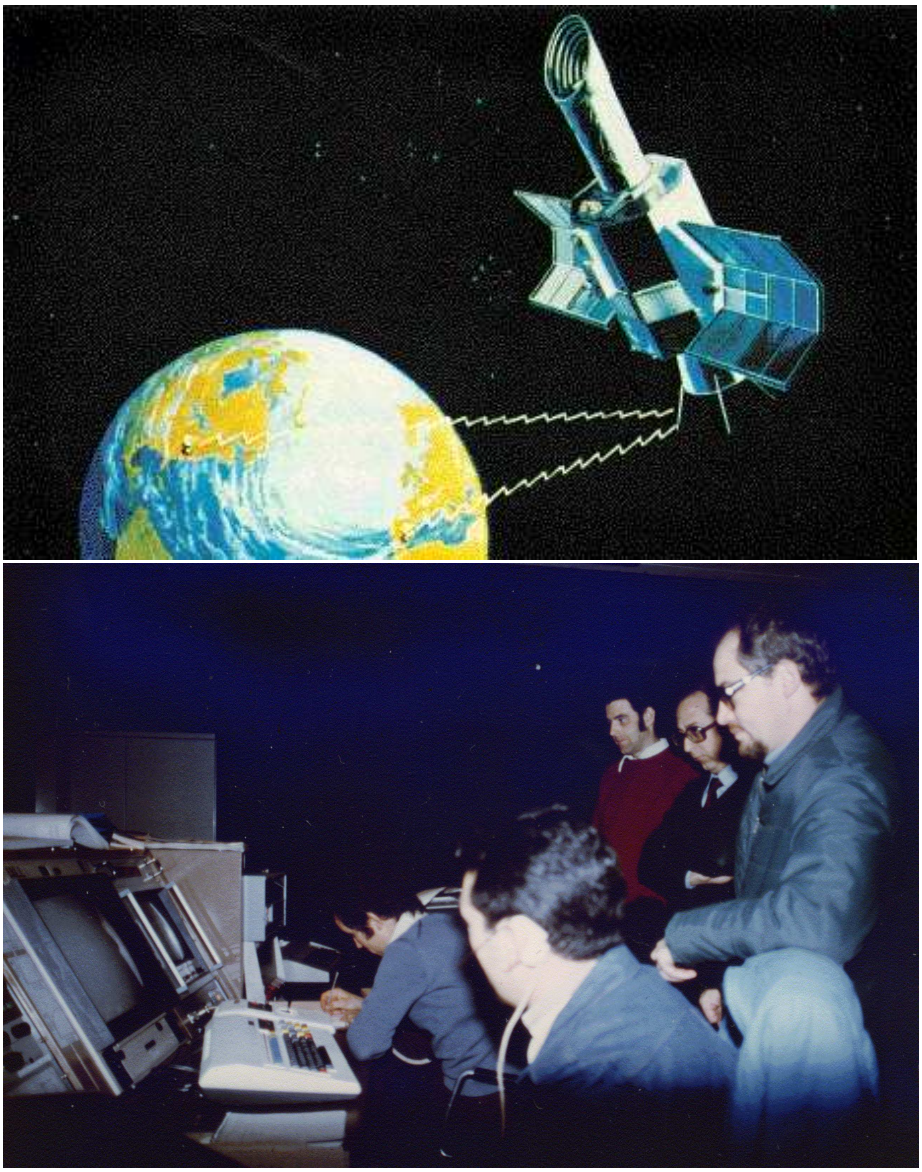


Fig. 78: Launched on 26 January 1978 and operated from two ground observatories (GSFC & Vilspa) as illustrated by the top picture, IUE underwent a commissioning period before being made accessible to visiting astronomers. The historical bottom picture taken on 5 April 1978 illustrates the very first European shift with visiting astronomers. From left to right: F.J. Castro (Telescope Operator), A. Heck (R/A in charge of science operations), M.V. Penston (Deputy Observatory Controller) and Visiting Astronomers M. Perinotto & S. Aiello. The optimization of observing procedures increased fourfold the spacecraft lifetime (18.7 years!) compared to the most optimistic expectations from the space agencies (3 to 5 years).

> to the R/A in charge of R/T a fully documented list of approved targets and possible reference stars, including coordinates and magnitudes. The "training R/A" has also to engage his/her responsibility by signing the corresponding Training Report. The reception of an incomplete or insufficiently documented Training Report entitles the R/A in R/T to refuse observing according to it and to take any action – possibly at the cost of the visitor's observing time – to ensure the full safety of the operations."

There were indeed movements over time within the group of R/As, called IUE Fellows or IUE Visiting Scientists in ESA's administrative jargon. Benvenuti – who had become Deputy Observatory Controller on 01 December 1978 when Penston was promoted Controller – went back to his home institution in September 1980. Heck was then promoted Deputy Controller on 01 October 1980 while staying in charge of the science operations, which also included shaping the daily rota of service (R/As respectively in charge of "training", R/T operations and IPS supervision).

In a memo dated 10 November 1979 to his higher management about the extension of the IUE Fellows contracts, Fitton recommended that Heck be maintained as he was ideally suited for training the new R/As, writing:

> "Heck is the more mature person amongst the Fellows and is of course very experienced with IUE".

When Penston went back to the UK on 15 November 1980, Heck ensured the interim (Acting Observatory Controller) until Benvenuti came back in the position of Controller in April 1981. Clavel and Selvelli also left, pursuing their own careers in France and Italy respectively. They were replaced by newcomers who needed to get the necessary expertise from the oldtimers. When Heck left the IUE project in March 1983, only Cassatella and himself had been permanently employed at Vilspa till then. The SERC changed also several times its representative at Vilspa.

If the official language for the operations was English, all R/As were polyglots and would often switch from one language to the other whenever needed. Heck however was the only one to master German, which was handy for dealing with some German-speaking visiting astronomers, as well as for interacting with the spacecraft engineer, Jürgen Fälker, with whom operational issues had to be discussed.

Frictions or conflicts with visitors were exceptional, even when Targets of Opportunity (such as comets or supernovae) were disturbing the schedule. Sometimes rules had to be reminded and calm had to be requested from visitors in the control rooms, especially with a telescope operator who tended to be nervous in delicate phases or with another one whose impulsivity led him to lose track of commands he was generating frantically.

When building up the rota, Heck had some flexibility to accommodate requests from R/As for observing (or not) with some visitors. He knew also that some visitors of a specific nationality preferred not working with R/As from another nationality for, say, cultural differences. But this seldomly happened.

The Director General
of the
European Space Agency
(ESA)

El Presidente
de la
Comisión Nacional de
Investigación del Espacio
(CONIE)

and

y

request the pleasure of the company of

tienen el honor de invitar a

Dr. André Heck

on the occasion of the official inauguration by
His Majesty the King JUAN CARLOS I of Spain
of the ESA establishment at Villafranca del Castillo
on Friday, 12th May, 1978, at 11.00 a.m..

con ocasión de la inauguración oficial por
Su Majestad el Rey JUAN CARLOS I de España
de la instalaciones de ESA en Villafranca del Castillo
el Viernes 12 de Mayo de 1978 a las 11 de la mañana.



Fig. 79: King Juan Carlos (left) and Queen Sofia arriving at the inauguration ceremony of Vilspa on 12 May 1978, escorted by Andrés Ripoll, the administrative station Director (right). The King and the Queen were easily accessible (with cameras off though) after the official ceremony. Heck talked to the King reminding the copy of the photographic atlas (Fig. 58) he had sent to his attention. When stepping back into his helicopter for returning to the Zarzuela palace, the King came back and strongly shook hands again with our biographee.

As responsible for the science operations, Heck had to issue memos (and their regular updates) on a whole range of matters as can be seen from the following non-exhaustive list: training and observing procedures; checklists of forms to be filled in; archiving policies of documents and spectra collected; library of available catalogues, atlases and plates; CDS resources and (later) direct link[79]; homogenization of object identifiers; use of aperture shutters; multiple exposures in a large aperture; photometric calibrations; engineering and contingency shifts; blind offsets; β recovery of the spacecraft; degradation of the precision of manoeuvres; radiation monitoring; and so on.

Heck was also made the contact point for comets as Targets of Opportunity from October 1980 on.

The R/As had developed their own scale of easiness or difficulty for users and that precious piece of information was passed by word of mouth. Most often, Heck was handling himself the problematic characters. Combining diplomacy and firmness would generally do. In only one case, upon returning from a mission abroad, had he to involve the Chairman of the selection committee in telling a specially troublesome user that his behavior had been unacceptable: he had put a mess in various units of the station by hassling them, the R/As on duty being unable to control that character.

The worst of the situations were taking place when the attitude of the spacecraft was lost, in other words when nobody could tell in which direction it was pointing. Heck won a number of bottles of champagne by recovering the attitude through his ability to figure out mentally in 3D up there the successive steps the satellite had been instructed to follow until being able to identify on PSS plates where the spacecraft was actually pointing. Not easy with a 16′ field taken in the middle of seemingly nowhere!

Heck was once recalled from his home at night (roughly half an hour drive at full speed) to figure out a weird field obtained after a totally innocuous manoeuver. It had so happened that a bright star had fallen at exactly the position of a spectrograph aperture, disappearing from the field and disfiguring it. In most of the instances however, incorrect manoeuvres had been issued, had to be traced back, and corrected.

Whoever has been called into a control room because a multimillion-dollar bird up there has lost its pointing attitude knows that unique atmosphere: worried faces (and voices on the lines) of representatives from three agencies, a couple of shadows keeping low profile in a corner because feeling responsible for the mishap, the silent interrogation of visiting astronomers ticking the time passing, otherwise authoritative spacecraft controllers hanging on the lips of the R/A for the recovery manoeuvres with no right to miss.

Heck dedicated his recovery successes to the wonderful teams he was working with, but also to the many hours he had spent earlier in ground-based observing implying countless field identifications.

A cumbersome and expensive "jig machine" designed by Plessey and using PSS plates proved to be no match to well-trained and well-supported brainware. It was rapidly removed from the observatory room.

[79] See pp. 116ff.

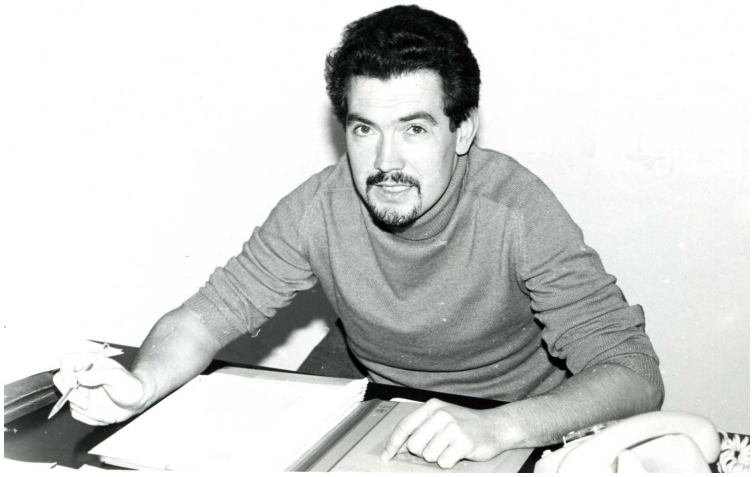


Fig. 80: In his Vilspa office as Deputy Observatory Director (22 October 1980).

Deputy and Acting Director

In his capacity as Deputy Controller, Heck was automatically relied upon for a smooth running of the house when the Controller was away. During absences of the Controller and his Deputy, one of the R/As would be Acting, *i.e.* ensuring the day-to-day management of the observatory. There was no difficulty in this since all of them had gone through the same mould, had lived the same challenges and, most important of all, functioned as a team. As explained already, the R/As had to be able to carry out all facets of duties. Everybody had to remain reachable, even when travelling.

This was a bit different with the new R/As who did not go through the initial phase. The sense for teamwork and shared responsibility was not at the same level among the new recruits. One loud gentleman in particular was arrogant and had to be told a couple of times to operate properly, not only by the local management, but also by the higher one at ESTEC. His term was not renewed and he actually left professional astronomy.

Without entering into much detail, here is, from an internal memo, a list of responsibilities shared and rotating among the R/As: administration, scheduling, operations, training, cameras and calibrations, image processing, library, log of observations, archives, CDS link, seminars, newsletter, calculators, etc. These of course evolved over time.

Many memos had to be issued for formalizing decisions and reminding practicalities in all matters of a thriving place. Some of those documents were reproduced in a dedicated newsletter, for instance about the preparation of the cameras (Publ. 174), on the usage of trailed spectra (Publ. 183), on CDS support (Publ. 173 & 184 – see next section), just to mention a few notes with Heck's signature.

He was also the first Editor of the *ESA IUE Newsletter* (Publ. 450, Fig. 221). As Acting Observatory Controller during the interim period, Heck addressed in it the users community in that capacity (Publ. 182), produced the yearly observatory report (Publ. 191) and served as Secretary for the Joint ESA/SRC IUE Selection Committee.

An event making the headlines worldwide took place during Heck's interim as Acting Controller: the coup attempt at the Spanish Parliament on 23 February 1981. In the late afternoon, our biographee was holding a meeting at Vilspa with the higher management from ESTEC when they were informed that some shooting was taking place at the *Palacio de las Cortes* (Congress of Deputies).

> "The first thing I did, recalls Heck, was to pick up the phone and to dial an external line. The telephone network was working. The putschists sounded as amateurs. I phoned the airport. The airport was open and functioning normally. The puschists sounded as double amateurs, not like what had happened in Chile eight years earlier. When driving home on dark and empty roads, I heard on the radio that putschist tanks were running in the streets of Valencia. But that radio station was not under putschist control either. Like most Spaniards, I stayed up late after midnight until the King [Fig. 79] spoke at the television, in practice ordering all militaries back to the barracks and urging civil life to go on normally. The next morning, everybody at Vilspa was in position, some with a portable radio next to them. By noon, the putschists had surrendered and the Deputies were freed. I really admired the firmness of the King upholding the democratic process of the country and the maturity of the Spanish people during that episode."

Thus the R/As were not only writing the history of ultraviolet astronomy and of novel observing, but also working in the historical context of the democratic transition in Spain. When they had arrived in late 1977, the political situation was still very much the same as it had been during the ∼40y dictatorship of Francisco Franco who had passed away on 20 November 1975. Changes were slowly taking place and the R/As could witness the various steps towards democracy such as the approval of a democratic constitution and rounds of free local and national elections since decades.

This however occurred on a background of violent episodes such as assassinations and bombings by extremists groups of various obediences. The King and his advisers had to play smart, being under pressure from both right and left sides, as well as from independentist movements and militaries nostalgic of the past regime, but also prime targets to terrorist attacks.

These in turn led to circles of roadblocks around the capital, always dangerous at night with anxious policemen sometimes a bit too easy on the trigger and occasionally causing collateral killings of innocent people.

In his Editorial of OSA 4 (Publ. 396), Heck tells briefly how, on his way back home after an IUE shift ending well after midnight, he had to slam on the brakes when running at high speed and in full darkness onto a hidden and sleepy roadblock squad. Machine guns were positioned further behind bushes to take care of cars that did not stop ...

During critical events of the democratic transition, Vilspa was guarded by militaries walking continually along the fence (Fig. 81). The station was indeed considered as a possible target for attacks or bombings by terrrorists.

Two tiny rooms had been made available at the back of the canteen for observers who did not want to drive from and back to Madrid, especially when the IUE shifts



Fig. 81: Militaries guarding Vilspa during the general elections of March 1979.

were taking place at odd hours. Astronomer Kurt Hunger from Kiel (1921-2002[80]) was staying in one of those rooms during an episode with militaries around the station.

Hearing him speaking at lunch of his time in the Afrika Korps and subsequent custody in British and Australian prisoner camps, Heck realized that, being stuck at Vilspa 24hrs/day surrounded by militaries and with no car to escape, Hunger was going again through this dramatic WWII period of his life. Bringing daily Hunger out for meals in the neighborhood was then organized ...

Not all practical sides had such a dramatic coloration. For the benefit of UK R/A Prab Gondhalekar (Fig. 67), Heck had to explain one day to the canteen cooks what was a vegetarian meal. The first reaction of these gentlemen – putting bits of meat in soups, salads, everywhere – had indeed been unequivocal (in Spanish): "Tell your friend that, if he is sick, a slice of meat would do some good to him!"

Just to quote a couple of other managerial enjoyments: petitions had to be run for covering the parking lot in order to protect the cars from overheating in Summer; newcomers had sometimes to be tuned down for excessive telephone usage, one of them eating for himself alone, just after his arrival, about half the telephone budget for the whole station, causing an uproar in the INTA local management. Heck managed to block the official complaint towards the higher management and to bring the phone addict to reasonable terms.

[80]See Hensler (2002).

Of course, administrative memos to be issued were plenty and of all kinds, including answers to weird requests from other ESA departments, all this being in addition to the responsibilities for science operations that Heck had retained. From the remaining archives, we see that the matters tackled were for instance (again a by far non-exhaustive list): restructuration of IUE outputs; job profile for a data assistant; reassignment of responsibilities; degradation of the newsletter quality; daily availability of R/As at the station; requirement to leave contact data during absences; necessity to copy all outgoing official letters and documents to the Controller or his substitute; and so on.

In late 1980/early 1981, personal objects and books – such as a three-volume relativity treatise! – started disappearing from offices, till then left freely accessible since documentation, archives or other items could be required for operational purposes at any time from the R/As offices. Whether the perpetrators were insiders or visitors remained an official mystery since no proof could be gathered against specific individuals. In agreement with the station management and his colleagues, Heck decided in March 1981 to lock all R/As offices and the library, the keys being kept in a box located in the telecoms room, permanently manned. This flagged a significant change in the local atmosphere.

In line with Heck's interest in communication and management of human resources, he was particularly happy from the set of lectures organized in June 1981 by the Management Center Europe that he attended in Nice, complimentary of ESA. Quite interesting for the everyday life were also the trainings received in security and firefighting. His real pleasure though was the daily diving into practical aspects such as engineering and strategical planning.

All in all, that Vilspa job suited him ideally with the diplomacy required, the management and optimization of the operations on the satellite, the international multilingual interactions, not only with the users, but also with the other space agencies where an unusually high human quality was met.

This was well expressed by Station Director Ripoll in his 1980 Christmas message:

> "This success [of IUE] is no doubt due to a number of factors that we all know; but it is the human factor, its quality, whether scientific, technical or professional of the people at the Station that has made it possible."

Linking CDS to the Space World

Given Heck's later career, it is interesting to spend here some space to see – through memos kept in his archives – how he managed to have Vilspa as the first international connection to the Strasbourg Data Center (CDS[81]).

Through it, given the multi-agency status of IUE and its leading-edge position in astronomy, CDS gained world-wide visibility not only in space-related astronomical research, but also in the observing world as a whole via the collaborative campaigns involv-

[81] Still called then *Centre de Données Stellaires* (Stellar Data Center).



Fig. 82: Such an excommunication notice (photograpged by our biographee at the University of Salamanca) might have been useful at Vilspa when books started disappearing from the library and individual offices.

ing ground and space observatories (see *e.g.* Peterson *et al.* 2001). Readers interested in the CDS itself, especially in its genesis and in its world penetration could refer to two detailed papers by our biographee: Publ. 123 & 126.

The space agencies operating IUE had agreed on data policies to avoid that the spectra collected disappear somehow forever through the hands of the original observers as it had been the case too often in the past.

Since the data were to be made publicly available one year after their collection, "the only way to be sure that the archives contained properly reduced and internally consistent data sets was to make the project itself responsible for delivering the data" (Boggess 2008).

This implied in turn that, for consistency, large amounts of spectra had to be re-processed following IPS upgrades. Also the responsibility for logging properly the observations resided with the R/As, not the V/As, according to a coherent and transparent policy for identifying the objects observed.

This *de facto* outlawed secrecy practices that were taking place here and there round the world, with astronomers using occasionally personal identifiers (such as *"my beloved star 27"*) by fear that subsequent observers could guess what they were after just by looking at the objects studied in case these had been logged under common names.

Another paramount issue was the operational safety of the spacecraft. The attitude of IUE had to be updated at each pointing by uploading the precise coordinates of the target before the next slew. Loosing attitude meant wasting a lot of expensive and otherwise useful time (cf. p. 112), plus potential hazard for the spacecraft instrumentation in case of accidental proximity to excessively bright objects.

As seen earlier (p. 39), Heck's PhD work initiated in 1970 at Paris Observatory with the first CDS Director, Jung, made of our biographee the first CDS scientific user, even before the center's official existence (see *e.g.* Publ. 157).

This also converted him into a kind of expert of the jungle of celestial identifiers and catalogues. Together with his extensive observational experience and international practice, this was a key factor for his appointment within the founding team of IUE R/As and of his later assignment as being in charge of science operations.

As explained in Publ. 163, NASA had developed a software package based on the Catalog of Stellar Identifications (CSI) developed at CDS. The advantages of that catalogue were its contents (cross-checked coordinates for more than 440,000 stars), its completion down to about m $\simeq$ 9.5 and its accessibility through various stellar identifications. Still at ESTEC, Heck served as intermediary between CDS and the IUE Vilspa project headed by Macchetto, as documented by a memo dated 21 October 1977 about how to get some CDS software operational at Vilspa.

There, during the "training" with each ESA or SERC observer, the coordinates of his/her targets and guiding objects were checked against the CSI if they were stars or against other specific catalogs if they were non-stellar objects.

In a memo dated 30 May 1978 for instance, Heck informed the R/As and the visitors of the possibility to check manually coordinates of non-stellar objects against Dixon's Master List (Dixon 1977). Heck maintained over years what was called the *Vilspa Catalogue of Catalogues, Atlases and Tables* gathering together what was available at Vilspa, including also the ephemerides. The second edition, released on 23 June 1978, covered nine pages.

Strong recommendations urged priority usage (in proposals, operations, and logs) of the most prominent identifiers (HD numbers for stars and NGC identifiers for non-stellar objects), leading *de facto* to a homogenization of IDs in the procedures and documents.

The collaboration with CDS would quickly go one step further as indicated by the following excerpt from Publ. 165:

> "At the end of August 1978, a collaboration between the Villafranca Station and the Stellar Data Center was set up for stellar observers. At the end of their run, they receive from CDS all measurements and the bibliography[82] available for the stars they have observed with the IUE. This service will be provided free of charge until the end of the first block of observations (March 1979). Because of budget restrictions, CDS will have to assess handling costs for all future services. However, it should be said that studies are already well under way to make available at Villafranca a terminal connected with CDS. Apart from the obvious advantages of this direct link, this improvement should help astronomers not only in the discussion of their data, but also in the preparation of their observations."

This already gave a formidable international visibility to CDS through the IUE users who, at the time, were a kind of astronomical avant-garde, a pre-HST generation.

[82] From the Bibliographical Star Index (BSI), then also a CDS product.



Fig. 83: Field of identification of a target (here HD51585) on the IUE Experimental Display System (EDS). Such fields had to be matched with the finding charts brought along by the V/As. PSS and ESO plates were used as backups. The faintest pixels might be background noise.

At the beginning of October 1978, Heck had drafted a document – to be signed by Macchetto – requesting ESOC to initiate a survey of feasibility for establishing a direct connection to the CNRS computer used by CDS and located in Cronenbourg.

It took several iterations and some obstinacy before getting in March 1979 a factual offer including the purchase of the material and the rental of the line[83]. The free CDS service mentioned above was meanwhile maintained (Publ. 173).

Things subsequently evolved not only in Strasbourg with the development of the database SIMBAD integrating the facilities of both the CSI and BSI, but also in the national telecom offices finalizing the pioneering X25 networks, such as Transpac in France and Datapac in Spain. Involving these into setting up an – at first stammering – international link between Vilspa and the CNRS computer in Cronenbourg was a natural further step, albeit a very laborious one with countless interactions between all parties involved. The link became official in January 1981 (Publ. 184 & 185):

> "This new link has also an important operational rôle for Vilspa since the Resident Astronomers have now a permanent access to a unique, cross-checked and constantly updated set of stellar positions and magnitudes."

In a memo dated 21 April 1981, Heck informed the staff that CDS would discontinue the initial CDS service (telex + mail) at the end of June 1981, all queries having now to be operated through the link ... when operational.

[83] CDS was informed of such a decisive step by the letter dated 15 March 1979 from Penston/cc Heck to Jaschek.

The same memo stated indeed that, due to a strike at the Strasbourg-Cronenbourg computer center, the line was dead and expected to remain so until the second round of the French presidential elections on following 10 May. A whole set of memos would later keep users informed of the not-unfrequent interruptions and failures, as well as of the regular modifications in the connecting procedures[84].

The Vilspa/CDS collaboration was subsequently supported by the successive Controllers in spite of some criticisms for buggy programming heard from the US. When later based in Strasbourg, Heck would manage both parties agree to the homogenization by CDS of the identifiers for the IUE log of observations (Wamsteker 1985), one of the cornerstones for the IUE Uniform Low-Dispersion Archive (ULDA, see Publ. 70 & 242).

On the CDS part, there is no sign from the archives that people there ever realized all the underground work and lobbying required for establishing that first international link – a link on which Heck would build a few years later for pushing the fledgling facility into the US and on the broader world scale via the space agencies (Publ. 126).

When dealing with large organizations undergoing strong political pressures, it is a naive mistake to expect that self-speculated merits – real or imaginary – would be recognized just by claiming them. At least the critical importance of space experiments seemed to have been understood when Macchetto was made a member of the CDS Council, but for one term only, from 1979 to 1984 (Fig. 84).

Interestingly, in a memo dated 28 January 1983 directed to the IUE Observatory staff and visitors, Heck commented that the meaning of the CDS acronym ought now to be changed: the CDS database was no more exclusively *stellar* since it included by then more than 35,000 galaxies. When in Strasbourg, Heck would finally convince CDS people to alter the facility name from Centre de Données *Stellaires* to Centre de Données [astronomiques] *de Strasbourg*, true to the stellar and non-stellar contents of the database and to the serviced catalogs, while retaining the acronym.

Other Scientific Activities

In parallel to their service duties, the R/As were pursuing their scientific research. Heck's prolific publishing shows up already in the first observatory report (Penston 1979): among the 46 papers listed, Heck appears as first or only author in 13 of them, plus in 8 of them as secondary author, in other words he (co)authored about half of the papers published by the IUE Observatory in the first year.

Through their position in one of the most advanced observing facilities of the time, the Vilspa R/As became quickly popular among European astronomers. They were courted by people seeking access to the telescope time, some not realizing that the R/As had also to go through the selection committee to get their own programs approved. There was of course an observatory program, but it was decided by consensus among the staff members.

[84] 35 steps were listed in the connection procedure circulated on 30 September 1981 ...



Fig. 84: December 1982 CDS Council: (left to right) J.Cl. Mermilliod (Lausanne), G. Westerhout (USNO), F. Macchetto (STScI), F. Ochsenbein (CDS staff), M. Crézé (Besançon), T. Lederle (ARI), O. Dluzhnevskaya (Moscow), Ch. Bruneau (CDS Secretary), G. Paturel (Lyon), C. Turon (Paris), L. Houziaux (Mons), C. Jaschek (CDS Director), J. Delhaye (Paris) and D.J. Carnochan (invited Starlink representative). See Publ. 353 for the membership of the CDS Councils till 2004.

Like others, Heck himself was approached. His responsibility for operations made him perhaps more "targettable". Not unfrequently he had to remind people of the rules and to tell off a few users exaggerately pressing. But why not entering attractive collaborations and let them benefit from his technical and scientific expertise?

It is not the place here to detail the scientific results coming out of all the investigations based on IUE spectra with Heck's involvment. This can be appreciated through the papers published during his Vilspa time and the subsequent years after he joined Strasbourg Observatory. The collaborations took place at various levels, often beyond the mere collection of the IUE spectra, with their analysis and interpretation, but also ensuring the observation of objects with other ground and space instruments.

Here is a non-exhaustive list illustrating the variety of objects in papers with Heck's co-authorship: Be stars (Publ. 197); Carbon stars (Publ. 46); Cepheids (Publ. 41 & 45); cool stars (Publ. 28); the Crab Pulsar (Publ. 178 & 188); globular clusters (Publ. 206); Horizontal-Branch stars (Publ. 61); the Hypergiant star HD152236 (Publ. 37, 44, 175, 176 & 180); χ Cygni (Publ. 177); λ Boo stars (Publ. 53); Nova Cygni 1978 (Publ. 29); P Cygni (Publ. 30 & 169); the planetary nebula HD138403 (Publ. 47); the very slow nova RR Tel (Publ. 49, 170, 171 & 187); Seyfert galaxies NGC7582 and NGC5548 (Publ. 35

& 71); the superluminous star HR8752 (Publ. 160); Supernova 1979c (Publ. 36); T CrB (Publ. 202 & 204); the irregular variable star V348 Sgr (Publ. 203 & 220); the WC star CPD-56°8032 (Publ. 199); ...

We shall come back in the following chapter on two objects that Heck studied in more details: V348 Sgr and RR Tel. Secondary theses were also devoted to them in the framework of his ProfDSc degree at Liège University (p. 157).

An ambitious program of ultraviolet stellar classification from IUE low-dispersion spectra was also initiated as early as 1978. It aimed at defining smooth spectral sequences proper to the UV and describing the stellar behavior in the UV while staying as much as possible in accordance with the MK frame established from spectra obtained in the visible range.

The rationale and development of the programme has been explained in various places, for instance through communications at colloquia (see *e.g.* Publ. 205, 209 & 213), but mainly in the introduction of what was to become the ultimate outcome: an atlas and a catalogue of reference spectra (Publ. 413 & 414 – Fig. 105 & 106), as well as advanced statistical investigations (Publ. 62).

We shall come back to this in the next chapter too (p. 152). In October 1981, Heck organized at Vilspa a workshop on *UV Stellar Classification* (Fig. 85) and edited the subsequent proceedings (Publ. 452 and Fig. 234).



Fig. 85: Participants to the workshop on Ultraviolet Stellar Classification (26-28 October 1981): (from left to right) Heck, Kashi Nandy, Françoise Praderie, Erika Böhm-Vitense, Bodo Baschek, Mrs Nandy, Anthony C. Danks, Paul Wesselius, Willem Wamsteker, Charlie C. Wu, Carla Cacciari, Carlos Jaschek, Mercedes Jaschek, Antonio Cucchiaro, Piero Benvenuti and Patrizio Patriarchi.

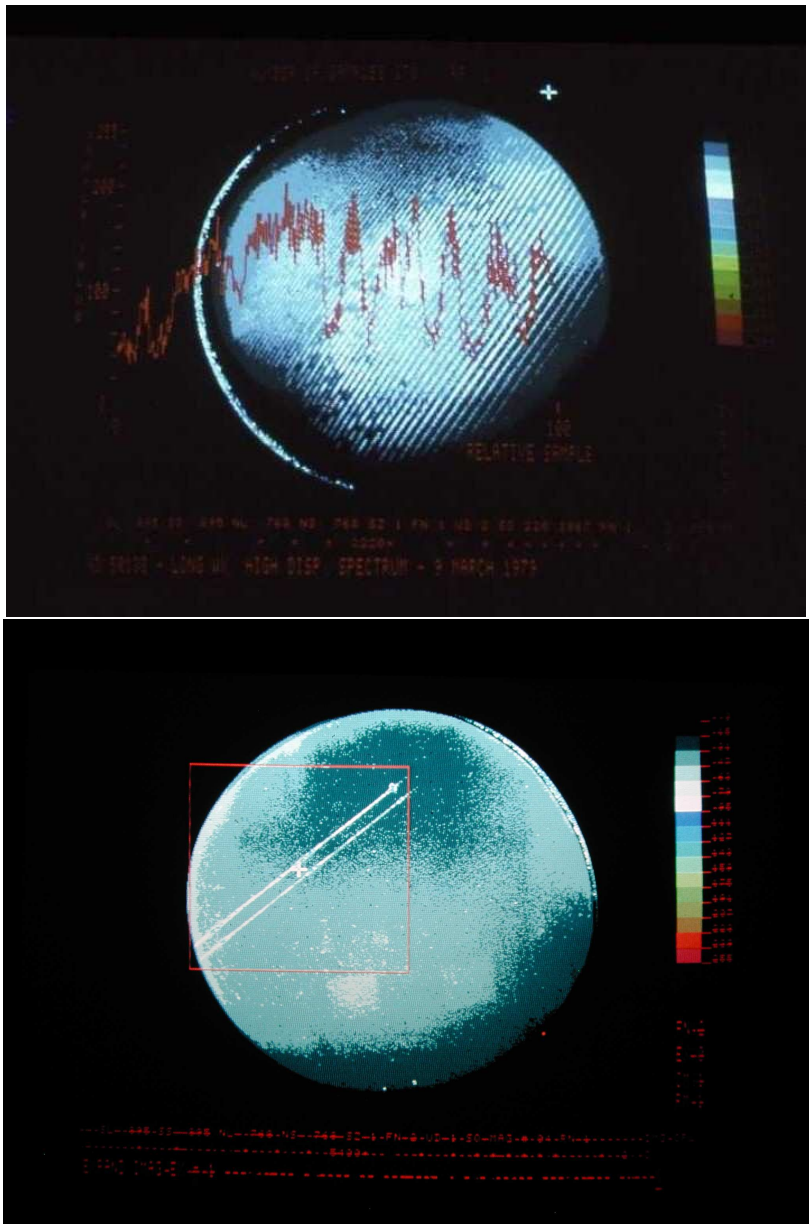


Fig. 86: The R/As became the targets of many requests for collaboration as outsiders thought this would be an easier way to get access to a heavily oversubscribed facility. All proposals had however to go through the same selection process. The illustration pictures (top) a high-resolution échelle spectrum displayed on the R/T EDS command console together with a quick-analysis histogram and (bottom) low-dispersion spectra through the small and large apertures.

A number of selected programs with Heck as Principal Investigator (PI) can be retrieved from the IUE page of the Barbara A. Mikulski Archive for Space Telescopes (MAST[85]):AH349 – AP Star Classification Criteria; AH351 – Ultraviolet Observations of Cool Wolf-Rayet Stars; AH352 – Ultraviolet Observations of the Young Evolving Planetary Nebula HD138404; AH510 – Spectral Classification in the Ultraviolet; AH550 – Ultraviolet Observations of WC10 Stars; AH553 – AP Classification Criteria; FA179 – The UV Stellar Classification Programme; FA180 – Ultraviolet Observations of V348 Sgr during Ascending and Descending Phases; GA107 – UV Stellar Classification Programme HA182 – UV Observations of V348 Sgr.

As it is retrieved only on the PI's name, this list might sound incomplete. In the particular case of our biographee, and as said ealier, he was also engaged in other programs, including the Vilspa Observatory ones.

The great interest of MAST however is to give access to a number of publications using the spectra obtained in the framework of the corresponding programs. Without blaming anybody here, it should again be mentioned that this resource does not seems complete for the data collected within the programs above.

As to the program for spectral classification, it never received a very high priority from the selection committees. As a consequence, it was not easy to collect the necessary spectra due to the competition with the other programs. Paradoxically those other observers were insistently calling for reference sequences needed for comparing their own objects or for their investigations in cosmic teratology. Even extragalactic astronomers were asking for reference fluxes for their modelling of populations.

Heck pursued his earlier research such as the absolute luminosity calibrations with his PhD algorithm involving collaborations with groups in Belgium, France, Japan (Fig. 230), Switzerland, the UK and the US on various groups of stars: RR Lyrae, F, Hg-Mn, Am, Ap, G5-M3, F-G-K-M (see *e.g.* Publ. 24, 25, 31, 40, 42, 43, 48 & 181). Several mainly methodological papers were also published (Publ. 26, 32 & 38).

Multivariate data analysis was applied to the prediction of spectral classifications from photometric data (Publ. 33, 34 & 166).

Photometric runs, essentially in Chile, measured mostly variable stars, some of them being observed simultaneously with IUE (Publ. 22, 23 & 39). Heck also pursued his work with Manfroid (IALg) on a generalized "multinight" algorithm for photometric reductions (Publ. 50).

As a side activity carried out at home, Heck continued compiling with Manfroid data on astronomy-related associations and societies, producing the first directory in 1978 (Publ. 428) and subsequently three updated editions dated 1979, 1981 and 1982 (Publ. 429 to 431) during Heck's time in Spain. This work involved huge mailings and was entirely financed by the authors themselves.

Heck maintained an intense activity in public outreach. See for instance Publ. 201, as well as the many articles in various magazines (pp. 453ff), the bibliographical reviews (pp. 445ff) and his column *Potins d'Uranie* (pp. 461ff). He also lectured here and there.

[85]https://archive.stsci.edu/iue/



Fig. 87: Organizers of the Third European IUE Conference (Madrid, 10-13 May 1982): IUE Observatory Secretary Carmen Palacios, IUE Controller Piero Benvenuti, ESA Editor Erica Rolfe (from ESTEC) and IUE Deputy Controller Heck.

Locally, he maintained the Vilspa staff informed of interesting phenomena (such as the total lunar eclipse of 16 September 1978).

The R/As were also involved in the organization of colloquia (as the one mentioned above on UV stellar classification) and conferences such as the Third European IUE Conference that took place in Madrid in May 1982 (Publ. 451, Fig. 87 & 234).

In late 1982, Heck got ESA to co-sponsor a colloquium to be organized at Strasbourg Observatory in September 1983 (after he left ESA) on *Statistical Methods in Astronomy* (Fig. 102). We shall come back to this in the next chapter.

As can be seen from the chapters on missions (pp. 369ff) and meetings (pp. 383ff), the R/As could move around, break their relative isolation by visiting colleagues abroad (especially those who never came observing at Vilspa) and attend colloquia where they could also present their own work and remain visible from the scientific community worldwide at a time when e-mail, the web and social networks were not yet existing.

The attempts made by Heck for collaborating with local professional astronomers turned out to be frustrating, perhaps because dealing with people more interested in "stealing ideas" (that, after all, they were not up to leading anywhere) than in ensuring a balanced partnership – a tell-tale attitude, alas. Spanish astronomy – and related mentalities – would strongly evolve in the subsequent decades, essentially through the leadership of the *Instituto de Astrofísica de Canarias* (see *e.g.* Sánchez 2004).

Parallel Activities

Culturally and socially, Spain was still very much in a "Franquist" mood when the R/As arrived barely two years after the death of the dictator[86]. Things were evolving though, but, for Heck, it was a big step backwards compared to the open society and free culture he had known North of the Pyrenees and even in the Hispanic context of Chile. Spain was still far from the *movida* that would take its full momentum a decade later.

The R/As were enjoying a sub-diplomatic status resulting from an agreement between ESA and Spain[87], also exempting them from taxes. They were carrying a blue identification booklet from the Ministry of Security and could import their car with a special license. This made them some kinds of UFOs for the local administrations who had little idea of who those guys were exactly. At best, as some US astronauts had been touring the NASA stations in the area, they were thought to be part of the gang.

During the decades of isolationism and nationalism cultivated by the dictatorship, foreigners were mainly seen as sources of financial income through tourism. Beyond this, the attitude towards them was not always friendly, even sometimes definitely aggressive, as the freedom they were enjoying was coveted by the nationals.

Hard-working Castilians were also known for their strong temper, a feature familiar to someone from the Belgian high-plateaux. More disturbing for our biographee was the general poor quality of walls in modern housing, pervious to omnipresent noise natives seemed to enjoy – a real nuisance for someone having to work in shifts and obliged to rest at hours not in phase with the local activeness.

The general attitude towards foreigners would quickly change with the transition towards democracy, the aspiration at European integration, not to forget the media impact and, never to be underestimated, what were telling the thousands and thousands of Spaniards who had been temporarily working abroad and who knew the realities in those countries building step by step what ultimately became the European Union.

In their everyday life just after their arrival in Spain, the first IUE R/As had to face some irritating aspects that became progressively unknown to the subsequent generations of R/As. Just to give one example, trying to get an insurance for an imported car, not to speak of spare parts, was next to *"Mission: Impossible"*. On the other hand, as a legacy of the earlier authoritative regime, the security was pretty good, apart from the occasional assassinations aiming at specific targets.

At that time, two types of bank accounts, both labelled in Pesetas, were used in Spain: one was in exportable or convertible currency, and not the other one. The R/As were of course paid with the convertible type, which was handy for all kinds of operations, such as sending back home part of the salary. But in the local dealings, shops and individuals had an easier life if they were receiving checks written in the non-convertible currency. Although it was in principle prohibited, the R/As had managed to hold accounts in both types of currencies, at different banks of course.

[86] General Francisco Franco Bahamonde (1862-1975) ruled Spain from 1939 till his death.
[87] BOE **166** (12 July 1975) Par. 13, p. 15032.



Fig. 88: This global view somehow summarizes Heck's place of life in Spain. Taken from the Abantos (cf. Fig. 74), it shows in the center the Palace-Monastery and the two villages next to it (El Escorial & San Lorenzo de El Escorial). Madrid is at 60km towards the left on the horizon line, while Vilspa is hidden halfway in a small valley towards the right. On the far right at about 110km lies Toledo. NASA stations are among the hills at the extreme right outside the picture, some 30km away.

The country immensely prestigious past was a source of permanent interest for Heck. Spain had also been ruling the Low Countries. Well, not all of them: the Prince-Bishopric of Liège had never been a Spanish possession. For centuries (till Napoleon), it had been part of the Holy Roman Empire of the German Nation. Largely independent, it formally answered to the Archbishop of Cologne, an Elector at the German Diet.

But Charles I reigning over Spain from 1516 to 1556 happened to be elected as Holy Roman Emperor under the name of Charles V from 1520 to 1558[88]. Who knows why, Heck had always held the man in high esteem since getting acquainted with him in the history book lent during the primary studies at Jalhay boys' school, a book where was also reproduced the floor plan of the Escorial Palace-Monastery (Fig. 74) built by Philip II (Charles V's son) and located near Heck's flat.

Heck was especially grateful on 12 June 1980 when, arriving too late at the Monastery of Yuste for the last guided tour, he was granted a private visit by the porter's wife. Founded by the Hieronymite Order of monks in 1402, far from being the touristic attraction it is today, the monastery was then almost ignored at the end of a small road. This is where Charles V retired in 1556 after abdicating the Spanish crown in favour of his son and later the crown of the Holy Roman Empire in favour of his brother Ferdinand I. Quite a moving piece was the chair in which he was carried over six days from Laredo on the Cantabrian coast to Yuste, while suffering from acute gout.

Among other historical figures, Heck was also fond of Rodrigo Díaz de Vivar (El Cid, c. 1043 – 1099). He also investigated the detailed negociations that allowed the Genoan Christopher Columbus (1451-1506) to sail towards new territories on behalf of the Catholic Monarchs Ferdinand II of Aragon and Isabella I of Castile (cf. Publ. 799).

If the country was full of remnants from ancient times, much more recent episodes were also retaining Heck's interest, such as the Spanish Civil War (1936-1939) since it was possible to speak to people who had gone through that dramatic period and the ensuing dictatorship. During their trips from El Escorial to Madrid-Barajas airport or back, his usual taxi driver, nicknamed *Batán* from his bullfighting pastime, was telling lots of anecdotes from the everyday life then. Several times, Heck had stumbled on remnants from Civil War fortifications when hiking in the hills around El Escorial.

With the mechanical workshop for his car at the Eastern side of Madrid, at some 70km from his flat, each maintenance was the opportunity for another visit to the Prado art collections or to spend hours visiting various museums of the Spanish capital.

Among the nearest cities, Heck by far preferred Toledo[89], an ancient Spanish capital at some 110km from his home, for its rich monumental heritage and its historical symbolism for the coexistence of Christian, Jewish and Muslim cultures. Quiet evenings among fountains and perfumes in the gardens of an *hosteria* on the city edge were appreciated breaks in a hectic life and also thoroughly enjoyed by his occasional guests.

[88] That gentleman (1500-1558) was also known as Carlos I°, Karl V and Charles Quint.

[89] As an astronomical connection, the famous *Alfonsine Tables* providing data for computing the position of the Sun, the Moon and planets relative to the fixed stars were compiled in Toledo and named after Alfonso X of Castile, who sponsored their creation. The data were starting on 01 January 1252, the date of the King coronation.



Fig. 89: Toledo, an ancient Spanish capital pictured here in October 2013, was Heck's preferred city, located at some 110km from his home, for its rich monumental heritage and its historical symbolism for the coexistence of Christian, Jewish and Muslim cultures.



Fig. 90: Staying fit while working hard: on top of the "Siete Picos" (Sierra de Guadarrama) with Jean Manfroid (left) in July 1979.

Of course, the numerous sierras in the country , especially the nearby ones of Guadarrama and Gredos, were the targets for a most welcome physical exercise (Fig. 90).

As seen above (p. 100), bush fires could affect IUE operations. They were in fact an omnipresent hazard during the many dry months. When driving home one day at dawn after a night shift, Heck and his companion spacecraft controller had to wake up the inhabitants of an isolated house with the grass burning around it, probably set alight by a butt thrown from a vehicle passing on the road. Interestingly the man of the house removed first his car, then the dog, and finally his wife and kids ...

"Wherever You Wish, Dr Heck"

Heck's initial appointment for two years as IUE R/A had been extended by one year till the end of August 1980, then for another year to the end of August 1981. This last letter warned of a possible interruption of the IUE program and, should that happen, of a three-month notice for the termination of the appointment.

In September 1980 however, ESA's Director of Science, Ernst A. Trendelenburg, decided to extend Heck's contract till 01 January 1983 and to nominate him as Deputy IUE Controller.

But Heck was getting tired of those extensions by bits with an always short horizon ahead of him. Most of his colleagues had a permanent backup position at home and did not feel that need for stabilization. Heck had enough of waking up at his desk now and then, pen in the air, after having wondered for a while what would be his future.



These binoculars, a precious acquisition as a teenager for observing wildlife and the night sky, literally saved Heck's life on a Sunday morning in early 1979 on a icy slope of the Sierra de Guadarrama where he started sliding on his back, quickly taking speed with blades of ice on tips of emerging rocks grazing his face. Using his open arms, he could direct his trajectory towards a rock big enough to stop him. He then used the binoculars in their case to carve steps in the ice. His woolen cap around one shoe and a woolen scarf around the other shoe prevented sliding for a while. But the slope was steep and sliding started again, fortunately this time towards scrubs. An old gentleman then passed screaming next to Heck, slowing down his slide with a stick. Both reached safely the bottom of the slope.

Three years later, Heck heard from an innkeeper that, on that very day, a couple of young men arrived at the bottom of that slope deeply cut by the icy blades, bleeding to their death.

Heck experienced a few other critical near-misses and the following ones could be mentioned here: as a young boy, a horsecart where he was flipped over, a stone preventing one of its edges to crush the boy's neck sticking out; as a teenager, Heck narrowly escaped a flash flooding due to a violent thunderstorm in a suburb of Verviers; a couple of years later, he was half-swallowed by a swamp (cf. Publ. 894); he also performed some spectacular skating with his car on a suddenly icing Belgian freeway, fortunately not incurring the fate of those other cars that jumped over bridges killing a number of people; in December 1981, Heck was in a BA B747 taking off at full speed from Rome Fiumicino airport towards the Far East when Engine No 1 exploded with the Malaysian pilot in command – on his final qualification flight that day with BA examiners – able to stop the machine before the end of the runway; in the late 1980s, he was told he might have only some 90min left to live when a cerebrovascular ailment hit him (cf. p. 181), ultimately leaving him with a permanent partial invalidity.

He knew the IUE story could be terminated at any time, either by a major spacecraft breakdown or by a political decision. After all, the initial plans had been made for a lifetime of three to five years. Last, but not least, routine had crept into the operations, even if the occasional malfunction of a gyroscope or another piece aboard IUE was bringing some pepper into the procedures, but the big initial challenges were long past.

Senior pioneers at the other agencies had left the project for new horizons and had been replaced by more administrative-minded people with less vision. The V/A mentality was also gradually changing, with less consideration for the R/As, assistants for some, sometimes servants, rather than partners. All in all, the *anni mirabiles* were gone.

As a consequence of this, Heck started investigating, mainly along 1982, where he could move for his next slice of life. Quite unexpectedly, even if flattering, he ended up with an embarrassment of riches: he had ultimately to choose between five firm offers.

Of course, he could have stayed at Vilspa. Nobody pushed him out. His appointment was indeed extended till the end of 1983, but the salary received did not really follow the increase of responsibilities and load of work when he was promoted as Deputy Controller. Having heard of his wishes for a change, his management proposed to move him – while remaining under ESA contract – to the Space Telescope Science Institute (STScI) established in 1981 in Baltimore, MD[90].

The position offered was however far from exciting as it was little more than programming. Heck talked to STScI officials, visited the place in November 1982, convinced them that their interest was to get him working in his slots of expertise – operations or interacting with users. But after agreeing, they came back to their first idea. Heck's confidence was then gone as he would never be sure of the word given. In any case, he thought he do could better with his abilities and experience than writing lines of code.

Paul Melchior (1925-2004), who had become in 1981 Director of the Royal Observatory of Belgium (ORB) in Uccle, needed a manager for Brussels Planetarium, an ORB dependency. He invited Heck a couple of times, explaining that he could also carry out research at ORB itself. From his very experience at Vilspa, Heck knew all too well that such promises ended up in doing most of the scientific research in the evenings, weekends and holidays, as the main assignment was enough on its own to monopolize the official working time.

Also the linguistics quarrels were not yet over in Belgium. If Heck was fluent in one national language (French) and mastered a second one (German), he never learned properly the third one, Dutch, spoken in the Northern part of the country. Since the planetarium was located in bilingual Brussels, the knowledge of Dutch was in practice mandatory, failing what any Flemish activist could try to eat Heck alive. Of course, given Heck's easiness with languages, this was just a matter of time, but was it worth the time and trouble, not to say the hassle? And this meant going back to Belgium while he had been virtually forced out of the country a few years earlier.

[90]The launch of Hubble Space Telescope (HST), scheduled for October 1986, was delayed until April 1990 because of the explosion of the Space Shuttle Challenger. An optical flaw (spherical aberration) was then discovered after launch, leading to a repair Shuttle mission in December 1993.



Fig. 91: Jean Delhaye (1921-2001,left) directed Paris Observatory from 1967 to 1971 and INAG (now INSU) from 1971 to 1979. Pierre Charvin (1931-1990,right) was Deputy Director of INAG as of 1975 and became temporary administrator of Paris Observatory in 1981 before being elected its President (director) in 1984.

Along all those years at Vilspa, Heck had built an extensive network of contacts and collaborators. He had stayed in touch with French institutions and teams, be it for establishing the CDS link as explained above (p. 116) or for scientific collaborations as illustrated by the publications from that time slot. Carlos Jaschek (Fig. 60) was willing to recommend Heck for a temporary position as Associated Astronomer at Strasbourg Observatory. The French Institut National d'Astronomie et de Géophysique (INAG[91]) was also looking for someone to manage in Paris their automatic measuring machine project, called MAMA (Machine À Mesurer Automatique).

Heck had met regularly with Jean Delhaye (Fig. 91) whom he knew from his stay at Paris Observatory in 1971 – at what time Delhaye was taking up the directorship of INAG. One of his pupils, Jean Jung, had supervised Heck's PhD. Delhaye had of course followed Heck's scientific work[92] and was aware of what our biographee did for linking CDS to Vilspa since he attended the CDS meetings not only as one of the original inspirators of the facility (cf. Publ. 123), but also *ex officio* as INAG Director (till 1979).

In 1982, INAG was directed by Jean-Marie Petit. Heck met him and his deputy for astronomy, Pierre Charvin (Fig. 91), on 14 October 1982 at the INAG headquarters. They suggested Heck could take the leadership of the MAMA project together with a couple of possibilities for teaching at Parisian universities on provisional positions, at least at the beginning. In view of Heck's embarrassment about several positions offered in France, their crystal clear reaction meant in practice they wanted the country benefit from Heck's multifarious expertise:

> "We want you in this country, Dr Heck, wherever you wish to go and whatever you decide to do."

[91] Now Institut National des Sciences de l'Univers (INSU).

[92] Delhaye would be a member of the jury for Heck's later upper degrees in Belgium and France (see p. 157).

Making up his mind was not an easy task for our biographee. Back to his El Escorial flat, Heck applied some multivariate analysis on large sheets of paper, cross-checking places against a number of criteria, most of them non-quantifiable. The quality of life played a big rôle, as did the ability to retain his intellectual independence, as well as his freedom to develop personal research and activities.

Staying at ESA would have unavoidably forced him up the ladder, always further away from science and observing, with more and more involvment in administration and politics, in other words being dominated by a system, something Heck wanted to avoid.

In that respect, together with his affinity with the secular foundation of the French Republic, the unconditional blank check voiced by INAG's Charvin & Petit in October 1982 gave him confidence for working in France, even if each of the positions mentioned was temporary at the start. Among these, the mixed Alsatian culture – Latino-Germanic – he would meet in Strasbourg certainly suited Heck better. There was also that border along a great river, the Rhine, with mountainous terrain at short distance on each side where it would be easy to hike at will.

In fact, Heck could be considered as a Rhinelander, even if his schooling language had been French. The marshy high-plateaux of birth and childhood were the tip in Belgium of the Eifel low-mountain range West of the Rhine. As seen earlier (p. 128), the Prince-Bishopric of Liège had been a state of the Holy Roman Empire of the German Nation. Heck had also studied the German mythology, heavily centered on the Rhine, while learning German in his secondary studies at ARV.

If Paris – that he knew probably better – had the advantage of prestige, intense cultural life and proximity to French decision bodies, the cost of living in the city itself would be disproportionate with the salary offered. The other option would be spending hours in daily commuting from some suburb. Life was too short for wasting it that way, he thought. A similar salary in Strasbourg would give him a better life in a more congenial regional context. A couple of people there had also expressed an interest to work with him, either for carrying out more luminosity calibrations with his PhD algorithm or for developing further applications of modern multivariate analysis to astronomical data.

Heck had managed to introduce CDS into the space world and, even if he had never received some explicit recognition from the locals, apparently oblivious of the intensive underground work that had been required to achieve that, he thought that more could be done in the upcoming years with the predictable development of electronic networks.

In line with Heck's European aspirations, Strasbourg at that time was presented as a major European "capital" having the wind aft, being the seat of several European institutions such as the Council of Europe and the European Parliament that had been first elected in 1979. It was not unreasonable to believe, and there were talks in that sense, that Strasbourg could become a kind of European "Washington, DC" – at least if the European integration was pushed forward the same way it had been so far.

In a handwritten letter around mid-October, his ESTEC boss Fitton advised Heck he had put his application forward for a final decision by the STScI in the Guest Observer Support Branch, adding that some "horse-trading" had still to take place on the staff post distribution at STScI and on the nationality distribution within the ESA group. He



Fig. 92: The 1982/1983 Winter was busy for Heck in his El Escorial flat for determining his next professional move. His frequent hiking through the mountains around helped decanting ideas.

concluded: "I gather that you are actively trying to get a job in France and personally I think you will be happier with such a post. However, you are still seriously being considered for the ST jobs."

In November 1982, things accelerated with various meetings here and there, plus numerous phone calls enabling Heck to make up his mind: the choice would be Strasbourg. In a memo to his management dated 26 November 1982, he confirmed his resignation as of 31 March 1983. This would give him ample time to prepare his move and to find a suitable accommodation in or around Strasbourg. His accumulated compensatory days and remaining holidays made him free to leave earlier.

The trunks with his personal belonging and the boxes with his bulky and heavy library were picked up by a removal company on Wednesday 09 March 1983. The following Friday, after settling some banking matters in Madrid and visiting the *Fundación Juan March* where he met Roy Lichtenstein (cf. Publ. 342 & 768), he said goodbye to a station where he had spent exciting years.

On 12 March, he left early his apartment in El Escorial with the trunk of his car full. With an overnight in Figueras and after a total trip of about 1800km, he arrived on Sunday afternoon in Alsace ready for a new slice of his life.

As to the IUE mission, it was deliberately terminated on 30 September 1996 for financial reasons and in spite of the fact that its telescope was still functioning nearly at its original efficiency. Heck later received from ESA a certificate for exceptional contributions to the project (Fig. 211).

Advances of long historical impact remain generally unnoticed even if, quite often, those new techniques or procedures quickly become an integral part of daily professional activities. Some lasting pioneering features of IUE are reminded in the inset of p. 136.

Pioneering IUE

The International Ultraviolet Explorer (IUE), launched on 26 January 1978, has been the first space-borne instrument welcoming visiting astronomers in real time, just like most ground-based observatories – with the difference that the telescope was not in an adjacent dome, but in a geosynchronous orbit over the Atlantic Ocean. It was shut down on 30 September 1996 after 18.7 successful years of operations (while its expected lifetime was three years), having become by then the longest astronomy space mission with more than 104,000 observations of celestial objects of all kinds (Fig. 93), ten dedicated international symposia and more than 3,500 scientific papers at the time it was turned off. A fantastic achievement for a 45cm telescope.

In many respects, IUE has been the precursor of modern astronomical observing. Integral to the satellite exploitation were the strict procedures, such as those for spacecraft handover between the two ground stations operating it (NASA/GSFC & ESA/Vilspa), as well as the chains of commands and responsibilities needed in space operations for the instrument safety and for the efficiency of observing: visiting astronomers, resident astronomers, telescope operators, spacecraft controllers monitoring also communications and computer resources, plus overall permanent IUE control at NASA.

People realized that those procedures used for a spacecraft in geosynchronous orbit at some 36,000km from the Earth could be applied for remotely piloting a telescope at "only" a few thousand kilometers distance somewhere on Earth – saving travel money, substantial travel time, time difference disturbance and fatigue to the observers.

They also realized that the assistance provided to visiting astronomers through the team of resident ones, as well as the flexibility and dynamics introduced in the scheduling – for targets of opportunity and service observing for instance – could be extrapolated to ground-based instruments for optimizing their return (see *e.g.* Robson 2001). Additionally, with the panchromatization of astronomy and the multiplication of joint observing campaigns (see *e.g.* Peterson *et al.* 2001), procedures were progressively generalized and standardized for all instruments, ground-based or space-borne.

Finally, the space agencies operating IUE (NASA, ESA & SERC) agreed on effective data policies which inspired modern astronomical archives avoiding, as had happened too often in the past, data disappearing for ever on the shelves or in the drawers of the original observers – when they were logged at all. An IUE policy was to declare the data publicly available one year after the corresponding observations had been conducted. This meant too that an *ad hoc* service had to be set up by the agencies, providing access to the data archived. This, in turn, involved sometimes reprocessing large amounts of data, or transfering data to new media as the technology evolved. Living archives were born.

Lessons from IUE can also be found in projects for "virtual observatories" (see *e.g.* Benvenuti 2002).

[Reproduced, slightly adapted, from OSA 4 Editorial (Publ. 396).

See also Stickland (1996) and the IUE chapter in Wilson (2001).]

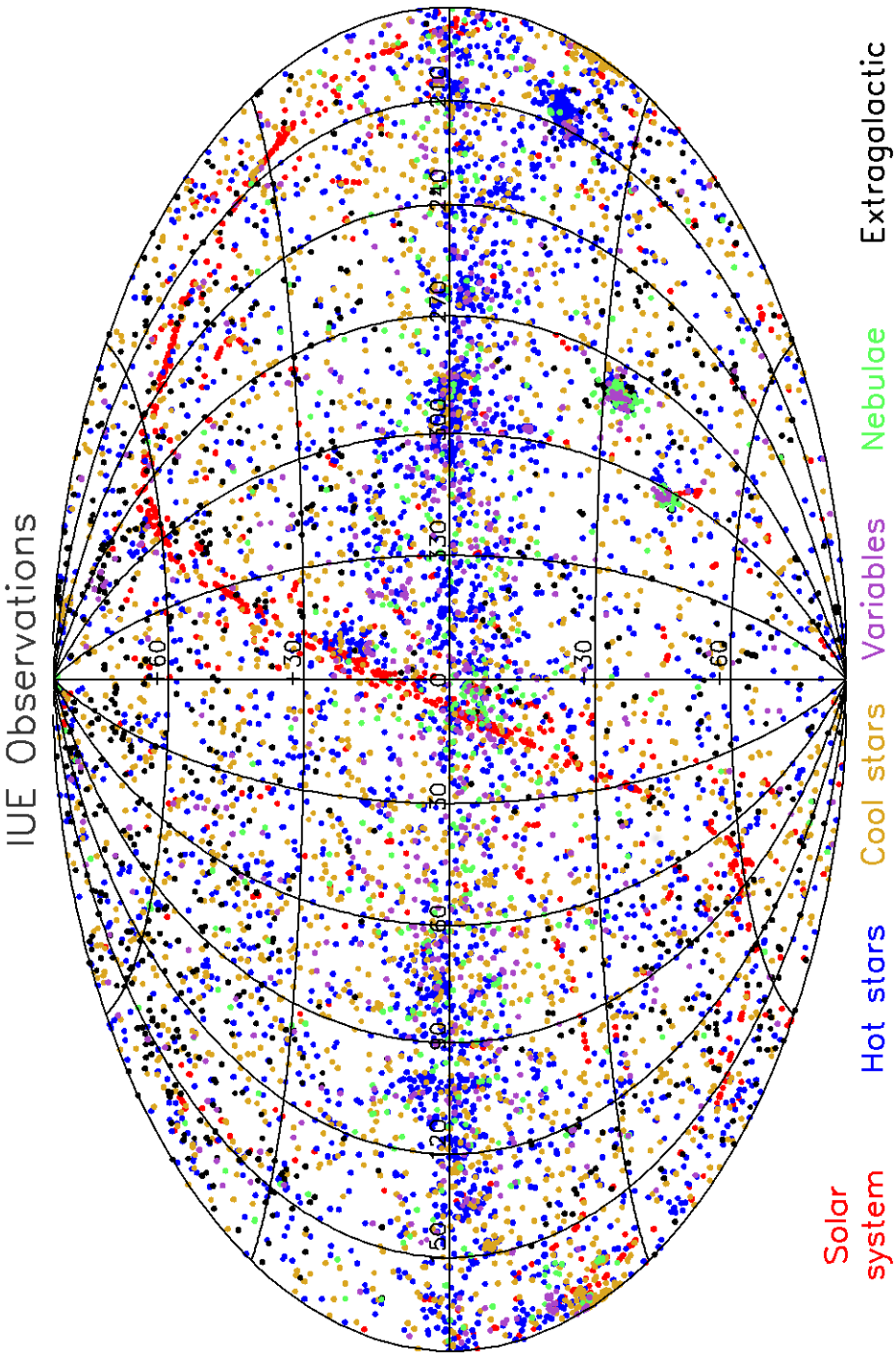


Fig. 93: Celestial distribution of IUE observations in galactic coordinates (0° at center) from the "Final Merged Log of IUE Observations" (NASA-ESA 2000). (Graphism by L. Cambrésy)

Heck's own satisfaction was to have contributed – together with teams of talent and high human quality – to the creation from scratch of a modern observatory and to the optimization of procedures enabling the collection of thousands of "novel" spectra, all in all helping hundreds of astronomers to progress in their understanding of the universe, and this while witnessing a great country in its transition towards democracy and in its march towards EU membership.

In exchange, through his privileged position in contact with so many leading scientists tackling so many different themes of research, Heck had acquired a broad view of world astronomy, with particular emphasis on the related observational and space ventures.

So far pretty separated with respect to the spectral ranges they tackled, the various subfields of the science were progressively merging into what would be called soon *panchromatic astronomy*. The time when individual astronomers could make a life-long cosy career within a narrow spectral approach of their lone pet objects was coming to an end ...



Fig. 94: Strasbourg Observatory grounds occupy most of this picture with its three buildings linked by covered corridors. The Big Dome is just above the center of the image. Below it is the original directorial house (white square on top), that Heck would relabel "Southern Building" and where he would host offices and the computer center. On the right of the picture is the third original building with two smaller domes and the meridian rooms (recycled for a planetarium and the library), with a subsequent extension, the so-called Eastern Building. See Publ. 398 for a history of the place. (Credits on the photograph)

First Years in Strasbourg

Thus, at about 09:00 on Monday 13 March 1983, Heck arrived at Strasbourg Observatory. He had no idea the place would be his professional affiliation until his retirement.

Taking the opportunity of earlier visits, Heck had looked for a reasonable lodging. He had been lucky to find a furnished detached house at the outskirts of the city, quite convenient for a start even if this was a step backwards compared to the modernity and well-being of his accommodation in El Escorial. In Spain, flats were routinely rented with furniture while here they were generally made available empty, people moving around with their own furniture – which was not the case for Heck. He had brought the most important things with him in the car. The removal from Spain was on its way. He had still a number of things in Liège where they could stay for a while.

Upon arriving, Heck thought of doing well by paying a visit to the Director of Strasbourg Observatory that he knew from earlier times and with whom his associated position had been arranged. In a kind of ESA deontology, but out of tune with the local practice, Heck described which kind of research he intended to carry out, including the acquisition of a small computer such as the PDP11 he had been using at Vilspa.

Such a talk flew well above the head of the man who abruptly interrupted Heck by weirdly asking: "Are you really coming here to work?" and pursuing with "There is no office available here for you". This was hardly believable given that the Observatory with its three buildings was largely oversized for its reduced staff. What a reception for someone who had been invited to the place! And from someone with whom Heck had been in regular contact for ensuring the good progress of the move[93].

Only months later Heck would understand that the gentleman had been conditioned against him by a familial lobby, at the observatory itself, fearing our biographee was coming to take the directorial seat, something far from Heck's intentions since his association was provisional. But this possibility was definitely present in the mind of a few other locals who had been spreading rumors ahead of his arrival, be it just for provoking the mentioned lobby.

With the help of a couple of technicians, Heck located a spacious office on the ground floor of the Big Dome building that was used as a storage room. The windows were almost opaque with dirt. Heck asked whether they could be cleaned.

[93] In comparison, refer to the praising comments (p. 193) made by the same person (Alphonse Florsch, 1929-2015, cf. Publ. 354, p. 282) – the day after Heck officially resigned for health reasons as Director of Strasbourg Observatory.

The Director let him know that there was no money for that. So Heck announced he was going to clean the windows himself and arranging for pictures being taken while doing it. The next morning, when he arrived at that office, someone was cleaning the windows ...

With the help of the same technicians, Heck cleared the room from all the garbage accumulated in it over years. They also mounted library shelves retrieved from some other place for accommodating his voluminous library on its way from Vilspa.

That room ultimately became a nice office where Heck could even hold small meetings. With time, money would indeed become available to renew the floor carpet, refresh the walls and upgrade all furniture.

When Heck was elected Director of Strasbourg Observatory five years later, it became the directorial office, the Big Dome building becoming the Director's place with the secretariat in the large room across the rotunda (Fig. 95).

But this is going too much ahead of our story.

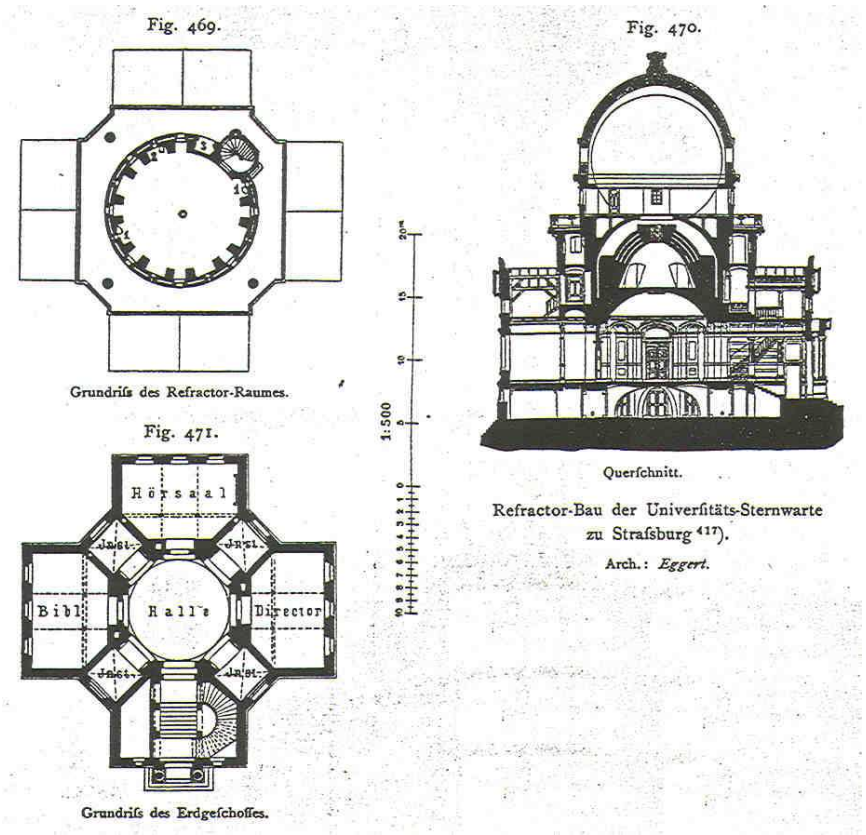


Fig. 95: Upon arriving at Strasbourg Observatory, Heck established his office in the Big Dome building (Fig. 96). The Western large room (marked "Bibl." in this original German floor plan extracted from Eggert 1884) was cleared from all the garbage accumulated in it. Heck transformed it later into the directorial office, with the secretariat across the rotunda in the room marked "Director".

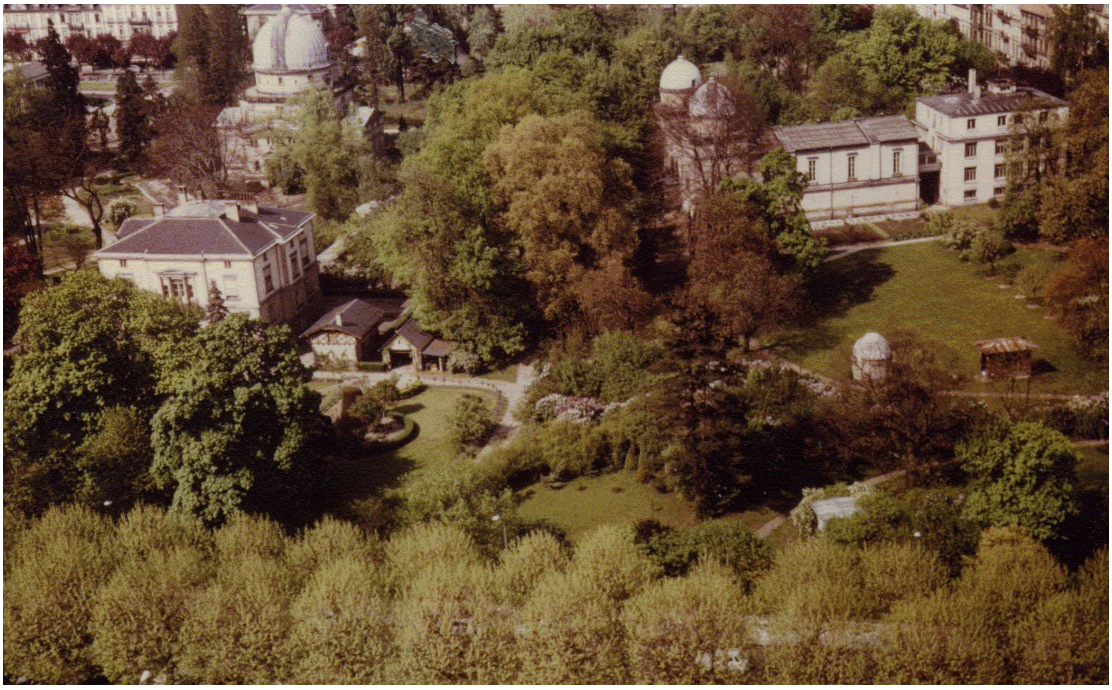


Fig. 96: This other global view of Strasbourg Observatory shows under a more earthy angle the buildings described in Fig. 94.

The Tortuous Way Towards Being Tenured

On that very week of March 1983 when Heck arrived in France, President Mitterand's economic policies knew a substantial U-turn in what was later known as the *tournant de la rigueur* (austerity turn).

If the French Franc was again devaluated (something that had already taken place in 1981 and 1982), other drastic measures prohibited the free exportation of the currency and the usage of French credit cards in foreign operations, particularly affecting scientists travelling extensively. Welcome to France.

Fortunately Heck had still his Belgian postal account, where he had been receiving his Belgian salary, and mainly his Dutch bank account dating back to ESTEC times. He could then get a credit card from the latter and safely travel.

But border crossings had to be done carefully either when going to Belgium for his continuing collaborations at IALg or simply when refueling the car in nearby Kehl. Gas was indeed significantly cheaper in Germany in those times and many drivers were crossing the Rhine for taking advantage of the lower prices.

Controls could have dramatic consequences. One day, CDS Director Jaschek had to pay a heavy fine[94] after customs officers found out he was holding foreign bank accounts and could not give satisfactory explanations.

[94]Several thousands of Euros (€) in today's terms.

Some time later, when crossing the river on a Sunday morning to refill his car, Heck was also stopped and brought into the customs office. His attaché case was searched and his foreign checkbooks were found. He escaped being fined by convincingly explaining that the money on the foreign accounts had always been there, that there had been no money transfer between countries and that anyway his current employment as a poor scientist in France was only provisional.

For this was indeed his situation.

Heck's association to Strasbourg Observatory was for one year only, from 01 April 1983 to 31 March 1984, and resulted from a ministerial decision dated 24 February 1983 putting him on the position temporarily vacated by Astronomer Alain Fresneau, on leave at STScI in Baltimore, MD.

Towards the end of 1983 and beginning of 1984, Heck's archives reveal surrealistic letters from the Director of the Observatory (him again) conditioning his support for extending Heck's association to his firm long-term commitment towards the Observatory while confessing that such an extension could only be for one year!

The extension was granted by another ministerial decision dated 16 March 1984 and transmitted to the Observatory by the University personnel office on 28 March 1984, *i.e.* only three days before the termination of the ongoing term.

The same procedure was repeated the following year with a ministerial decision dated 11 March 1985 and transmitted through the University personnel office on 20 March 1985, again only a few days before the end of the ongoing association. This time however, the extension was not for one year, but only for the period from 01 April to 30 September 1985, with the disquieting warning that it could be shortened if the titular of the position was coming back earlier to Strasbourg Observatory.

Heck did not remain inactive meanwhile in terms of looking for a stable position, far from that. His diaries are witnesses of a hectic life. In addition to his scientific research on which we shall come back later, he was attending and organizing colloquia, carrying out observing runs from ground and space, as well as giving lectures and seminars here and there, promoting his investigations and collaborations.

He was called at several interviews, including by his former employer ESA, ultimately rating him as overqualified for the open positions. In parallel to all this, Heck was following a course on techniques of marketing and advertising at Strasbourg III University.

By the end of 1984, he had bought a nice villa in a quiet village near a wooden area at some 25km from the Observatory. His initial lodging in the suburbs of Strasbourg was indeed provisional and poorly located next to an increasingly violent quarter of the city. It was also lying right under the landing path for civilian aircraft and air force *Mirages* passing at very low altitude when heading towards Entzheim airport.

Apart from being a financial investment, the new house was making his life easier for his extensive travelling as it was located not too far from the airport, but away enough from the nuisances of the landing and taking-off routes. Heck had to officially request the authorization to reside there as his new lodging was outside the city limits.

A recurrent question however was whether his future was in Strasbourg and even in France.



Fig. 97: Towards the end of his first Winter in Strasbourg: on 10 March 1984 in "La Petite France", the most touristic area of the Alsatian capital, renowned also for its numerous excellent restaurants.

On 08 April 1983, three weeks after arriving at Strasbourg Observatory, Heck wrote a few words of thanks to Brian Fitton, his ESTEC boss. It is interesting to reproduce here an excerpt from that letter:

> "My appointment with IUE being now officially terminated, I would like to thank you very much for having given me the opportunity to participate in this very exciting experience and for having expressed several times your confidence by extending my contract and promoting me within the IUE Observatory.
> These five years and half with ESA have been for me extremely rewarding personally and scientifically. Even if my initial interests have not disappeared completely, my scientific activities have been significantly modified. On the other hand, the human experiences I went through have also had a precious impact! [...]
> Strasbourg may be a welcome haven of rest for some time, but I do not see me staying here very long, unless the means available for research dramatically improve. Also the prospects of getting a tenure here are very, very low. Therefore, I am already preparing the future. [...]"

As hinted by a couple anecdotes above, Heck's move to Strasbourg had turned out to be a significant deterioration in terms of working atmosphere. He quickly realized that the situation of the place was much worse than what he could have imagined from earlier visits: petty bickering of childish level between individuals and groups; people ignoring what others were doing – when they were doing something relevant at all; buildings and offices in neglected condition, urgently needing refurbishing; library with big gaps in the collections and in discare; and so on.

This was quite different from his previous space age working context! It was also a textbook illustration of the tourist effect: a site, a city or a country looks often differently whether one is living there or just visiting the place.

Individual antagonisms could take disturbing dimensions with loud characters heavily badmouthing people they disliked or who were "different", such as a homosexual colleague[95]. Heck himself became the target of seemingly deeply-rooted and persistent xenophobic comments[96].

He wondered more than once in which kind of kindergarten he had landed. As he happened to utter the word a couple of times, some of the people laughing at this quipping did not realize they were among its prime *raison d'être*.

All this led Heck to question the choice he had made among the various offers at hand when he had decided to leave Vilspa. Had he been misled at some stage? But he had opted to live for a while in Alsace and such obnoxious behaviors would not change his resolution, quite the opposite.

For outside the observatory, Heck was perfectly at ease, enjoying the mixture of cultures, the "French style of life within a Germanic setting" as some were saying.

Heck's name allowed him to be considered as a local and, contrary to scores of French people, especially Parisian ones, he was not offended when addressed in Alsatian, the regional dialect. His mastering of German would help and, if he did not understand, he would quietly request switching to French. He actually noticed that a number of Alsatians had developed the ability to quickly detect if their interlocutors were not understanding their language and would then speak French in front of them.

On 16 April 1984, Heck was interviewed in Paris as he had applied at the French National Center for Scientific Research[97] (CNRS). While issuing unanimously positive comments, the board opined that Heck's profile was more suited for a position within the network of observatories, without explaining the reasons behind such a recommendation.

In those years, there were three major ways to work as an astronomer in France: on a CNRS position, on a university position or within a corps of civil servants called astronomers and physicists. These were making up the basic personnel of the network of observatories and were administered by a *Conseil des Observatoires Astronomiques et des Instituts et Observatoires de Physique du Globe* (Council of the Astronomical Observatories and of the Institutes and Observatories of Earth Physics).

Heck had been so far associated on such a position (Fresneau's) as *Astronome Adjoint Associé* that could be translated as Associated Assistant Astronomer.

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[95] Imagine what kind of eyeglances Heck got when he told he had been courteously invited to the gentleman's apartment for a drink to celebrate the latter's recently obtained PhD. Later as Director, Heck could measure the distress of the gentleman in this hostile environment, a situation that could motivate legal actions today. That gentleman ultimately moved out of the country.

[96] Just to mention an instance: during 30 years, and even after his retirement, Heck was consistently asked by one of his colleagues whether or when he was going to "go home". What was home for the multilingual and multicultural Heck who had lived and worked in various countries? To say the least, this exposed dramatically the narrowmindedness or immaturity of the person asking such questions.

[97] Centre National de la Recherche Scientifique.

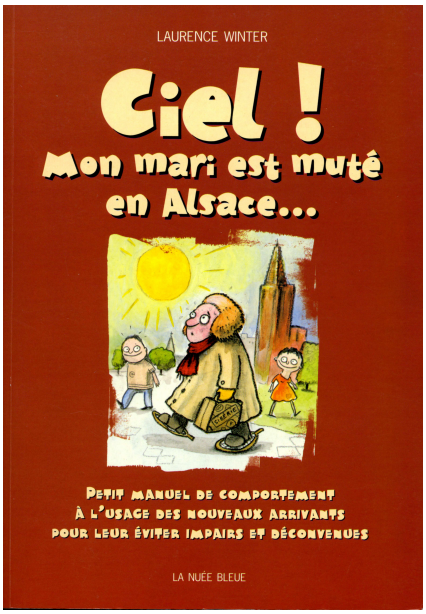


Fig. 98: The title of this bestseller by Laurence Winter (2000) could be translated as "Heavens! My Husband is Transferred to Alsace ..." and its subtitle as "Small Behavior Manual for Newcomers to Save Them Blunders and Disappointment". Full of anecdotes, it describes specificities of the region and exposes prejudices. Many French people, and a fortiori foreigners, are unaware that the law in Alsace is not quite the same as in the rest of France; that the trains run on the right as in Germany and not on the left as in "Inner France"; that the payroll of civil servants shows a line labelled "indemnity for administrative difficulties"; etc. See Sect. 2 of Publ. 122 for an introduction to Alsatian peculiarities and recent history.

The only problem was that, if foreigners could be temporarily associated on such observatory positions, there was a requisite of French citizenship for obtaining a fully-fledged and indefinite nomination as a civil servant in that corps.

Thus the CNRS committee recommendation was making no sense, all the more since there was no requirement of nationality for applying to a CNRS position! As to looking for a teaching position at a university, we have already seen that Heck was not considering his future in that direction.

Fresneau's term at STScI being extended, Heck's association in turn could be extended from 01 October 1985 to 31 August 1986, with the renewed caveat of a possible shortening if the titular was coming back meanwhile[98].

And due to the return of Fresneau to his home institution (cf. Publ. 354, p. 282), Heck's association was moved, as of 01 February 1986, onto a position transferred from the Pic du Midi/Toulouse Observatory (ministerial decree of 06 March 1986).

[98]Interestingly, if the ministerial decision was dated 05 August 1985, the University personnel office transmitted it only on 28 August 1985, reflecting the delaying effect of the sacrosanct Summer holidays in the French academic institutions.

The association was again extended for one year as of 01 October 1986, being moved on yet another position (ministerial decree dated 12 November 1986).

The reader has noted that the effective dates of those decisions were retroactive, something certainly not unusual then, but a process that definitely left the people concerned in a cloud of uncertainty. And that was becoming for Heck much worse and stressing than what he had known at the IUE Observatory.

In addition, all this was taking place on a background of discussions for possibly modifying the statutes of the corps of astronomers and physicists. The Council of Observatories would become the National Council of Astronomers and Physicists (*Conseil National des Astronomes et Physiciens, CNAP*) and, more importantly for Heck, the requisite of French citizenship would be dropped.

On top of his multifarious activities, our biographee undertook to "please" the French system by presenting on 28 January 1986 an Habilitation to Direct Researches (Fig. 207), a degree recently introduced in the country[99], and this in spite of the fact that his Belgian PhD was fully recognized in France.

All along 1985, he had also gone through the various steps for obtaining from Liège University a Belgian ProfDSc degree[100] (Fig. 205), a long process involving one major memoir and three secondary theses, plus an Academic Lesson to be given in tails in front of the whole Faculty of Sciences in gown.

Heck was the first astronomer in more than a decade to be awarded unanimously and with the highest distinction that degree, typical of Northern countries and never understood by the French who believed their own degrees were the highest ones – another reason for having secured the *Habilitation* in France. We shall come back to those degrees hereafter (pp. 157ff).

The new statutes for astronomers and physicists were finally adopted in March 1986.

One year later, in a letter dated 03 March 1987, a delay likely due to the unavoidable administrative lingering for new procedures, the Ministry informed Heck that they were willing to hire him in the new corps and to take into account the time he had served as Associated Astronomer since 1983, requesting his agreement on the proposal.

The formal unconditional nomination as *Astronome* was issued on 28 August 1987 (Fig. 208), with a retroactive effect on 01 April 1986 and carrying the signatures of the top officials of the French Republic from President François Mitterand to Prime Minister Jacques Chirac[101] and Minister of Education René Monory down to the various ministerial officers.

Was this the end of the story? Not quite.

When Heck believed he could finally enjoy some peace of mind with a career in France quietly following its normal course, this was challenged by an absurd event, with lasting consequences. Here is the chronology from the archives.

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[99] Heck was in fact the first recipient of that degree at Strasbourg I (Louis Pasteur) University.

[100] Official title in French: Agrégation de l'Enseignement Supérieur Universitaire.

[101] This was the time of the first *cohabitation* between a President issued from a political party on the left and a parliamentary majority (and thus a Prime Minister) from the right.



Fig. 99: Posing on Washington's Mall (USA-DC) on a Cherry Blossom Parade day (08 April 1984) while attending, at NASA's Goddard Space Flight Center, a symposium on the "Future Ultraviolet Astronomy Based on Six Years of IUE Research" (cf. Publ. 216 & 217).

In 1988, Heck had already enough seniority to apply for a First-Class Astronomer position (*Astronome de Première Classe*), but such promotions were rarely granted, if ever, the first time they were sought for.

The following year, Heck applied again and was most surprized when realizing after the session that, this time, his application had not been submitted to the selection committee (CNAP). A request for explanation from the Ministry received no answer, nor did other approaches, including formal ones from the Observatory.

In such conditions, Heck had no other choice than putting a lawyer on the matter. After several months, the Ministry finally replied with a long letter explaining that they had filtered the applications before submitting them to the CNAP and had rejected Heck's on the basis that he was lacking the *mobility* of two years demanded by the new statutes, a requirement applied whatever had been the itinerary of the scientists before being hired within the system.

This was a gross mistake: the last paragraph of Article 24 of the same statutes was indeed explicitely excusing from the obligation of mobility foreign scientists recruited in order the country benefited from their expertise – which was typically the case for Heck (cf. p. 133) with his past responsibilities and extensive publishing in various fields[102].

Charvin, who had invited Heck to France and was now at the helm of Paris Observatory, but also CNAP Chairman, was embarrassed. He had never seen Heck's application since removed from the stack before it reached his desk.

[102] At that time, he had already authored or co-authored some 70 refereed papers and more than 130 secondary publications.



Fig. 100: The participants to the workshop "Calibration of Luminosities by Astrometric Techniques" in front of the Herstmonceux castle (England) on 05 May 1983. Front row, squatting, left to right: Wilhelm Gliese, Daniel Egret, Michel Crézé, Margaret Penston and Bob Argyle. Back row, standing, left to right: William van Altena, Arthur Upgren, Heck, Benard Pagel, Tom Lutz, Andrew Murray, Floor van Leeuwen, Hartmut Jahreiß, Chas Parker, Derek Jones, Bill Martin, Noel Argue and Victor Clube.

In his opinion, the mobility before being hired should have been taken into account, for nationals and foreigners alike. The Ministry never apologized for the mistake. Undertaking a procedure through the Administrative Tribunal could have taken years, with no guarantee of any kind of result.

Even if considering that possibility, Charvin advised to rather wait for a new version of the statutes, on which he was working, that would leave only to CNAP the appreciation of mobility. At the minimum, this ministerial blunder resulted in a delay of several years in Heck's career progress[103].

One can easily conceive how our biographee – now Director of Strasbourg Observatory – felt at the idea of being obliged, in his management position and at more than forty, to take again his pilgrim stick to validate that required mobility after having worked abroad for twenty years, including in a definitely more prominent situation.

He says today that the issue was serious enough for considering throwing in the towel and leaving for good, not only Strasbourg Observatory, but astronomy altogether. In addition, this was taking place at a time he was physically diminished and laboriously recovering from a cerebrovascular ailment that had left him with a partial permanent disability (cf. p. 181).

[103]Heck was promoted as First-Class Astronomer almost a decade later, in 1997.



Fig. 101: Two convicts? With Michael J. Kurtz (left) at the colloquium on "MK Spectral Classification: Criteria and Applications" organized at the University of Toronto (Canada-ON) on 07 Jun 1983 (cf. Publ. 221). Refer to Kurtz's statement in another section of in this book (p. 353).

All in all, this definitely participated to a decision that we shall discuss in the next chapter. But before we get there, some space should now be devoted to Heck's scientific achievements during his first years in Alsace.

Statistical Methodologies

Heck had continued to maintain an intense activity on various fronts while organizing his new life in France: getting used to administrative and local peculiarities (cf. Fig. 98), securing a permanent lodging, finding out good practicians and skilled workmen as well as, last but not least, building up a social network with a substantial cultural component.

On the scientific side, he carried on, with some overlap, in two major directions – applications of 'modern' statistical methodologies and stellar spectral classification from IUE spectra – while trying to foster new collaborations locally. After all, he had come to Strasbourg in part because some locals had expressed the desire to work with him.

Actually things did not go as hoped for in that respect and, one year after his arrival, Heck could not avoid expressing a bitter disappointment to one colleague, certainly a pleasant fellow, but definitely more interested in enjoying life than in doing real work. Even motivation attempts by putting him as first author on some papers had failed.

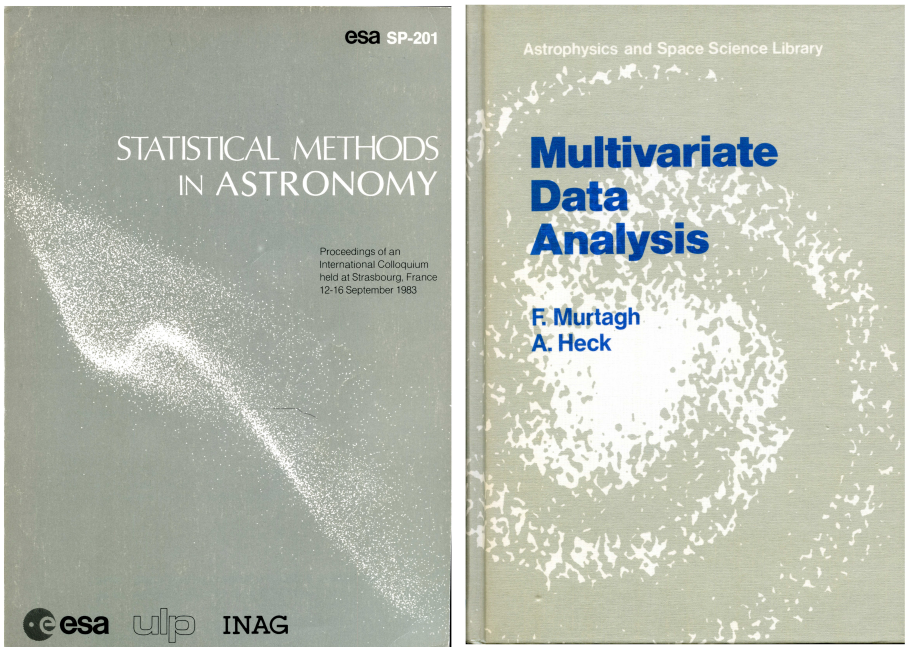


Fig. 102: Proceedings of the conference "Statistical Methods in Astronomy" organized by Heck on 12-16 September 1983 at Strasbourg Observatory with the co-sponsoring of ESA and INAG (left) and (right) the book "Multivariate Data Analysis" (Publ. 405) co-authored with Fionn Murtagh that would be the textbook for a range of courses, seminars and workshops.

The luminosity calibrations of stellar groups with Heck's PhD algorithm (cf. p. 64) were continued through various collaborations, such as those for "normal" stars (Publ. 59) and for Barium stars (Publ. 232). A synthesis of the various calibrations performed with his algorithm was presented at IAU Symposium 111 in Como on "Calibration of Fundamental Stellar Quantities" (Publ. 227).

As to multivariate statistical methodologies, Heck always insisted they had to be taken as complements to physical analyses, often as preliminaries to "objectively" clear grounds and/or to reveal facets that would otherwise remain unsuspected. They had to be used not as black boxes, but in full knowledge of their limitations and conditions of applicability.

One milestone was definitely the colloquium "Statistical Methods in Astronomy" organized at Strasbourg Observatory on 12-16 September 1983 (Fig. 102). Heck had been lobbying for such a meeting since 1979 as recalled in the welcome addresses by both the Observatory and the CDS Directors reproduced in the proceedings.

Before leaving Vilspa, he had also obtained that ESA be the publisher of those proceedings[104]. The first of its kind, that meeting gathered together some 80 participants from 14 countries, including a large delegation from overseas.

[104]Letter by D.E. Page dated 30 November 1982.



Fig. 103: With Piero Benvenuti (right), now Head of the Space Telescope – European Coordinating Facility (ST-ECF), at a CDS Council Meeting at Bordeaux Observatory (14 May 1985).

Heck himself, on top of a review paper on *Predictions: Also an Astronomical Tool* (Publ. 51), was involved in four other contributions dealing with the statistical classification of ultraviolet stellar spectra (Publ. 209), the comparison of period determination methods (Publ. 210), the statistical determination of the precision obtained by a photometric reduction algorithm (Publ. 211) and the prediction of spectral classification from photometric data in the Geneva system (Publ. 212).

On 24 October 1984, Heck received a phone call from – as noted in his diary – "someone from ST-ECF[105]" in Garching. The line was so noisy that he could not get the name. This would be solved a few days later by a postal package landing on his desk with a number of publications and preprints.

Taking up the suggestion of Heck's past Vilspa colleague Benvenuti (Fig. 103) now heading ST-ECF, Fionn Murtagh (Fig. 151) was investigating potential common interests. This would lead to a productive collaboration over the next dozen years.

The two immediately reached good understanding. They rapidly published papers advertizing the importance of modern statistical methodologies (for instance Publ. 225 and 226). They started planning meetings and books. Later, Heck also coached Murtagh in obtaining a Habilitation to Direct Researches from Strasbourg University, as well as a Visiting Professor position within the third-cycle curriculum set up by the Observatory.

[105]Space Telescope – European Coordinating Facility.

In 1985, they launched the *Working Group of Modern Astronomical Methodology (WGMAM)* with a dedicated newsletter, also reprinted in the *CDS Information Bulletin*.

A compendium of the most useful techniques in multivariate statistics, with annotated references and Fortran programs, was put together, initially intended as a CDS Special Publication. But the complications raised by the Observatory Director through surrealistic notes addressed to the CDS Director pushed Heck and Murtagh to approach a commercial publisher (Reidel).

The final outcome was a successful book in hardbound and paperback versions together with the codes available on diskettes, the digital support of the time (Publ. 405, Fig. 102).

The pair also organized on 11-14 October 1987 at ST-ECF a conference on the theme *Astronomy from Large Databases* that turned out to be a smashing success: about 150 participants from a dozen countries, the USA having the largest delegation (30). Seventy-four communications were presented and the proceedings (about 530 pages) were swiftly produced by ESO (Publ. 454, Fig. 222).

In the wake of that colloquium and the papers published, but also in view of the forthcoming avalanches of data from various experiments from ground and space, the astronomical community became really conscious of the importance of those modern methodologies. Several schools were organized. See for instance the lecture notes put together in Publ. 259, 406, 407 & 408.

An annotated bibliographical catalogue of astronomical applications was also compiled and made available to the community at large (Publ. 63, 238 & 415).

Within weeks of his arrival in Strasbourg, Heck had established contacts with local statisticians.This would lead to several collaborations, such as an independent confirmation of the UV morphological spectral classification for normal stars elaborated from IUE low-dispersion spectra (see next section). An interesting (and amusing) supervision of a thesis from the Medical Faculty was also carried out with their collaboration (Dub 1987 & Publ. 827).

Ultraviolet Stellar Classification

As mentioned earlier (p. 122), a program of ultraviolet spectral classification had been initiated in 1978 and endorsed by the IUE Observatory at Vilspa. Its specific goal was to gather sets of IUE low-dispersion spectra from which a classification scheme could be structured in the UV (see for instance Publ. 205 & 213). Fig. 104 shows how far in apparent magnitude such spectra could be collected.

The program had been strongly supported by the Vilspa workshop on *UV Spectral Classification* held on 26-28 October 1981 (cf. Fig. 85 & Publ. 452): the final resolution stressed its basic importance not only for stellar and extragalactic astronomy, but also for the preparation of spectroscopic programs on future space missions. Various announcements of the undergoing work (*e.g.* Publ. 216, 219 & 231) were well received.

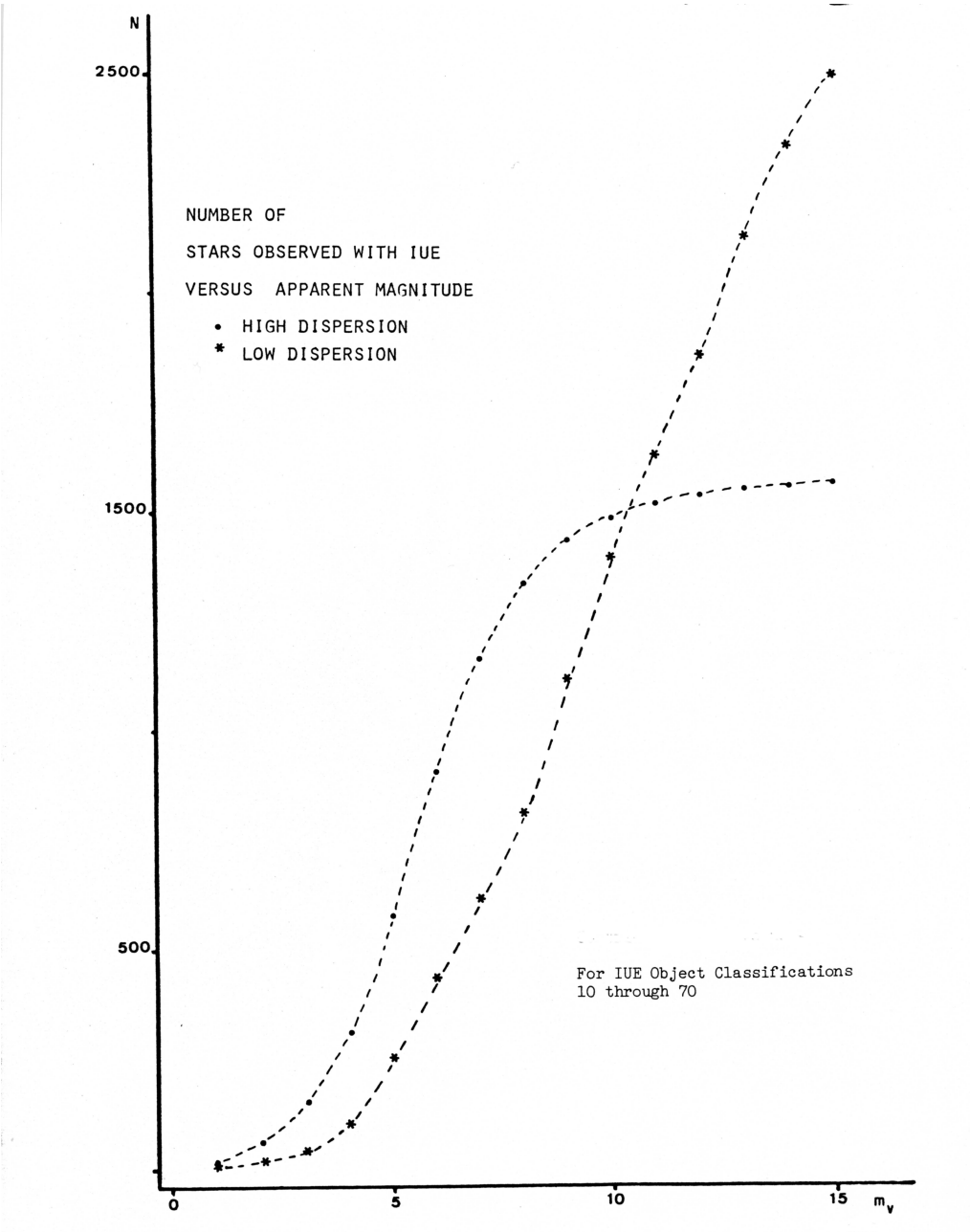


Fig. 104: Number of stars observed with IUE versus apparent magnitude (reproduced from Publ. 215): taller curve (asterisks) for low-dispersion spectra; lower curve (dots) for high-dispersion spectra. See also Publ. 200.

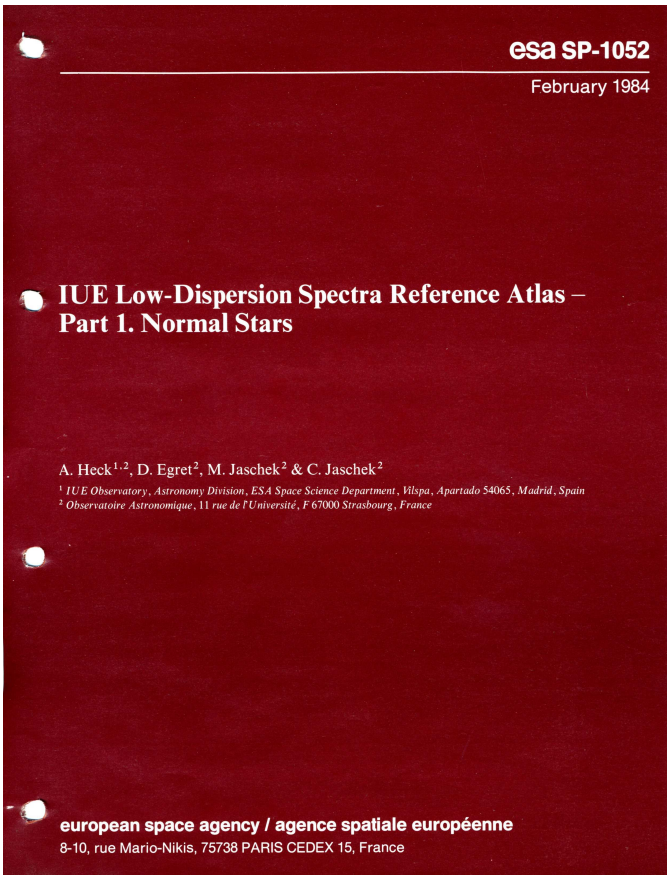


Fig. 105: Cover page of the IUE low-dispersion spectra reference atlas (Publ. 413).

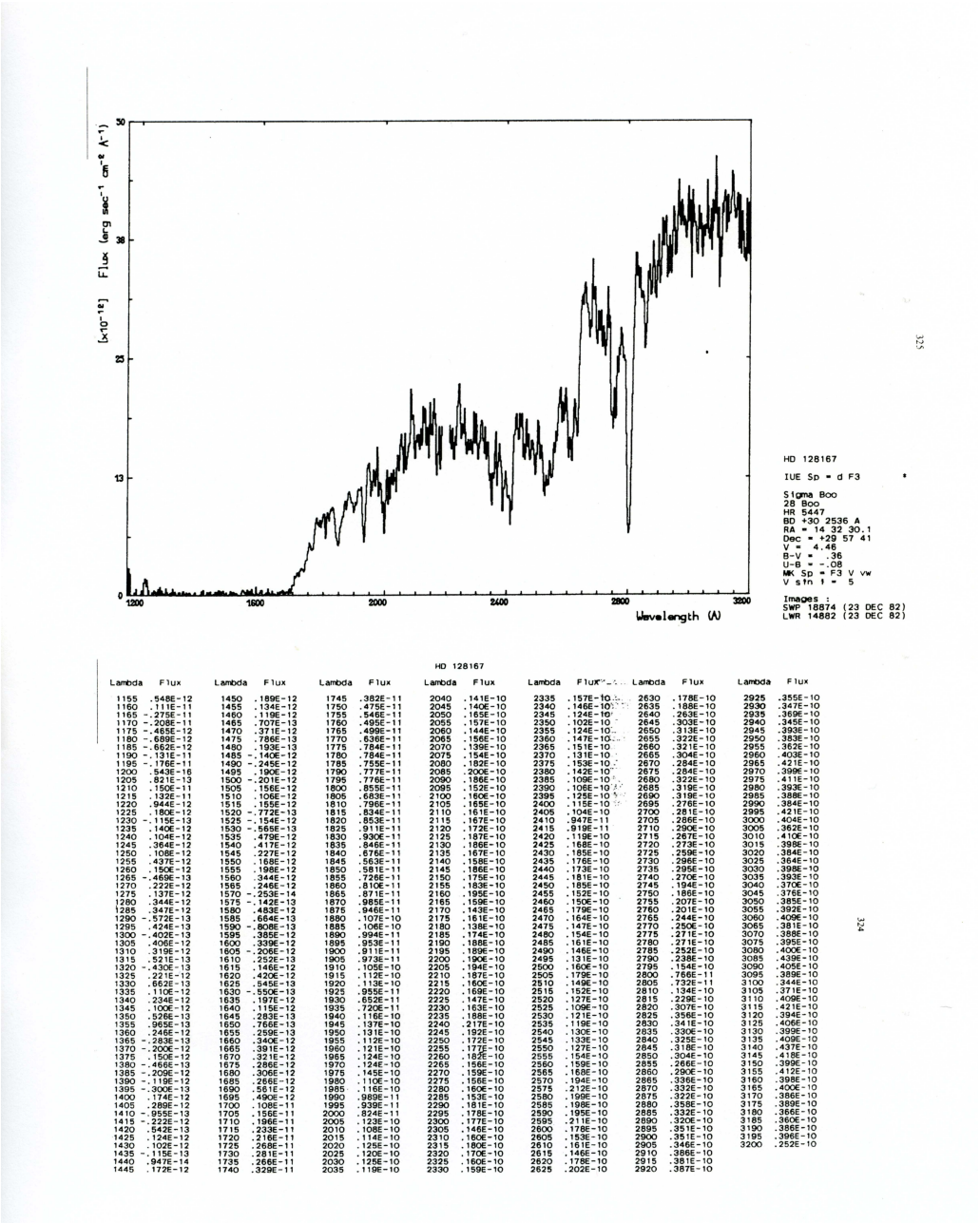
There was however some difficulty in gathering the necessary data due to the competition with the other observing programs while ... those other observers were repeatedly asking for reference sequences needed for comparison. Reference fluxes were also required for modelling populations.

As shown in the list of missions (p. 369), Heck went back to Vilspa several times in 1983 to collect data and to work on the local computers for producing calibrated spectra.

Refer to the *IUE Low-Dispersion Spectra Reference Atlas* (Publ. 413, Fig. 105 & 106) for details on the rationale of the project, the construction of the reference sequences and their comparison with existing schemes in the visible (MK system) and in the ultraviolet (from TD1 spectra at a much lower resolution).

The atlas was ready and delivered to ESA's Publications Branch in January 1984. The first copies were received in Strasbourg towards the end of March 1984. It was provided in the shape of a strong ring binder holding not far from 500 pages presenting 229 stars with their basic identifications and data, including the new ultraviolet spectral classification, together with flux tables (by steps of 5Å) and the corresponding composite graphs (by steps of 2Å) for the full IUE range.

A specific catalogue of fluxes was also made available on magnetic tape (Publ. 55).



HD 128167

Lambda	Flux	Lambda	Flux	Lambda	Flux	Lambda	Flux	Lambda	Flux	Lambda	Flux	Lambda	Flux
1155	.548E-12	1450	.189E-12	1745	.382E-11	2040	.141E-10	2335	.157E-10	2630	.178E-10	2925	.355E-10
1160	.111E-11	1455	.134E-12	1750	.475E-11	2045	.140E-10	2340	.146E-10	2635	.188E-10	2930	.347E-10
1165	-.275E-11	1460	.119E-12	1755	.546E-11	2050	.165E-10	2345	.124E-10	2640	.263E-10	2935	.369E-10
1170	-.208E-11	1465	.707E-13	1760	.495E-11	2055	.157E-10	2350	.102E-10	2645	.303E-10	2940	.345E-10
1175	-.465E-12	1470	.371E-12	1765	.499E-11	2060	.144E-10	2355	.124E-10	2650	.313E-10	2945	.393E-10
1180	-.689E-12	1475	.786E-13	1770	.636E-11	2065	.156E-10	2360	.147E-10	2655	.322E-10	2950	.383E-10
1185	-.662E-12	1480	.193E-13	1775	.784E-11	2070	.139E-10	2365	.151E-10	2660	.321E-10	2955	.362E-10
1190	-.131E-11	1485	-.140E-12	1780	.784E-11	2075	.154E-10	2370	.131E-10	2665	.304E-10	2960	.403E-10
1195	-.176E-11	1490	-.245E-12	1785	.755E-11	2080	.182E-10	2375	.153E-10	2670	.284E-10	2965	.421E-10
1200	.543E-16	1495	.190E-12	1790	.777E-11	2085	.200E-10	2380	.142E-10	2675	.284E-10	2970	.399E-10
1205	.821E-13	1500	-.201E-12	1795	.776E-11	2090	.186E-10	2385	.109E-10	2680	.322E-10	2975	.411E-10
1210	.150E-11	1505	.156E-12	1800	.855E-11	2095	.152E-10	2390	.106E-10	2685	.319E-10	2980	.393E-10
1215	.132E-11	1510	.106E-12	1805	.683E-11	2100	.160E-10	2395	.125E-10	2690	.318E-10	2985	.388E-10
1220	.944E-12	1515	.155E-12	1810	.798E-11	2105	.165E-10	2400	.115E-10	2695	.278E-10	2990	.384E-10
1225	.180E-12	1520	-.772E-13	1815	.834E-11	2110	.161E-10	2405	.104E-10	2700	.281E-10	2995	.421E-10
1230	-.115E-13	1525	-.154E-12	1820	.853E-11	2115	.167E-10	2410	.947E-11	2705	.286E-10	3000	.404E-10
1235	.140E-12	1530	-.568E-13	1825	.911E-11	2120	.172E-10	2415	.919E-11	2710	.290E-10	3005	.362E-10
1240	.104E-12	1535	.479E-12	1830	.930E-11	2125	.187E-10	2420	.119E-10	2715	.267E-10	3010	.410E-10
1245	.364E-12	1540	.417E-12	1835	.846E-11	2130	.186E-10	2425	.168E-10	2720	.273E-10	3015	.398E-10
1250	.108E-12	1545	.227E-12	1840	.676E-11	2135	.167E-10	2430	.185E-10	2725	.259E-10	3020	.384E-10
1255	.437E-12	1550	.168E-12	1845	.563E-11	2140	.158E-10	2435	.176E-10	2730	.296E-10	3025	.364E-10
1260	.150E-12	1555	.198E-12	1850	.581E-11	2145	.186E-10	2440	.173E-10	2735	.295E-10	3030	.398E-10
1265	-.469E-13	1560	.344E-12	1855	.726E-11	2150	.175E-10	2445	.181E-10	2740	.270E-10	3035	.393E-10
1270	.222E-12	1565	.246E-12	1860	.810E-11	2155	.183E-10	2450	.185E-10	2745	.194E-10	3040	.370E-10
1275	.137E-12	1570	-.253E-14	1865	.871E-11	2160	.195E-10	2455	.152E-10	2750	.186E-10	3045	.376E-10
1280	.344E-12	1575	-.142E-13	1870	.985E-11	2165	.159E-10	2460	.150E-10	2755	.207E-10	3050	.385E-10
1285	.347E-12	1580	.483E-12	1875	.946E-11	2170	.143E-10	2465	.179E-10	2760	.201E-10	3055	.392E-10
1290	-.572E-13	1585	.664E-13	1880	.107E-10	2175	.161E-10	2470	.164E-10	2765	.244E-10	3060	.409E-10
1295	.424E-13	1590	-.808E-13	1885	.106E-10	2180	.138E-10	2475	.147E-10	2770	.250E-10	3065	.381E-10
1300	-.402E-13	1595	.385E-12	1890	.994E-11	2185	.174E-10	2480	.154E-10	2775	.271E-10	3070	.388E-10
1305	.406E-12	1600	.339E-12	1895	.953E-11	2190	.188E-10	2485	.161E-10	2780	.271E-10	3075	.395E-10
1310	.319E-12	1605	-.206E-12	1900	.911E-11	2195	.189E-10	2490	.146E-10	2785	.252E-10	3080	.400E-10
1315	.521E-13	1610	.252E-13	1905	.973E-11	2200	.190E-10	2495	.131E-10	2790	.238E-10	3085	.439E-10
1320	-.430E-13	1615	.146E-12	1910	.105E-10	2205	.194E-10	2500	.160E-10	2795	.154E-10	3090	.405E-10
1325	.221E-12	1620	.420E-12	1915	.112E-10	2210	.187E-10	2505	.179E-10	2800	.766E-11	3095	.389E-10
1330	.662E-13	1625	.545E-13	1920	.113E-10	2215	.160E-10	2510	.149E-10	2805	.732E-11	3100	.344E-10
1335	.110E-12	1630	-.559E-13	1925	.955E-11	2220	.169E-10	2515	.152E-10	2810	.134E-10	3105	.371E-10
1340	.234E-12	1635	.197E-12	1930	.652E-11	2225	.147E-10	2520	.127E-10	2815	.229E-10	3110	.409E-10
1345	.100E-12	1640	.115E-12	1935	.720E-11	2230	.163E-10	2525	.109E-10	2820	.307E-10	3115	.421E-10
1350	.528E-13	1645	.283E-13	1940	.116E-10	2235	.188E-10	2530	.121E-10	2825	.356E-10	3120	.394E-10
1355	.965E-13	1650	.766E-13	1945	.137E-10	2240	.217E-10	2535	.119E-10	2830	.341E-10	3125	.406E-10
1360	.246E-12	1655	.259E-13	1950	.131E-10	2245	.192E-10	2540	.130E-10	2835	.330E-10	3130	.399E-10
1365	-.283E-13	1660	.340E-12	1955	.112E-10	2250	.172E-10	2545	.133E-10	2840	.325E-10	3135	.409E-10
1370	-.200E-12	1665	.391E-12	1960	.121E-10	2255	.177E-10	2550	.127E-10	2845	.318E-10	3140	.437E-10
1375	.150E-12	1670	.321E-12	1965	.124E-10	2260	.183E-10	2555	.154E-10	2850	.304E-10	3145	.418E-10
1380	-.466E-13	1675	.286E-12	1970	.124E-10	2265	.156E-10	2560	.159E-10	2855	.266E-10	3150	.399E-10
1385	-.209E-12	1680	.306E-12	1975	.145E-10	2270	.159E-10	2565	.168E-10	2860	.290E-10	3155	.412E-10
1390	-.119E-12	1685	.266E-12	1980	.110E-10	2275	.156E-10	2570	.194E-10	2865	.336E-10	3160	.398E-10
1395	-.300E-13	1690	.561E-12	1985	.116E-10	2280	.160E-10	2575	.212E-10	2870	.332E-10	3165	.400E-10
1400	.174E-12	1695	.490E-12	1990	.989E-11	2285	.153E-10	2580	.198E-10	2875	.322E-10	3170	.386E-10
1405	.289E-12	1700	.108E-11	1995	.939E-11	2290	.181E-10	2585	.198E-10	2880	.358E-10	3175	.389E-10
1410	-.955E-13	1705	.156E-11	2000	.824E-11	2295	.178E-10	2590	.195E-10	2885	.332E-10	3180	.366E-10
1415	-.222E-12	1710	.196E-11	2005	.123E-10	2300	.177E-10	2595	.211E-10	2890	.320E-10	3185	.360E-10
1420	.542E-13	1715	.233E-11	2010	.108E-10	2305	.146E-10	2600	.178E-10	2895	.351E-10	3190	.386E-10
1425	.124E-12	1720	.216E-11	2015	.114E-10	2310	.160E-10	2605	.153E-10	2900	.351E-10	3195	.396E-10
1430	.102E-12	1725	.268E-11	2020	.125E-10	2315	.180E-10	2610	.161E-10	2905	.346E-10	3200	.252E-10
1435	-.115E-13	1730	.281E-11	2025	.120E-10	2320	.170E-10	2615	.146E-10	2910	.386E-10		
1440	.947E-14	1735	.266E-11	2030	.125E-10	2325	.160E-10	2620	.178E-10	2915	.381E-10		
1445	.172E-12	1740	.329E-11	2035	.119E-10	2330	.159E-10	2625	.202E-10	2920	.387E-10		

Fig. 106: Example of inside pages from the "IUE Low-Dispersion Spectra Reference Atlas. Part 1. Normal Stars" (Publ. 413) displaying the spectrum and flux table for the star HD128167 (σ Boo), an F3 dwarf.

A set of 34 transparencies had been provided in a folder with the atlas for the most representative standard stars in order to allow direct comparison with the spectra and easy illustration of the spectral sequences.

They could also be used by the observers as overlays on collected spectra with *ad hoc* scaling.

Unfortunately, the collaborator in charge of the final plotting of the spectra and of their expedition to the publisher while Heck was away had neglected to tune the abscissa scale properly (a straightforward adjustment though). It had indeed been intended that, on the final printout, 1cm would represent 100Å. As this was not the case, a revision of the atlas was needed with the corresponding sentence removed from the introduction (Publ. 414).

However the atlas success was such that ESA had to reprint it several times. The volume definitely landed in all astronomy libraries and in the hands of virtually all users of UV data on the planet. It is rarely listed in the bibliographies of related scientific papers, but this is a fate common to reference works.

As visible on Fig. 105, the "Part 1" implied further parts, at least intended. As announced in Publ. 236 and as prepared by Heck's bibliographical compilation (Publ. 223 & 412), some work had been initiated for peculiar stars, but was never concluded for failure from the morphological classifiers to provide validated representative spectra.

An interesting investigation was undertaken at the convergence of the above and of 'modern' statistical methodologies: the statistical assessment of the morphological classification achieved for the normal stars (Jaschek & Jaschek 1984). The study was introduced through various announcements (Publ. 209, 217, 218, 222 & 228) and the ultimate results were presented in Publ. 62, confirming independently the morphological approach.

The latter, leading to a new spectral classification system proper to the UV, had to be developed because of the lack of one-to-one correspondence between the ultraviolet and visible ranges. Its correctness was demonstrated by working in a multidimensional parametric space with variables expressing, as objectively as possible, the information contained in the continuum and the spectral features of a set of stellar low-dispersion IUE spectra.

This was done through, on the one hand, an asymmetry coefficient describing the continuum shape and empirically corrected for the interstellar reddening, and, on the other hand, the intensity of sixty objectively selected lines.

These line intensities were all weighted in a way that was ultimately nicknamed as the Variable Procrustean Bed (VPB) method: contrary to a standard process where a variable is weighted in the same way for all the individuals of a sample, the spectral variables were weighted in that study according to the asymmetry coefficient varying with the star at hand[106].

[106]The Greek mythological bandit Procrustes, *i.e.* "the stretcher", was attacking people and stretching them or cutting off their feet and possibly part of their legs so as to force them to fit the size of an iron bed. In the statistical application described, the procedure was even more sadistic since the length of the bed was varying with each individual.



Fig. 107: Photis Nobelis (of Greek ancestry) suggested the mythological figure Procrustes for characterizing the statistical weighting method used i.a. in Publ. 62.

The choice of the lines used for the morphological approach was shown to be correct, as was the resulting UV classification system used in the *IUE Low-Dispersion Spectra Reference Atlas*. In addition, the standard stars proposed were found near the barycenters of the groups (clusters) formed by the statistical analyses.

By closing this section, we should also mention an important invited review paper by Heck on *UV Stellar Spectral Classification* (Publ. 65) in what became known as the 'IUE book' (Kondo *et al.* 1987), as well as reports to IAU Commission 45 (Publ. 234, 241 & 254). Summaries for this section can be found on p. 482.

The ProfDSc and HDR Degrees

Heck's diaries of those years reveal a very hectic life not only professionally on several fronts, but also socially and culturally. One could really wonder where he found the time to prepare two additional degrees.

If the Habilitation to Direct Researches[107] in Strasbourg was a rather simple event, the ProfDSc[108] in Liège was a long and complex process with the preparation of four theses and of an Academic Lesson, involving repeated trips to Belgium.

[107] In French: Habilitation à Diriger les Recherches.
[108] In French: Agrégation de l'Enseignement Supérieur Universitaire (degree suppressed in 2007).

The ProfDSc degree

In most countries, the highest academic degree is the PhD. But Belgium, like other Northern countries, had at that time a higher degree obtainable quite a few years after the PhD. The candidate had to demonstrate his/her research capability on different matters and his/her ability to teach at a university level. One memoir (*thèse principale*) and three secondary theses (*thèses annexes*) had to be prepared on distinct themes.

The memoir had to be printed and deposited at the university, once the corresponding manuscript had been cleared by the Faculty of Sciences. The candidate was authorized to "defend" it orally during about one hour in front of the whole Faculty acting as a jury. Then the candidate was invited to defend one of the secondary theses during about twenty minutes. But the subject selected by the jury was not known in advance, so those three secondary theses had to be prepared and the candidate had to be ready to jump straight into the matter requested.

The jury would then deliberate and, if happy with the presentation of the theses, come back and announce the title of the Academic Lesson to be presented within a fortnight. The lesson was a solemn event taking place in the Academic Auditorium. The candidate was expected to be in tails and the university professors wearing their gowns.

The process was complex and, in this case, it was taking place with an outsider. Even if the candidate had been educated and had been working for some years in their *alma mater*, the University high-ranking officers were anxious to get it running smoothly.

But the first question that comes to mind is: why did Heck decide to go through such a hassle?

> "It is very simple", answers Heck. "I had no stable position at about 40 in spite of my itinerary, expertise acquired and extensive publishing. I decided to please the French system by obtaining the Habilitation degree that had just been created. I would actually be the first one to get it at Strasbourg University. On the other hand, Belgium had that ProfDSc degree that only few people had secured over time. Getting it would help standing out of the mass of the PhDs awarded at an increasing rate. And I had enough material in various research fields, both theoretical and observational, to satisfy the requirements. So after discussing the issue with a couple of potential mentors, I decided to go for it."

One natural mentor was his first teacher of astronomy in the sixties, Léo Houziaux (Fig. 64) who was back in Liège since 1978 in the Chair of Astrophysics left vacant by Pol Swings, one of Heck's former bosses at IALg.

As to the statistical component, Heck had maintained close collaborative links with Gisèle Mersch, the right arm of Henri Breny, Professor of Probability and Statistics at Liège who also had Heck as a student in the sixties[109]. Breny agreed to be the other mentor in the whole process.

[109]Henri Breny (1923-1991), hiding under the pen name of Bob Sassenagh back in 1967, had also exchanged views with Heck about one of the latter's articles (Publ. 567) in the journal of their common secondary schooling establishment (ARV).

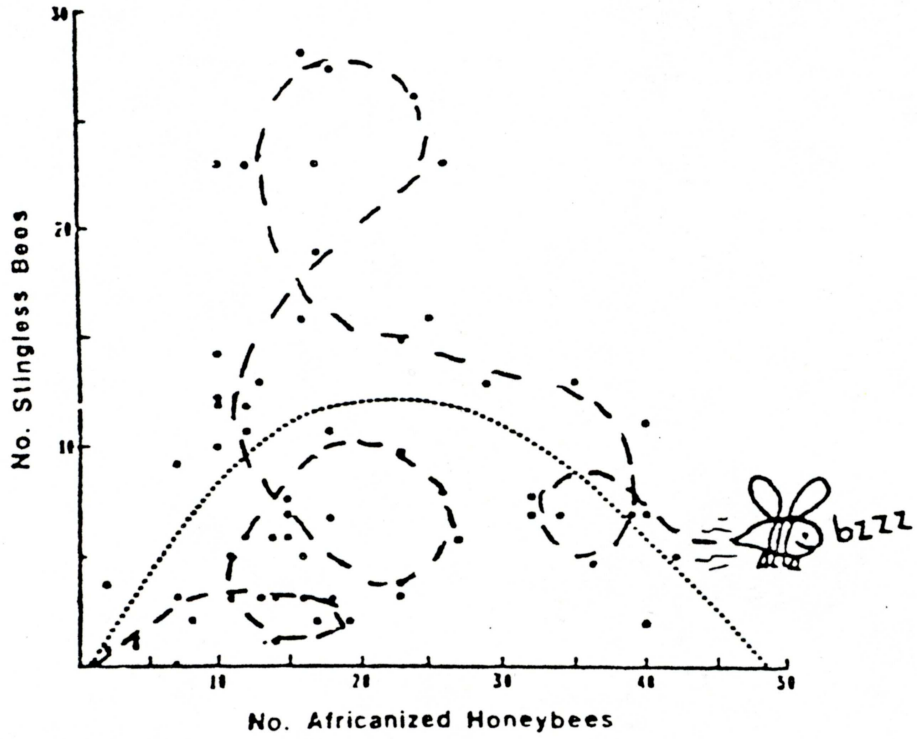


Fig. 108: Heck has always insisted that statistical algorithms, even simple fitting methods, should not be used blindly. The above figure was often illustrating his talks. The observations (two types of bees on some flowers) are represented by dots. The author of the original paper (Roubik 1978) claimed that the dashed parabola was the best fit to represent them. An humoristic comment on this blunder came from Hazen (1978) suggesting an alternative curve fitting ...

The memoir corresponding to the main thesis had first to be deposited in a manuscript form and its acceptability had to be assessed by the Faculty of Sciences. Over about 100 pages, it was divided in three parts and nine chapters, plus a general introduction and conclusions opening onto future research developments. Most of the chapters were reproducing published papers on statistical applications already mentioned in these pages.

The originally written introduction and conclusions are interesting as they give a snapshot of the situation and of the challenges ahead at that time, especially in view of the coming big amounts of data from ground-based and space-borne instruments.

Statistical and physical analyses are complementary, insisted Heck in the conclusions. The former ones can be used as exploratory means, for instance in domains where physics is still in infancy, or to get an "objective" and "independent" approach on some problems, or again to bring out facets that would not be detected by a classical approach. Physical analyses can then refine and interpret the results, taking care of all the details. Statistical algorithms have the advantage of working at will in muldimensional spaces while classical approaches can hardly get out of two, exeptionally three dimensions.

The memoir was rated acceptable by the Faculty of Sciences and cleared for being printed as it appears from an official statement[110] inserted as the first page of the work. As Heck spent the whole month of July observing with the ESO 3.6m, 1.52m and 1m telescopes on La Silla, he could take again the matter in his hands only in August. This had no delaying impact since it was then academic vacation time.

According to Heck's diaries, he was in Liège at the end of the Summer 1985 to deliver his memoir to the printer-binder, then to the University three days later with the bundle of requested copies (26 & 29 August).

On 20 September 1985[111], a printed announcement from Liège University Rectorate[112] officialized the second step in the series of examinations: the public defense of a dissertation entitled "A Few New Contributions to Astronomical Statistics[113]" on 18 October 1985 at 17:00. The titles of the secondary theses were also listed:
– "The study of the behavior of the irregular variable V348 Sgr reveal the groundless nature of the characteristic times of variation formerly proposed[114]";
– "The statistical parallaxes obtained by applying the maximum-likelihood algorithm allow a consistent and independent recalibration of the Hertzsprung-Russell diagram[115]";
– "The quasi-periodical variations of the very slow Nova RR Tel since its outburst in 1944 help defining the rôle played by the Mira component of the system [116]".
As said earlier, the three secondary theses had to be prepared for a possible exposé.

Spectrographic observations of V348 Sgr in the ultraviolet had been recommended by Houziaux (1983) when Heck was still at Vilspa. The object observed characteristics allowed quite a range of possible interpretations: an extremely rich He star; a very hot R CrB object; a giant star deprived of its outside layers; an intermediate stage between R CrB objets and Wolf-Rayet stars at the center of planetary nebulae; or a system made of a B0-B1 central stars with high abundances of C, He, N & O, surrounded by a envelope of moderate size. The diversity of the models reflected the difficulties met to explain all the observations.

Beyond organizing a campaign of joint ground/space observations, Heck's contributions to the understanding of V348 Sgr (Publ. 60, 67, 186 193 & 220, for instance) helped demonstrating that the characteristic times of variation formerly proposed were wrong and that it was even impossible to put any forward.

The difficult celestial field (Fig. 109) – where the object can suddenly become much fainter and even invisible in some instruments – could explain numerous pointing mistakes and incorrect interpretations. See summaries on p. 484.

[110]Statement signed by the Faculty Dean and dated 28 June 1985.
[111]Incidentally Heck's 39th birthday.
[112]Émile-Hippolyte Betz (1919-2012) was then just finishing his term as Rector (1977-1985).
[113]Original title in French: Quelques nouvelles contributions à la statistique astronomique (Fig. 220).
[114]In French: L'étude du comportement de la variable irrégulière V348 Sgr fait apparaître le non-fondé des temps caractéristiques de variation proposés antérieurement.
[115]In French: Les parallaxes statistiques obtenues par application du principe du maximum de vraisemblance permettent une recalibration cohérente et indépendante du diagramme de Hertzsprung-Russell.
[116]In French: La mise en évidence des variations quasi-périodiques de la très lente nova RR tel depuis

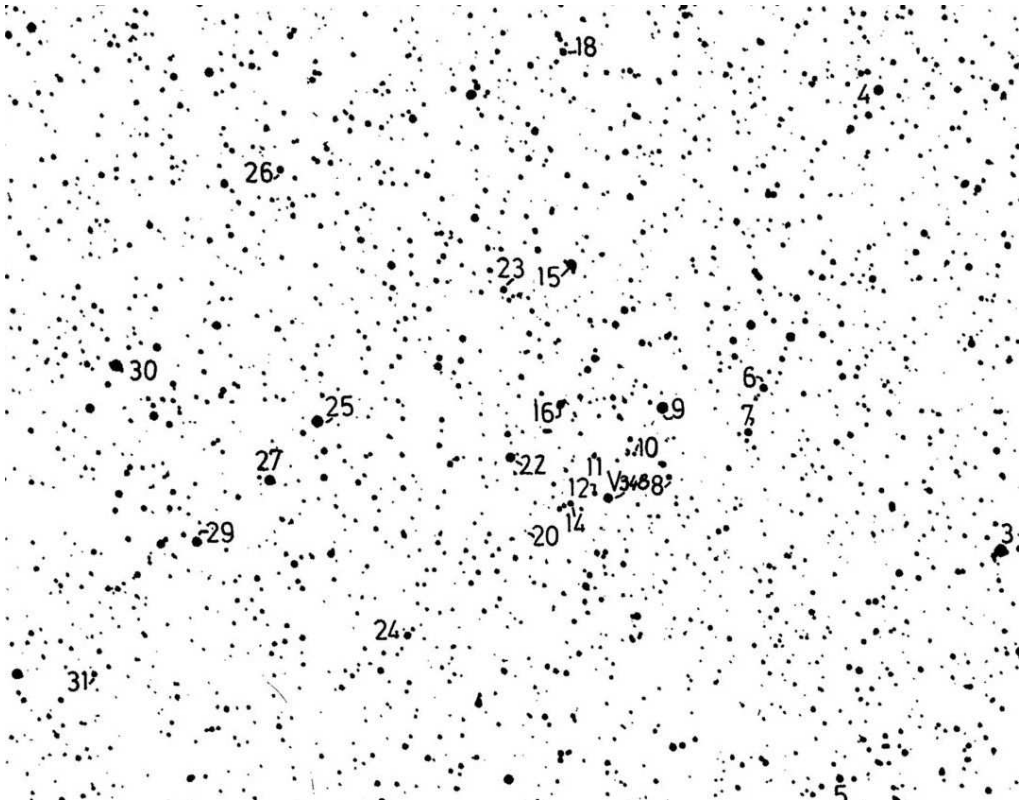


Fig. 109: The crowded field of V348 Sgr can explain numerous pointing mistakes and incorrect interpretations by some observers, especially since the object can suddenly become much fainter and even invisible in some instruments. (Reproduced from Publ. 60)

The second *thèse annexe* was essentially a synthesis of all luminosity calibrations carried out with the algorithm developed by Heck for his PhD, which had been rehearsed as a contribution to IAU Symposium 111 (Publ. 227).

Successive studies of the variable star RR Tel had assigned various labels to this object (Publ. 196), but the most adequate qualification was that of a very slow nova. RR Tel had also been suggested as a target for Vilspa's program of IUE observations, but Heck had broadened the approach by organizing campaigns of simultaneous data collection from ground and space, both photometric and spectrographic (see Publ. 57, 196 & 233, for instance).

Additional contributions of our biographee helped bringing out the variation of the period (between 350 and 410 days) and precising the rôle played by the Mira component of the system and of its mass loss, ultimately proposing RR Tel as the missing link between dwarf novae, classical novae and symbiotic stars. Refer to the summaries on p. 483.

son "outburst" en 1944 précise le rôle joué par la composante Mira du système.

With the oral presentation of his theses allowed, Heck had to formally register as a student and to undergo a medical examination (11 October). The "public defense" of the memoir went well in front of a large attendance, mainly astronomers and physicists, plus a few officials. There were quite a few questions, satisfactorily answered.

The Dean of the Faculty of Sciences, José A. Sporck[117], then announced the title of the selected secondary thesis to be presented rightaway: the behavior of V348 Sgr. This also went well.

After a brief deliberation, the jury came back announcing they were giving the green light for the last step on Monday 04 November 1985. The title assigned to the Academic Lesson was "The Rotation of the Galaxy[118]". This was confirmed by a letter dated 22 October from the Dean.

Heck came back to Liège on 31 October for a rehearsal in the Academic Auditorium with Breny and Houziaux. This was also the opportunity to visit John Kennis' shop for fitting his tails. They would be kept ready for his show a few days later. In fact, Heck would change clothes in the shop and then walk to the university main building where he had to appear in tails at the Rector's office by 16:45.

He was welcome by the new Rector Arthur Bodson in gown, together with quite a few professors from the Faculty of Sciences already there. At 17:00, the group moved to the Academic Auditorium, Bodson and Heck leading it between two mace holders (Fig. 110).

The system was confident: the document that can be distinguished in Heck's hands on the poor-quality illustration is in fact his ProfDSc diploma, a 35cm $\times$ 54cm piece of parchment that had still to be signed by all Faculty members (see Fig. 205).

Jean Delhaye (Fig. 91) had been coopted by the Faculty of sciences as a foreign rapporteur and examiner. Originally from Lille in Northern France, next to the Belgian border, he confessed later enjoying this kind of ceremonial, then unkown in France. "That was an excellent opportunity to wear my gown that I hadn't pulled out for a long time", he added with a large smile.

Before the Academic Lesson itself, the ceremonial required that the credentials of the applicant be read by the Rector to the whole Faculty of Sciences and possible other attendees. And, no, during this presentation, the candidates didn't have to lie flat facing the floor like future Cardinals! In turn, the candidates had to begin their talk by thanking their masters, collaborators, and possibly other persons who played a significant rôle in their professional careers.

Determining the right level for the lesson was a challenge: it had not to be too low for specialists (essentially astronomers and physicists), nor too high as non-specialists in the audience (such as biologists, botanists, etc.) had to remain under the impression they understood what the chap in tails was explaining. The timing was also important: one hour, as sharply respected as possible.

[117]Incidentally, José A. Sporck (1922-1988) was also a former ARV pupil (refer to the obituary by Merenne-Schoumaker 1989).

[118]In French: La rotation de la Galaxie.



Fig. 110: This poor-quality picture is the only archive from the ceremony surrounding the Academic Lesson for securing the "Agrégation de l'Enseignement Supérieur Universitaire" at Liège University on 04 November 1985. The group is reaching the top of the monumental stairs within the main university building. Notice the mace holders on each side. Heck (in tails) is holding the diploma next to University Rector Arthur Bodson (in gown with ermine stole).

The experience of Heck in lecturing here and there was quite useful: he had always enjoyed captivating a large audience; his transparencies were keeping him on track; and, invisible to the viewers, tiny mentions on the separators between the viewgraphs were telling him whether he was ok in terms of timing.

But he still remembers this was a demanding exercise, possibly also because, in parallel with other activities, he had been accumulating strain with all these multiple trips between Strasbourg and Liège and with the successive examinations finally coming to an end.

The subsequent dinner with a few friends in a nearby restaurant was both a debriefing exercise and a most relaxing moment, the common joke being that Heck should be careful when going back to his car dressed in tails as the local police was pretty strict against people walking around disguised ...

The HDR degree

In comparison, the HDR degree in Strasbourg was much more straightforward.

Heck had also to register as a student at Strasbourg I (Louis Pasteur) University[119]. Our biographee was then "studying" in three universities at the same time: Liège for the ProfDSc degree, Strasbourg I for the HDR degree, and Strasbourg III for the course of marketing and advertising.

[119] On 05 December 1984. The student card is still in his archives, mentioning a fee of FFR36, i.e. the equivalent of roughly €5.50.

For some administrative reason, probably linked to the fact that the degree was new and that the details of the procedure had to be defined[120], the date of the examination was set on 28 January 1986 only. The jury was made of three locals and two outsiders (Michel Crézé and Jean Delhaye).

Three documents had to be provided: a memoir (104pp., Fig. 220), a curriculum vitae including a list of publications, and a brief notice summarizing scientific and related activities such as teaching and public outreach. Only a few copies of the memoir were needed. They could be home-made out of photocopies and rudimentary binding.

The memoir could include refereed papers already published and there was naturally some overlap with the memoir for the Belgian ProfDSc degree. But here it was the only document to demonstrate the variety of research themes tackled, while in Liège this load could be borne by the secondary theses. Hence the HDR memoir was more 'colorful'.

After a general introduction, five sections were respectively devoted to the calibration of stellar luminosity criteria, statistical studies of photometric indices, the processing of spectrographic data, the reduction of photometric observations, and other investigations. Each part included an extensive bibliography. The third section contained an original writeup on the development of the VPB analysis of IUE spectra (cf. p. 156).

Like in Liège ten weeks earlier, the introductory part of his talk ended with thanks towards his masters, former bosses and collaborators with special words for his pal Manfroid "with whom we share more than fifteen years of productive collaborations and rewarding experiences[121]".

The talk went glitchless (Fig. 111), with questions that turned out to be essentially a discussion between peers with praising comments. A lot of work for a short show. And here no large-size impressive parchment: an A4 typewritten piece of paper certifying the degree was all what sanctioned the award (Fig. 207).

Helping to Put CDS onto the Worldwide Scene

Heck had always had a lot of sympathy for CDS. Back in 1969 at IALg, he had conceived a project of the same vein (p. 32), turned down by his boss of the time. As the first CDS Director Jung (Fig. 25) had been his PhD supervisor in Paris, Heck had become *de facto* the first CDS scientific user, even before the official foundation of the Center.

Later, he had been in regular contact with the second CDS Director Jaschek (Fig. 60) who had invited him in 1976 and was part of the negociations for his association at Strasbourg Observatory starting in 1983.

Heck had also arranged for a direct link between CDS and Vilspa when he was in charge of the science operations on the IUE satellite (p. 116), a move that granted also CDS with broad visibility on the American side via the IUE NASA users.

[120] Heck was the first person to register for that degree in Strasbourg.

[121] In French: "notre ami Jean Manfroid avec lequel nous partageons plus de quinze ans de fructueuses collaborations et d'enrichissantes expriences".



Fig. 111: Presentation of works on 28 January 1986 for the Habilitation to Direct Researches at Strasbourg I (Louis Pasteur) University, historically the first such degree awarded by that establishment.

Thus, whenever he had the opportunity, Heck gladly pulled a few strings for promoting CDS or giving it a bit of a boost, even if he had not been explicitely hired for working at the Center. As a consequence, he has been a privileged observer of its development. In that capacity, he wrote two detailed, well documented papers on the CDS genesis (Publ. 123) and on its world penetration (Publ. 126). Heck himself was an key actor in the latter process.

Before we go further, it should be reminded how limited at that time was CDS in terms of means and manpower (refer for instance to Table 9 in Publ. 126). The reduced staff had to go through unsecured phases, with unclear future and rumors of removal to some other city or of merging between Besançon and Strasbourg Observatories.

Complications were generated by a central Parisian administration at the level of material support, machines, software packages to be used for handling the database, and so on. Until towards the end of the 1980s, CDS had no proper machine and its activities had to be hosted on remote big computers, with persistent pressure to use French-manufactured inadequate equipment.

An idea of the stress generated at a specific time can be given by the fact that the CDS Director received phone calls from a wife anxious to know how long that unpleasant situation would last in view of the depressing impact on her husband.

CDS did not always receive appropriate support from the French community, being occasionally labeled as an 'astrogrocery' with its utility not well perceived and questioned.

In the 1980s, the space agencies became under increasing pressure and realized that the accumulation of space data had to be cared of in an more efficient way that it had been so far. This triggered initiatives in which it became crucial to position properly CDS for the future, for its own future and even for its survival: the agencies were contemplating – and had the means – to set up competitive services able to wipe CDS off the astronomical map.

On 06-08 March and 19 April 1985, ESA's Space Science Department (SSD) convened at respectively ESRIN and ESTEC a *Spacenet Advisory Panel* under the leadership of Brian Fitton, one of Heck's past bosses.

The group was of a mixture of astro- and geophysicists[122] and had to decide what to do with the data already collected and to be gathered by space experiments – and this, on the background of a return for Italy within ESA's policies (in other words, if a center or service was going to be created, it had to be located at ESRIN).

Due to his past connections, our biographee was part of the panel and he quickly realized that this was a unique opportunity not to be missed to get CDS recognized as a center of excellence to be associated to any structure set up by ESA[123].

This was workable for his communications skills coupled to a gentle bluff while staying within the CDS potentialities if however the material conditions of the Center were improved and Parisian impediments lifted. To achieve this, Heck elaborated the following memorandum directed to the CDS Director (20 April 1985):

> "One of the important conclusions of the last meeting of the *European Space Science Data Center Study Panel* of the European Space Agency is that a software package designed essentially for bibliographic handling (such as the IRS one at ESRIN) is not at all suitable for the management of space or astronomical data. This conclusion from ad hoc studies and tests by competent people at the European level should definitely be seriously considered by those who would like to impose to CDS a software package inadapted to its aims and functions.
> The recommended operating system has been a Unix-derived one.
> Finally, the recognition of CDS' intrinsic importance has been confirmed, SIMBAD being retained in the examples of connections to national centers of excellence.[124]"

[122] It quickly appeared that the problematics for geophysical and astronomical data were quite different.

[123] This would be the ESIS network to which CDS would be officially connected. See *e.g.* Publ. 235 and note that, when returning on 30 April 1986 from the Erice workshop where this paper had been presented (cf. p. 390), Heck flew through the Chernobyl cloud that was then over Northern Italy, Switzerland and Southern Germany.

[124] Original text in French: "Une des importantes conclusions de la dernière réunion du *European Space Science Data Center Study Panel* de l'Agence Spatiale Européenne est qu'un logiciel conçu essentiellement pour une gestion bibliographique (comme celui de l'IRS à l'ESRIN) n'est pas du tout adapté à la gestion d'une base de données du type spatiales ou astronomiques. // Cette conclusion acquise après les études et tests appropriés par des personnes compétentes à l'échelle européenne devrait certainement être prise sérieusement en considération par ceux qui voudraient imposer au CDS un logiciel inapproprié à ses buts et fonctions. // L'operating system recommandé a été l'un de ceux



Fig. 112: ESRIN (above) and ESTEC (Fig. 65) saw two Spacenet meetings, resp. on 07-08 March and 18-19 April 1985, critical for the future of CDS single-handedly represented by our biographee.

The trick worked: Jaschek took the document to Paris, shutting up some of the troublemakers who did not dare going against recommendations from 'European experts', especially as to the software to be used. CDS became free to proceed as it thought fit.

Specific meetings on network problematics were also organized by CDS itself, such as the scientific session at a Council Meeting on 07-08 November 1985 (Fig. 114) and a follow-up one on 29-30 May 1986, both gatherings being co-hosted by the European Science Foundation.

But it became also obvious that more assertive policies had to be followed. An eight-page leaflet (Fig. 113) was designed under the direction of Heck and massively produced in 1985, with an update the following year, to advertize the CDS services at every opportunity. Promotional articles were published here and there (such as Publ. 235, 237 & 244). CDS-marked pencils and T-shirts were also ordered.

Determined actions were required towards North America where networks were more developed. Thus the first historical demonstration of the database SIMBAD in that part of the world took place, with Heck at the keyboard, at the 169$^{\rm th}$ Meeting of the American Astronomical Society held in January 1987 in Pasadena (Fig. 115).

In spite of lines plagued with interferences (this was still the very beginning of the public-network era), the show had a brilliant impact. Heck's personal connections in the space communities worked marvels. Dedicated demonstrations impressed key NASA and NSF managers, something that would result in a exclusive invitation to attend a workshop in Annapolis (17-22 August 1987, Fig. 116).

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dérivés d'Unix. // Enfin, la reconnaissance de l'importance du CDS en soi a été confirmée, SIMBAD étant repris dans les exemples de connexions de centres d'excellence nationaux."

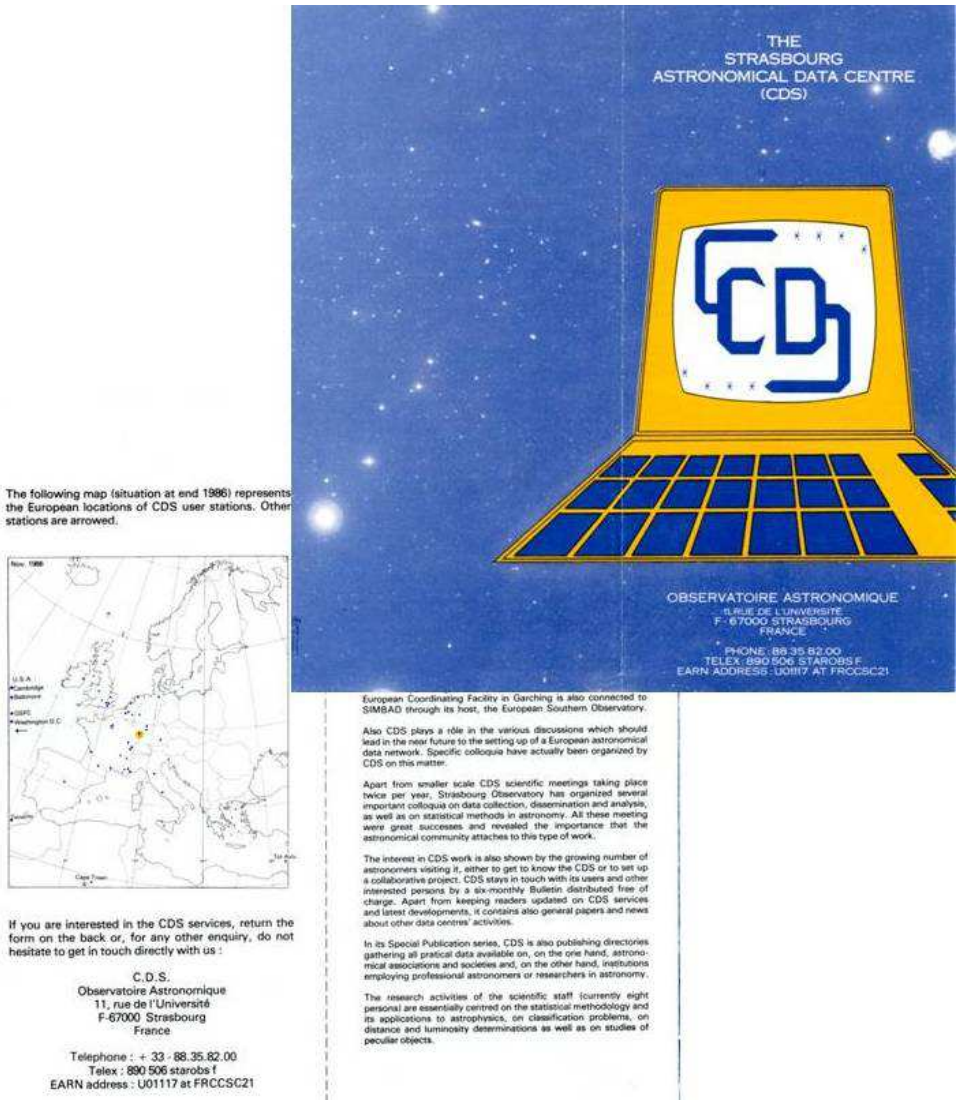


Fig. 113: This eight-page leaflet was designed in 1985 under Heck's direction and massively produced for advertising CDS services. An update was printed in 1986.



Fig. 114: International attendance to the first CDS meeting on data networks in astronomy (Strasbourg, November 1985). In the first row (left to right): J. Andersen (Copenhagen Obs.), P. Bartholdi (Geneva Obs.), Ph. Crane (ESO) and R. Albrecht (ST-ECF). Our biographee/co-organizer is on the second row, arms folded, with the white shirt. See also Publ. 240.



Fig. 115: Demonstrating, for the first time in the US, a fledging CDS remote capability on 06 January 1987 at the 169th Meeting of the American Astronomical Society in Pasadena.

The purpose of that gathering, as stated in the letter dated 10 August 1987 from Gael F. Squibb[125], was to study the needs for accessing space-acquired astrophysics data sets, focussing on the scientific requirements, the data that would be available, and the technology which would be in common usage in the mid-1990's.

The panels had to consider the needs of the scientists with access to significant processing and analysis capabilities, as well as the scientists with very limited resources. Quoting Heck from Publ. 126:

> "What seemed at first to be one of those standard meetings where to present CDS and SIMBAD turned out quickly of unusual importance with the presence of major project leaders[126] as well as that of Charles J. Pellerin, then NASA's Director of Astrophysics.
>
> With a talk scheduled in the late afternoon, it became a real fight with jetlag to re-tailor in real time the presentation of SIMBAD emphasizing the differences with the individual papers on space logs and catalogs filling in the agenda, insisting on the integrated-database character, and clearing any possible suspicion of chauvinism by praising, as a Belgian, that France-based jewel. Believe it or not, the subsequent questions and comments showed that this had made an impact!
>
> The next morning, with typical American efficiency, NASA Headquarters' Anthony J. Villasenor shook hands in an elevator of the Annapolis Hotel and, between the ground and third floors, declared he was going to support a link between CDS and the Astrophysics Data System (ADS) being set up, as well as to likely complete the arrangements by installing a machine at Strasbourg Observatory and even possibly putting at our disposal a couple of yearly grants.
>
> This excellent contact with Tony paved the way to a soft subsequent materialization of the agreement. From then on indeed again, the political decision having been acquired, the story became essentially technical."

A specific resolution on SIMBAD was issued at the end of the Workshop:

> "SIMBAD is recognized as the most comprehensive astronomical database in the world. It is run by the Strasbourg Data Center (CDS) and provides basic data and bibliography on stellar, galactic and extragalactic objects. It has proven to be an enormous asset in planning observations and interpreting data; however, communication costs are inhibiting its useby US-based astronomers.
>
> We recommend that NASA implement a plan to provide no-cost access to SIMBAD for all US-based astronomers by:
> 1. covering communication costs
> 2. paying a lump sum to cover SIMBAD charges.
>
> We recommend also that NASA assist CDS in incorporating into SIMBAD catalogs from all available space experiments (as IUE merged log, Einstein, Exosat,

[125] Acting Manager, NASA Observatories Operations Branch, Astrophysics Division.

[126] Including Al Boggess who had been leading the overall IUE project for years while Heck was with the project on ESA's side.

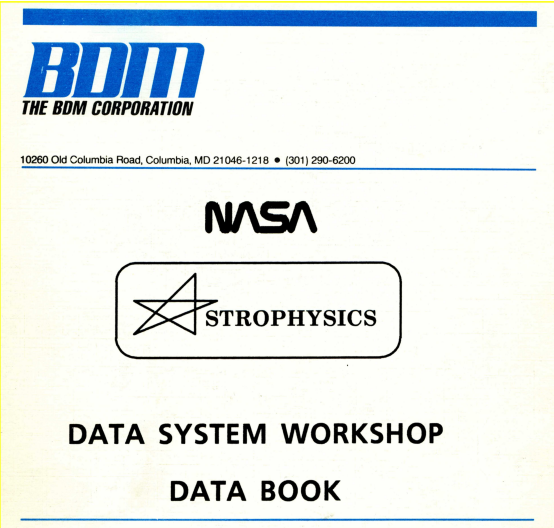


Fig. 116: This NASA meeting in Annapolis MD, with Heck as the only European invited attendee, was seminal not only for the creation of the Astrophysics Data System (ADS, cf. Publ. 363), but also decisive for a large-scale NASA-supported penetration of CDS in North America.

> IRAS point source catalogs, etc.) in order to link the astronomical observations made from space with the corresponding data and bibliography already available in SIMBAD."

All this not only opened the door to intensified access from the US community to SIMBAD, but laid grounds for a strong collaboration with ADS (cf. Publ. 363). The Annapolis meeting saw also the initial discussions of what was to become a fruitful collaboration with the Infrared Processing and Analysis Center (IPAC) in Pasadena for their NASA Extragalactic Database (NED), formalized by an official agreement proposed by NASA on 13 March 1989 and approved by INSU on 28 April 1989.

Heck had produced an eleven-page memorandum dated 31 August 1987, summarizing the Annapolis event and commenting what he viewed as consequences for CDS, including the need to modify officially the name (dropping the 'stellar' restriction), and concluding on the necessity to bridge the gap between the quality of service provided by CDS, acknowledged world-wide, and the modesty of its human and material means – a real program of development the relevance of which would be confirmed by subsequent events.

The following appeared in the subsequent CDS annual report (Jaschek 1988):

> "The year 1987 was characterized by a very rapid growth of the number of users of the CDS, which passed from 80 to 120, and includes now a large number of American Observatories. This rapidly growing number constitutes the best comment of the feelings of the international community toward the CDS. [...] The CDS was presented by A. Heck at the meeting of the American Astronomical Society. This presentation was partially responsible for the large increase in the number of American users."

If the above may seem flattering, it was reduced to mere statistics and ignored – in line with what had already happened with the CDS link at Vilspa – Heck's intense lobbying over the previous years.

Such a work was heavily based on personal connections and commitment, with reciprocal trust and partial bluff, each side relying on the other to pave ways together in unchartered and pioneering directions. All contacts (as well actually as all representatives of the Western space agencies at the CDS Council) were Heck's past direct colleagues or acquaintances from his time at IUE.

The momentum was definitely towards setting up data services for the benefit of the astronomical community worldwide. It is obvious that they would have been set up anyway, but, if our biographee had not been there at those critical moments and with the appropriate steps when the space agencies were moving, such services might have left CDS out. This has never been fully acknowledged as Heck kindly mentioned it in a letter (signed "friendly yours") to Jaschek on 28 March 1988:

> "I am somehow disappointed not to see [in your report] a clearer indication of my rôle in the international spreading of Simbad over the past year, nor to find in it the credit I believe to deserve for the time (extensive, unrewarding and little visible) devoted to the corresponding lobbying.
> The change of gradient after 1983 on the attached curve (prepared by [a collaborator] [Fig. 117]) shows unequivocally a correlation between my arrival [1983] and my subsequent contributions.[127]"

Jaschek might have had the excuse of being of a certain age and perhaps of not comprehending fully the various facets of modern lobbying through large-scale entities like space agencies.

But for other CDS members, it was perhaps all too easy, when things had been put well on track, to forget how harsh, precarious and depressing were the initial conditions, and, when arrived the time for collecting some glory, to forget those who had worked behind the scenes with low-profile dedication to enable this.

As to subsequent managers, those who showed the unfortunate tendency to believe they knew everything were in fact ignoring history, or behaving as if history was beginning with themselves.

But they should always be reminded that (quoting Heck in Publ. 126) seemingly modest decisions by courageous and clear-sighted people caring for structures in their initial phase lead often to far-reaching fruitful consequences, without which subsequent development would not be possible and those later managers disregarding history would not even enjoy their positions.

[127] Original text in French: "Je suis un peu déçu de ne pas voir transparaître plus clairement [dans votre rapport] le rôle que j'ai joué pour la diffusion internationale de SIMBAD au cours de l'année écoulée, ni d'y trouver le crédit que j'estime mériter pour le temps (long, ingrat et peu visible) consacré au lobbying correspondant. // Le changement de gradient après 1983 de la courbe ci-jointe (préparée par [un collaborateur] [Fig. 117]) montre sans équivoque une corrélation avec mon arrivée [1983] et mes contributions subséquentes,."

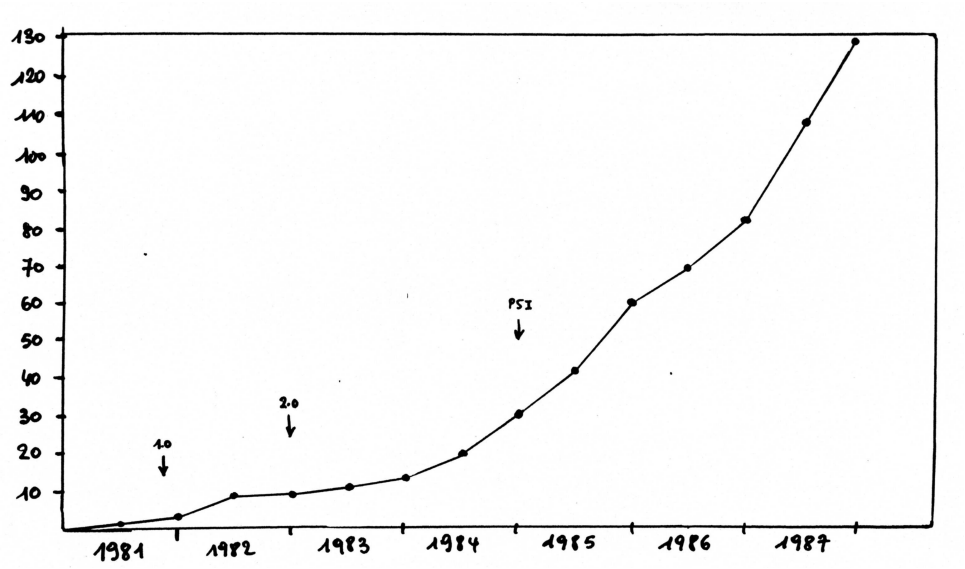


Fig. 117: Evolution of the CDS SIMBAD usership over time. Heck's arrival in 1983 marks the beginning of a dramatically steeper gradient.

CDS was very close to disappearing in the 1980s, hadn't the right initiatives been taken at the right moment by our biographee.

But those who have lived through those uncertain times might naturally prefer to forget them. Others were all too happy to step forward and slip into the notoriety of the slot Heck had to vacate for the health problems and disability that will be discussed in the next chapter.

Other Scientific and Parallel Activities

Heck pursued observing with ground-based and space-borne instruments. He was back at Vilspa from 19 June to 5 July 1983 for carrying out his own observing (λ Boo and standard stars), but also exceptionally in real-time shifts for others in his former capacity of R/A as the IUE Observatory had a shortage of manpower.

In August and December that year, he was again at Vilspa for more observing and for working on the local computers, shaping properly the spectra intended for the low-dispersion atlas (see p. 152). This also resulted in two papers from the data collected on λ Boo stars (Publ. 53) and on Field Horizontal-Branch stars (Publ. 61).

Several photometric runs were attempted at the OHP 1m telescope located on Chiran, but instrumental failures, weather conditions and smoke from bushfires lighted by shepherds in the hills around never allowed some useful observing.

On the opposite, intensely productive were runs on La Silla (July/August 1983, July 1985 and November/December 1986) at various instruments for observing V348 Sgr (cf. p. 160), RR Tel (cf. p. 160) and a range of other stars.

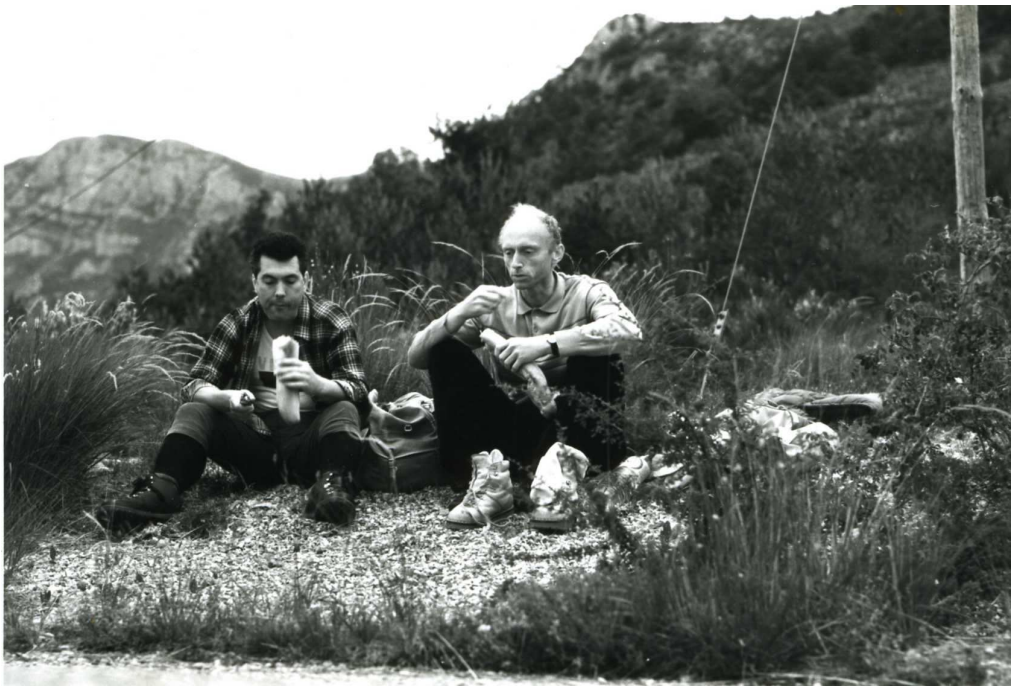


Fig. 118: Having a brunch break with Jean Manfroid on the way down from the OHP Chiran station to the Verdon gorges (1400m elevation difference) on 19 June 1985. They went back up the same day: a 10 hrs 1/2 hike between two night shifts in an unproductive run ruined by instrumental problems, bad weather and smoke from bushfires started by shepherds in the nearby hills.

The significant amount of time Heck had to devote to the preparation of his ProfDSc and HDR degrees[128] naturally induced a diminution of his production of papers in refereed journals in 1986.

Nevertheless, in addition to the publications already mentioned for this period, a number of photometric papers, most of them co-authored with Manfroid and occasionally with others, can be mentioned from those first years in Strasbourg: on the methodology itself (Publ. 50, 54 & 56), as well as on the Ap star HR3831 (Publ. 52), on the α^2 CVn star HD25267 (Publ. 58), on the W UMa system ϵ CrA (Publ. 64) and on various CP stars (Publ. 66).

Secondary papers are also dealing with photometric observations on various objects and on the reduction methodology (Publ. 207, 208, 214, 224 & 229), but mostly reveal all the scientific meetings attended in a busy agenda (cf. p. 383).

[128]Largely achieved at home on one of the first IBM XTs in the area, equipped with no more than a 64 kB RAM, later expanded to 256 kB, something that sounds ludicrous by today's standards, but that was a real luxury then, with a monochrome display and a needle printer with continuous paper feed. This was to become the first of a long series of personal computers of various brands (IBM, Toshiba, Tandon, ...), completed by laptops and notebooks (IBM, Toshiba, Psion, HP, Dell, Sony, ...) paid by our biographee out of his own pennies, all this evolving along the years towards a fully networked installation at home including multiple A3 scanners and professional color printers.



Fig. 119: With clouds around, time for a walk on the slopes near La Silla Observatory on 17 July 1985. The "hills" in the background are Andes mountains.

Heck also organized and inspired local meetings without being always credited. In late 1983, when lying in a clinic bed after getting something fixed in his body, Heck was approached by a collaborator seeking an idea for an upcoming *Journée de Strasbourg*.

The theme suggested was taken up, but the meeting was organized with someone else and Heck's name was not even mentioned in the acknowledgements. Not a very elegant attitude from someone holding a tenure towards a recently arrived colleague still looking for one!

Struck by the lack of communication within the observatory, Heck launched in September 1985 a series of seminars that are lasting to this day. A handwritten note dated 08 September 1985 sought approval from the Observatory Director: "I'd like to get your blessing for launching informal seminars that I would organize on Monday morning in the meeting room to increase the exchanges within the house. All themes linked to astronomy would be welcome.[129]". This was answered by a brief: "OK. And I do not wish you too much disappointment [sic].[130]"

Called the "Astronomical Aperitifs of Monday Mornings", the talks were only occasionally followed by a drink. But since it was not known in advance whether there would be something after the seminar, some people would show up to the talk, just in case.

[129]Original text in French: "J'aimerais avoir ta bénédiction pour le lancement de séminaires informels que j'organiserais le lundi matin dans la salle de réunions afin d'augmenter les échanges à l'intérieur de la maison. Tous les sujets liés à l'astronomie seraient les bienvenus."

[130]In French: " OK. Et je ne te souhaite pas trop de déceptions [sic]."

And, contrary to many places where the seminars were the last event of the week, quickly forgotten during the weekends, the *Apéritifs Astronomiques* were organized before lunch on Mondays in order to (hopefully) trigger discussions during the week on the theme presented[131]. One can gather there Heck's practice of communication techniques.

Observatory visitors were of course solicited for one or several talks. Specific invitations were issued to outsiders as soon as a budget line could be assigned to the seminars. Heck himself inaugurated the series with a talk on "Space law" on 30 September 1985 and lectured subsequently on a range of issues.

See p. 383 for a list including seminars given by Heck not only locally, but also nationally and internationally as he became a planetary traveller from North and South America to China via Hawai, New Zealand, Australia, South Africa and India (Fig. 120), addressing local astronomers here and there[132].

Heck pursued an intense activity of popularization ('public outreach' as per today's buzzword), be it through his column *Potins d'Uranie* (pp. 461ff) and many other papers for amateurs and grand public in various magazines (pp. 453ff). He was also routinely solicited for bibliographical reviews (pp. 445ff).

With the complicity of Jean Manfroid, Editor of the society magazine *Le Ciel* since November 1981, a compilation of the fifty first *Potins d'Uranie* was published by the SAL (Publ. 925, Fig. 57).

Heck was invited for giving lectures here and there, by schools, associations, Lions Clubs, Rotary Clubs, and so on. The *Université du Troisième Âge et du Temps Libre (u3a – UTL)*[133] requested also various interventions, not only in Strasbourg, but also at several branches in other Alsatian cities.

A memorable evening lecture was organized on 08 October 1985 by the Mayor of the village where our biographee had bought his house. As the advertizing campaign had been run in all surrounding villages, the large room of the *Foyer Culturel*[134] was so packed that many people had to stand or sit on the floor. The talk entitled *Voyage dans l'univers*[135] tackled also the upcoming return of Halley Comet.

In the wake of the success of that lecture, an astronomy club was set up in the village, with Heck attending the gatherings whenever he could, which was not always easy with his numerous trips abroad and other commitments.

The group had a promising start with talks (most by Heck), outings, a library, and a newsletter (again most articles by Heck), but died quietly after a couple of years for lack of an active leadership arising from the members themselves and the unability of our biographee to continue carrying most of the load on his shoulders for the health problems mentioned in the next chapter.

With Manfroid, Heck continued to produce directories on astronomy-related organizations.

[131] Heck's successors would drop the name of the seminars and moved them to Friday morning.
[132] Such as his seminar on 28 October 1983 at the SAAO (Cape Town), just to mention one example.
[133] Third-Age and Leisure University.
[134] Cultural center.
[135] Journey through the Universe.

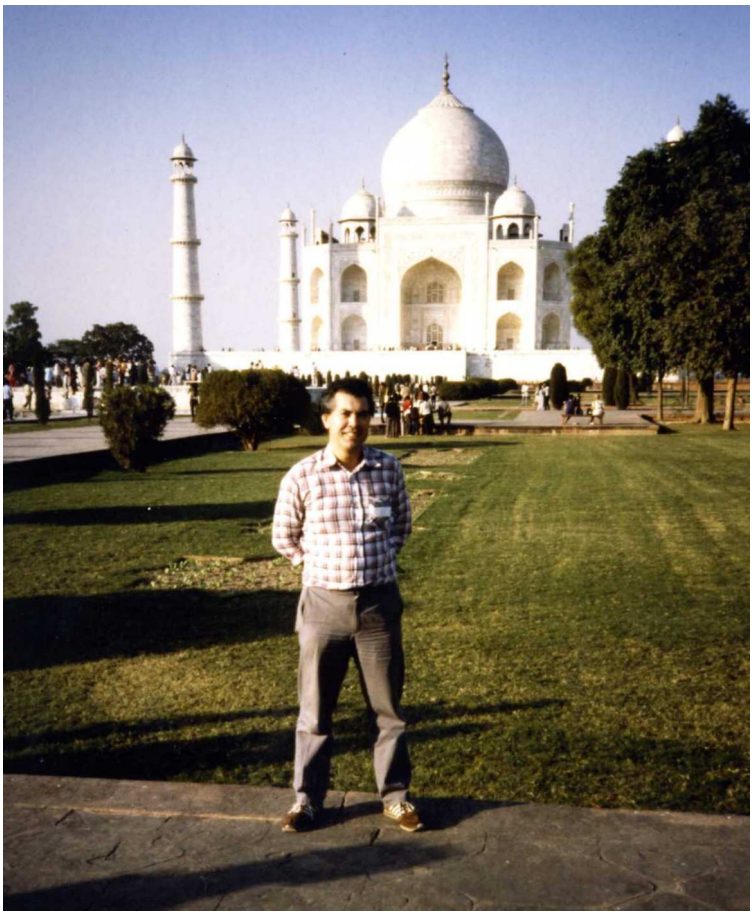


Fig. 120: Paying a visit to the Taj Mahal on 24 November 1985 while attending the XIXth General Assembly of the International Astronomical Union in New Delhi (cf. Publ. 239 to 241).

The 1984 edition of the *International Directory of Amateur Astronomical Societies* (IDAAS 1984, Publ. 432) was still a private production involving massive worldwide mailings in six languages.

But, in view of potential fiscal complications, Heck negociated with CDS the production of the subsequent directories, starting with IDAAS 1986 as *CDS Special Publication n° 8* (Publ. 433). This compendium carried however a slightly different title: *International Directory of Astronomical Associations and Societies*. More and more professional societies were included and the word *amateur* was no more appropriate in the title that retained however the same abbreviation.

As explained in Publ. 73, an increasing number of professional institutions were showing an interest in the successive IDAAS editions. A list of such institutions was then compiled for advertizing IDAAS and, since that list was existing, it was made available separately: the *International Directory of Professional Astronomical Institutions* materialized as IDPAI 1987 (Publ. 434).



Fig. 121: With US Naval Observatory Director Gart Westerhout (1927-2012, left) on 06 January 1987 at the 169th Meeting of the American Astronomical Society in Pasadena.

By living during the first year and half at the edge of a city (rather than in a mountain site like in Spain), it was easier for Heck to have an intense social life and to attend cultural events such as concerts.

Alas! He soon discovered that these were attended by a non-negligible amount of people more interested in being seen than in appreciating the performances. It must have been a ludicrous, if not offending, display for the invited artists when, barely the last notes played, probably the same people were rushing out of the auditorium towards their cars. "Otherwise, you know, we could have to wait to get out of the parking lot," Heck heard a couple of times.

When asked by the organizing company why he was not renewing his season ticket, Heck explained with typical Belgian humor that he was not so keen in concertos of throats being cleared or sonatas of coughes barely toned down[136].

By sitting in the first row, he could observe how artists were bothered by such behaviors, like Yehudi Menuhin, bow raised and his back to the audience, asking for calm before launching the orchestra, or Director Myung-whun Chung making signs of patience with a gentle smile to the Stuttgarter Philharmoniker with his two sisters, violinist Kyung-wha Chung and cellist Myung-wha Chung, performing as soloists.

[136]This sounds much nicer in French: *concertos pour gorges râclées et toux à peine atténuées*.

As expected, the area was a hiking paradise. Alone or with others, and when in Alsace, Heck would spend most of his weekends walking in the deep forests covering the low-mountain ridges on each side of the Rhine, the Black Forest to the East and the Vosges to the West of the river. He could find there an environment similar to the High-Plateaux of his youth. The Alps were at a mere stone's throw. There he could practice some climbing taking advantage of the *vie ferrate*. With a group linked to the university, they walked, segment after segment, all along the crests of the Vosges from the German border on the North to the Swiss one on the South.

The closest hills of the Vosges were at only a 20 minutes drive from Heck's home, and it was a most relaxing episode for him to go there during weekdays, when the area had been deserted, to breathe some fresh air, to exercise on steep pathes, and to come back with pages of small notebooks filled with ideas for future papers or books, or with strategies against difficulties of all kinds.

And there could be occasionally serious ones.



Fig. 122: The logo conceived by University graphists for Strasbourg Observatory during Heck directorship.



Fig. 123: The Big Dome of Strasbourg Observatory in Winter.

Anni Horribiles

In late November 1987, Heck, who had never seen a doctor over the past decades except for the mandatory check-ups required by ESA, saw some 25 physicians within a couple of days. He was diagnosed with a dissection at a location so bad that the surgeons preferred not treating it: "We would risk damaging the brains and killing your right ear", said the leader of the team, Bernard Eisenmann.

With Heck lying naked on a table, he was taking a break chatting about the Challenger disaster and the Space Telescope still to be launched[137] while his assistants were perusing the patient's X-rays, scans and other results of analyses performed earlier. These had revealed the cerebrovascular ailment (CVA).

The cardiologist went on saying that the most sensible approach was certainly to wait and to see what Heck's own nature would do.

In the state of knowledge of the time, it was hazardous to predict anything. As it was then assessed, life expectation with dissections could sometimes be as short as no more than a few hours, in which case they could anyway do little about it. After some negociation, Heck was released, walked to his car in the hospital parking lot and simply drove it back home. He thought that the best approach was to take this CVA as an accident of life.

The next day, he had been booked through an emergency procedure for an MRI investigation through the first and only machine in the area. Physicians were still learning then how CCDs could help them. Heck gave some explanations on the technology while examining with them the first in-depth image of his head (Fig. 124).

Violent and persistent headaches, not the usual ones but cephalgiae from inside the head, together with a contraction of the right pupil and a drop of his right eyelid, had led him to consult a physician he had befriended at a Lions Club where he had lectured.

He was sent to a young ophtalmologist who preferred referring – an attitude to be commended! – to her boss, José Sahel, Director of the eye clinic at the city hospital and nowadays a pioneer in the field of artificial retina and eye regenerative therapies[138]. Heck's symptoms could have been indications of several ailments, but Sahel had the correct intuition. He had seen a number of patients with dissection at a Boston hospital where he was also practicing.

[137] The Space Shuttle *Challenger* exploded 73 seconds after liftoff on 28 January 1986; the Space Telescope was put into space by the Space Shuttle *Discovery* on 24 April 1990.

[138] Currently heading the Vision Institute (*Institut de la Vision*) in Paris.

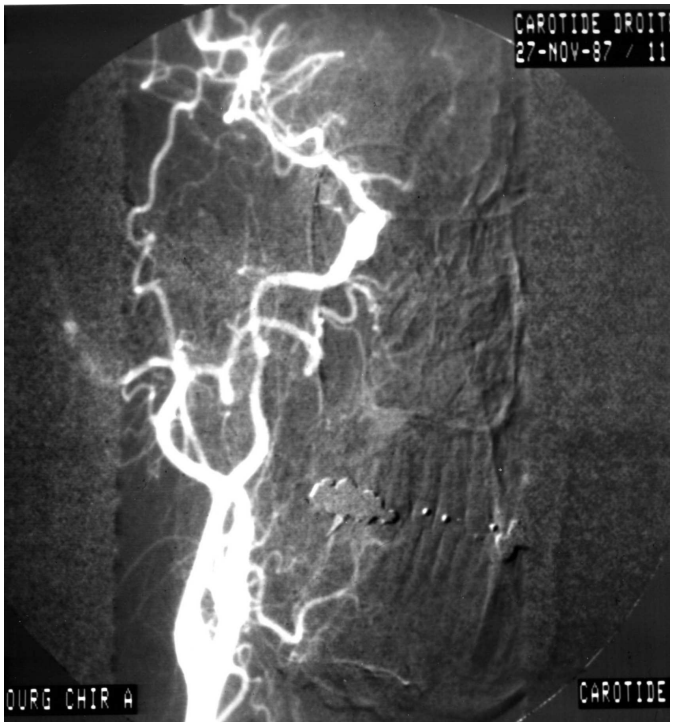


Fig. 124: MRI image of the CVA that hit Heck in November 1987.

He suggested Heck could be attended there if he had the opportunity to be on the East Coast in a near future, otherwise it was preferable to undergo a thorough examination locally. Years later, a student of Sahel would write a two-volume thesis involving Heck's case (Baer 1993a&b, Fig. 125) – a significant publication to which our biographee had contributed in substance without co-authoring it!

That "accident of life" turned out however to be much more critical than thought initially. Aside from a kind of Damocles' sword literally hanging over Heck's head, his eyesight was affected, as well as his balance, requiring the usage of a walking stick, an embarrassment for that intensive hiker. Climbing cliffs while mountaineering was discouraged. Some reeducation of his stereoscopic vision was necessary. His hands needed to be finely trained again, especially for writing and typing properly.

Other impacts were at the level of his memory[139] and of the nervous system that had been particularly shaken due to the particular location of the dissection squeezing major nerves. Heck's sensitivity had been dramatically sharpened, especially to noise. He could have been hired as 'Golden Ears' in submarines.

But, more critically, a recurrence had to be prevented as it could be lethal. Blood pressure had to be lowered. Stress and conflictual situations had absolutely to be avoided. Any social interaction had to be approached carefully, a serious hindrance for a person appreciated as a character prompt to socialize and to foster human relationships.

[139] He used to say he had lost a number of "memory modules".

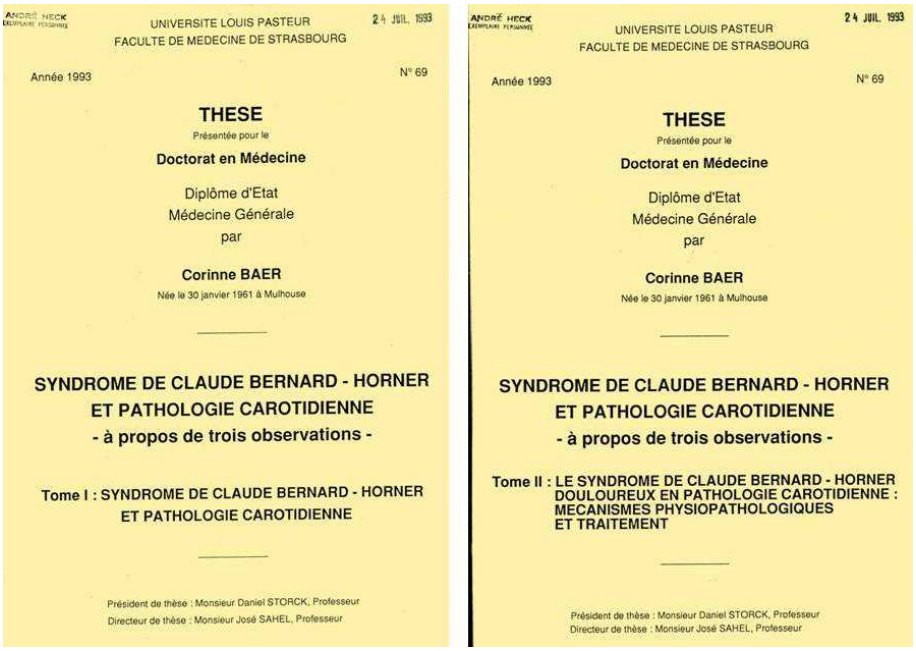


Fig. 125: The two volumes of Corinne Baer's PhD thesis in medicine including data and description of Heck's CVA.

Contrary to what is done today with the advice to maintain some physical activity, people in Heck's condition were at the time put in a kind of mothball environment. No physical effort. No gardening. Even staying outdoor exposed to the Sun was not advisable. Imagine how this could have been depressing and counterproductive psychologically for a previously very active person.

Instead of 'living on his handicap', Heck explored the best way to remain as productive as possible. As we shall see hereafter, he was ultimately recognized officially as a 50% handicapped person with a permanent partial disability. In that perspective, he received full support from the University medical service and was authorized to work at home. The University paid for the (then expensive) installation of a computer link to his home and for its usage via the *Numeris* network.

Through his atavistic pride, Heck decided that his interactions with others, especially at the Observatory, would take place only when he would be in good shape. In no way would he appear for instance when half-blinded, unable to walk properly, in a noisy or problematic environment with a potential negative impact on his capabilities or behavior.

Since he was then appearing unaffected, the usual mean characters of the Observatory thought, when meeting him, that he had nothing and that he was only pretending. They did not spare dissing and sarcastic comments, deeply hurting someone doing his best to function as normally as possible in his diminished condition.

His handicap was also largely ignored by a society who had identified only motor disabilities. Having no hindrance perceptible by outsiders was both an advantage (being treated normally) and a disadvantage (people unaware of the disability).

> "It would have made things more straightforward for the outside world if the CVA had had a perceptible impact, such as a paralysis of some kind", says Heck. "When it became available, Baer's voluminous thesis was a welcome assistance to get people realizing this was no imaginary ailment. Things have significantly improved in a quarter century, with dissections and CVAs much better understood, people followed and adequately advised. But in those times you were left alone, and sometimes on inadequate medication as I had to experience it myself. You had to sort out by yourself your new limitations that at first you did not fully comprehend, and in an environment that was not especially empathetic, sometimes even suspicious or squarely hostile. Some people seemed to enjoy taking advantage of my weakened condition for complicating my life rather than helping me to negociate that difficult passage. The worst definitely came from people who knew I had to avoid conflictual situations – as mentioned on several medical certificates – and who tried to make the most from the fact that I could react only in a very limited way to unfair treatments or wrongdoings. Initially, it took me a long time to sort out what I was still able to do and to cope with, in parallel with a patient and laborious reconstruction of whatever was possible. Had I realized from the start what were exactly my limitations, I would have never applied for the directorship of Strasbourg Observatory, especially in the context of the time when a number of conflicts had to be straightened and bad habits corrected."

The Directorship of Strasbourg Observatory

It is important at this stage to recall the chronology of events.

Heck's nomination as *Astronome* in France took place on 28 August 1987 (cf. p. 146), right when he was busy lobbying for CDS in Annapolis (cf. p. 167).

The decree that had created the new status of astronomers in France, and its regulating body CNAP, also required the observatories be reorganized with a new-style Council in charge of electing the Director.

The polls for constituting the new Council took place on 16 December 1987 at Strasbourg Observatory. Heck was then elected as representative of College A (senior scientists), only days after his CVA had been diagnosed.

At its first meeting on 18 February 1988, three days after Heck underwent another MRI session, the Council fixed the timeline for the selection of the new Observatory Director: the applications had to be submitted by 11 April with another Council meeting on 02 May to audition the applicants.

Still unaware of the extent of his disability and being what turned out later ill-advised by a number of sirens, Heck filed an application just before heading to Goutelas for lecturing at an SFSA school (Fig. 126).

He was easily elected as the next Director at the first round by 10 votes against 3 for a candidate supported by the internal lobby mentioned earlier (p. 139). This showed the relatively small importance of that opposition, albeit quite obnoxious at times.



Fig. 126: Heck lectured on multivariate data analysis in astronomy in November 1987 at the CNRS Luminy school near Marseilles (above) and in April 1988 at the SFSA school held in the Goutelas castle.

Our biographee had put together an interesting six-page document outlining the principles for his directorship of the Observatory[140]: resolute support to CDS; development of scientific and technical educational programs enabling the future recruitment of qualified personnel; fostering advanced astrophysical research making best use of the local facilities together with the integration of new teams lured to the house. The status of the planetarium associated to the Observatory was also discussed and his management policy described.

In view of the recurrent conflicts he had witnessed between the various Observatory components (CDS, *Stellar Populations* team, planetarium), as well as between these and the previous Director, Heck decided to take a neutral position, not belonging officially to any of the components.

He put in place a delegation policy starting with the association of a Deputy Director. He also structured proper directorial services with a head of logistics and a secretariat worth its name in the Big Dome (cf. p. 140).

Heck interviewed all personnel members after requesting from each of them a curriculum vitae including a personal appreciation of their duties and of the possible evolution of their career, something that might have been a *première* in a French observatory.

[140]Title in French: Principes de Direction de l'Observatoire de Strasbourg.

At that time, the observatories were still pretty independent, able to talk straight to the Ministry without having necessarily to pass through the university administration. This was particularly handy as far as budget handling was concerned, especially for planning the renovation of offices that was urgently needed, as well for as equipping – finally – the Observatory with its own computers.

Heck also launched, in collaboration with Pierre Couturier managing the astronomy branch at INSU, longer-term 'concrete plans' on the expansion of buildings, either by adapting the existing ones or by constructing new ones in the gardens. Such projects, always long to mature, would materialize during the term of his successor as Director.

Absorption attempts from other institutions, such as from the local institute for earth physics, had to be resisted. Such empire-building merging policies, already fashionable at the time, were simply ignored by burying the requests coming from the university management in the lowest desk drawer.

The prestige and authority of the previous management had gone so low that (just to give one example) improper approaches from a specific scientist had to be corrected with statements such as *"The Direction is not under your command, but will consider with attention and kindliness the motivated requests you would consider appropriate to submit*[141]*."* Further action was also needed with respect to the same person who – to put it gently – did nothing to discourage being considered by outsiders as the head of the Observatory, a problem the previous Director had already to face.

A few individual situations, so far tolerated, had to be straightened. People without any status were spending their days in the buildings. A number of associations were using the lecture room, some of them without a clear status and occasionally leaving a mess behind them. This was not acceptable not only on security grounds, but also because no insurance was covering such activities nor the persons involved.

Heck got a first insight into what might have become the mentality of the younger generation when he had a no-status 30y PhD-holder crying in his office and claiming that since he had been educated in this Observatory, it was up to Heck to find a job for him. It would never have occurred to our Belgium-educated, ESA-seasoned biographee that a supposedly grown-up aspiring scientist could formulate such a statement, more proper to a child unable to take his own future in his hands.

That gentleman had provided a personal file with some thirty mistakes on the first two pages, stating also a PhD thesis of doubtful value. If that fellow had slipped so far through the system, his future was definitely not at the Observatory. Several other cases of the same vein had to be rectified.

Hiring personnel of quality was another issue. It was necessary to initiate a lengthy lobbying for being granted attractive positions either directly by the supervising authorities or by setting up new projects. In parallel, the notoriety of the place had to be improved in order to attract good people on such positions. Such a stirring-up process would bear fruit only during the terms of Heck's successors as Directors.

[141] In French: "La Direction n'est pas à vos ordres, mais considérera avec attention et bienveillance les requêtes circonstanciées que vous jugerez opportun de lui présenter." [letter dated 11 October 1988]



Fig. 127: Heck lectured on artificial-intelligence applications to space projects at the 1989 Summer Session of the International Space University (ISU) held at Strasbourg University (Publ. 257).

As far as third-cycle education was concerned, there were in-house good-will people, but the structures had to be put in place and the programs defined, all this on the background of the new status for astronomers requiring from them some teaching, not necessarily individually, but globally at the level of the Observatory. In addition, a new national policy was aiming at creating graduate DEA[142] degrees everywhere, which meant, for the only field of astronomy, producing yearly more astronomers than the society needed or simply could absorb.

As a consequence, if the graduate students from Strasbourg Observatory had to find a job more easily than others, they had to be able to boast some practical aspects in their curriculum, of potential interest to private companies for instance – hence the need to include in the learning program facets related to databases, methodologies, statistics, information handling, etc. This is what ultimately happened after the necessary running-in time, but Heck's archives reveal a number of iterations needed to convince in that respect the local astrophysicists.

It is actually amusing to note, from the minutes of the Observatory Council meeting held on 14 March 1989, that one of the professors of astronomy "opposed the contribution from astronomers to the teaching activities, fearing that forced and overloaded teachers would lower the overall quality.[143]" Or was it by fear of loosing a monopoly?

[142] Diplôme d'Études Approfondies.

[143] In French: "ne souhaite pas voir les astronomes contribuer à l'enseignement, craignant que des enseignants forcés et surchargés n'en fassent baisser la qualité".

Weird Visitors, Death Threats and Other Events

If the human landscape at Strasbourg Observatory was sensibly different from what Heck had known at IALg and Vilspa, this was also the case for visitors.

IALg guests included many Nobel Laureates and prestigious names. Observers coming daily to Vilspa were people at the then leading edge of space astronomy. At Strasbourg Observatory, most of the outsiders were visiting CDS, often in the framework of international agreements specific to CDS activities, sometimes through bilateral arrangements between countries, including some so-called socialist ones.

As the Cold War was not yet over, people from East European countries were allowed to get out only if they had serious political connections or guarantees of their return, such as close family members staying at home. Scientists from the old USSR might have been themselves outright KGB affiliates. This meant that the scientific level of those travellers across the Iron Curtain was not necessarily the primary criterion retained and that the contribution of those visitors to the Observatory scientific life was sometimes arguable. But Heck does not remember a specific incident with them.

On the contrary, during a visit at ST-ECF in Garching on 04 October 1988, Heck received panicking calls from the CDS Director: a young lady from North America, who had been earlier a CDS visitor, had unexpectedly returned to the Observatory. She had locked up herself in a toilet, saying she would open the door only after talking to military authorities. It was true that, during her earlier stay, she had already startled a few people by explaining how fast she could dismantle and reassemble a military automatic rifle.

Heck could do little by being at a remote location a few hours away, but he advised that everybody should remain calm and recommended that the onlookers queuing at the small side window of the toilet be kept at a distance. No violent action such as breaking into the toilet should be taken if the lady was not attempting to her life. The best thing to do was to call a doctor and someone from the nearby police station who could possibly fake being a 'military authority'.

The plan worked. The young lady opened the door, was given some sedative by an EMS crew and taken away to a nursing home until someone from the family came to fetch her and bring her back to the other side of the world.

One later evening at home, Heck had already fallen asleep when he was waken up by a phone call. A male voice started issuing death threats in Spanish with an accent from a specific South American country. 'Arabs' had been hired to do away with him.

The next day, Heck heard that other people from Strasbourg Observatory had been threatened and that a mess had been made in the buildings, such as shredding mail and other misdeeds. Since this was taking an institutional dimension, it was reported to the University Secretary General Soulas who in turn requested the police to intervene.

The perpetrators were easily identified: a female scientist from South America who had been associated with CDS over the previous year and a friend of hers who had recently showed up in France. They were somewhere in Paris, but the problem was to locate them exactly: at that time indeed, the calling phone numbers could not be displayed at the receiving end yet.



Fig. 128: While lecturing at the meeting above in Montpellier in September 1989, Heck had to deal with perpetrators of death threats against himself and other staff of Strasbourg Observatory.

The story lingered for a couple of months with repeated threats until, when attending a meeting in Montpellier (Fig. 128), Heck was notified to urgently call back the male perpetrator, failing what nasty things would allegedly happen to some people from the Observatory. To make this possible, the South American gentleman had to provide a phone number, what he did, and this was a mistake on his part.

Heck requested the number be immediately forwarded to the police, in fact the national security services. It would enable them to locate the perpetrator's position.

Meanwhile, Heck called the guy from a pay phone in the convention center, not only keeping him talking as long as possible, but also, among other things, pointing out (in Spanish, of course) that, if anything happened to anyone from the Observatory, his interlocutor would be the first person identified as a possible culprit, even if he had nothing to do with it. And he better changed his mind if he thought, as he was boasting, that by being a foreigner he was immune to the French police.

Shortly afterwards, an intermediary relaying another intermediary called the Observatory with the message that the perpetrators had been joking and that they wanted to put an end to the story, to which it was replied that this was coming much too late and that anyway the matter was now in the hands of the police.

The French security services arrived at the identified location only minutes after the couple had left for the airport, rushing back home in South America, probably also under pressure from the compatriots whose flat they had been using.

The perpetrators' motivations remained unclear. The most plausible one was some disappointment on the part of the female scientist, perhaps hoping for an extension of her stay or for a permanent position at CDS. She also seemed to have been disturbed by the unexpected arrival in France of the friend. In any case, she had managed to make him jealous or to excite him against the staff of Strasbourg Observatory.

Those idiots were registered as troublemakers in the French security files. Had they been caught in today's context, they might have ended up spending some time in jail, possibly also dragging into trouble a couple of Observatory characters who enjoyed playing as amplifiers, just for the thrill of living something unusual. Their 'jokes' affected a number of people for the rest of their lives.

As to Heck, it made him reflect on his own security, something he had already been forced to do when working in Spain where Vilspa was a potential target for terrorists. He equipped his house with an automatic outdoor lighting system and entered a shooting club where he discovered being a natural shooter when practicing his Feinwerkbau 621 sport rifle or his Smith & Wesson 357 Magnum revolver.

Unrelated to the above, Heck was called one day with all his relevant files to the income tax office for some questioning. Everything went well. As he was chatting with the people there about his job and activities, Heck realized that they had been acting upon the receipt of an anonymous letter which, according to their experience, was obviously coming from his professional environment. "But don't worry", one inspector said, "we are used to such things. It's probably from someone jealous or frustrated, unless you did not answer the advances of a secretary," he added winking.

Another interesting event worth mentioning here took place during the visit of a ministry representative. Each scientist had been invited to talk briefly about his/her activities. Our biographee was most astonished when an unproductive gentleman presented as his own research some recent extragalactic results published in a magazine a couple of weeks earlier.

The chap became embarrassed when he was asked to be more specific about his personal contributions to the project. Hitting him harder in front of the ministry delegate would have been damaging for the whole Observatory, but these are cases when a Director really wonders whether he is managing the right people.

Passing on the Torch

While all those incidents were taking place in a short period of time, Heck's health status did not improve. His diaries are littered by medical appointments. He had regularly to stay at home, sometimes half-blinded, having to skip meetings and to rely on others.

This was unfortunately giving some space to the return of earlier bad habits. Some people started playing their own game in the back of the Director, sometimes taking advantage of the position where he had put them. Add to this the complications and miseries of the French administration such as that obligation of mobility when he had just taken up the directorship (cf. p. 147).



Fig. 129: Michel Crézé, pictured here lecturing at a Goutelas school in 1979, responded favorably when Heck approached him as a potential successor for the directorship of Strasbourg Observatory.

Heck was repeatedly warned by his physicians that he was going to literally kill himself within a few months if continuing on the job.

This ultimately forced him to reconsider the whole situation, especially when the CDS management, who should have been Heck's best supporter given his directorial program, started repeating with him the attitudes that had poisened the term of the previous Observatory Director, such as challenging the authority chain on the usage of personnel as well as on budgetary and other issues.

One evening, back home after a particularly heated discussion with Carlos Jaschek and his wife Mercedes, Heck could only conclude that those two had backed his election as Director with the hope of mastering also the Observatory. Only a dramatic move could put an end to such recurrent difficulties leading nowhere. Heck conceived it that evening, even if it was a difficult, embarrassing and painful decision: he would request an early replacement for health reasons, looking in parallel for an able successor, but he would also make sure that those conflicts with CDS be openly discussed and solved once for all, possibly by rewriting the CDS statutes.

> "This has been the most difficult step of my career," says Heck with gravity,
> "but it had to be done, putting the future of the Observatory above my own."

Heck's resigning letter to the Chairperson of the Observatory Council, copied to his supervising authorities (INSU, University, and Ministry), simply stated that, much to his regret, the evolution of his health did not allow him to continue in his directorial position with the needed serenity, reliability and efficiency, requesting to be discharged and replaced whenever possible, while ensuring he would continue managing the place until the nomination of his successor.

The archives reveal quite a number of letters and documents, some extensive and confidential ones, where Heck was reporting the difficulties met and suggesting possible ways out, with the aim of having the Council members arriving at the following meetings well briefed and ready to put things straight.

In a four-page confidential letter to INSU's Couturier dated 21 November 1988, Heck analyzed the conflicts of authority between the Observatory and CDS Directors. He suggested several solutions, including merging both directorships[144].

He detailed the regulating structure, exaggerately complicated around a small staff: a Council for an Observatory hinging on a CDS itself with two Councils (the statutory and FAGS[145] ones, fortunately merged into one) and a planetarium (financially independent, but with a Director nominated by the Observatory Council), together with the new CNRS unit (URA[146]) organized around the groups of common interest recently put together, and finally the Research Center created by the University (also with a Council).

Heck recommended to revise the CDS statutes and to take this opportunity to finally drop the word *'Stellaires'*, no more appropriate since the center was also dealing with non-stellar objects, and to replace it with *'de Strasbourg'*. He also called the attention on the fact that CDS was providing a world-wide service with basically only French money so far. As a consequence, international financing should be explored.

The status of CDS personnel had to be clarified: those already spending their full time in servicing catalogues and databases should not be overloaded with educational tasks; those claiming a CDS affiliation but not involved in any servicing should be put in front of a choice; people not based in Strasbourg but working for CDS should be offered some adequate recognition.

At the Council meeting of 17 January 1989, Couturier thanked Heck for his analyses and for his clarifications, as did other attendees like the University President. When opening that meeting, Heck had repeated the reasons for requesting his advanced replacement and had expressed gratitude towards the persons who had assisted him since taking up the directorship.

He recalled a few measures taken so far during his short stay in office[147]: a management structure with offices in the Big Dome; a computer center being installed in the old directorial building, with connections to the other buildings; the planned refurbishing of a meridian room to accommodate part of the library (Fig. 130); the rationalisation of the usage of other premises; the upgrading of sanitary rooms; etc.

On the scientific level, among other things, he had put in place groups of common interests[148]; he had obtained the Observatory be recognized as a *Centre de Recherche*; a meeting on "Artificial Intelligence Techniques for Astronomy" (Fig. 134) was organized; a collaborative agreement with ESO and ST-ECF had been shaped on the same theme; the search for a permanent physical location for the database SIMBAD was under way.

[144]This would be the case during the term of his successor.
[145]FAGS = Federation of Astronomical and Geophysical Services.
[146]URA = Unité de Recherche Associée.
[147]All details mentioned in this section are extracted from the minutes of the meeting.
[148]The forerunners of today's *équipes* (teams).

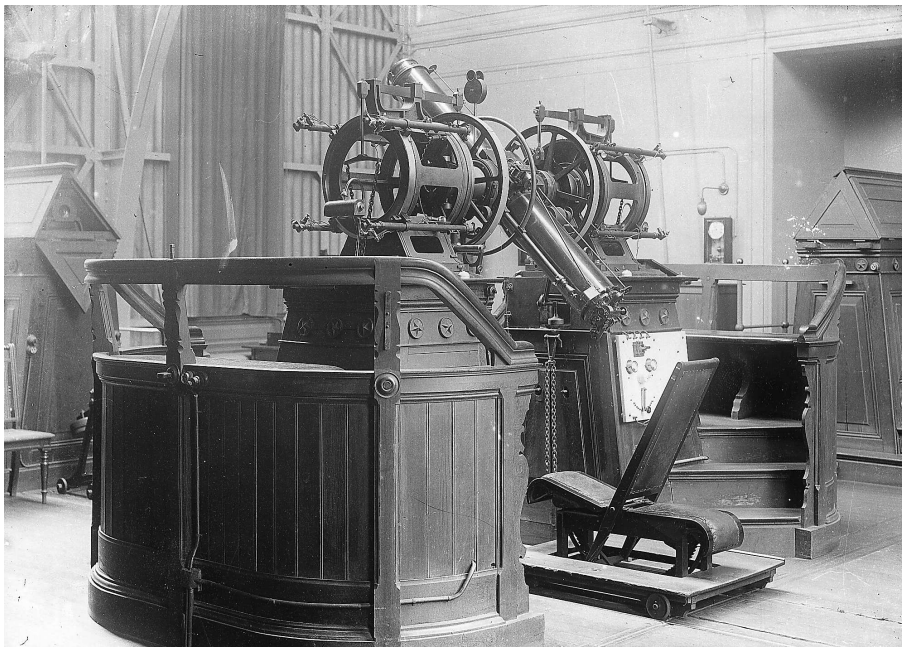


Fig. 130: Heck's plan for upgrading Strasbourg Observatory premises included refurbishing this meridian room (here with the Repsold instrument in a post-WWI picture reproduced from Esclangon 1926) for accommodating part of the library.

When starting his report, Heck had paid tribute to his predecessor in office, Alphonse Florsch, specifically referring to the difficulties both had to face because of the unsatisfactory definition of the authority chains within the house. During the subsequent round of thanks expressed towards Heck for his actions, Florsch, obviously moved, in turn paid tribute to Heck and to the courage shown by resigning from the directorship[149].

The following day, Florsch, in dirty overall and obviously coming from his home where he was doing some work, burst into Heck's office and, searching for his words, with tears in his eyes, uttered the nicest professional compliment Heck might have ever received: "You have done more than anyone else for this Observatory[150]". Even if excessive, this flattery from that impulsive character has to be put in parallel with the weird welcome issued when Heck arrived about six years earlier (p. 139).

As to his succession, Heck had triggered the application of five candidates. The first person he had approached was Michel Crézé, an astronomer at Besançon Observatory where he had served as Director a few years earlier (Fig. 129). Crézé was elected as Heck's successor by the Council on 05-06 April 1989. Three rounds were needed.

The minutes of that Council meeting are again interesting as they confirmed the nebulous situation of CDS within the Observatory: the CDS Director was obviously referring to a protocol only when it suited him, be it for personnel or budgetary issues.

[149]From the minutes in French: "M. Florsch rend hommage à M. Heck et au courage dont il fait preuve en renonçant à la direction".

[150]In French: "Tu as fait plus que n'importe qui pour cet Observatoire".

Heck reminded that, as Observatory Director, he did not belong to CDS and that he would go on serving in the directorial capacity until his official replacement. He recalled that he requested budgetary estimates from the various groups, but that not everyone complied with satisfactory documents. In rather strong words, INSU's Couturier stressed that the texts were not granting CDS with a status of fortress within the Observatory.

With an implicit reference to the incidents described earlier with CDS visitors, Heck, followed by the Council, requested a long-term policy for people temporarily associated, insisting on paying special attention to their profile and to the terms of their hiring.

Crézé's official term as Director started only in April 1990, in spite of a request to speed up the nomination sent to the supervising authorities on 22 December 1989 by several persons, including our biographee. A smooth transition had nevertheless been ensured in the everyday management, with frequent discussions between the incumbent and next Directors, and with Crézé progressively running the house on his own.

Years later, University President Adrien Schmitt sent to Heck a handwritten letter (dated 19 June 1994) saying, in reference to the statutory repositioning of the Observatory components, the structural modernization, and the expansion planning: "You have labored as we would wish to do it in all fields: in-depth work, collective thinking and openness towards external input. [...] This makes what is called a 'virtuous circle' et I congratulate you for your so significant contribution.[151]"

With the weight of the observatory gradually taken away from his shoulders, Heck could now devote more time to personal matters, such as his health status and the mess about his position with the surprizing requirement of 'mobility' (p. 147). The Ministry had finally clarified their position on the issue in a letter dated 11 December 1989.

It might be interesting to close this section with excerpts from a letter that Heck sent on 10 February 1989 to his Belgian mentor Léo Houziaux, reviewing his awkward professional situation:

> "You are not without knowing that I had very serious health problems towards the end of 1987, troubles that left me with rather unpleasant after-effects preventing me to carry my duties as Director of Strasbourg Observatory with all the desired efficiency, serenity and reliability.
> In agreement with my supervising authorities, I investigated several solutions and, essentially because of difficulties generated by the CDS Director, the only outcome that appeared legally acceptable and viable for the future was my resignation followed by a normal elective procedure for a new Director. [...]
> It will be without much regret that I shall leave that directorship. We shall certainly have the opportunity to talk again about all this and I shall probably let you discover surprizing facets of institutions and individuals. More than once did I consider as a mistake of mine to have come to Strasbourg when I wanted to leave the IUE Observatory and when I had other employment offers. But what

[151] Original: Vous avez oeuvré comme nous souhaiterions pouvoir le faire en tous domaines: travail en profondeur, réflexion collective, ouverture sur un apport extérieur. [...] Voilà qui constitue ce qu'on appelle un "cercle vertueux" et je vous félicite d'y avoir contribué de manière aussi significative.



Fig. 131: Alphonse Florsch (1929-2015).

has been done is done, and I prefer not to come back on the matter.
There is more however. I just discovered that, if I wish to progress in my career in France, I must prove some 'mobility' and this is only recognized after the nomination. As a consequence, all my peregrinations prior to my arrival in Strasbourg are irrelevant and I should again take my pilgrim staff ...[152]"

Parallel Activities

Heck did not feel like moving again. He had had already to start a new life from scratch a couple of times in different countries. Now he was in fully congenial surroundings in Alsace and, last but not least, he had around him a competent medical environment knowing perfectly his case.

[152]Original text in French: "Vous n'êtes pas sans savoir que j'ai eu de très sérieux ennuis de santé fin 1987, problèmes qui m'ont laissé quelques séquelles assez désagréables et qui m'ont empêché d'assumer avec toute l'efficacité, la sérénité et la fiabilité que j'aurais souhaitées mes fonctions de Directeur de l'Observatoire de Strasbourg. // En concertation avec mes instances de tutelle, j'ai recherché différentes solutions et, essentiellement à cause de difficultés générées par le Directeur du CDS, la seule issue qui soit apparue légalement acceptable et viable pour le futur fut une démission de ma part suivie d'une procédure normale d'élection d'un nouveau directeur. [...] // Ce sera sans grand regret que je quitterai cette fonction de direction. Nous aurons certainement l'occasion d'en reparler et je vous ferai probablement découvrir des aspects étonnants d'institutions et de personnes. Nombre de fois, j'ai considéré comme une erreur de ma part de m'être dirigé vers Strasbourg à l'époque où je voulais quitter l'Observatoire IUE et où j'avais d'autres possibilités d'emploi. Mais ce qui a été fait est fait et je préfère ne pas y revenir. // Il y mieux cependant. Je viens en effet de découvrir que, si je veux progresser dans ma carrière en France, je dois faire preuve de 'mobilité' et celle-ci n'est considérée effective qu'après la nomination. Toutes mes pérégrinations antérieures à mon arrivée à Strasbourg ne compteraient donc pas et il faudrait que je reprenne mon bâton de pélerin ..."

Hence he decided to follow Charvin's advice and to wait for the new version of the statutes regulating the career of astronomers that would remove the explicit obligation of mobility (p. 148). This meant a delay of several years before Heck could be promoted as First-Class Astronomer (1997).

It took also a while before Heck's disability be officially recognized, and this in spite of the full support from the University medical service. Documents disappeared, applications were lost and had to be reintroduced.

In 1992, things converged: an extensively updated medical file; Baer's thesis nearing completion (Fig. 125); and the formal authorization for our biographee to work at home – as expressed *e.g.* in the following excerpt from a document dated 01 September 1992 and signed by Crézé, Heck's successor as Director of Strasbourg Observatory:

> "André Heck is a talented astronomer with an international notoriety. He is employed at Strasbourg Observatory since many years. He has been its Director until his health condition forced him to step down. Since I succeeded him, I noticed that his production as researcher in astronomy and his rôle in international scientific bodies has remained at the best level. [...] I have been led to authorize him too work at his home. [...] I insist on the fact that his scientific productivity, even if slightly reduced, remains at the level of the best researchers of his generation.[153]"

On 17 August 1993, COTOREP, then the competent organization[154], declared officially Heck as a handicapped person with a permanent partial disability, a status renewed until his retirement. The application had reviewed the personal costs borne by our biographee, from the installation of a multiple phone line to the purchase of a telefax and a portable computer equipment with printer, plus some expensive software packages of the time. It was also mentioning the overcost for trips as these needed to be reasonably confortable and as direct as possible. Additional hotel nights were sometimes necessary to recover.

From then on indeed, Heck travelled mostly at his own expenses in Business Class for the long-haul flights (while sometimes noticing that some other colleagues, definitely with no officially recognized handicap, had managed to be in the same class on institutional money, in other terms on the taxpayers' pennies). Heck was also too proud to apply the handicap sticker on his cars.

The contribution of the Observatory appeared as a 'heavy' computer, some software packages and consumables. A duplex printer came later. The computer link to Heck's home via the *Numeris* network was still in project. It materialized in 1994 after the

[153] Original text in French: "Monsieur André Heck est un astronome de talent et de renom international. Il est employé à l'Observatoire de Strasbourg depuis de nombreuses années. Il en a été le Directeur avant que son état de santé ne l'oblige à renoncer à cette charge. Depuis que j'ai pris sa succession, j'ai pu constater que sa production de chercheur en astronomie, ainsi que son rôle dans les instances scientifiques internationales étaient restés au meilleur niveau. [...] J'ai été amené à l'autoriser à travailler à son domicile. [...] J'insiste sur le fait que sa production scientifique, même si elle s'est quelque peu réduite, reste au niveau des meilleurs chercheurs de sa génération."

[154] Today MDPH.

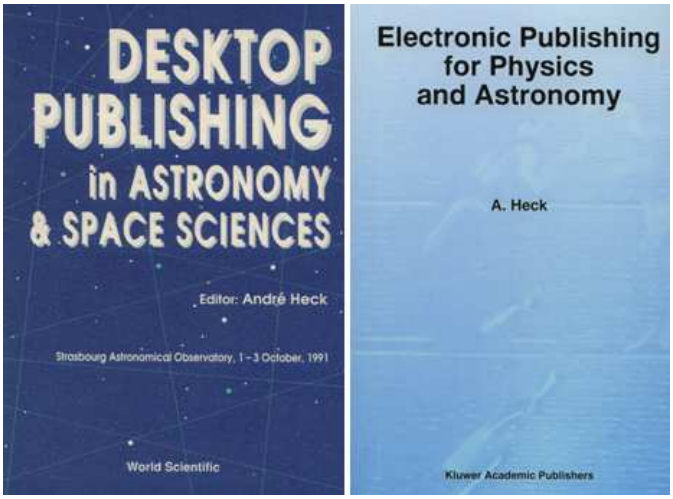


Fig. 132: Left: proceedings of the conference "DeskTop Publishing in Astronomy and Space Sciences" (Publ. 458) organized at Strasbourg Observatory by Heck in October 1991, first international meeting of its kind; between the launch of the conference and its actual happening, the buzzword changed from "Desktop Publishing" to "Electronic Publishing" (EP). Right: the edited book published on EP by Kluwer in 1997 (Publ. 388).

University and the Observatory agreed to share expenses: the costly installation by the University and the running fees by the Observatory.

So configured, our biographee's home became *de facto* a kind of annex of Strasbourg Observatory and many people getting in telecontact with him had no idea where he was physically located.

This was a big improvement in Heck's life. He was able to stay in touch with colleagues at the Observatory and with the rest of the world while staying at home. He could work in a calm environment, also adjusting his presence at the Observatory to quiet hours, minimizing potentially stressing contacts and the pejorative impacts to be avoided as a consequence of his CVA.

Over the turn of the decade, Heck's publishing production knew a drop resulting from both his disability and the priority given to his directorial office. He managed nevertheless to put out a few volumes as illustrated by Fig. 134.

He also organized or co-organized several meetings over the period covered by this chapter. Chronologically there was first the colloquium "Astronomy from Large Databases: Scientific Objectives and Methodological Approaches", in short ALD I, in 11-14 October 1987 at ST-ECF (Publ. 285 & 454, Fig. 222). Beyond co-editing the proceedings with Murtagh, Heck authored/co-authored five papers (Publ. 248 to 252) respectively dealing with the mass analysis of photometric data from the Tycho experiment, the parametrical clustering of extragalactic data, the rule-based classification of IUE spectra, the surface distribution of fundamental data, and the handling of photometric databases.

In April 1989, he organized the *XIth Journée de Strasbourg* on "Artificial Intelligence Techniques for Astronomy", followed in June 1990 by the *XIIth Journée de Strasbourg* on "Fractals in Astronomy" shaped with his past IALg colleague Jean Perdang (Publ. 456). The pair took advantage of the momentum created to put together an edited volume (Publ. 386, Fig. 134) including a review paper by our biographee (Publ. 74).

On 01-03 October 1991, Heck organized a history-making colloquium entitled "Desk-Top Publishing in Astronomy and Space Sciences" (Publ. 458, Fig. 132), in fact dealing with electronic publishing (EP). The buzzword had evolved between the launch of the conference and its actual happening.

The first international meeting of its kind, it gathered 65 participants from a dozen countries with again a strong representation from overseas (including Australia, China, Japan and the USA). Beyond introducing the colloquium, Heck presented the results of an EP survey as well as a paper linking EP to intelligent information retrieval (Publ. 272 to 274).

This event marked an inflection in Heck's centers of interest. He came back to electronic publishing with an edited volume (Publ. 388, Fig. 132), review papers (Publ. 77 & 79) and a number of secondary contributions (Publ. 267, 271 & 275), influencing the policies adopted by learned societies and periodicals world-wide. See for instance the citation in *Physics Today* by Boyce & Dalterio (p. 350).

Publishing being an intrinsic part of scientific activity, Heck would always consider it as an element of the broader concept of information flow (Fig. 133). This would be part of his concern until the end of his professional career as illustrated by the two FPCA[155] meetings he organized in 2007 and 2010 respectively at the Royal Academy in Brussels and at Harvard-Smithsonian Center for Astrophysics in Cambridge, MA (see p. 259).

In September 1992, Heck & Murtagh organized in Haguenau a sequel to the ALD I conference, "Astronomy from Large Databases II" (ALD II, Publ. 459, Fig. 222). Initially planned in Strasbourg, the event had to be relocated as all the hotels booked in the city cancelled the reservations in favor of an out-of-schedule session of the European Parliament, paying much better than poor astronomers. With reference to Frederick I Barbarossa, Heck dubbed Haguenau as an Imperial City to enhanced its attractiveness.

In spite of its hectic genesis, the meeting was another big success with the presentation of 86 papers and the attendance of 122 participants, the US delegation ranking second (30 heads) between the French (36) and German (20) ones.

Again, beyond co-editing the proceedings with Murtagh, Heck authored/co-authored several contributions ranging from the impact of electronic publishing in advanced information retrieval, the future of yellow-page services, his database StarWays (see p. 207), and the increasing rôle of librarians in information retrieval (Publ. 275 to 278).

Of course, Heck attended also quite a few other conferences (cf. p. 383). He continued paying special attention to the rôle of librarians (*e.g.* Publ. 278 & 284 and Fig. 226 on p. 393), making also sure that some of them would contribute to the volumes he would produce subsequently (cf. p. 497).

[155] Future Professional Communication in Astronomy.

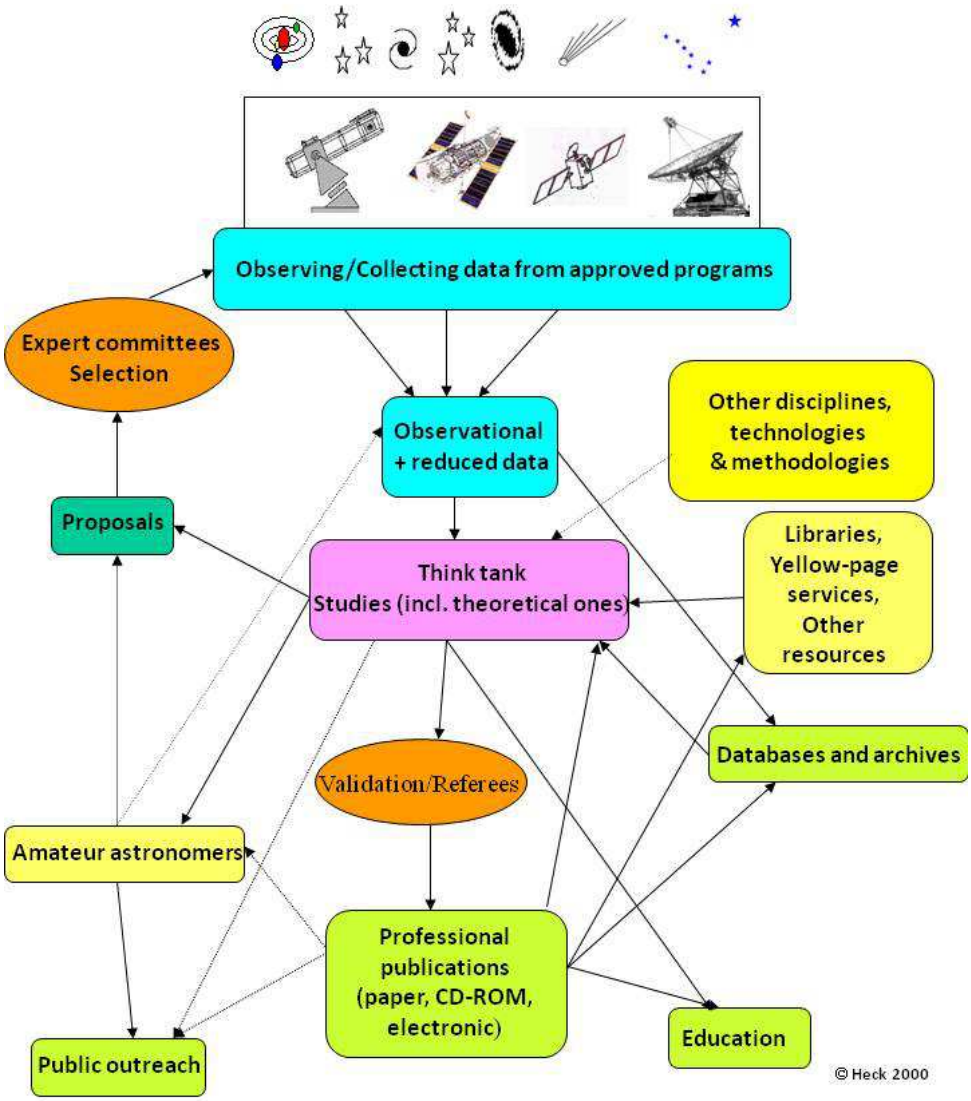


Fig. 133: The information flow as illustrated by Heck in several of his publications.

By becoming in 1991 Chairman the Working Group on "Astronomical Data" (Fig. 224) pertaining to the International Astronomical Union (IAU) Commission 5, Heck was *de facto* the IAU representative to CODATA, the Committee on Data for Science and Technology of ICSU, the International Council of Scientific Unions[156].

In that capacity, Heck attended a number of CODATA world conferences (Fig. 135) and became temporarily involved with CODATA France and its Board. Higher responsibilities were offered to him, both at the international and French levels, but he turned them down: he did not alleviate his load by resigning from the directorial office at Strasbourg Observatory to start increasing it rightaway with other things.

In a similar paradoxical way, offers came from the President of Strasbourg University (who had assisted our biographee during the delicate phase of his replacement and therefore was quite aware of his disability), attempting to put Heck in charge of a couple of ventures linked to space and in particular to the permanent location of the International Space University (ISU).

Here too, Heck declined getting involved, be it only because he discovered, after a quick audit, that 40% of the budget supposedly assigned to one of the projects had already vanished for reasons he could not clearly identify.

By now, beyond the IAU, Heck was a member of the major Western professional societies: the American Astronomical Society (AAS), the Astronomical Society of the Pacific (ASP), the Astronomische Gesellschaft (AG) and the Royal Astronomical Society (RAS). He co-founded the European Astronomical Society (EAS, Fig. 209).

He served for some time in the Bureau of the Société Française des Spécialistes d'Astronomie (SFSA[157]), under the successive presidencies of Jean Delhaye and Jean Audouze, where, by the way, he inspired the creation of what became the SFSA Digital Prize for young astronomers[158]. Here he noticed that a couple of bureau members resented that, as a foreigner, he could have his say in a French society.

But he was also a member of non-astronomical societies such as the American Management Association International (AMA), the Association for Computational Machinery (ACM), the European Association for the Study of Science and Technology (EASST), Euroscience, the International Association on Pattern Recognition (IAPR), NaSPA, the New York Academy of Science (NYAS), the Society for Industrial and Applied Mathematics (SIAM), the TEX Users Group, ...

Within the IAU, Heck belonged to the (then) Commissions 5 (Documentation and Astronomical Data), 25 (Stellar Photometry and Polarimetry), 45 (Stellar Classification) as well as, after it was created, to Commission 51 (Search for Extraterrestrial Life). He served in the Organizing Committees of IAU Commissions 5 and 45.

Beyond his own WGMAM (p. 152) and panels of the space agencies (p. 166), he was involved with several working groups (WG), such as the IAU WGs on "Astronomical Data[159]" and "Standard Stars", the CODATA WG on "Electronic Information Transfer".

[156]Now called the International Council for Science.indexInternational Council for Science

[157]Now the Société Française d'Astronomie et d'Astrophysique (SF2A).

[158]Now the Prix Jeune Chercheur.

[159]See *e.g.* Publ. 239 to 241.

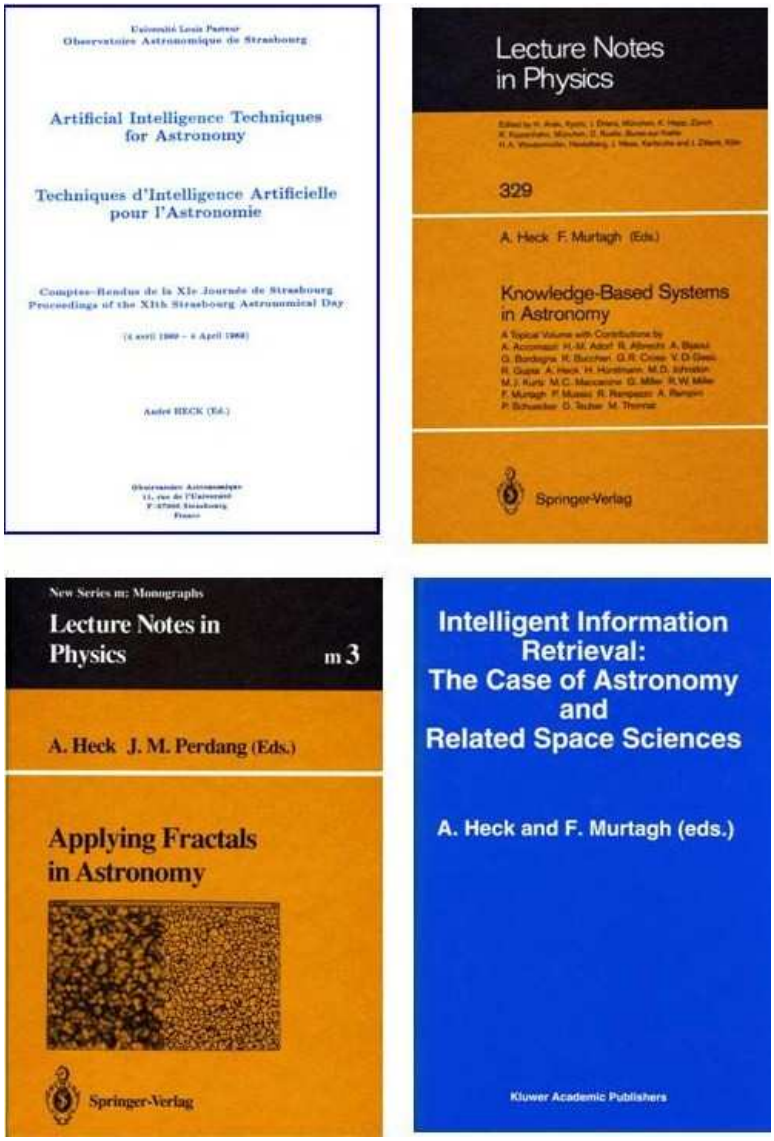


Fig. 134: From left to right and top to bottom: proceedings of a colloquium organized in April 1989 at Strasbourg Observatory on artificial-intelligence techniques for astronomy (Publ. 455); co-edited books on knowledge-based systems in astronomy (1989, Publ. 385), on the applications of fractals in astronomy (1991, Publ. 386), and on intelligent techniques for information retrieval in astronomy and related space sciences (1993, Publ. 387).

Later he belonged to the IAPR Task Group (TG) 13 on "Pattern Recognition" and to the ESF network on "Converging Computing Methodologies in Astronomy" (CCMA). He was also correspondent of the Scientific Event Alert Network (SEAN) of the Smithsonian Institution.

If the books co-edited now by Heck showed a definite shift towards facets of information handling, such as those illustrated in Fig. 134 on knowledge-based systems (Publ. 385) and on intelligent techniques for information retrieval (Publ. 387), refereed and secondary papers were still coming out on earlier fields of interest: RR Lyrae stars (Publ. 68, 246 & 253), IUE spectra (Publ. 69 to 71, 245, 247, 250 & 255), long-term photometry of variable stars (Publ. 80), as well as photometric methodology (Publ. 252) and even luminosity calibrations (Publ. 85, cf. facing page).

Other papers dealt with the usage of databases (Publ. 76), the research links between astronomy/astrophysics and computing/statistics (Publ. 243), as well as on applications of artificial intelligence to space projects (Publ. 257, 261 & 263).

The September 1986 issue of *Le Ciel* carried an interesting paper by Heck and Manfroid (Publ. 627): with reference, among other sources, to ancient Chinese reports, the authors were stating that the color of Sirius had been stable over the historical scale, contrary to what had been published here and there. That article was reproduced by two magazines, the Belgian *Ciel et Terre* (Publ. 628) and the French *Ciel et Espace* (Publ. 629, see Fig. 235 on p. 457).

Years later, other authors claimed to have 'discovered' the same stability[160], ignoring Manfroid & Heck's papers! This could be seen as a case of editors and referees not doing their job properly, but, contrary to what happened with the 'rediscovery' of Hipparchus' catalogue (see Publ. 833), a problem of language cannot be put forward here since the mother tongue of the 'rediscoverers' of the stability of Sirius' color was also French.

As mentioned already, the new status of astronomers was requiring some teaching from them, not necessarily individually, but globally at the level of each observatory. It was up to the Directors to ensure that this was duly provided by distributing the required hours among the staff taking into account expertises, personal wishes and disponibilities.

The system was not quite operational when Heck was in charge of Strasbourg Observatory due to the usual delays to put new things into place and to change habits. With his disability, Heck himself was dispensed of that obligation, something he had to reaffirm a couple of times when his successors tried to put him in trouble with it. The provided medical certificates seemed to disappear strangely from his file (cf. p. 281).

Nevertheless Heck took part in various 'fourth-cycle' schools for peers and young scientists, lecturing a couple of hours on modern methodologies and their astronomical applications. Such schools were for instance organized by CNRS (1987, Publ. 406), SFSA (1988, Publ. 407), ISU (1989, Publ. 257) or abroad by OAC-Formez (1991, Publ. 408).

Before his handicap be officialized, our biographee intervened also a couple of hours within the CNED[161] program and the curriculum for the local degrees.

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[160] See *e.g.* *Nature* **347** (1990) 625.

[161] Centre National d'Éducation à Distance, a French public institution providing distance learning.



Philip C. Keenan (1908-2000) was one of those generous scientists always ready to work with young collaborators. He co-authored several papers with Heck, such as one on "SMR stars, Strong CN Stars and R Stars" published in 1994 outside the usual pathes in the *Revista Mexicana de Astronomía y Astrofísica* (Publ. 85). But Keenan was also an astro-philatelist keeping sending stamps to our biographee. His last letter to Heck is dated from 29 January 2000 and says:

> "My long silence is due to bad fall which smashed my left hip and broke the elbow. Since then I have been continuously in two hospitals and this nursing home where I shall be for several more weeks.
> No astronomy!
> I hope that your news is better!
> How are you and what are you working on?"

Keenan passed away less than two months later, on 20 April 2000.

But compared to his earlier teaching experiences, Heck could not be enthusiastic about students talking, sometimes drinking and eating during lectures.

When one of them arrived one morning an hour and half late for a slot of two hours, Heck did not accept it. As the gentleman refused to leave, Heck declared the course over. Under the pressure of the other students, the chap finally left and went crying by the lady overseeing the DEA.

What bothered Heck most was not so much the behavior of the student at a time teachers had to stand classes of so-called young adults (over 22y generally though) behaving like uneducated kids. What was most disturbing were the comments by his colleagues: he should accept all this and just give his lecture.

This was totally opposed to Heck's conception of teaching: at that level of education, it was a waste of time and an insult to intelligence to repeat aloud what the students could find in notes and books.

The mission of the teacher, as Heck viewed it, was to educate those fellows to the realities of life, more specifically here to the way research was conducted, and to introduce them to the facets of the astronomy-related life and environment, as he would later do through his OSA and OPSA volumes (cf. pp. 248ff).

This sharing of 'life experience' was certainly what Heck considered as the best part of the education he received from his masters.

But he was now in a demagogic system where asking for results could sound as an offense, where the students were also rating the teachers and expecting to be granted a degree at the end of the studies, encouraged by a university management considering that "all the students had to succeed"[162].

More than once, Heck had the feeling to belong to a system walking on its head.

This was reinforced by a brief experience in supervising a student for which he had arranged a unique machinery involving Strasbourg Observatory, ESO and ST-ECF. But one day, the young lady came back saying she had been given crap as a PhD theme and did not want to go further. She had obviously been talking to someone who did not realize what would be the consequences of a reckless chat and her immature character had not been able to put things in a proper perspective.

In Heck's education times, students were honored and grateful to be accepted for a PhD work. They would have never argued about the relevance of the subject proposed by a supervisor, per definition more competent than the greenhorn.

But now students (at least, an always larger number of arrogant ones) considered that degrees were due to them and that supervisors were at their service, including to find grants and possibly jobs for them afterwards. We already saw one such case earlier (p. 186).

Our biographee noticed similar attitudes in other occurrences, like in a surrealistic mail exchange with a Catalan student in Heidelberg issuing without reason insults and xenophobic comments to Heck's address while having a high opinion of his research capabilities yet to be proven. In another instance, at Strasbourg Observatory, family members were demonstrating in the back of an auditorium at a PhD thesis defense the level of which was quite arguable.

The subsequent degree half-heartedly granted was probably not deserved at all. There have always been people, say, out of line, but the increasing frequency of such events was revealing a clear societal change.

When giving a series of seminars in October-November 1990 at Porto University, Heck noticed a totally different attitude from the students there.

Those young democratic societies in Portugal and Spain were producing students respectful, keen to learn, dynamic in their undertakings, many of them busy in parallel to finance their studies. They enthusiastically worked on the project our biographee gave them at the outcome of his talks in English: "Porto Astronomical Database – A First Study for a Conceptual Overview".

[162] As declared – to Heck's amazement – by the University President at the first meeting of the heads of educational and research units attended by our biographee in 1988.



Fig. 135: Lecturing on 21 October 1992 during the 18th CODATA General Assembly in Beijing that Heck attended as IAU representative (cf. Publ. 270 & 293).

Back to the matter of databases and data centers, Heck's diaries reveal that on 01 February 1990, Carlos Jaschek had announced his resignation as CDS Director. Jaschek's last editorial in the *CDS Information Bulletin* **38** (December 1990) mentioned that Crézé had been nominated as CDS Director in May 1990.

As a consequence, from that date on, the CDS and Observatory directorships were held by the same person, something Heck had been advocating in his analyses of the in-house difficulties (cf. p. 192). But when Crézé would leave Strasbourg in 1995, the two directorships would be separated again.

During his travels, even during personally funded ones, our biographee would occasionally give a hand to CDS without actually belonging to the team (cf. *e.g.* Publ. 265). This was for instance the case in January 1993 when returning from the 181$^{\rm st}$ AAS Meeting in Phoenix with a stop in DC for discussions with NASA's Frank Giovane, or the following month during a private trip in Australia for contacts with the Anglo-Australian Observatory (AAO) management.

But those steps, made at the request of CDS, exposed the continuation of the earlier meanness: complaints *a posteriori* about the factual costs of the additional stop in Washington and no participation in the extra expenditures in Sydney. Heck had to remind that he had not been hired to work for CDS, not to lobby for it round the world at his own expenses – all the more since his earlier achievements in that respect had never been duly credited.

Similar pettinesses would come up again later such as promised reimbursements of taxi rides that would never materialize, but this is not the place here to be too long about that facet of the place. One feature however deserves to be mentioned: the attitude of some computer people or engineers expecting that senior scientists would "work for them" and attempting to impose their views on what should be their agendas and activities in that respect.

Another world walking over its head!

This was probably in the back of Heck's mind when, in late 1994 and again in 1995, he was approached by INSU seeking whether he would be interested in taking over the CDS directorship. Our biographee politely declined it for the same reason he had turned down earlier offers: he did not request an advanced replacement from the directorship of Strasbourg Observatory to take over other heavy responsibilities.

But there was now another equally important reason: CDS was dealing with celestial objects while Heck's interests were henceforth centered on people, organizations and the way astronomy-related activities were conducted.



Fig. 136: This Observatory old postcard distributed by the planetarium displays the Big Dome and its host: the Large Refractor (487mm) built by Merz in 1877 on a mounting manufactured by Repsold. The instrument was then the largest in Germany. See the various chapters in Publ. 398 for all historical details.

The Star*s Family and Relatives

At the end of 1994, Heck had produced some 90 refereed papers and more than 170 secondary publications.

The drop in his overall publishing production due to the CVA and the priority given to his directorial office was especially perceptible in the articles for amateurs and grand public: no outreach paper in the slot 1991-1995 with only a handful of bibliographical reviews and *Potins d'Uranie* notes. But we saw that a new type of publications was taking shape: the edited books. These would become an important activity in Heck's later professional career as described in the next chapter.

The compilation of directories was continued, together with related catalogues and dictionaries. Our biographee has published quite a few papers on this facet of his activities[163], putting it in the historical perspective of similar undertakings that took place in Belgium at the first half of the 20th century: a first compilation by Stroobant *et al.* (1907), followed by a second edition (Stroobant *et al.* 1931), a supplement (Stroobant *et al* 1936), and later updates (Rigaux 1959 & 1961). The first catalog included a map displaying the distribution of observatories at that time (Fig. 137).

We have seen (p. 82 & p. 124) how the compilation of lists entered Heck's life and led to the publication of the 1978, 1979, 1981, 1982 and 1984 versions of the IDAAS directory under its original title *International Directory of Amateur Astronomical Societies* (Publ. 428 to 432). A few specific computer printouts were also produced at request between the 1978 and 1979 editions.

Later on, IDAAS' meaning was changed to *International Directory of Astronomical Associations and Societies* since more and more mixed amateur-professional societies were included and the word *amateur* was not quite appropriate anymore in the title. Three more editions (1986, 1988 and 1990) were produced (Publ. 433, 435 & 437).

Along the years, an increasing number of professional institutions showed an interest in the successive IDAAS editions. Therefore a list of institutions was also compiled for advertising IDAAS and, since that list was now existing, why not publishing it too? Hence came to light the other directory IDPAI, standing for *International Directory of Professional astronomical Institutions*. Three editions were produced: 1987, 1989 and 1990 (Publ. 434, 436 & 438).

[163]Refer to Publ. 73, 86, 89, 93, 94, 101 and mainly to Publ. 117 for details on the forerunners and Heck's subsequent productions. A number of secondary papers could also be mentioned for the record: Publ. 256, 258, 260, 268, 270, 276, 281, 282, 293, 297, 301, 312, 313, 318, 322 & 337.

From the start, these directories received an enthusiastic welcome and, along the years, letters of support urged continuing the work and broadening the scope of the compilations (refer to the citations on pp. 348ff). Hence the last editions were bearing the subtitle *together with items of general interest*.

As the overlap between the two directories IDAAS and IDPAI grew bigger, it was decided to merge them, for the year 1991, into a single one entitled *Astronomy, Space Sciences and Related Organizations of the World* (ASpScROW 1991, Publ. 75 & 439).

Before going on with the history as summarized from Heck's own papers, it is probably appropriate to say a few words on the contents of those compilations, significantly more exhaustive than earlier ones. As said in their presentations, they were intended as

> "... gathering together all practical data available on associations, societies, scientific committees, agencies, companies, institutions, observatories, universities, etc., more generally organizations, involved in astronomy and related space sciences. But many other entries were also included such as academies, advisory and expert committees, bibliographical services, data and documentation centers, dealers, distributors, funding agencies and organizations, journals, manufacturers, meteorological services, museums, norms and standards offices, planetariums, private consultants, public observatories, publishers, software producers and distributors, and so on.
>
> Other fields such as aeronautics, aeronomy, astronautics, atmospheric sciences, chemistry,communications, computer sciences, data processing, education, electronics, energetics, engineering, environment, geodesy, geophysics, information handling, management, mathematics, meteorology, optics, physics, remote sensing, and so on, were also covered when justified.
>
> The information was given in an uncoded way for easy and direct use. For each entry, all practical data available were listed: city, postal and electronic-mail addresses; URLs; telephone and telefax numbers; foundation years; numbers of members or staff; main activities; titles, frequencies, ISS-Numbers and circulations of periodicals produced; names and geographical coordinates of observing sites; names of planetariums; awards, prizes or distinctions granted; and so on.
>
> Whenevere applicable, telex and FTS[164] numbers were included in the first versions while electronic and web addresses made their appearance only in the later ones.
>
> The entries were listed alphabetically in each country. At the end of the volumes, an exhaustive index gave a breakdown not only by different designations and acronyms, but also by location and major terms in names.
>
> Subindices of academies, awards, bibliographical services, data centers, dealers and distributors, funding organizations, IAU-adhering organizations, ISS-Numbers, journals, manufacturers, meteorological offices, observatories, planetariums, publishers, software producers, etc., were also provided as well as statistics on the contents (numbers of entries per country, memberships, years of foundation) and a list of telephone, telefax and telex national codes.

[164] Federal Telecommunications Service (USA).

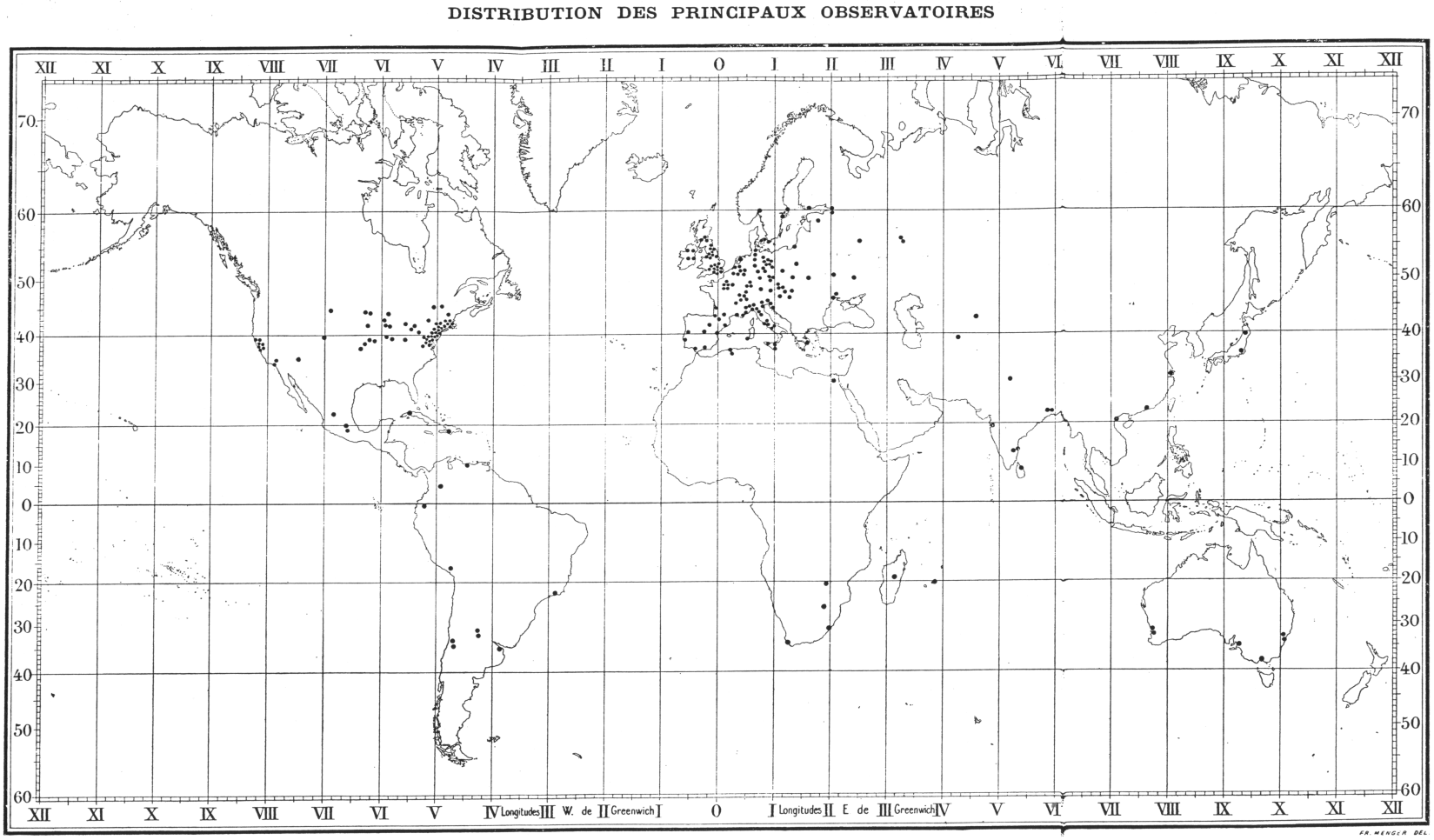


Fig. 137: World distribution of observatories reproduced from Stroobant et al. (1907) and to be compared with Fig. 148.

Table 1 provides some statistics on the IDAAS, IDPAI and ASpScROW editions.

From 1986 onwards, the directories were distributed as *CDS Special Publications*. The publication language was English[165] while the data were at some stage collected in six languages (English, French, Spanish, German, Italian, Portuguese[166]), later reduced to two (English and French) for simple practical reasons.

A list of acronyms was also included in the 1990 editions of IDAAS and IDPAI, but it became so voluminous that it was provided as a separate and complementary compendium in later years, also as a *CDS Special Publication* (Publ. 72, 264, 417 & 418).

Table 1: Statistics from successive editions of the first directories

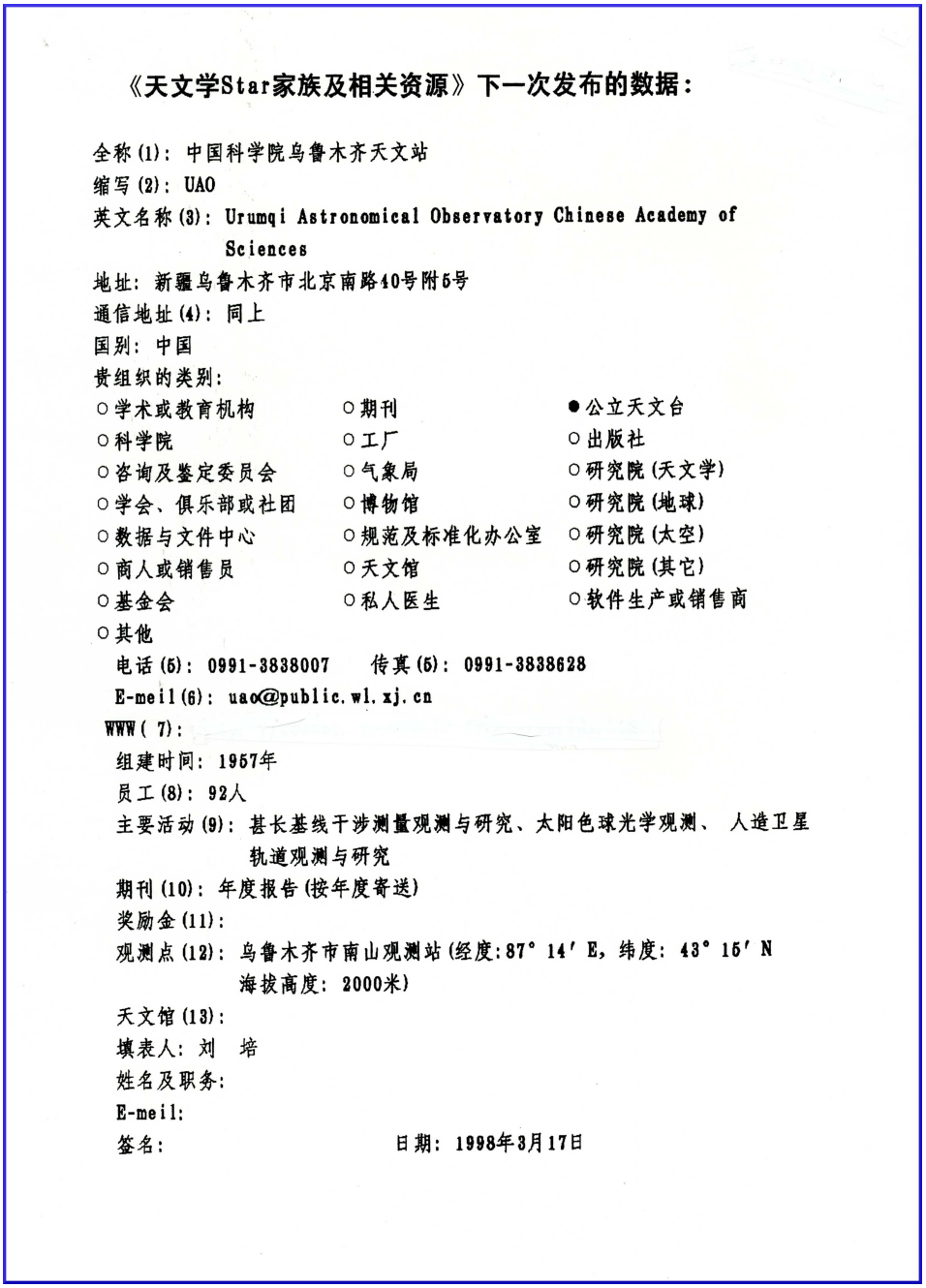
Directory	Number of countries	Number of entries	Number of pages
IDAAS 1978	27	≈600	112
IDAAS 1979	56	>1200	290
IDAAS 1981	51	>1100	304
IDAAS 1982	54	>1200	308
IDAAS 1984	56	>1200	282
IDAAS 1986	58	>1100	270
IDAAS 1988	64	>1700	522
IDAAS 1990	90	>3200	724
IDPAI 1987	68	>1500	280
IDPAI 1989	80	>2700	498
IDPAI 1990	90	>3500	666
ASpScROW 1991	95	≈5200	1192 (2 vol.)

The First Star*s

Things changed dramatically at the beginning of the 1990s. Networks were all over, e-mail was well into its invasion, information flow was in an ever higher gear. There was an increasing demand for societal data, from both individuals and organizations, a demand for a dynamic usage that would be satisfied by providing online access to the information. Everything had to go faster too, from the collection-verification-update of data to their shaping and their provision online.

[165] The first editions had bilingual English/French forewords.

[166] And occasionally returned in Russian or in Chinese (Fig. 138).



《天文学Star家族及相关资源》下一次发布的数据：

全称 (1)：中国科学院乌鲁木齐天文站
缩写 (2)：UAO
英文名称 (3)：Urumqi Astronomical Observatory Chinese Academy of Sciences
地址：新疆乌鲁木齐市北京南路40号附5号
通信地址 (4)：同上
国别：中国
贵组织的类别：

○学术或教育机构	○期刊	●公立天文台
○科学院	○工厂	○出版社
○咨询及鉴定委员会	○气象局	○研究院 (天文学)
○学会、俱乐部或社团	○博物馆	○研究院 (地球)
○数据与文件中心	○规范及标准化办公室	○研究院 (太空)
○商人或销售员	○天文馆	○研究院 (其它)
○基金会	○私人医生	○软件生产或销售商
○其他		

电话 (5)：0991-3838007　　传真 (5)：0991-3838628
E-mail (6)：uao@public.wl.xj.cn
WWW (7)：
组建时间：1957年
员工 (8)：92人
主要活动 (9)：甚长基线干涉测量观测与研究、太阳色球光学观测、 人造卫星轨道观测与研究
期刊 (10)：年度报告 (按年度寄送)
奖励金 (11)：
观测点 (12)：乌鲁木齐市南山观测站 (经度：87° 14′ E，纬度：43° 15′ N 海拔高度：2000米)
天文馆 (13)：
填表人：刘　培
姓名及职务：
E-mail:
签名：　　日期：1998年3月17日

*Fig. 138: Star*s Family questionnaire returned in Chinese for Urumqi Observatory.*

Here are a few key steps in the accelerating evolution: ENIAC computer at the University of Pennsylvania (1946); IBM 701 on the market (1953); ARPA (1957); time sharing for computer services at MIT (1958); integrated circuits in computers (1964); first WAN (1965); *hypertext* coined (1967); ARPANET commissioned (1969); e-mail for a distributed network (1971); Ethernet outlined (1974); first modem at 300 bits/sec (1977); Bitnet (1981); French Teletel/Minitel (1981); TCP/IP protocol for ARPANET (1982); EARN (1983); a thousand network hosts in 1984, doubled by the end of 1985, passing 5,000 by November 1986 and reaching 28,000 in 1987; ARPANET officially renamed as Internet (1990); WWW proposal by Bernes-Lee & Cailliau (1990); some 617,000 Internet hosts registered in October 1991; ...

Within the framework of its European Space Information System (ESIS, cf. p. 166), ESA became the first institution interested in making the organizational data from ASp-ScROW 1991 available through the networks. Heck was appointed as a consultant by an ESRIN contract dated 23 August 1991. An online database called StarWays was set up with the collaboration of Alessandro Ciarlo and Henning Stokke from ESRIN together with Antonella Gabriele from CISET (Publ. 78 & 279).

By being ESIS Project Scientist from 1986 to 1991, Miguel Albrecht had been involved in StarWays' genesis. Now heading ESO's Science Archive Group, he was interested in having the organizational data and the dictionary of acronyms also set up as online databases at ESO. This was the birth of StarGates (Publ. 84, 283 & 292) for the organizations and StarWords (Publ. 83, 283 & 292) for the acronyms and abbreviations.

The Star*s Family was born (Fig. 139). This was announced in the *CDS Information Bulletin* (Publ. 268) where new names were introduced for the paper versions: StarGuides for the directory of organizations (see also Publ. 81 & 280) and StarBriefs for the dictionary of abbreviations, acronyms, etc. (see also Publ. 82 & 269).

Two more products were announced: StarLabels as sets of mailing stickers bearing addresses, essentially delivered at production cost to publishers, manufacturers, and conference organizers; and StarSets as subsets of data occasionally provided under some conditions of usage (see hereafter the comments about the protection of data).

Tables 2 & 3 give a description of the successive editions of StarGuides (Publ. 440 to 449) and StarBriefs (Publ. 419, 420 & 422 to 427). All of them were distributed by CDS, except the last ones, 2001 and 2004 (called "Plus"), published by Kluwer Academic Publishers. Decreasing numbers of pages indicate transitions to more compact printing and possible purges of obsolete entries. This happened mainly with volatile amateur groups that needed to be tracked carefully.

From an annual (or so) exercise during the previous fifteen years, Heck entered a continuous, increasingly time-consuming and complex updating process with an ever heavier pressure (Fig. 145).

Note that all directories till 1993 were delivered as A5 paperbacks printed and bound by a local shop under contract with CDS from an original A4 computer printout that was ignoring the low-case characters. The foreword was typeset in TEX. StarGuides 1993 was made available as two A5 volumes with pink pages for the appendices and yellow ones for the index (Publ. 440).

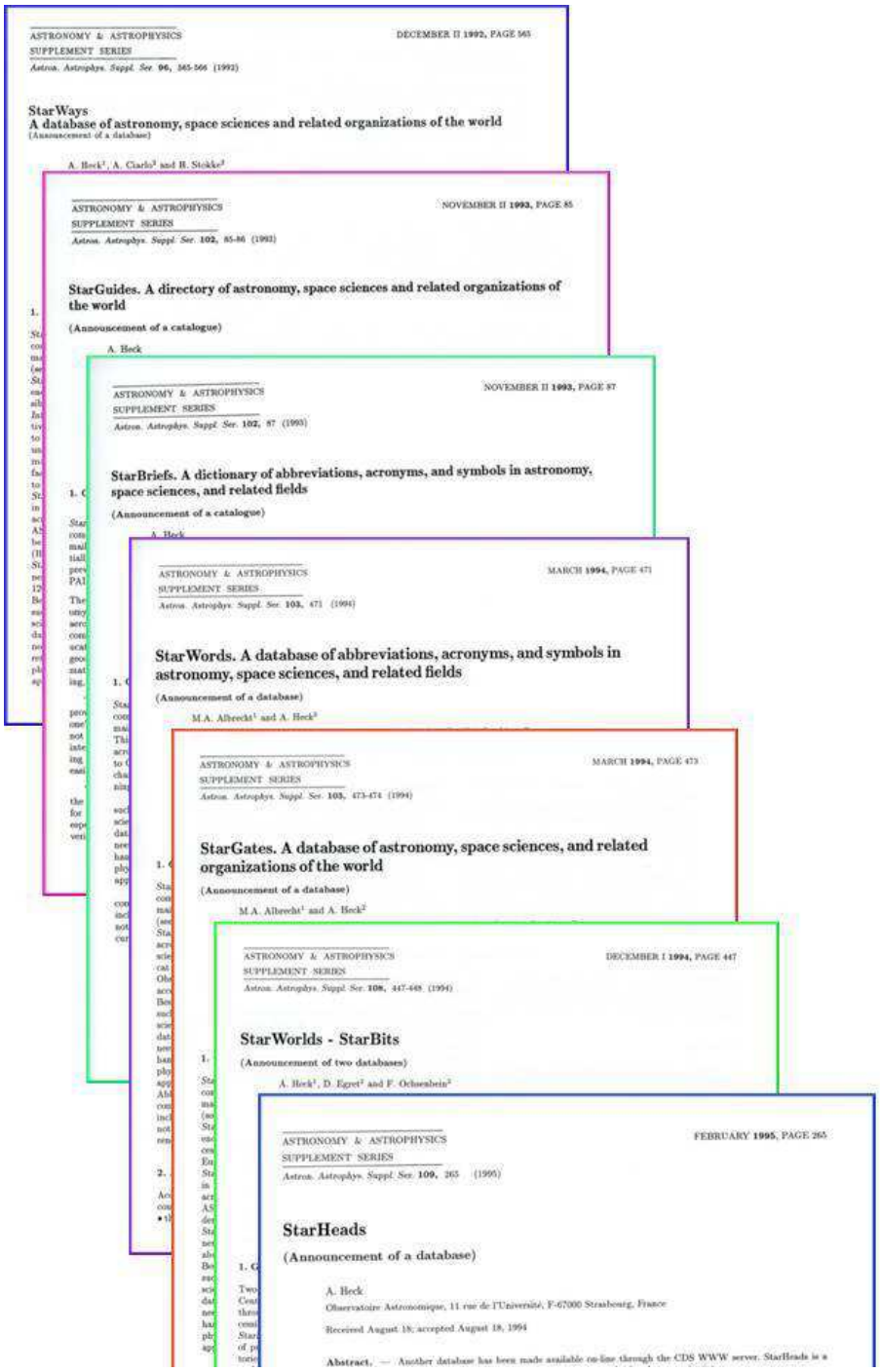


*Fig. 139: Announcements of Star*s Family members in Astronomy & Astrophysics Supplements (resp. Publ. 78, 81 to 84, 88 & 90).*

The closure of the CNRS computer center in Strasbourg-Cronenbourg (CCSC) on 24 December 1993 forced Heck to reprogram the production and printing of the directories on his own home equipment, using advanced TEX typesetting features (Publ. 266) piloted by Fortran programs *(sic)* working on coded master data files.

This resulted in a much nicer layout using low-case and special characters, together with better structured indices. The A4 output was delivered to customers in strong holders, with the advantage of being printed on demand and updated monthly. Kluwer kept the A4 format for the 2001 and 2004 ("Plus") editions (Fig. 140).

Table 2: Statistics from successive editions of the directory StarGuides

Year	Number of countries	Number of entries	Number of pages
1993	96	≈5200	1184
1994	96	≈5200	888
1995	97	≈5300	822
1996	97	≈5500	924
1997	98	≈5800	964
1998	100	≈6100	1030
1999	101	≈6100	1132
2000	101	≈6200	1148
2001	100	≈6200	1238
2004	100	≈6000	1140

Table 3: Statistics from successive editions of the dictionary StarBriefs

Year	Number of entries	Number of pages
1992	≈50,000	808
1993	>60,000	812
1994	≈70,000	824
1995	≈80,000	750
1996	≈100,000	912
2000	≈140,000	808
2001	>140,000	822
2004	≈200,000	1114

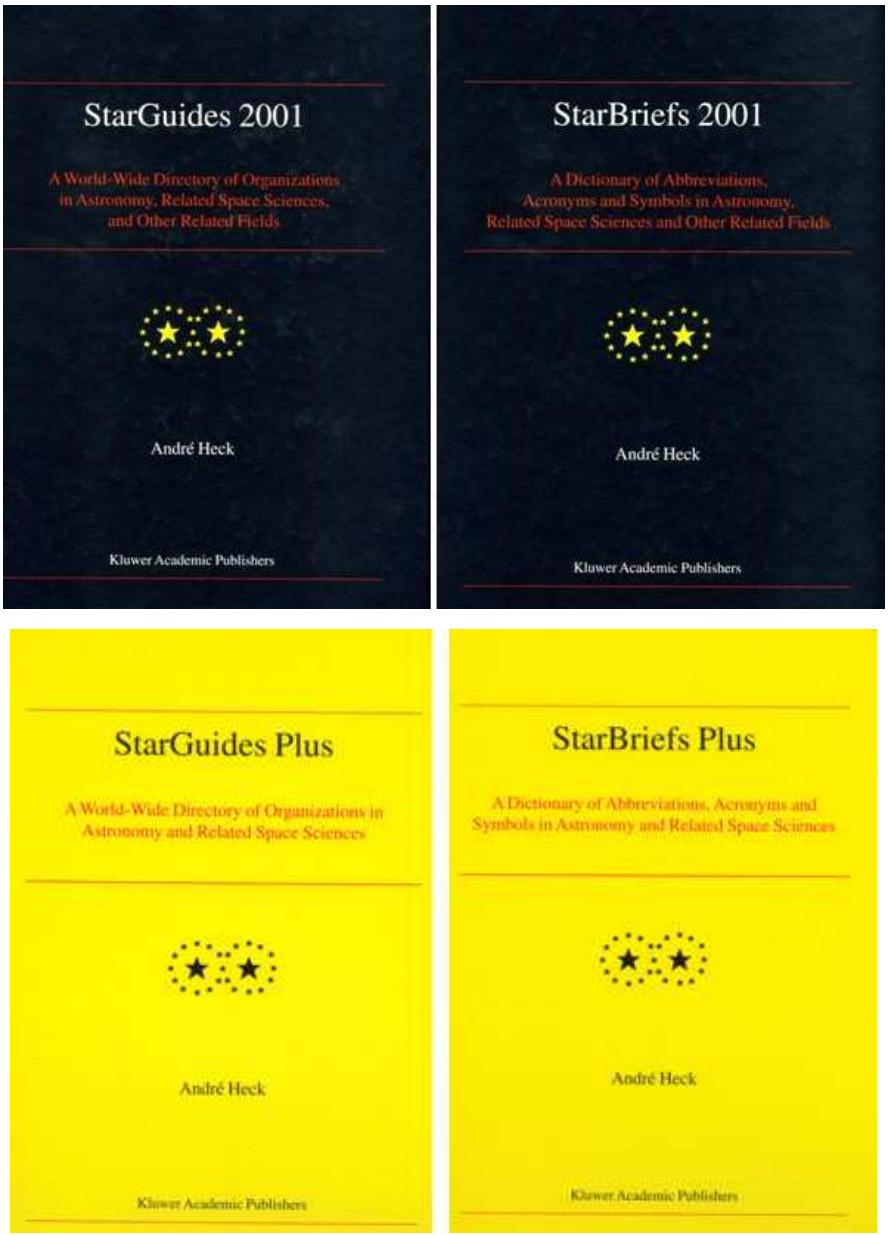


Fig. 140: Two editions of the volumes StarGuides and StarBriefs, each of about 1200 A4 pages, paper versions of the directory of astronomy-related organizations and of the dictionary of abbreviations, acronyms, symbols, etc. (resp. Publ. 448, 426, 449 & 427).



L'œuvre monumentale du professeur Heck

● ● ● *Les deux volumes, chacun plus de mille pages, représentent trente années de travail, de recherche, de compilation, de mise à jour permanente. Avec StarGuides Plus et StarBriefs Plus (☆), le professeur André Heck, ancien directeur de l'Observatoire astronomique de Strasbourg, a réalisé une oeuvre monumentale qui fournit à tous les intéressés une clé universelle d'accès au monde de l'astronomie.*

StarGuides Plus regroupe ainsi l'ensemble des données pratiques sur les sociétés, agences, institutions, associations, universités, etc. touchant de près ou de loin à l'astronomie et aux sciences spatiales. L'impressionnant volume contient quelque 6000 informations (adresses, numéros de téléphone, e-mails, activités, etc.) concernant une centaine de pays, d'Albanie au Zimbabwe.

Il s'intéresse aussi aux domaines voisins de l'astronomie, en fournissant des informations sur l'environnement, la météorologie, la géophysique ou encore l'optique.

Pas moins de 50 pages sont consacrés à la France. Vous y trouverez aussi bien le Club Astro Junior M67 de Hoenheim et le siège de l'Agence spatiale européenne à Paris que l'observatoire de Strasbourg ou le Musée de l'Air et de l'Espace au Bourget.

A cet ouvrage s'associe, avec StarBriefs Plus, un volume aux dimensions également *«astronomiques»* puisqu'il relève quelque 200000 abbréviations utilisées dans les sciences des étoiles et de l'espace. Deux ouvrages de référence que le professeur Heck complètera bientôt par une histoire de l'observatoire de Strasbourg. **W. B.**

☆ *Parus en 2004 chez Kluwer Academic Publishers - Dordrecht, Boston, London.*

Dernières Nouvelles d'Alsace Politique 12

Fig. 141: The local daily Dernières Nouvelles d'Alsace (DNA) published this article (12 September 2004) on Heck's "monumental work" after the publication of the voluminous compilations StarGuides Plus and StarBriefs Plus (Fig. 140), showing more interest than the local colleagues of our biographee for those auxiliary professional tools (see also the list of citations pp. 348ff).

The StarPages

The World-Wide Web (see *e.g.* Berners-Lee *et al.* 1992 & 1994) knocked at the door of astronomers, space scientists and high-energy physicists with an immediate success. Astronomy users and servers were, by the end of 1993, the largest group on the web (Hardin 1993).

CDS in turn decided to make available, through its WWW server, the resources it was distributing on paper, giving birth to the StarPages, the web members of the Star*s Family: StarWorlds, the counterpart of StarGuides for organizations; and StarBits, the counterpart of StarBriefs for acronyms, abbreviations, etc. (Publ. 88 & 296).

François Ochsenbein, who had been involved in setting up the ESO databases while on leave there, elaborated a sophisticated querying system directly plugged into Heck's master data files, now continually updated.

On 16-21 October 1994, our biographee attended the Second International WWW Conference in Chicago (Publ. 302). He then suggested to have a meeting fully dedicated to astronomy at Strasbourg Observatory on 06-07 April 1995, just before the Third International WWW Conference in Darmstadt (Publ. 314). He thus co-organized the Weaving the Astronomy Web (WAW) colloquium, attended by about a hundred participants representing fifty institutions from ten countries – a real success for a two-day meeting set up at short notice.



Fig. 142: Guenther Eichhorn (here on the wing of a Stearman biplane) understood the interest of having Heck's StarPages and in particular the database StarHeads linked to the resources of the Astrophysics Data System (ADS) located at Harvard-Smithsonian Center for Astrophysics. Each ADS query was de facto leading to StarHeads for accessing more information on authors of the papers retrieved. Eichhorn also contributed to the books produced by our biographee (cf. pp. 497ff).

Heck launched the WAW colloquium with a paper on the WWW practice (Publ. 95) and reviewed the Star*s Family resources on the web (Publ. 312). He naturally co-edited the proceedings (Publ. 460).

As astronomers and related scientists started to develop personal homepages on the web, Heck compiled another database gathering together the corresponding URLs: StarHeads, also made available through the CDS WWW server (Publ. 90, 306 & 321).

That database was purely web-oriented, while the other resources such as StarGuides and StarWorlds offered much more, as explained above, with an information fully mastered. The data retrieved from StarHeads were essentially no more than pointers towards personal homepages maintained by the individual themselves or by the institutional webmasters. The quality of those individual homepages was very uneven.

When the WWW became operational, many individuals had not realized the enormous visibility those homepages were going to have professionally: real windows on people and on their activities. Students and young scientists – quick to jump on those new "gimmicks" – were not unfrequently filling in their pages with jokes, personal matters, when not simply rubbish of dubious quality often without astronomical interest.

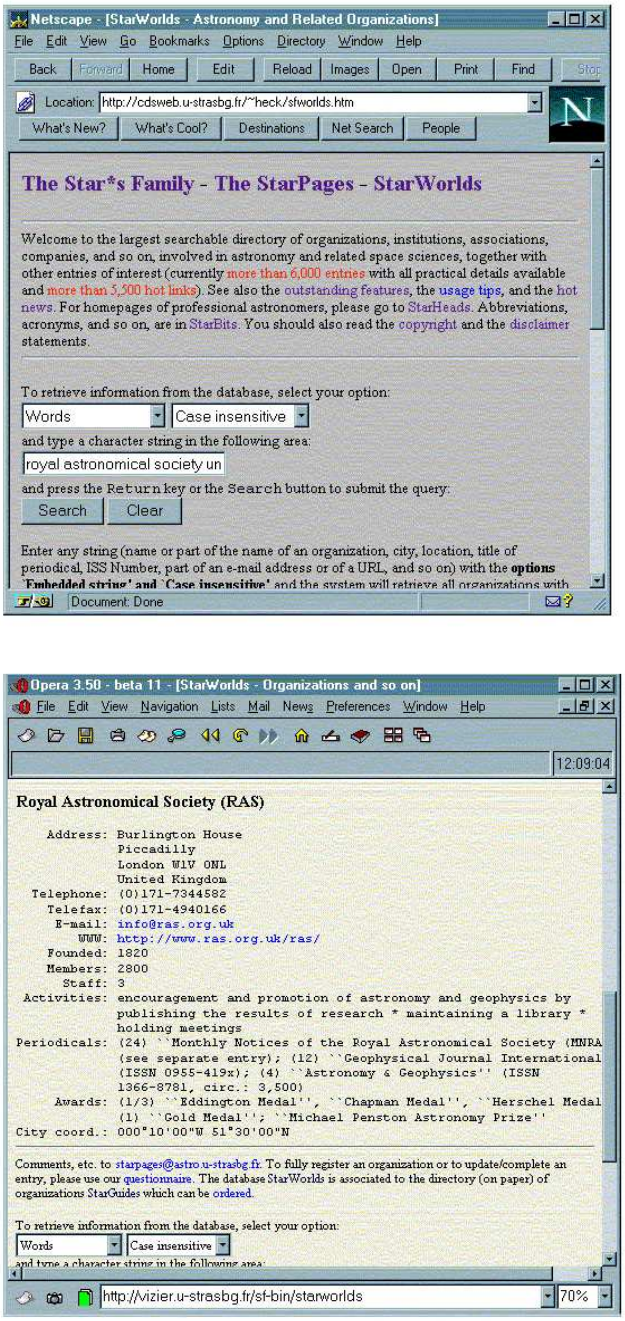


Fig. 143: StarWorlds query for "Royal Astronomical Society" on an earlier web navigator (Netscape) and the result of the same query on another one (Opera).

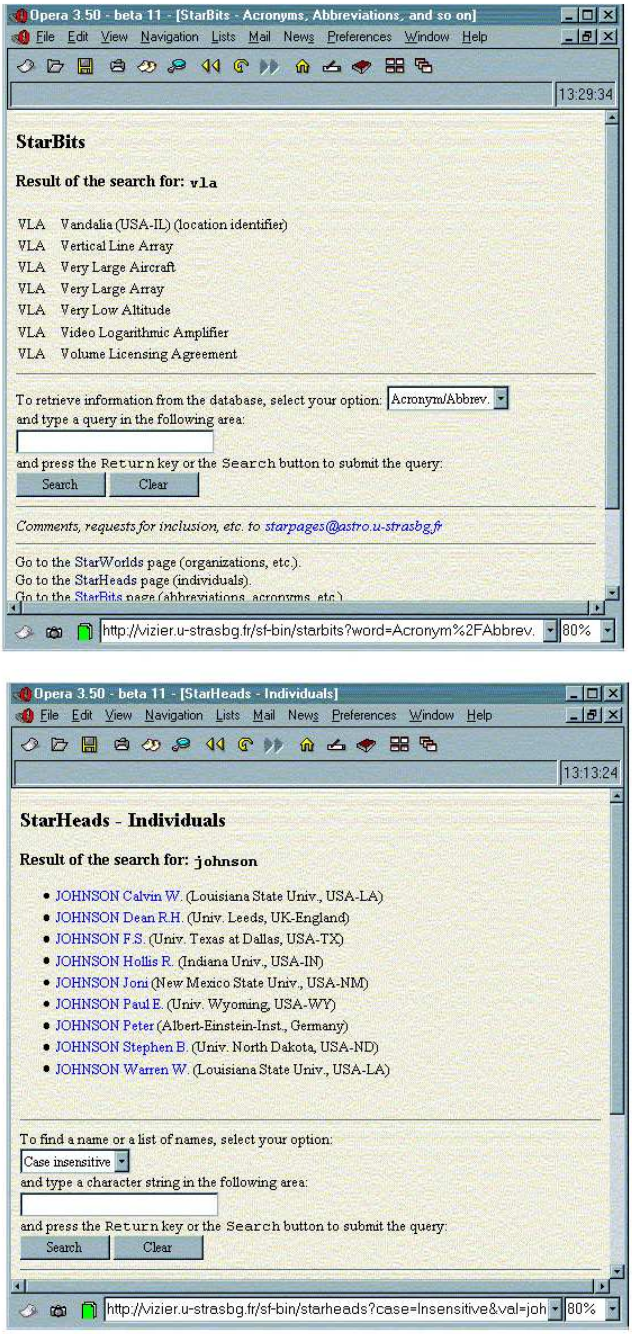


Fig. 144: Early Opera snapshots displaying the results of queries for the acronym "VLA" on StarBits (top) and for "Johnson" on StarHeads (bottom).

Another problem had to be faced quickly too: the volatility of URLs and the difficulty to maintain a valuable compilation of such links. There were two main sources for volatility: people moving (this was especially true for students and young scientists); and server names changed with URLs redefined as webmasters were becoming more "professional" – a typical maturing phase.

As explained in Publ. 117, Heck had to set up a few rules to ensure StarHeads' best level: entries were restricted to professional astronomers with a PhD and above; homepages were included only after being checked, authenticated, and sometimes refereed; advices for improvement were occasionally given; tips were issued for shaping professionally useful pages; a procedure, including systematic scanning of the database, was set up for checking periodically that the links were alive; new links were researched and entered into the database; individuals were systematically informed of their page's inclusion.

Such efforts were rewarded. For instance, ADS (see *e.g.* Eichhorn *et al.* 2003 & Publ. 363) decided to point towards the StarPages and in particular towards the database StarHeads. In practice, for each bibliographical reference retrieved from the ADS database[167], the world bibliographical reference for astronomy and related sciences, the author names were pointing towards StarHeads, enabling access to additional information on their profile, activities, and so on.

This, in turn, incited authors to set up personal homepages, and informative ones, and to submit them for registration or an update of the corresponding URLs.

Maintenance, Rights and Other Facets

From the above and from the complexity of Fig. 145, it is easy to infere that the maintenance of the Star*s Family products became a time-consuming work, carried out by our biographee at the expense of his evenings and weekends, in other words in extra time on top of his other activities.

> "The Star*s Family bottomline [was] to provide services for the benefit of a better communication within the world-wide astronomical community, and between it and the society at large, resolutely putting the emphasis on the quality, on the homogeneity and on the exhaustivity of the information delivered."
> [...]
> "What should be said to a young scientist who would like to initiate such a compilation activity? The first thing is that this should be done with the highest quality possible or not at all. The second point would be that this should be a secondary activity with however substantial amount of time available for careful maintenance. The third condition would be that the job be done by the scientist him/herself and not by being delegated to unexperienced clerks or technicians."
>
> (from Publ. 117)

[167] http://adsabs.harvard.edu/

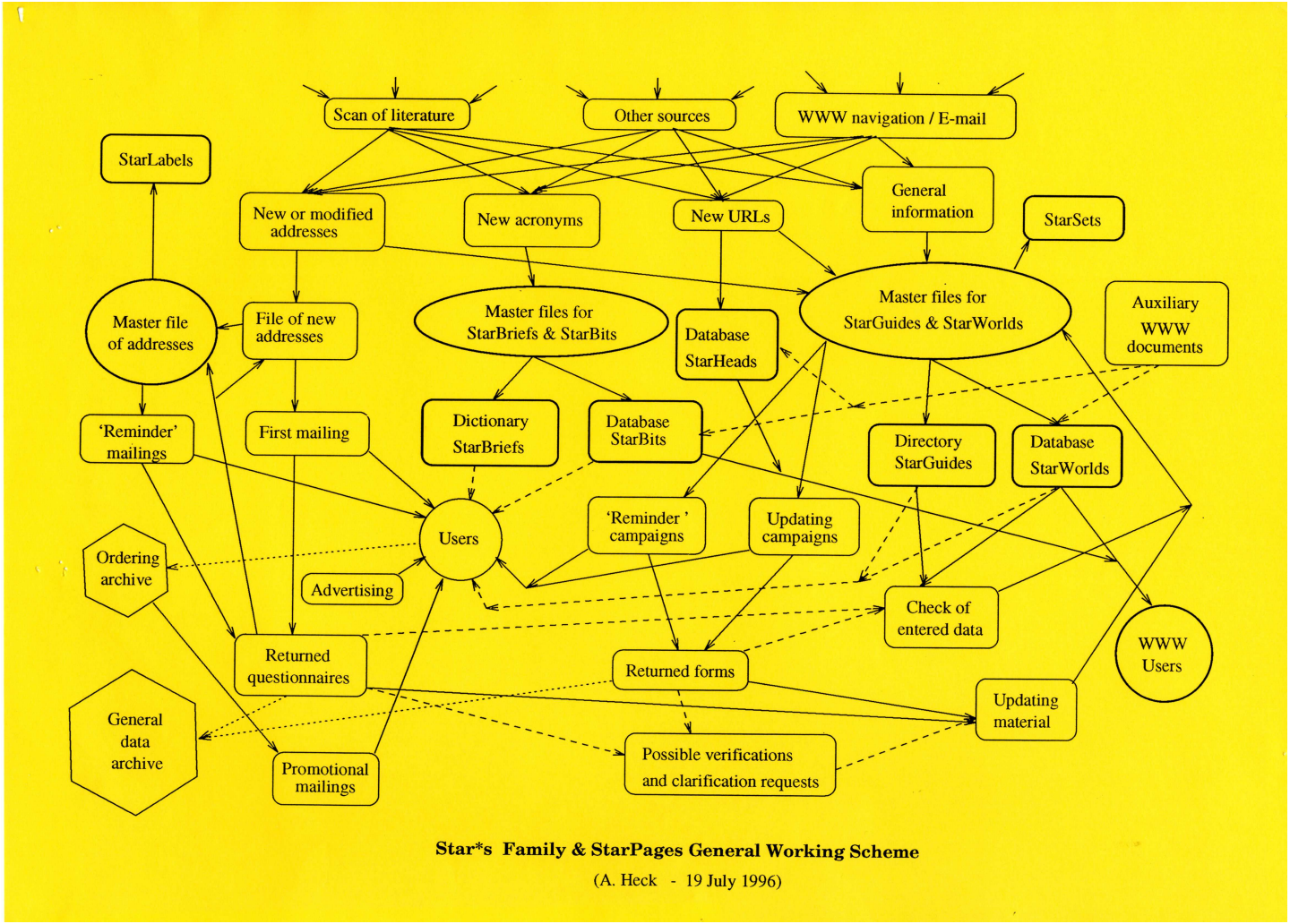


*Fig. 145: Maintenance diagram for the Star*s Family products, first collection of diversified media of astronomy-related organizational and individual data: paper (since 1978), electronic samples (1982), remotely accessible databases (1992), web resources (1993).*

Heck established working relationships with various organizations such as the Astronomical League (AL), the Committee for the Scientific Investigations of Claims of the Paranormal (CSICOP), the International Astronomical Union (IAU), the International Standardization Organization (ISO), NASA's Astrophysics Data System (ADS), the World Meteorological Organization (WMO), ...

Recognizing the personal involvment of our biographee in that work, initiated well before his arrival at Strasbourg Observatory (cf. p. 82 & p. 124), his successor at the directorship recognized his intellectual property of the data, ensuring him with the possibility and the means to develop, update and distribute them. In exchange, our biographee granted non-exclusive rights of distribution (Fig. 146).

Heck became quickly flooded with reports and products sent by the organizations to document their activities when returning the updating questionnaires for StarGuides and its web versions. Reports were useful to complement and sometimes to rectify the information provided on the forms. They were also a precious source for abbreviations and acronyms used in all kinds of experiments and projects that were in turn feeding the master data files for StarBriefs and its web relatives.

As (then) modern media were piling up on his desk, Heck launched in 1993 a new project, MediaTheque, a collection gathering together diskettes, CDs, video tapes, cassettes, and so on, that were offering material related to astronomy and space sciences (Publ. 286). MediaTheque can be seen as a spinoff of the Star*s Family updating campaings. After a couple of years (Publ. 291, 295, 305, 309 & 315), our biographee handed the project to someone else who unfortunately did not carry it much further.

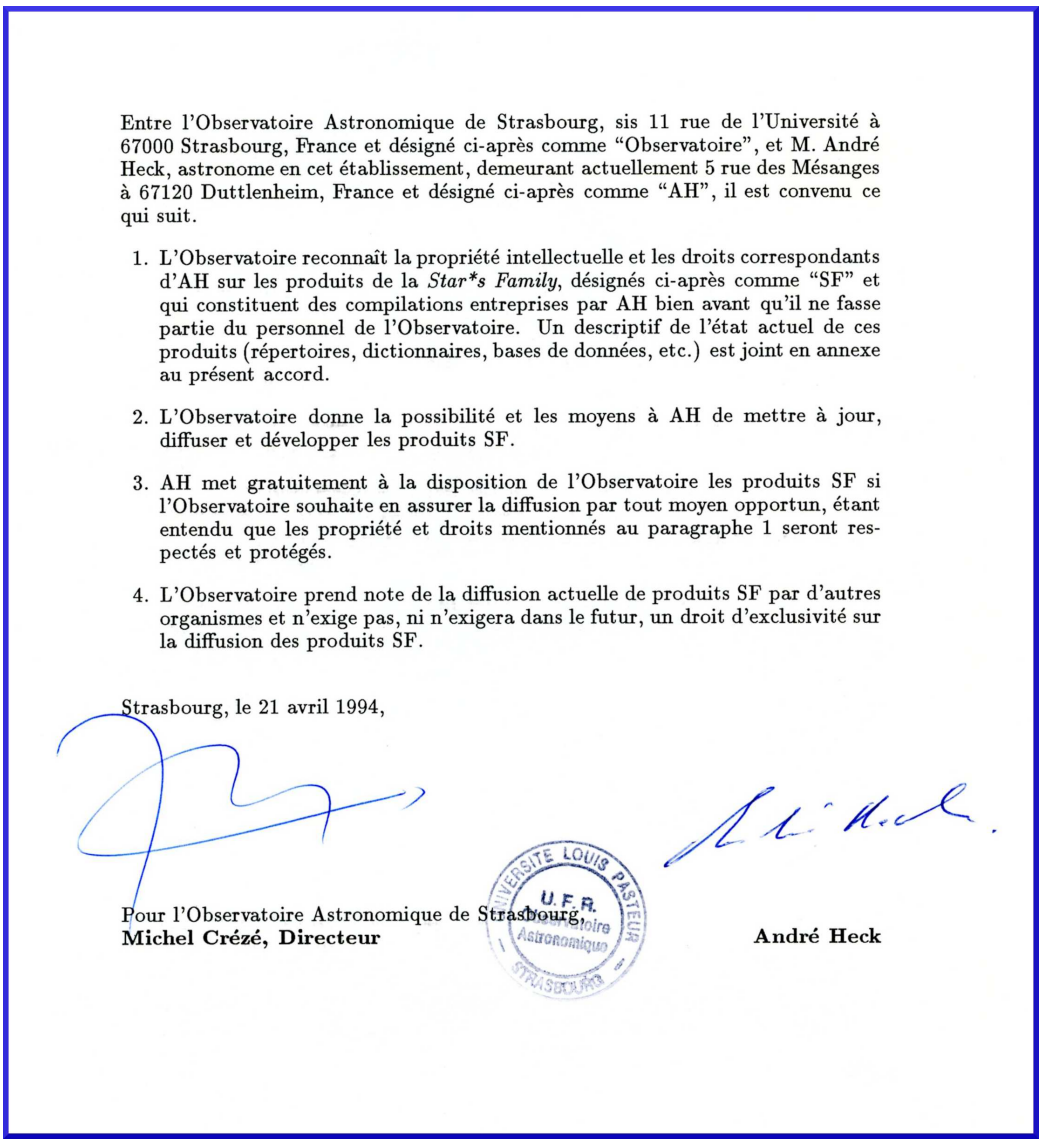
Heck was also a founding member of the AstroWeb consortium (Publ. 87, 294, 299, 304 & 311) building up a database made essentially of commented URLs of resources.

Our biographee had often to answer questions on whether or how the StarPages were related to AstroWeb and/or which resource was best. As explained above, the master data files for the StarPages predated AstroWeb by a couple of decades. They offered much more, and more diversified, information than AstroWeb, admittedly in a less visible way. The two resources were also structured and operated quite differently.

AstroWeb was basically a list of commented URLs while in StarWorlds all practical data had been systematically compiled, authentified and verified. The latter also included quite a number of organizations not yet on the web.

The fact that, in AstroWeb, the material was presented in long lists gave not only a feeling of plenty, but allowed a direct visible search through it. In the StarPages, the full master files were not made accessible as a protective measure for the individuals listed and against excessive download of material. The main purpose however was to enable queries via more flexible search engines.

In StarWorlds, the material retrieved was presented in an homogeneous way, with all practical information available on the organization(s) matching the search (Fig. 143). This was the result of daily maintenance, updating campaigns, and inclusion of validated information from signed and documented questionnaires. In AstroWeb, and because of the spontaneous on-line submission of URLs by third parties, the level was heterogeneous, not exhaustive, and sometimes questionable.



Entre l'Observatoire Astronomique de Strasbourg, sis 11 rue de l'Université à 67000 Strasbourg, France et désigné ci-après comme "Observatoire", et M. André Heck, astronome en cet établissement, demeurant actuellement 5 rue des Mésanges à 67120 Duttlenheim, France et désigné ci-après comme "AH", il est convenu ce qui suit.

1. L'Observatoire reconnaît la propriété intellectuelle et les droits correspondants d'AH sur les produits de la *Star*s Family*, désignés ci-après comme "SF" et qui constituent des compilations entreprises par AH bien avant qu'il ne fasse partie du personnel de l'Observatoire. Un descriptif de l'état actuel de ces produits (répertoires, dictionnaires, bases de données, etc.) est joint en annexe au présent accord.

2. L'Observatoire donne la possibilité et les moyens à AH de mettre à jour, diffuser et développer les produits SF.

3. AH met gratuitement à la disposition de l'Observatoire les produits SF si l'Observatoire souhaite en assurer la diffusion par tout moyen opportun, étant entendu que les propriété et droits mentionnés au paragraphe 1 seront respectés et protégés.

4. L'Observatoire prend note de la diffusion actuelle de produits SF par d'autres organismes et n'exige pas, ni n'exigera dans le futur, un droit d'exclusivité sur la diffusion des produits SF.

Strasbourg, le 21 avril 1994,

Pour l'Observatoire Astronomique de Strasbourg,
Michel Crézé, Directeur

André Heck

*Fig. 146: Agreement between Strasbourg Observatory and Heck on the Star*s Family rights signed on 21 April 1994: the Observatory recognized Heck's intellectual property of the data and ensured him with the possibility and the means to develop, update and distribute them. In exchange, our biographee was granting non-exclusive rights of distribution.*

Since they were submitted by the entries themselves, the comments attached in AstroWeb to the URLs were basically self-promoting and thus, in some instances, were lacking the objectivity desired in a scientific resource.

AstroWeb contained however some URLs (essentially of specific experiments or projects) that could not naturally fit within the StarPages. On the other hand, StarWorlds included full data on a significant amount of entries still without Internet presence and/or web sites. A significant number of URLs from the StarPages were downloaded into AstroWeb to help it taking off.

The success of the Star*s Family created envy not only by a couple of Strasbourg Observatory insiders who attempted to be associated while doing nothing relevant, but also by outsiders, individuals and organizations alike.

The tens of thousands of acronyms[168] in the StarBriefs/StarBits data files became a target for hackers aiming at setting up dictionaries or sites making money through side advertisements (cf. Fig. 147). The thousands of addresses (postal and electronic) in StarGuides/StarWorlds data files were a tempting prey for commercial companies, but also for ingenuous scientists. The malefactors could be local[169] or international[170].

Beyond limitations set to the volume retrieved and to the frequency of queries, Heck used the professional technique of seeding his files with detectors: acronyms of his own invention and imaginary organizations, all these being regularly modified and deposited by a law office. Finding a set of invented data in another resource would indicate an illicit copying or download of some sort. The detailed usage of the StarPages was monitored with the assistance of Ochsenbein.

The sets of mailing labels delivered were also seeded with a few addresses such that, when used, the material mailed by the customers would ultimately end in Heck's hands. This allowed checking that this material was in accordance to what had been declared when ordering the labels, in other words non-problematic nor polemical, and that the addresses were used only for this.

Hackers were threatened of legal proceedings and this was generally enough to keep them quiet. Commercial companies misusing the adresses had to pay additional compensations to the Observatory. In a couple of cases, Heck had to seek the assistance of the University jurist whose naivity made things worse.

As evidenced by the copies in Heck's archives, Strasbourg Observatory cashed substantial amounts of money from hundreds and hundreds of orders for the publications on paper and sets of mailing stickers, all produced on Heck's home equipment. Some of the orders amounted to about €10,000 apiece and others might have been even higher.

But at the Observatory, the general atmosphere was changing. In line with Heck's views for upgrading the place (cf. p. 185), new people and groups had been accreted.

[168] Up to about 200,000 entries in the last paper edition.

[169] The 11 August 1999 total solar eclipse induced a wave of misdemeanors, including illicit copying and usage of Heck's extensive collection of mailing addresses.

[170] Such as that US institution that made up a publication of its own with data strangely identical to StarGuides/StarWorlds ones and freely fitting (*i.e.* free of charge) the needs of a commercial company that had approached Strasbourg Observatory a bit earlier.

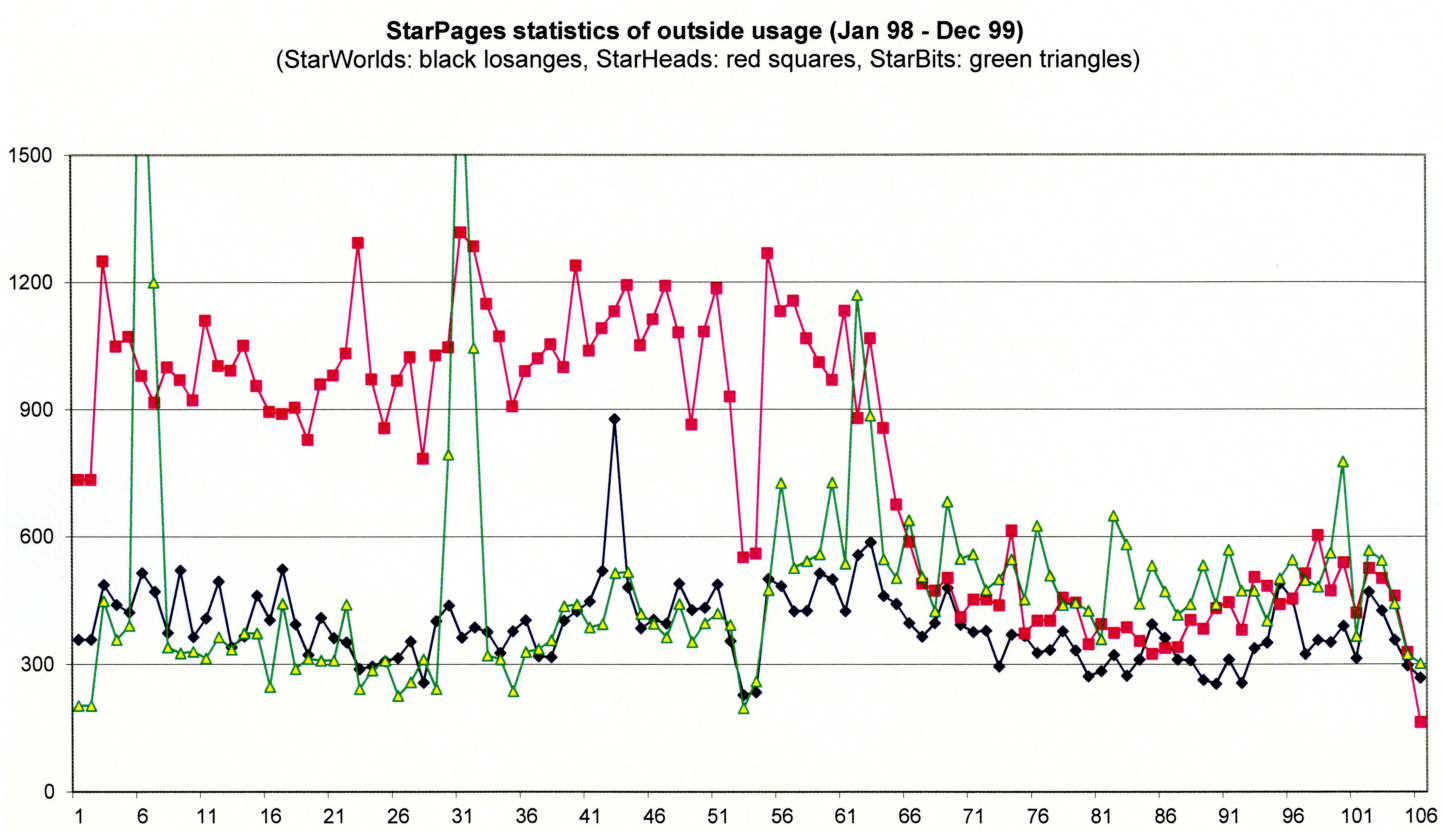


Fig. 147: StarPages statistics for the period January 1998 – December 1999 illustrating hacking episodes, especially in StarBits (green peaks). The abcissa measures weeks while the ordinate in hundreds of queries has been dynamically adjusted. Note the dips at the turn of year and the decrease of hacking after countermeasures were taken.

This included surprising personalities such as a particularly arrogant character who behave as knowing everything better than others, but in fact was ignoring history; or another scientist who, during years, was looking the other way when meeting our biographee in the gardens until finally emitting one day a few words about the weather.

> "On [precise date]", says Heck, "as a former Director of the Observatory, I was called to the University medical service. The physician in charge was worried at the number of complaints heard from Observatory staff members, some leaving, others asking for transfers, mentioning difficulties to sleep, showing signs of stress beyond acceptable limits, etc. She was trying to understand what was going on. I had no other choice than to explain this was resulting from a new management of the place. A few people had been talking to me too as one of the veterans of the house. I was myself experiencing a mobbing effect[171], but believing that I would give in, leave or ask for earlier retirement under such pressure was showing a poor knowledge of human psychology: it had just the opposite result, even if my medical environment was warning me of potential pejorative consequences."

The attitude towards Heck's handicap and activities substantially changed. In particular, the status of his Star*s Family work as agreed with Crézé was progressively disregarded. Delays in shipping the orders were increasingly frequent and longer.

When our biographee negociated the transfer of his data files to Kluwer, he could not access the money received by the Observatory. He wanted to devote it to the printing of a brochure gathering together the results of his historical research on earlier times of the house (see p. 260). It is true that the Observatory management had just produced then a glossy booklet ... with an incorrect name for the founder of the place *(sic)*.

Not being given the means to go on with his work as foreseen in the agreement with Crézé (Fig. 146), Heck approached the Mediator of the Republic, who in turn wrote to the University President. As this resulted in an interview set up at the University General Secretariat, Heck hired a lawyer, Jean-Louis Jung, ... who could not believe his ears when hearing the arguments put forward by the University jurist, including that Heck's Observatory office had been recently repainted.

Putting an end to the discussion as their interlocutors were obviously trying to make a fool of his legal adviser, Heck quipped that the obvious next step would be an attempt to charge him for the water and the toilet paper he was using when at the Observatory! The two had a debriefing lunch where they were shared between the ludicrous situation and the poor level of university approaches. Years later, the lawyer would still ironically ask Heck whether mentalities had improved at his working place.

Not quite, as we shall see in the following chapters.

For the reader unaware of the local university practices, it should be clearly stated that no scientist had ever been asked to finance the painting and furniture of his/her office, nor his/her consumables, all this being included in a bulk allotment for the general running of the premises.

[171] Mobbing is not a legal issue in France, contrary to other European countries (cf. 300).

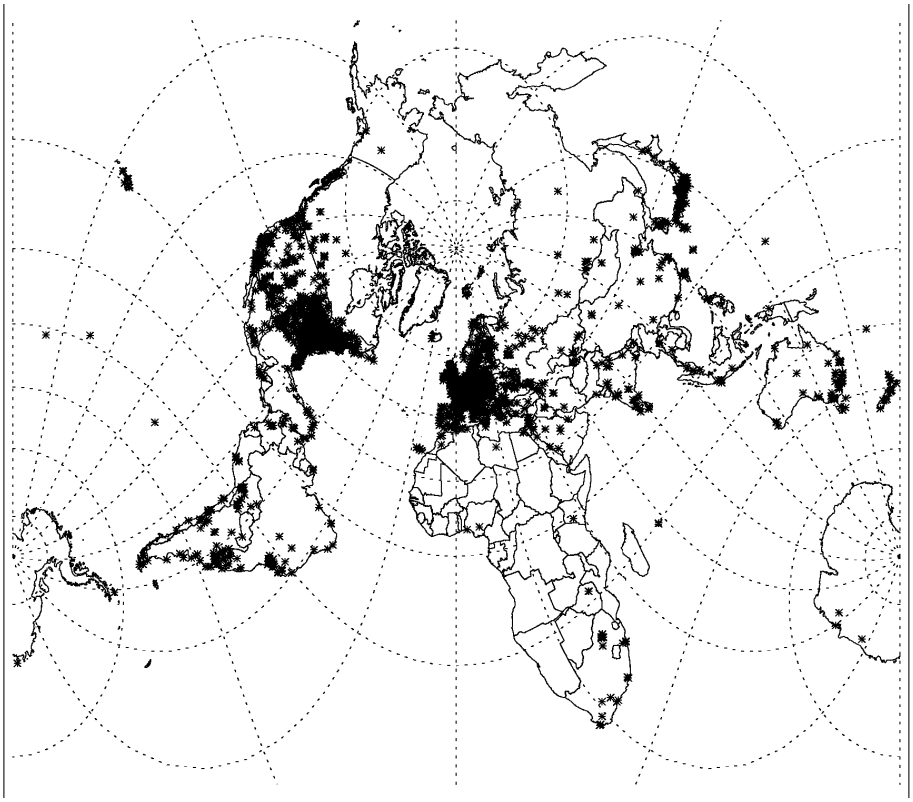


Fig. 148: Planet Astronomy: World (from Publ. 111).

It should also be added that, by then, apart from a modest contribution received by every Observatory scientist (not even covering a trip to the US), Heck was financing all his trips, missions and attendances to conferences, as well as his equipment and documentation from his own pennies (up to €35,000 yearly) while, in the Observatory activity reports, his numerous publications were associated without his agreement to a group which was not supporting him.

Our biographee was fortunate to receive more consideration from the income tax office than from his colleagues since he was allowed to declare professional expenses, something unusual for a civil servant.

Organizational Studies and Other Research

For Heck, the above incident meant the end of his time-consuming maintenance of some of the databases run at Strasbourg, preferring to devote himself to more rewarding editorial activities as we shall see in the following chapter.

He would nevertheless continue, for the benefit of all ADS users, to update StarHeads until his retirement. He also finalized two voluminous paper editions of StarGuides and StarBriefs published by Kluwer (Publ. 426, 427, 448 & 449, Fig. 140).

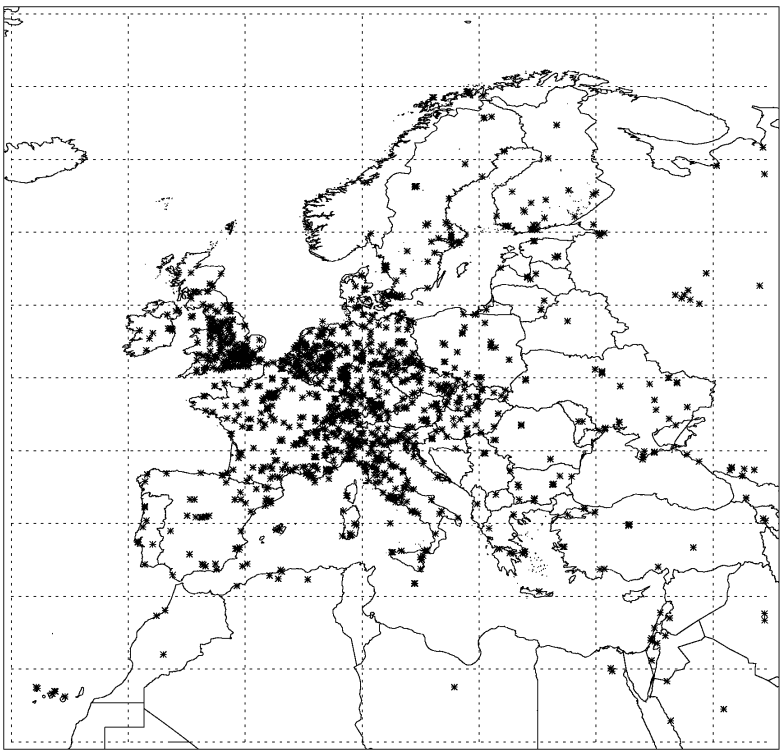


Fig. 149: Planet Astronomy: Western Europe (from Publ. 111).

With all the material he had compiled, Heck investigated a few features of astronomy-related organizations, all the more easily that the data had been standardized and homogenized as much as possible, enabling comprehensive and up-to-date samples leading to meaningful statistical results.

Hence our biographee studied the geographical distributions, ages and sizes of organizations. Results for professional institutions, associations, planetariums, and public observatories were presented, as well as specific distributions for astronomy-related publishers and commercial-software producers. See *e.g.* Publ. 104, 106, 107, 323, 324 & 330, but mainly Publ. 111 for a synthesis.

The highly uneven pattern displayed by geographical distributions (see Fig. 148 to 150) was still very much the same as it was in the early $20^{\rm th}$ century (Fig. 137), even if the densities were higher – another illustration of the well-known socio-economic effect of self-reinforcement. Other geographical peculiarities (local concentrations, national cultures and policies, electronic astronomy, ...) were discussed, as well as the uneasy separation between amateur and professional astronomers in associations.

Some events had a clear impact on the rate of foundation of astronomy-related organizations, such as World Wars I and II, the beginning of space exploration, the landing of man on the Moon, the end of the Cold War, spectacular comets, and so on. However, as detailed in Publ. 111, not all of them affected in the same way Western Europe and North America, nor the various types of organizations.

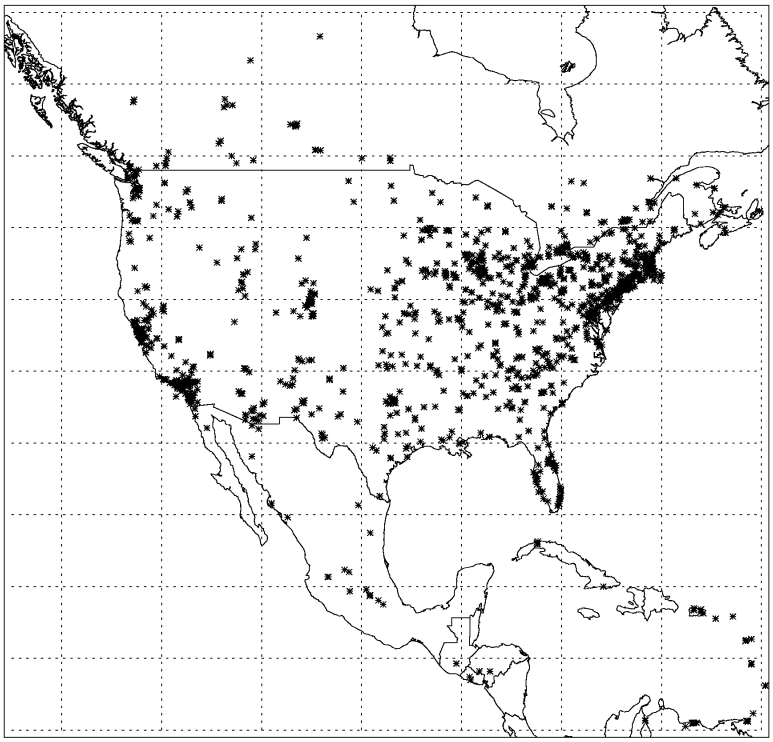


Fig. 150: Planet Astronomy: North America (from Publ. 111).

If the size of the vast majority of astronomy-related organizations was relatively small, there were however some differences between Western Europe and North America. Again, see Publ. 111 and the references quoted therein for details.

As illustrated in the list of meetings, especially for the year 1999 (p. 396), Heck was invited to talk about those matters here and there. Several public outreach magazines became also interested in the matter (*e.g.* Publ. 645 & 647). *Sky & Telescope* included a remarkably well illustrated paper in its January 2000 issue (Publ. 648).

In that magazine, Heck had published earlier a note (Publ. 641), also echoed in other outlets (*e.g.* Publ. 646), surfing on a craze of the time to "buy" stars. Our biographee suggested that astronomical institutions should instead offer to *adopt* celestial objects, creating both a financial income and an opportunity to educate the public at large. Such an idea was supported by other professionals of public outreach. In ending an excellent and comprehensive paper on the naming of astronomical objects, Jeanne E. Bishop (2004) came back at length to Heck's proposal:

> Heck suggests that "instead of posing as a shocked goddess," at the practice of forming a personal connection with an astronomical object, astronomers should take advantage of the interest that had been shown by people responding to the businesses which "sell stars". The astronomy community, says Heck, should build on public and student interest in astronomy by promoting the "adoption" (not the selling) of various sky objects. Heck concludes that supplying people who

> "adopt" sky objects with accurate and up-to-date information about their objects, including professional data and bibliographical references, and sometimes complete scholarly papers, combining all the information in a pleasing package, would cost little and be very educational. Heck enthuses, "I see kids and adults showing around information on the latest advances relating to their adopted objects." Heck believes that this mode of popularizing astronomy as well as accurate education of an interested sector of the public could create a large source of political and economic support for astronomy.
>
> Continuing his provocative discussion, Heck notes, "We should never forget that we Earth-based astronomers have no more right to name celestial objects than hypothetical beings living somewhere else in space. Our rules are no more than human-made naming conventions, recognized by our learned bodies, to avoid confusion and allow immediate identification."

As Heck had pointed at the data centers as the prime locations for developing such an activity, he was told bluntly by his Strasbourg colleagues that they "needed public funding" (taxpayers pennies) for their own ones and could not care less about such "business". In other words, "commercial" money was a dirty thing, even if it had an educational facet and if it could be easily obtained. Such a position could also explain why the money income from his Star*s Family products had been given little consideration by the new management.

Regarding the public funding of his own research activities, Heck had understood that this was hopeless from the French side as they were out of pre-defined channels – an illustration of the difficulty to develop pioneering work in new directions.

As to seeking support from the European level, it was so complicated that institutions had to hire administrative assistants almost fully dedicated to the involved paperwork for both applying and, if successful, for filling in reports at length that were probably archived without being read. The rules required also the association of representatives from countries whose motivations were sometimes questionable beyond touring Europe for attending meetings where their contributions were often irrelevant.

Heck nevertheless assisted his pal Murtagh in setting up a "network" of the European Science Foundation (ESF) under the name *Converging Computing Methodologies in Astronomy (CCMA)* (Publ. 307). They co-organized the first meeting in 1996 at the ESF premises in Strasbourg on the theme "Strategies and Techniques of Information for Astronomy" (Publ. 461). Heck also co-edited the proceedings of another CCMA meeting on "From Information Fusion to Data Mining" (Publ. 463), before leaving the group in Fall 1997 when it became evident that their interests were diverging.

In February 1996, our biographee had been most surprized to hear he had been awarded the Édouard Mailly Prize for the period 1992-1995 by the Royal Belgian Academy of Sciences, Letters and Fine Arts. The diploma (Fig. 210) was formally handed over to him on 11 January 1997 after a talk on electronic publishing in front of the Class of Sciences. The local Alsatian daily published a short note on the distinction (Fig. 152).

Heck progressively resumed travelling with all the needed precautions, skipping social events at conferences and resting whenever necessary.



Fig. 151: Heck and Fionn Murtagh (right) during the colloquium "Weaving the Astronomy Web" (WAW) co-organized by our biographee at Strasbourg Observatory on 06 April 1995.

Strasbourg: A. Heck à l'honneur

L'Académie Royale de Belgique a attribué le prix Edouard Mailly à André Heck, astronome à l'observatoire de Strasbourg. Le lauréat qui était d'abord chercheur à l'institut d'astrophysique de l'Université de Liège était un des membres fondateurs de l'observatoire installé en Espagne par l'Agence Spatiale Européenne pour l'exploitation du satellite astronomique IUE.

En 1983, M. Heck est arrivé à l'observatoire de Strasbourg qu'il a dirigé entre 1988 et 1990. Ses recherches portent surtout sur la méthodologie statistique et les systèmes d'informations. Plus récemment, il s'est fortement engagé en faveur du développement de la publication électronique dans la communauté astronomique.

Un observateur expérimenté

Théoricien, auteur de nombreux ouvrages et vulgarisateur actif, esprit toujours ouvert aux questions du grand public, M. Heck est aussi un observateur expérimenté, tant pour les observations au sol qu'à l'aide de satellites. En 1973, le lauréat a découvert une comète.

W.B.

Dernières Nouvelles d'Alsace S1 Politiq

Fig. 152: Article published in the local newspaper after Heck was awarded the Mailly Prize (DNA of 21 January 1997).



Fig. 153: As a reaction against his handicap and with all necessary precautions, our biographee took advantage of his trips round the world to fly all kinds of fixed- and rotary-wing aircraft from Alaskan fjords to Hawaiian volcanoes via the Arizonan canyons, from the Zambezi Victoria Falls to Mount Cook glaciers via the Australian Outback, etc. Especially good memories were attached to a Tiger Moth flight near Queenstown in New Zealand (top) and to a ride in a venerable "Tante Ju" (bottom) over the Rhine valley and the Black Forest.

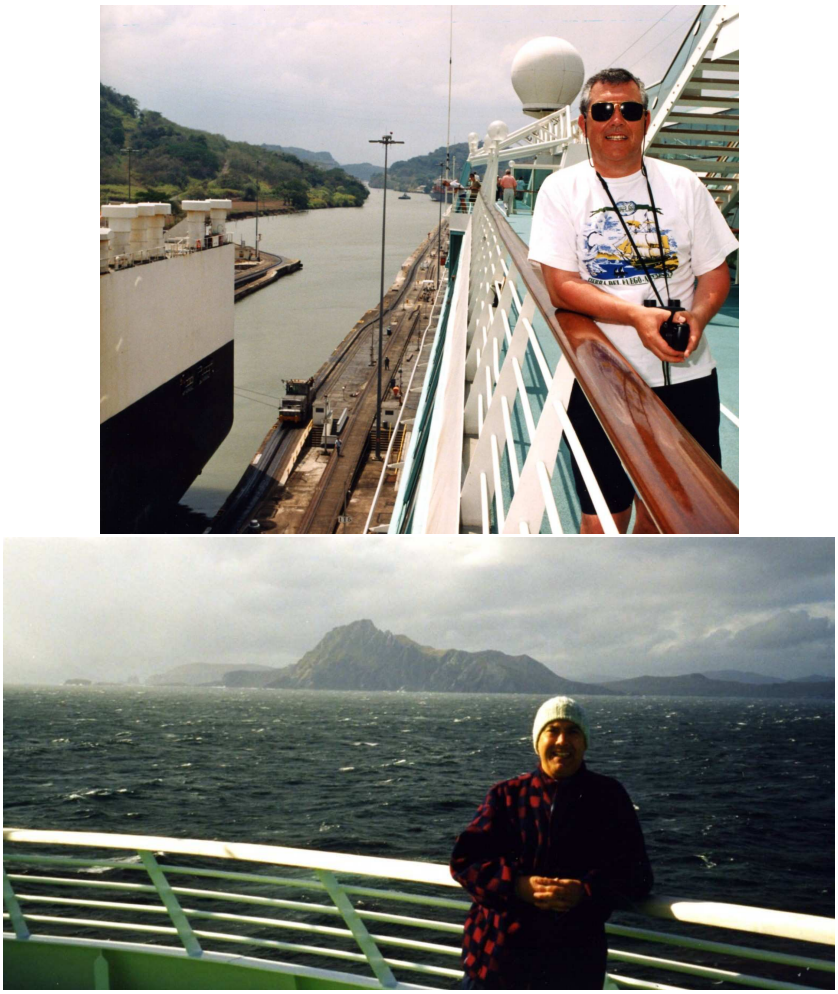


Fig. 154: Heck also cruised the oceans on big ships, such as from Sydney to Singapore, or passing Cape Horn several times (bottom), visiting on his way the Falkland Islands[173] *(Publ. 867) and the Chilean Southern fjords, later entering the mythic Valparaiso harbor. He also travelled all along the the Panama Canal before its broadening (top, when passing the Miraflores Locks with the Culebra Cut in the background). Those trips round the world were opportunities to meet astro-related artists and to collect legends with astronomical connotations for his public outreach papers.*

Well before this became easily practicable for the plain Earthlings, our biographee visited remote places – as a traveller, he insists, not as a tourist – merging with the local population as much as feasible. He took these opportunities to collect local legends with astronomical connotations. He echoed these in his writings for grand public that he resumed producing regularly in the mid-1990s, especially in the series *Potins d'Uranie*[174] under pen name. Several of these articles on legends were translated into German[175].

This was also the time when fictional characters multiply in the stories. The most recurrent one, pointed out by reviewers such as Manfroid (2014) and Dunlop (2015), was a Scottish seaman called Jim McCullogh. As Heck was explaining in an e-mail to Storm Dunlop (15 May 2015):

> The Scottish sailor JMcC that seemed to puzzle you was born in 1998 during one of my visits to Aberdeen, while leaning against the wall in Back Wynd in front of *O'Neill's* pub (see attached picture [Fig. 155], taken twelve years later – the street is now a taxi row and all the area has become much more touristic). JMcC was first mentioned in "Les trois soleils de McCullogh" [Pub. 778] (a pun in French that I would not dare explaining by e-mail) and became a recurrent character in the stories[176]. Most of his "adventures" are autobiographical. This character was loved by Swiss and Belgian readers. I appreciate that his appearance here and there in the Constellations book [Publ. 409] seems a bit mysterious. There were other characters appearing in my stories such as the futuristic chap Radomek Slizir[177], or the couple Bromak-Zalei[178] that I got arguing when I wanted to present two faces of a coin without having myself to take sides. Their names have again double meanings. Those chaps were also loved by readers and I wish I had written more stories involving them."

The names of all the characters introduced by Heck were indeed kinds of puns, sometimes multilingual ones, that it would be too laborious to explain here.

The first appearance of McCullogh in Pub. 778 was also an opportunity to advertize a recent book by his friend Biémont (1997). But the two fellows Bromak and Zalei, teasing each other and arguing on various issues, were born much earlier, in 1984, discussing the Search for Extraterrestrial Intelligence (SETI, Publ. 708).

The futuristic Slizir was used to warn of possible "drifts" by our society and of their future consequences. That approach was opening interesting perspectives that would have deserved more developments, had not been Heck absorbed by multiple activities in his particular context.

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[173] During the Falklands War (April-June 1982), the IUE R/As at Vilspa had sometimes to keep spirits from heating up between UK V/As and the Spanish personnel historically and culturally close to the Argentinian side.

[174] See *e.g.* Publ. 755, 757, 758, 763, 764, 770, 781, 782, 790, 792 & 798.

[175] Publ. 930 to & 933.

[176] Publ. 778, 812, 824, 829, 831, 839, 849, 854, 859, 861, 867, 872, 890, 899 & 922.

[177] Pub. 786, 800 & 895.

[178] Pub. 708, 725, 737, 777, 783, 804, 813, 818, 833, 837 & 843.



Fig. 155: The character Jim McCullogh took shape one day of 1998 when Heck was resting against a wall in Back Wynd (Aberdeen) in front of O'Neill's pub. This picture of the pub has been taken twelve years later. The street had become a taxi row in an area much more touristic and commercial.

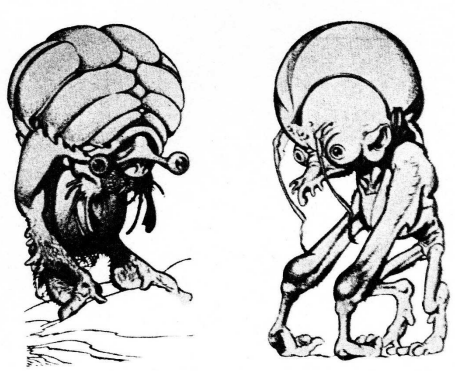


Fig. 156: Those two weird fellows illustrated the first appearance of the characters Bromak and Zalei in Publ. 708 when reprinted in the compendium of the Potins d'Uranie published by the SAL in 1985 (Publ. 925, p. 95).



Fig. 157: Heck fell in love with Beijing's Temple of Heaven as soon as his first visit to the city in December 1981, just when China was opening itself again. Even if Heck learned rudiments of Chinese, much of the communication process had to be done by gestures. And it worked! In Beijing for instance, just by asking a policeman demonstratively where to eat in 1992, he ended up with two colleagues in a local canteen eating typical Chinese food with local workers. The courteous and heart opening "Xièxiè" (Thank you) did marvels. In December 1981, Heck ended up in the wing of a Guilin hotel with the Chinese air force. Friendly exchanges took place via a few words of English and a couple of beers. In the same hotel, Heck's attention was attracted by a mysterious slit in the wall of his bathroom: an ill-copy in that Australian-inspired hotel for a disposal of razor blades. He also woke up next morning covered with long blond hair while he was certain to have spent the night alone. Obviously the sheets of the bed had not been changed from a previous user. His best memories from the Temple of Heaven date back from a Sunday morning of a later visit to Beijing when it was then allowed for foreigners to walk alone in the city. He sat not far from a group of elderly locals enjoying quiet sunny hours and singing in high-pitched voices accompanied by traditional instruments such as the long-necked two-stringed Chinese lute.

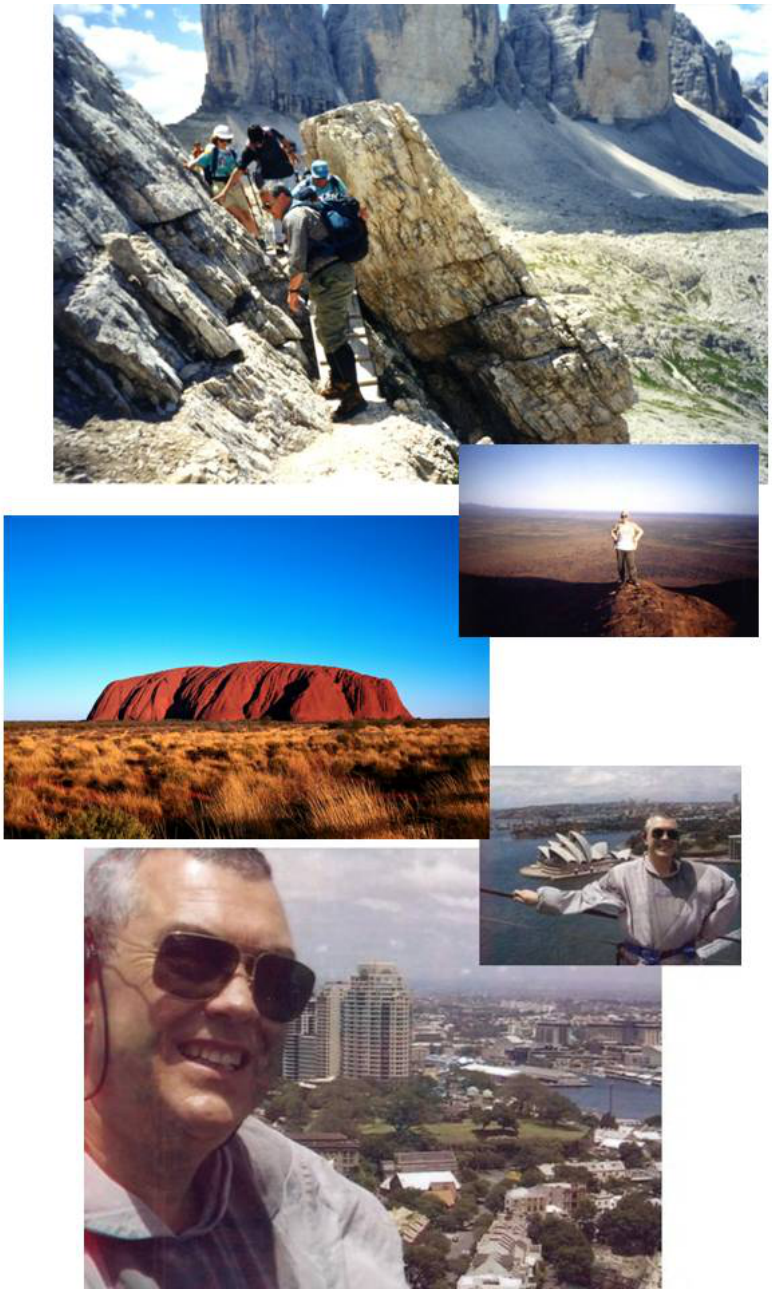


Fig. 158: All kinds of climbs. Upper picture: leading a group around the Tre Cime (background) in the Dolomites (30 July 1997). Middle group: on top of Uluru (aka Ayers Rock) on 08 March 1993, a large Australian sandstone rock formation (348m above surrounding ground) sacred to the local Aboriginal people, something that Heck learned after climbing it. He says that, had he known that beforehand and that climbing was discouraged, he would have hesitated doing it, just by respect. Lower group: Sydney Harbour Bridge has great views from the top of its arches, such as the city well-known landmark, the Opera House (small picture), while the domes of Sydney Observatory can be distinguished off center right of the larger picture (22 January 2000). See also Publ. 797.

Our biographee started also publishing papers on astronomy-related art pieces[179].

He attended two INSAP[180] conferences, in Malta and Palermo, where he presented respectively the works of Belgian Artist Paul Delvaux (Fig. 159) and some "ramblings through astro-art relationships" with findings in literature, fine arts and cartooning (Publ. 342).

Several reproductions of astro-art pieces are also illustrating the books he produced as well as the current volume.



Fig. 159: "Les astronomes" (The Astronomers) (1961), oil on canvas (155cm×255cm) by Paul Delvaux (1897-1994). For more on Delvaux and his astro-related paintings, see Publ. 767 & 910. (Private collection, by courtesy)

[179]See *e.g.* Publ. 762, 767, 768, 771, 776, 784, 787, 802, 820, 822, 830, 846, 850 & 910.
[180]Inspiration from Astronomical Phenomena.

The Editor-Catalyst and the Historian

At the end the 20th century, Heck had produced 112 refereed papers, some 200 secondary publications, about 260 articles of public outreach, plus 42 books, directories, dictionaries and atlases, all bearing the Strasbourg/France affiliation from 1983 onwards.

While still carrying a stick when hiking, Heck had gradually overcome some of his impair through patient reeducation. In September 1997, between an ADASS meeting in Sonthofen and a *Tagung* of the Astronomische Gesellschat (AG) in Innsbruck, he stayed in Grainau near the Austro-German border, at the foot of the Wetterstein Mountains.

The day after his 51st birthday, our biographee managed to climb unassisted the cliffs of the highest German peak, the Zugspitze (2962m, Fig. 160), something he had to forego when intending to do it with his pal Houbart at the age of 23 (p. 30). They had then to satisfy themselves with the lower nearby summit, the Alpspitze (2628m), the pyramidal symbol of Garmisch-Partenkirchen.

But the critical risk, a lethal CVA recurrence, was still very much there and would not disappear with age, on the contrary. Stress and conflicts had to be shunned. Obnoxious characters had to be avoided. Heck's disability had forced a reassessment of his priorities, an adaptation of his lifestyle, and a total reorganization of his activities. He had to shift them towards "quiet" ones, dropping teaching, lecturing, observing, as well as straining meetings of committees and panels of all kinds. He had fortunately that flexibility since his hiring in France fifteen years earlier had been unconstrained (cf. p. 146).

He thus felt free to keep busy at the best of his capabilities and had no reason to continue spending part of his time for a team that repeatedly failed to express a minimum recognition for what he had done, specifically establishing CDS on the world scene. By now, not only this group seemed to be struck by total amnesia, but the dissing of some of its members went much beyond what would be normally tolerated in academia[181].

Such a whiff of mobbing pushed our biographee into a protective working isolation, devoting himself almost entirely to publishing and editing. This was not only perfectly fitting his situation, but particularly suiting his tastes and abilities. He saw it as another opportunity to serve his community, especially by opening new pathes.

[181] In his private memories to be released *post mortem*, Heck expands on this with spy pen records including wordings especially unconceivable from characters who were received or who even slept at his home, and who had the ear of a new management not digging further.



Fig. 160: Heck managed to climb solo the Zugspitze (2962m elevation) the day after his 51st birthday starting from Grainau (758m) through the Höllental (filled by clouds left of center). Taken close to the Zugspitze summit with the back sticking to the cliffs on a narrow grip, the picture shows the Alpspitze (2628m) near the center. Garmisch-Partenkirchen is far beyond, also under the clouds. Part of the Waxenstein is visible on the left foreground. After a night spent in the Münchner Haus of the Deutscher Alpenverein, right on the Zugspitze, watching the magnificent sunrise over the alpine ridge the next morning gave Heck a peaceful sensation of relief after a particularly difficult decade following his CVA.

This was also giving the possibility to others to share their experiences and expertise in unusual matters, those that could not easily find their way through the customary publishing channels.

As we shall see hereafter, this was particularly well appreciated by the professional world outside Strasbourg while it was disregarded internally, except when was coming the time to put activity reports together and to make substantially longer the lists of publications of the house by including the profuse production of our biographee.

One could wonder why Heck did not quit Strasbourg Observatory in view of such a working environment. He already answered that (p. 226): he had no obligation to do so; he was at home in Alsace; his local and competent medical environment knew perfectly well his case; and, last but not least, he had no reason to yield to people wanting to push him out or to impose their views on his activities. Thus he decided to stay and to carry out his own projects, be it at his own expenses.

The recognition he would receive later on with the Stroobant Prize and his promotion to the Exceptional Class of Astronomers – the first one to reach that level at Strasbourg Observatory – proved that he had gone the right way.



Fig. 161: At the May 1997 Hipparcos conference in Venice, Adriaan Blaauw (1914-2010) somehow expressed regrets that, when ESO Director General, he did not hire Heck when he had the opportunity to do so back in 1970. Blaauw later wrote the foreword of the OSA 2 volume (Publ. 392).

Heck's experience in editing had substantially matured since the modest beginnings with the *ESA IUE Newsletter* (Publ. 450, Fig. 221) in 1979 and the proceedings of the IUE meetings in Spain in 1981/82 (Publ. 451/452, Fig. 234). He later took care of two other newsletters, namely one for the Working Group for Modern Astronomical Methodology (Publ. 453) that he had co-founded, and the other one for the IAU Commission 5 Working Group on Astronomical Data (Publ. 457) that he chaired from 1991 to 1994.

Over the 1980s/1990s, our biographee had organized or co-organized a number of meetings. He was then naturally involved in the edition of their proceedings: the two "Astronomy from Large Databases" conferences resp. in 1987 and 1992 (Publ. 454 & 459, Fig. 222); two *Journée de Strasbourg* events, resp. in 1989 on "Artificial Intelligence Techniques for Astronomy" (Publ. 455, Fig. 134) and in 1990 on "Fractals in Astronomy" (Publ. 456); his colloquium on "DeskTop Publishing in Astronomy and Space Sciences" in 1991 (Publ. 458, Fig. 132); the "Weaving the Astronomy Web" workshop in 1995 (Publ. 460); the two gatherings of the CCMA network, resp. in 1996 on "Strategies and Techniques of Information for Astronomy" (Publ. 461) and in 1997 on "From Information Fusion to Data Mining" (Publ. 463); the "Fifth Workshop on Data Analysis in Astronomy" in 1996 (Publ. 462) and finally a conference on "Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era" held in 1998 (Publ. 108 & 464, Fig. 162).

Next to these, edited books were produced: *Knowledge-Based Systems in Astronomy* (1989, Publ. 385) and *Intelligent Information Retrieval: The Case of Astronomy and Related Space Sciences* (1993, Publ. 387) with Fionn Murtagh; *Applying Fractals in Astronomy* (1991, Publ. 386) with Jean Perdang, all these illustrated in Fig. 134; and *Post-Hipparcos Cosmic Candles* (1999, Publ. 389, Fig. 241) with Filipina Caputo.

Together with a paper with John Fernley on statistical-parallax algorithms (Publ. 103), this latter volume closed a long period of Heck's interest in cosmic distance determinations initiated with his PhD work in the early 1970s.

Heck had attended the May 1997 Hipparcos meeting in Venice (Publ. 320), but amidst all the fuss from the expansion of the sphere for precise parallaxes and proper motions, he could not refrain from finding a substantial and unattractive *déjà vu* in many of the discussions. His own interests were now definitely elsewhere.

Incidently, during that conference, he was approached sympathetically by Adriaan Blaauw (Fig. 161) who somehow expressed regrets that, when ESO Director General, he did not hire our biographee when he had the opportunity to do so back in 1970. Well, this was an unexpected confession from an aging man. And this would have meant a quite different career for Heck!

The Information Flow

When in Grainau between the ADASS meeting and the AG GA, Heck had received on his 51st birthday his editor copy – sent by Kluwer via express mail – of the book *Electronic Publishing for Physics and Astronomy* (Publ. 388, Fig. 132), the editorial of which had been written three months earlier on a ship cruising the Panama Canal (Fig. 154). The last contribution had reached the Editor while speeding through the Caribbean Sea – one of the first illustrations of the shrinking world with the new communication technologies.

First published as a special issue of the journal *Astrophysics and Space Sciences*, this set of contributions had been rated so interesting that Kluwer had decided to have it also as Vol. 224 in its series *Astrophysics and Space Science Library*. It had the peculiarity to include chapters from publishers detailing their activities and projects in a book produced by a competitor.

In concluding his foreword, our biographee warned that there was "no simple thruth nor a single answer either to the various issues and challenges raised by EP [electronic publishing]", so one should not expect all the authors to be 'on the same wavelength', but that all experiences described in the volume were worth perusing and meditating.

Due to his pioneering reflection on the EP impact since his DeskTop Publishing colloquium in 1991 (p. 198), Heck had been an invited lecturer at various meetings such as ADASS'92 in Boston (Publ 79), LISA II in Garching (1995, Publ. 96), and the UNESCO/ICSU Press Conference on "Electronic Publishing in Science" (1996, Publ. 99).

Our biographee published review papers here and there too (*e.g.* Publ. 77, 98, 100 & 105). He was associated as an EP expert to the European Union DG XIII and also took part at various sessions of the Academia Europaea Working Group on Electronic Publishing (see *e.g.* Publ. 109).

All those contributions of his were not considering EP as an end *per se*, but putting it always in its context. For our biographee, EP was part of a broader approach going much beyond the essentially technical and algorithmic contributions of earlier books where the human component was also largely absent.

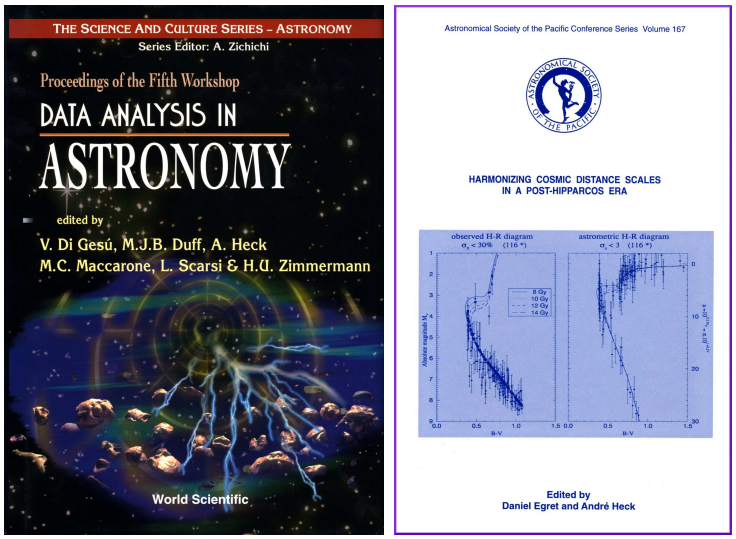


Fig. 162: Proceedings of the "Fifth Workshop on Data Analysis in Astronomy" held in Erice (1996, Publ. 462) and of the conference "Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era" held in Haguenau (1998, Publ. 464).

His vision was at the convergence of what he called flexible publishing, intelligent information handling and professional communication, as expressed in a series of papers (*e.g.* Publ. 91, 92, 97, 102, 298, 300, 303, 308, 316, 317, 319 & 333).

This is well illustrated by the following excerpt of Heck's article entitled "Information Handling in Astronomy" in the four-volume *Encyclopedia of Astronomy and Astrophysics* (Publ. 113):

> In a science such as astronomy, *information handling* encompasses data collection, analysis, and dissemination, as well as the way astronomers publish, interact, and communicate, including with other communities, with amateur astronomers and with the public at large. [...] The concept of *information* [covers] the observational material, the more or less reduced data extracted from it, the scientific results and the accessory material used by scientists in their work (bibliographical resources, yellow-page services, and so on), as well as the communications and publications of all kinds.[...] *Information handling in astronomy* thus reflects the way astronomers work and ensure progress of the astronomical knowledge which is then shared with colleague scientists as well as, on a less specialized level, with the significant community of amateur astronomers round the world (also a phenomenon proper to astronomy) and the public at large since cosmic perceptions have always been a fundamental component of human culture and philosophy. Astronomers are of course also deeply involved in education at all levels. [...] The information flow in astronomy is far from being a simple linear one. [cf. Fig. 133]

Heck felt that the field of astronomy was missing comprehensive compendiums with review papers covering the various facets of information handling.

Hence he conceived two edited books: *Information Handling in Astronomy* (2000, Publ. 390) and *Information Handling in Astronomy – Historical Vistas* (2003, Publ. 394), a historical complement putting the previous one in perspective (Fig. 163).

The first one was also completed on a ship, this time cruising the Coral Sea (Fig. 154) while the second one was dedicated to the memory of his former collaborator Gisèle Mersch (p. 68) who died prematurely in 2002. That volume featured also something that was going to become common in Heck's books: the reproduction of astronomy-related art works, in this case "The Emergence of Knowledge" by Corinne Gerling, on the book cover. Heck authored the opening historical chapter (Publ. 116).

As to the communication facet, our biographee had already published a few papers. His first paper in English (Publ. 133, cf. p. 34) was already containing the word 'communication'. Other contributions followed (Publ. 112, 115, 262 & 331), together with the inclusion of chapters by others on that theme in volumes already produced.

Heck associated himself with Claus Madsen from ESO for producing a fully dedicated book: *Astronomy Communication* (2003, Publ. 395, Fig 164), covering what could be done for astronomy by using all kinds of modern media. The Foreword was written by Helmut A. Abt (Fig. 167) who would become a frequent contributor to the books produced by our biographee[182]. Heck authored the chapter entitled "Astronomy Professional Communication" (Publ. 119). Two interesting paragraphs can be extracted from the Editorial:

> Books and papers have already been devoted to science-related communication in general. Is communication of astronomy different from what it is in other communities? Basically not, with perhaps two significant differences though: the astronomy community is rather compact and well organized world-wide; astronomy has penetrated the general public remarkably well with an extensive network of associations and organizations of aficionados all over the world.
>
> Accessorily, as a result of the huge amount of data accumulated, but also by necessity for their extensive international collaborations, astronomers have been pioneering the development of distributed resources, electronic communications and networks coupled to advanced methodologies and technologies often much before they become of common world-wide usage.

The problematics of astronomy communication was definitely in the air, together with the perception of the discipline by large audiences and its penetration in so far little-receptive areas of the world, such as developing countries. Refer to the big voids in the maps reproduced in the previous chapter (mainly Fig. 148). This had also been emphasized in popular articles such as the one published in *Sky & Telescope* (Publ. 648).

Dedicated conferences on communicating astronomy to the public were organized here and there, such as the June 2005 one in Munich (Fig. 165). Most of the organizers of such meetings and the related activists had contributed to Heck's volumes[183].

[182] See the Index of People pp. 551ff.

[183] See the many related papers in the table of contents of the edited volumes (pp. 497ff) and more specifically to Robson (2006) for the CAP genesis.

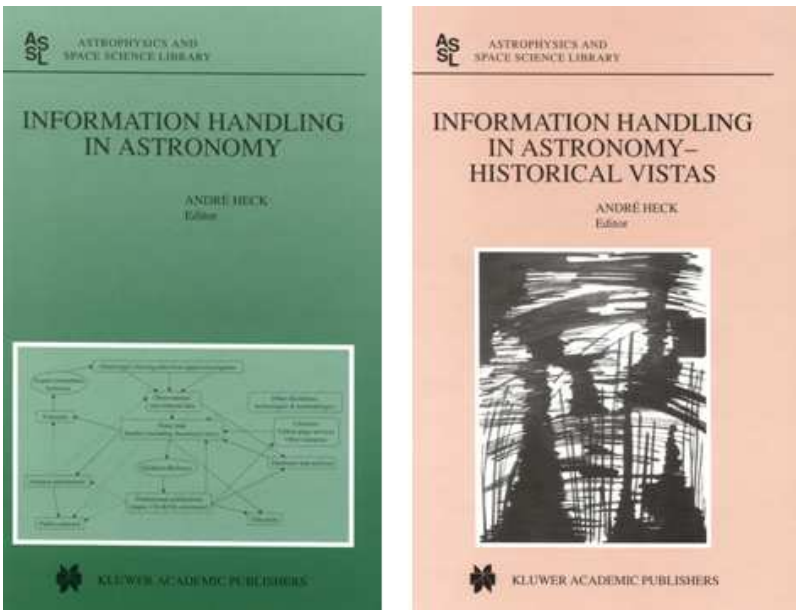


Fig. 163: Edited volumes gathering together invited chapters reviewing facets of information handling in astronomy (Publ. 390 & 394).

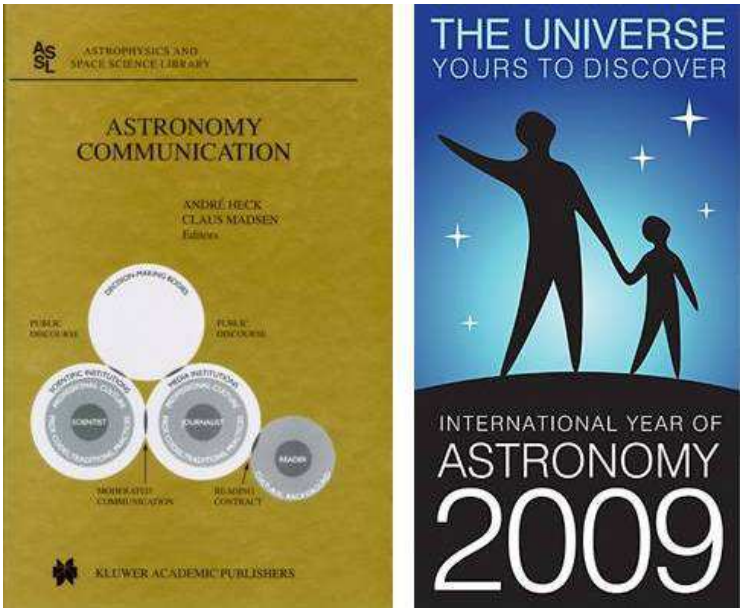


Fig. 164: The edited book gathering together review papers on various facets of astronomy communication (left, Publ. 395), together with the doublet "Information Handling in Astronomy" (Fig. 163) and the OSA volumes (Fig. 231), has helped catalyzing the reflection on the communication in astronomy ultimately leading to the International Year of Astronomy 2009 (left).

Madsen was also the key negociator for the advent of the International Year of Astronomy (IYA) in 2009 (Fig. 164), so it is not exaggerated to say that our biographee helped catalyzing the conception of all those events. He was actually invited to the IYA Opening Ceremony at UNESCO in Paris on 15 January 2009.

Although Heck gave his full support and provided visibility to the inspirators and animators of what ultimately became IAU Commission 55 on "Communicating Astronomy with the Public" (CAP) with a dedicated journal[184], he did not always feel easy with the approaches of some professionals who, as was saying ironically one of his colleagues, "manage to find their ego flattered in such public outreach activities of amateur level rather than by advancing scientific investigations".

While attending a conference in Cambridge MA in October/November 2005, Heck was interviewed by two students of the University of Roskilde (Fig. 166) on credibility and other issues. It is not the place here to reproduce all the quotes retained by the students in their final report (Nielsen *et al.* 2006, pp. 45-46), but our biographee summarized as follows his views on credibility in a book editorial (Publ. 125):

> *Credibility occurs if the message conveyed has been received as credible by the receiver* – which is no excuse for deliberate cheating or avoiding to chase out possibly misleading formulations. In other words, it is not enough to be honest: one is largely responsible to tailor messages in a way they are correctly received. And this applies externally as well as internally.

Heck's broad and varied interests led him to attend all kinds of events during those years (cf. p. 383): from the technical ADASS, ESLAB and SPIE conferences to the meetings organized by the American, British[185], French, German, and European professional societies, via forecasting workshops of the Academia Europaea, EU or CERN, the astro-art INSAP gatherings, the LISA colloquiums, not to forget the IAU General Assemblies and the world convention of historians of science in Beijing.

Various thematic meetings could also be mentioned, such as the 4S/EASST colloquium on "Worlds in Transition" in Vienna (Publ. 327) and the conference on "Light Pollution: The Global View" in La Serena (Publ. 118) where his presence in the final panel on the stage was motivated by Organizer Hugo Schwarz (1953-2006) with the comment that our biographee had "always an original fresh look and an unusual interesting approach of things". On light pollution, see also Publ. 338, 653 & 654.

Add to this a so-called "Texas Symposium" in Palo Alto, "Space Days" in Liège, a meeting on Chandra results in Cambridge, a conference on "Extragalactic Star Clusters" in Pucón to get an idea of the non-exhaustive list of Heck's diversified concerns.

Our biographee felt the need of going one more level up in the books he produced, by bringing all these themes together and recording the expertise of their actors for the future generations of historians, in other words by retaining a snapshot of how astronomy was living and advancing at the turn of centuries.

[184] Also at the later FPCA meetings our biographee organized as we shall see hereafter (p. 259).

[185] Heck watched the 1999 total solar eclipse from Alderney, a Channel Island, during the RAS National Astronomy Meeting on another Channel Island, Guernsey (cf. the certificate illustrated on p. 328)



Fig. 165: This poor-quality picture shows our biographee (standing, center) making some comments from the back of the ESO auditorium on 14 June 2005 during the conference "Communicating Astronomy with the Public" in Garching (Robson & Christensen 2005).



Fig. 166: Heck being interviewed by Danish students Nanna Torpe Jørgensen and Lars Holm Nielsen from the University of Roskilde on credibility matters for a project financed by ESA/HST on 03 November 2005 while attending a conference in Cambridge MA (Nielsen et al. 2006).

The OSA Volumes

Hence came to light a book entitled "Organizations and Strategies in Astronomy" (OSA). But it appeared quickly that more volumes were needed to cover all relevant facets. Thus OSA 1 was followed annually by six other volumes, a series ending provisionally with an impressive 600pp. compendium (Publ. 391, 392, 393, 396, 397, 399 & 400, Fig. 231). They would be later completed by a pair of OPSA volumes with more emphasis on the human factor (Publ. 401 & 402, Fig. 190, see next chapter). The presentation of the OSA volumes was well summarized in a letter published in the *Observatory* (Publ. 375):

> The range of subjects tackled in the seven volumes [...] (some 150 review chapters) has been quite broad: characteristics and strategies of astronomy-related organizations (globally and specifically, nationally and internationally), with a planetary sample including even Antarctica; recruitment and promotional policies; economy of activities; evaluation processes (proposals, individuals, institutions, etc.); policies for professional publications; bibliometric studies; evolving sociology of scheduling and coordinated observing; communication, and its diverse facets; series of astronomy-related conferences; interactions with other communities and society at large; and a long list of matters covering the astronomy-related life and context, in the spirit of sharing specific expertise and lessons learned. Rather than being devoted to the publication of hard-science results, the OSA volumes describe how astronomy research lives: how it is planned, funded and organized, how it interacts with other disciplines and the rest of the world, how it communicates, etc. [...]
>
> Thus the OSA series has been a unique medium for scientists and non-scientists (sometimes from outside astronomy) to tell of their experience and to elaborate on non-purely scientific matters – often of fundamental importance for the efficient conduct of our activities.
>
> As the initiator and catalyst of the series, it has been a privilege for [our biographee] to interact with the various contributors. These have also done their best to write in a way that is understandable to readers not necessarily hyper-specialized in astronomy while providing specific detailed information on their expertise and sometimes quite enlightening 'lessons learned' sections.
>
> The independent readers ('referees') must also be praised as they ensured prompt and constructive reading of the contributions. Their task was essentially to get the best out of chapters solicited from authors who did not always realize the extent of their own expertise, especially in the context of an unusual series in astronomy such as the OSA volumes. Some of them had to be encouraged to go as deep as possible.
>
> Remarkably, very few contributions – to be counted on the fingers of a hand – had to be turned down, mainly because their authors did not comprehend the purpose and level of the OSA series, or, in only one specific case, because the author refused, with an unrelated argumentation, to compromise with the reasonable requirements from an independent referee seconded by the editor.



Fig. 167: Illustrating the dramatic increase of astronomical literature over the 20th century, Helmut A. Abt, then Editor-in-Chief of the Astrophysical Journal, is standing next to stacks of that professional publication. Abt became a recurrent contributor to the volumes produced by our biographee. (Courtesy NOAO)

> Each of the OSA volumes offered an updated bibliographical list of papers (from 1990 onwards) on socio-astronomy and on the interactions of the astronomy community with the society at large[186]. [...]As illustrated by a histogram included in OSA 6's Editorial[187], the global number of astronomy-related papers on organizational, strategical and socio-dynamical issues is growing more than steadily, reflecting increased interest. Years ago, the term 'sociology' carried a negative connotation in hard-science circles where only bibliometric counts were barely accepted. As exemplified by the above diversification, the overall approach has now evolved and matured. The OSA volumes have contributed to this and the distinction received by the Stroobant Prize must be echoed over all contributors.

As illustrated in the citations (p. 348), the OSA volumes were very well received. In line with their contents authored by major players of the organization of astronomy worldwide, the volumes had a foreword written by a grandee of astronomy, respectively Léo Houziaux, Adriaan Blaauw, Roger Cayrel, Derek McNally, Caty Pilachowski, Catherine Cesarsky and Roger-Maurice Bonnet. The various chapters were rated most useful by both students and professionals as a complement to their scientific training for a better awareness of the context of their activities.

[186] Publ. 329, 335, 340, 345, 347, 357 & 364.
[187] The editorials of the seven volumes are to be found in Publ. 120, 124, 125, 328, 334, 339 & 344.



Fig. 168: Bob Stencel waving to Heck's camera in front of Mt Evans Observatory (USA-CO, 4305m elevation) on 30 May 2004. The temperature was then about -25°C. Within an hour, a blizzard would rage over the whole site, forcing the rangers to close the mountain road. Stencel contributed with a chapter to the OSA 6 volume (Stencel 2006).

Some of the volumes included also reproductions of astro-related pieces of art[188]. A dedicated chapter to Space Artist Ludek Pesek appeared in OSA 5 (Cramer 2004). Heck had always been interested by the impact astronomy could have on the artistic creativity, hence his attendance to a couple of INSAP conferences and the inclusion of dedicated chapters on those events in the OSA 1 and OSA 7 volumes (White 2000, Bolt 2006).

Our biographee offered visibility to astro-related artists in quite a number of his public outreach papers, mainly in the column *Potins d'Uranie*[189]. Conversely he thought that professional astronomers should be alerted on what their activities triggered in art-oriented minds.

Heck also carried out a survey on creativity in both scientific and artistic circles worldwide (Publ. 114 & 652), mainly illustrating that there was no unique creativity process, with however many similarities between artistic and scientific approaches.

[188] See details in the caption of Fig. 236 on p. 460.

[189] See *e.g.* Publ. 725, 751, 762, 767, 768, 771, 772, 776, 782, 784, 787, 788, 789, 805, 812, 820, 822, 830, 846, 850, 882, 892 & 910.



Fig. 169: A heavily sweating biographee is visible here in a shelter for terracotta soldiers near Xi'an. This picture was taken on 01 August 2005 by Marvin Bolt from Chicago's Adler Planetarium. Bolt later contributed to the OSA 7 volume with a chapter on the INSAP V conference he organized (Bolt 2006).

The Stroobant Prize

On 15 December 2007, Heck received the Paul and Marie Stroobant Prize from the hands of Léo Houziaux, Permanent Secretary of the Royal Belgian Academy (Fig. 170).

According to the Academy press release (p. 346), the international jury distinguished our biographee for his "impressive professional production and in particular for his pioneering series of volumes entitled Organizations and Strategies in Astronomy". The diploma (p. 329) as well as the jury made also reference to his scientific work.

In an amusing anecdote (well, perhaps not so much on the spot in front of guns), Heck tells that, after leaving Brussels very early the day after the ceremony at the Academy, he was stopped in full darkness on an empty Belgian highway by a customs squad for what was announced as a routine check. When leaving the Mercedes passenger compartment for opening the trunk, our biographee had however the unpleasant surprize to see pistols pointed at him.

Pretty irritated, and after telling the officers he was no drug dealer but an innocuous scientist, Heck opened the trunk revealing the large-size Academy folder with the award diploma he had placed over the luggage to avoid damaging it. "In fact, he added showing a couple of packs of bottles, the only thing I am trafficking is mineral water from Spa[190]." The customs officers became so confused that they did not check the suitcases, nor even ask for identity or car papers.

[190]Natural water of his native High-Plateaux (cf. Fig. 1) and unavailable in France.

The Stroobant Prize had in fact honored Heck's original editorial work.

Heck had opened the pages of his books to quite a few of his fellow editors: for instance H.A. Abt for the *Astrophysical Journal*; Cl. Bertout, H.J. Habing, J. Lequeux, G. Meynet and Aa. Sandqvist for *Astronomy & Astrophysics*; A. Cirou for *Ciel et Espace*; N. Cramer for *Orion*; R. Ferlet for *l'Astronomie*; J.L. Linsky for the *AAS Newsletter*; P. Murdin for the *Encyclopedia of Astronomy and Astrophysics* and for the *Monthly Notices of the Royal Astronomical Society*; L.J. Robinson for *Sky & Telescope*; A. Schubert for *Scientometrics*; J. Staude for *Sterne und Weltraum*; D.J. Stickland for the *Observatory Magazine*; and J.C. White II for *Mercury*.

Refer to the Index of People (p. 551) or to the tables of contents of the books (p. 497) for the details of the respective articles from those contributors. Of course, other related issues such as publishing policies, impact factors, etc., were also tackled in other chapters. Heck's own experience with editing is well outlined this excerpt from his editorial of the OSA 4 volume (Publ. 344):

> Editing books is a gratifying experience, albeit a humbling task.
>
> The conception of a volume, the research of and the contacts with potential contributors, the subsequent, sometimes laborious, interactions with authors and referees, the work with safety margings in an optimized schedule involving other components of the publishing chain, the strict deadlines to get the masterpiece out in time for big events, etc., all the successive steps are often both exciting and stressing. Not infrequently, editors swear, when delivering the material for a book to the publisher, that they will never undertake such an endeavor again. But, struck by the virus, they do not need much time to launch new projects ...
>
> The rôle of editors and referees involved in journals and magazines has already been discussed in these volumes. [...] In edited books, the task is essentially to get the best out of chapters sollicited from authors initially approached for their expertise[191] and a contribution is very rarely turned down.
>
> Of course, there are sometimes difficult cases requiring psychology and diplomacy. *Prima-donna*-like behaviors, leading to psychodramas, are seldom met. More worrisome is the increasing proportion over the years of no-shows and failures to provide formally committed contributions. Reasons for such a significant trend remain unclear. Overload of work? Quickly changing priorities? Conflicting channels for visibility and career progress? Decreasing sense of responsibility regarding commitments or word given? Here are a few questions for sociologists of science.
>
> Authors do not always realize the extent of their own expertise, especially in the context of an unusual series in astronomy such as the OSA volumes, and they have to be encouraged to go as deep as possible. There is sometimes a tendency to spend too much time on presentation details or to interfere with typesetting

[191] Other criteria are applied too, sometimes *a contrario* such as the ability to meet deadlines and to write in proper English (although this editor, as many of his colleagues, occasionally re-writes valuable contributions when delivered in poor language). Balancing themes and geographical coverage is also part of the policy, whenever feasible, for the OSA series.



Fig. 170: Heck holding the Stroobant Prize diploma next to Léo Houziaux, the Permanent Secretary of the Royal Belgian Academy (15 December 2007). See Fig. 213 for a closeup of the diploma and p. 346 for the Academy press release. (Courtesy J. Schnitzler)

prerogatives of editors and publishers. The function of publication professionals to improve the impact and the "sexiness" (in editorial meaning) of the various contributions – while leaving untouched their very substance – is not always fully understood.

Conversely, in spite of their qualifications, editors cannot be competent in all aspects of the fields they are dealing with. They might sometimes meet difficulties to ensure the books they produce cover adequately the corresponding themes. [...] Quality is also in details. Getting *ad hoc* advising might be a challenge. This is typically one of the rôles devoted to editorial boards, but there are many ways to see an editorial board: from people with oily hands actually working together as a team towards a specific publication, to a list of name-giving well-known specialists patronizing a series; from a group of senior scientists acting as relays for their sub-disciplines, students and friends, to board members acting as parapets and verifiers for an essentially lone editor-in-chief. What is the best scheme? There is certainly no golden rule and, apart from what can say again sociologists of science, it is certainly up to each venture to find the optimum formula for itself.

The last step of the publication chain is the distribution of the book which implies 'sales', a dirty word for some scientific circles. For some mysterious reasons,

> astronomers always seem to expect to receive things for free or cheap[192]. But exactly because the astronomy community is small, the circulation of professional astronomical publications can only be small and prices of commercial products cannot be brought down as much as one would hope for.

Our editor had sometimes to get authors to realize how important it would be to share their expertise in an unusual series of volumes, not only for history, but also for their own colleagues in a kind of fourth-cycle education.

The Academy press release (p. 346) is quoting Heck as extending the honor of the Stroobant Prize to the various contributors to the books he produced. In his editorials, our biographee thanked also systematically the people at the publishing companies who "enthusiastically supported" or who "quickly understood the interest of such a volume and enthusiastically agreed to produce it".

Heck published almost all his volumes with same house. Initially called D. Reidel Publishing Company in the 1980s, it became known as Kluwer Academic Publishers in the 1990s until merging with Springer in 2004.

Interestingly, in his editorial for "The Multinational History of Strasbourg Observatory" (cf. p. 262), Heck thanked people at Kluwer while the book actually appeared under the Springer label, the practical changes having taken place between the delivery of the compuscript and the material production of the volume. But series such as the *Astrophysics and Space Science Library* persisted through all those name mutations. Volumes OSA 1 to 5 are bearing Kluwer, while OSA 6 & 7 carry the Springer logo.

The acquisition editors with whom Heck interacted stayed also in position. Among these, we see that, in the editorial of Volume OPSA 2 (Publ. 131), Heck is thanking "Harry Blom and Sonja Japenga at Kluwer, later Springer after the merger of the two companies, who were instrumental in launching and keeping running the initial OSA series" (Fig. 171).

For outsiders to the academic publishing world, it should be made clear that this was no money-making business. If the scientific editor and the contributing authors benefited from a 30% discount on almost all Kluwer/Springer books, the royalties were meager, often used by our biographee to pay for color illustrations beyond the allowance of three in the first volumes. Heck often paid from his own pennies for illustrations from authors with financial difficulties when he thought that those figures would substantially gain by being reproduced in color. And by no way could the royalties cover the trips or even only the detours made by our biographee to attend conferences, to cultivate contacts, to lobby authors and to secure contributions to the books he conceived.

A few words are also in order to pay tribute to the various editors of popular magazines with whom Heck interacted for his continuing public outreach, such as Noël Cramer (*Orion*, Fig. 172), Jean Manfroid (*Le Ciel*, Fig. 90 & 118), M.C. Paskoff (*l'Astronomie*), and Leif J. Robinson (*Sky & Telescope*, Fig. 172).

Heck himself was a member of several editorial committees as listed on p. 340.

[192] This comment could be put in parallel with the discussion by Albrecht (2003) about astronomers abhoring commercial software packages also for some unclear reasons.



Fig. 171: Heck published most of his books through Kluwer/Springer's Editors Sonja Japenga and Harry Blom (here at the 2004 JENAM in Granada).



Fig. 172: With "Sky & Telescope" Editor Leif J. Robinson on Gozo during the INSAP II Meeting on Malta (13 January 1999) and with "Orion" Editor Noël Cramer at Ridal Mount during the IAU GA in Manchester (14 August 2000).

Where was Publishing Going?

In a rationale launching a new conference organized with the collaboration of Houziaux and to be held on 10-13 June 2007 at the Royal Academy in Brussels, Heck reminded a few facts, asked questions and listed challenges (see *e.g.* Publ. 368):

> Fifteen years after the first international meeting on electronic publishing (Strasbourg, October 1991[193]) from which originated many of today's materializations and collaborations in the field, where do we stand? Electronic mailings and web postings have profoundly changed the way our community works and communicates, but when the time comes to publish refereed documents, we are still mainly producing electronic versions of documents printable or otherwise available on paper instead of practising full electronic publishing.
> Why is that? While maintaining a diversity of media is certainly desirable, are there technical barriers (for instance at the level of archiving) to going fully electronic for our verified knowledge? Are there sociological limitations in a scientific community known for being usually at the leading edge of the related technologies? One of these limitations might be that, down to the real rating, evaluation committees (of programmes, of individuals, of institutions) primarily take into account refereed "papers" available through traditional channels. Should not the evaluation processes reflect the complementarity of the various media?
> Commercial publishers are coming up with new publishing models. What are these and are we heading their way? On the other hand, authors/editors are delivering today finalized/immediately publishable material, but it can sometimes remain sitting for months with publishers or subcontractors not always producing satisfactory results. The question of rights is sometimes raised too as commercial publishers are reselling at high cost information to institutions from which it originally came. What role could learned societies play in this context? Should we accept proposals for community-supported minimum-work wiki-like servers? Are we ready for Open Access? And, if so, for which publications?
> Bibliometric tools, mainly citation-based ones, have been multiplying of late. What are they measuring exactly? Should we opt for specific ones or for several, each adapted to specific needs? Should we develop other evaluation criteria?

That meeting, entitled Future Professional Communication in Astronomy (FPCA), was mainly directed to editors, publishers, librarians, archives managers, officers of learned societies, as well as scientists involved in professional publishing and in evaluation processes.

Twenty-five participants including representatives of all major astronomy-related publishers and professional journals (Fig. 175) – for the first time gathered all together – presented their activities and projects for the future (Publ. 465). A good summary of the conference can be found in an *Observatory* paper (Publ. 376).

[193] Heck's DeskTop Publishing Colloquium (p. 198).

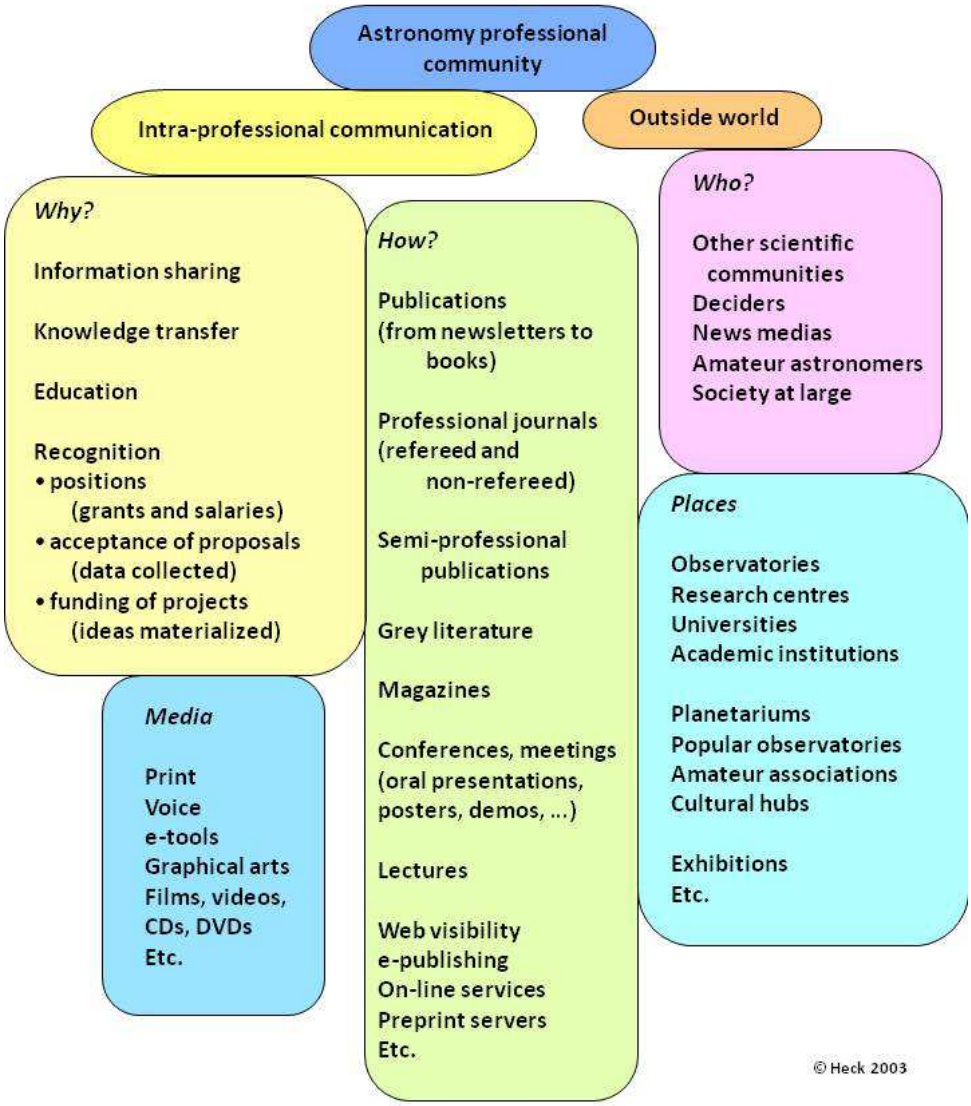


Fig. 173: The astronomy-communication process (reproduced from Publ. 127).

Heck opened the meeting with a paper outlining the astronomy-communication process (Fig. 173) and summarizing questions and challenges (Publ. 127). His complaint of the publishing astronomer (Fig. 174) triggered interesting comments from the subsequent speakers.



Fig. 174: Heck's Complaint of the Publishing Astronomer (medley/old ditties). (Extracted from Publ. 127)

While emphasizing the necessary complementarity of media, he wondered about possible sociological limitations (among others, at the level of evaluation committees?) responsible for the fact that scientists were still mainly producing electronic versions of documents printable or otherwise available on paper instead of practising full electronic publishing for the verified knowledge (refereed papers, mainly).

As no clear business model for the future could be extracted from the discussions, Heck felt the need of at least one follow-up meeting. An FPCA II took place at Harvard-Smithsonian Center for Astrophysics on 13-14 April 2010 (Fig. 175). It was attended by 44 representatives from the major astronomical publishers and learned societies, editors, librarians, scientists, as well as by archive and information system managers. The proceedings (Accomazzi 2011) gathered together most of the talks, including the opening comments by Heck (Publ. 128) and the keynote address by John P. Huchra (p. 261).



Fig. 175: Two colloquia were organized on the "Future Professional Communication in Astronomy": in 2007 at the Royal Academy in Brussels (top left) and in 2010 at Harvard-Smithsonian Center for Astrophysics in Cambridge MA (bottom).

In the framework of our story here, it is interesting to reproduce the following excerpt from Accomazzi's editorial of the FPCA II proceedings:

> Both this colloquium and its precursor, FPCA I, were the brainchildren of Prof. André Heck, who, as the prolific author of over 1,500 papers[194], knows a thing or two about scholarly communication. Over the past two decades, André has authored and edited several seminal books about the sociology of organizations and collaborations in astronomy and related fields. This colloquium and book would not have been possible without his intellectual and material contribution, for which we are all very grateful.

But Heck was no more satisfied with that meeting than he had been with the first one. Many technical and immediate issues had been tackled, but no long-term business model making sense had been put forward.

For the anecdotical records, the FPCA II closing day was also the time when the Icelandic volcano Eyjafjallajökull was the seat of an explosive eruption, throwing volcanic ash several kilometers up in the atmosphere and disrupting air traffic for about a week over Northwestern Europe and the Northern Atlantic Ocean. Many European FPCA II attendees had a forced extended stay on the East Coast.

Our biographee had to find a way to make up for a shortage of his medicines and to postpone his departure from Boston/Logan, initially scheduled on 17 April, till 22 April when Lufthansa could resume the flights to Frankfurt am Main.

Historical Investigations

Heck has always been interested in history. His still has big holders with hundreds and hundreds of pages filled in his teenager handwriting with notes copied from old documents about the history of his native village, as well as with sketches of coats of arms from tombstones in the old wall surrounding the church. The local authorities at that time did not care about such things and those relics seem to have been crushed to gravel when the church surroundings were modernized and repaved.

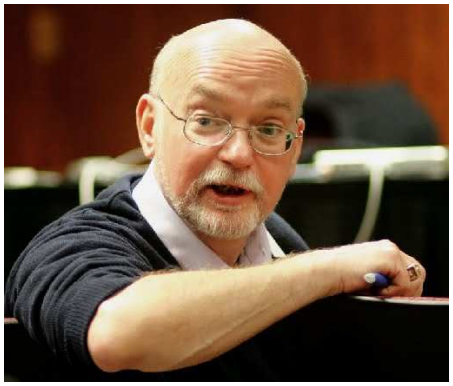
Even if presented along the concepts prevailing in the immediate post-WWII period, the history books lent by the primary school in Jalhay were also a source of inspiration (cf. p. 128).

During his years at ARV, Heck was lucky to retain the same history teacher, Germain Catoul. Feared for his terrible fits of anger when a pupil was getting on his nerves, this excellent professor was always, in his impressive talks, putting history in context, showing also how the Prince-Bishopric of Liège – then covering parts of four today's countries[195] – influenced and was itself influenced by events in the neighboring states.

Rigor, exactness and precision within nuanced complexity was definitely what Heck retained from Catoul's teaching for what should characterize genuine historical research.

[194] The reader will notice that we are listing only some 940 publications in the present volume.

[195] Belgium, France, Germany and Netherlands, with a surface area of about 5700km^2 at the end of the 18th century.



John P. Huchra (1948-2010) expressed interest and praise about Heck's prize-winning OSA series. They had a long chat at the 215th AAS Meeting in Washington (January 2010) where they discovered another mutual concern: ethics in astronomy.
They made plans for a meeting on "Facets of Professional Astronomy" at Harvard, but it could not take place due to Huchra's unexpected death.
At the time of their chat, Heck had inspired and was co-organizing with ADS people at Harvard the April 2010 colloquium on "Future Professional Communication in Astronomy II". Huchra became the keynote speaker with a talk entitled *Astronomical Publishing: Yesterday, Today and Tomorrow*. The colloquium proceedings (Accomazzi 2011) are dedicated to his memory.
Huchra was also planning to contribute to the first OPSA volume, then in preparation, with a chapter on ethical training for astronomers in the US.
On more private grounds to be shared with Heck, Huchra had already suffered a stroke at the time of their discussion and was half-jokingly showing an apple as his meal. Another stroke unfortunately took him away prematurely.

We saw also (p. 11) how our biographee, during his secondary studies, was diving into biographies of historical and contemporary great figures. He still has some of those books today. They could be used to illustrate how the approach of some characters by historians has evolved and matured over half a century.

At IALg, the walls of corridors and staircases were covered by photographs of great astronomers and meetings here and there, many in the US and most of them attended by Ledoux or Swings (Fig. 17). Heck remembers spending time in identifying the people pictured.

He would also write occasionally short obituaries for astronomers he had had the opportunity to meet or to work with (see *e.g.* Publ. 287, 310, 325 & 326, for respectively Pierre Lacroute, Subrahmanyan Chandrasekhar and Carlos Jaschek).

The interviews published in the OSA volumes have to be seen in that line (Publ. 121, 356, 362 & 363, for Marcel Golay, Émile Schweitzer, Roger-Maurice Bonnet and Guenther Eichhorn respectively).

As we saw on p. 128, Heck's historical curiosity while in Spain was monopolized by the prestigious past of the country and by the Spanish Civil War (1936-1939). He still has several shelves of his bookcases full of volumes and documentation on that conflict.

But Spain was also linked to the history of his birth place. Jalhay was one of the five *bans* of the Marquessate of Franchimont depending from the Prince-Bishopric of Liège, but enclaved between the Duchy of Limbourg, the Duchy of Luxembourg and the Principality of Stavelot-Malmedy (run by a Prince-Abbot).

If the Prince-Bishopric of Liège was never part of the Seventeen Provinces or the Spanish/Austrian Southern Low Countries, treaties of neutrality allowed the passage of troops through the territory provided they did not spend more than two nights in one place. Jalhay being at a mere ten kilometers from Limbourg, it was regularly "hosting" Spanish armies which, more than once, totally destroyed the village[196] (cf. Fig. 243). Heck has recently undertaken to better document this by visiting the archives of the Kingdom of Spain located in Simancas.

Once in Strasbourg, Heck became interested in the Alsatian history that he could put in parallel with the Belgian so-called East Cantons (Eupen-Malmedy) touching his village at the other side of the marshy High-Plateaux[197] and that had changed nationality several times over the previous decades, as did Alsace.

Hence this was also the case for Strasbourg Observatory that had been founded by the Second German Empire (*Reich*) in 1881. Its historical interest from an astronomical perspective was strengthened by high-profile scientists having been based there, big projects born (Hipparcos) or installed in its walls (CDS).

Most of the documents circulating on the history of the observatory and on related matters had however been poorly referenced till then, if at all. Occasionally some elements were grossly wrong, such as even the founder's name in a glossy leaflet printed by the Observatory itself[198]. As it can be expected, such errors were unfortunately carried over in all kinds of publications copying each other.

Heck started writing the history of the place that was first published in four installments by the Swiss popular magazine *Orion* (Publ. 656 to 659). These would evolve into a first chapter of an edited book: *The Multinational History of Strasbourg Observatory* (MNHSO, Publ. 398, Fig. 176).

Our biographee secured the collaboration of a dozen specialists, both French and German, for producing a major work offering fully-documented facts and references on the first decades of the Observatory history. See p. 509 for a detailed table of contents.

[196] Interestingly, the walloon word for *awake*, *duspièrté* or *dispièrté*, is similar to the Spanish one *despierto* (a totally different root from the French *éveillé*).

[197] Jalhay itself was a border village with Prussia before WWI.

[198] German Emperor William 1st (in German: Wilhelm I., 1797-1888) decided to make a showcase out of Alsace-Moselle after acquiring the region at the outcome of the Franco-Prussian War of 1870-1871. Together with new spacious and structured quarters on the Eastern edge of Strasbourg, university institutes were erected, including an astronomical observatory. They are still called today "Wilhelminian" from the names of the founding Emperor and of his grandson Wilhelm II. (1859-1941) who ruled from 1888 till the end of WWI. Between these two, there was a very brief interregnum (a couple of months) by Friedrich III., respectively their son and father.

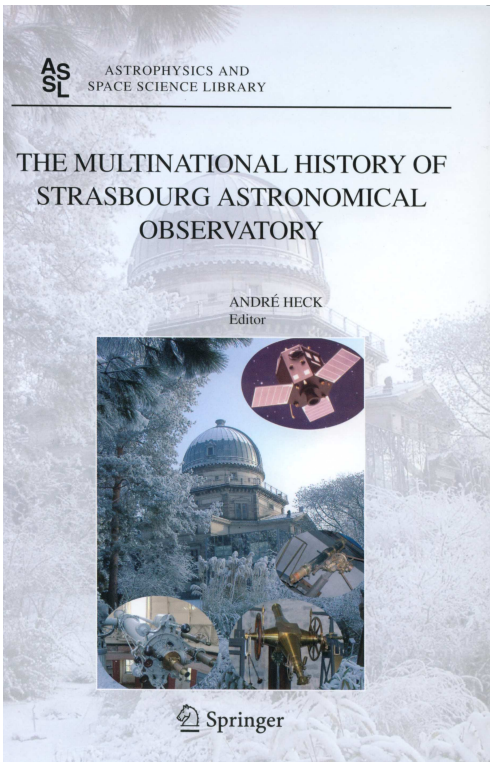


Fig. 176: Edited book on the history of Strasbourg Observatory (Publ. 398).



Fig. 177: Heck presented the results of his historical research at several meetings (Publ. 336, 343, 348 & 379). The above medium-quality illustration reproduces a photograph from the February 2002 issue of HAD News gathering together the speakers at a Special Session on "New Views of Historical Research in the 21st Century" (199th AAS Meeting, January 2002, Washington DC). From left to right: Craig Waff (Encyclopedia Americana), Ron Brashear (Smithsonian Institution), Brenda Corbin (USNO), Don Osterbrock (Lick Observatory), Mark Rothenberg (Smithsonian Institution) and our biographee. Corbin and Osterbrock also contributed to the OSA volumes (cf. p. 497).

Beyond the introductory chapter, Heck himself authored or co-authored other papers dealing with the CDS genesis, lists of scientific personnel and council members, institutional publications, as well as the impact of the regional press, the investigations of green rays carried out locally, and the Coronelli globe of the Observatory (Publ. 122, 123, 349 to 355).

All this triggered research and collaborations in several directions.

Heck started investigating earlier local observing facilities such as the turret lantern located at the top of the Strasbourg Hospital Gate (Fig. 178). It appeared however that this facility had been established in the 1670s essentially for the prestige of the city and the notoriety of the university. Its users did not make any significant contributions to the progress of astronomical knowledge. Our biographee concluded that it was, at best, used for rudimentary viewing of bright celestial objects or phenomena relative low on the horizons (Publ. 380, 381 & 382).

The observing post located on the roof of Strasbourg's 19th-century "Academy" can be seen as the second astronomical observatory of the city (Fig. 178). Heck's findings from archives shed some new light on that facility on which virtually nothing was known earlier. Heck showed it was in fact the first real attempt to set up in the city an actual observatory equipped with genuine instrumentation with the purpose to carry out serious research (Publ. 383 & 384). A Cauchoix meridian refractor had actually been retrieved from there and installed at the Wilhelminian Observatory (Fig. 179).

Several public-outreach articles on the above were also published, in English (*Mercury*), French (*l'Astronomie*) & German (*Sterne und Weltraum*), as well as in a local annual (Publ. 660, 664, 665, 667 & 668).

While doing this historical work with the necessary exactitude, Heck had to be careful with a number of issues. Earlier popular writings seemed to be under the pen of amateurs, both as historians (lacking "scientific" rigor) and/or as astronomers (missing in-depth astronomical knowledge to adopt a correct perspective).

A certain regional chauvinism tended to use superlatives or simply to emphasize past events that did not deserve such an importance when placed in a proper, broader geographical or historical context. For instance, the record of comet observations in local writings was nothing special since such phenomena could be observed by virtually everyone with clear skies on the planet.

The recent wars with Germany and resulting annexations of the area had the consequence that large chunks of the population tended to ignore, even voluntarily by some educated people, German contributions to the region (such as the Observatory itself and its instrumentation taken as a war bounty by the French at the end of WWI).

By being a foreigner who had grown up next to an area having had a similar fate as Alsace-Moselle, our biographee had both the freedom of speech and the necessary distance. But difficulties of understanding would also arise abroad, for instance with people, even professional historians, not having gone personally through similar events and/or who were not sufficiently aware of the complexity of the local context, with views tending to be too Manichaean-like, such as for instance considering that all Germans were necessarily bad people because of WWII Nazi crimes *(sic)*.

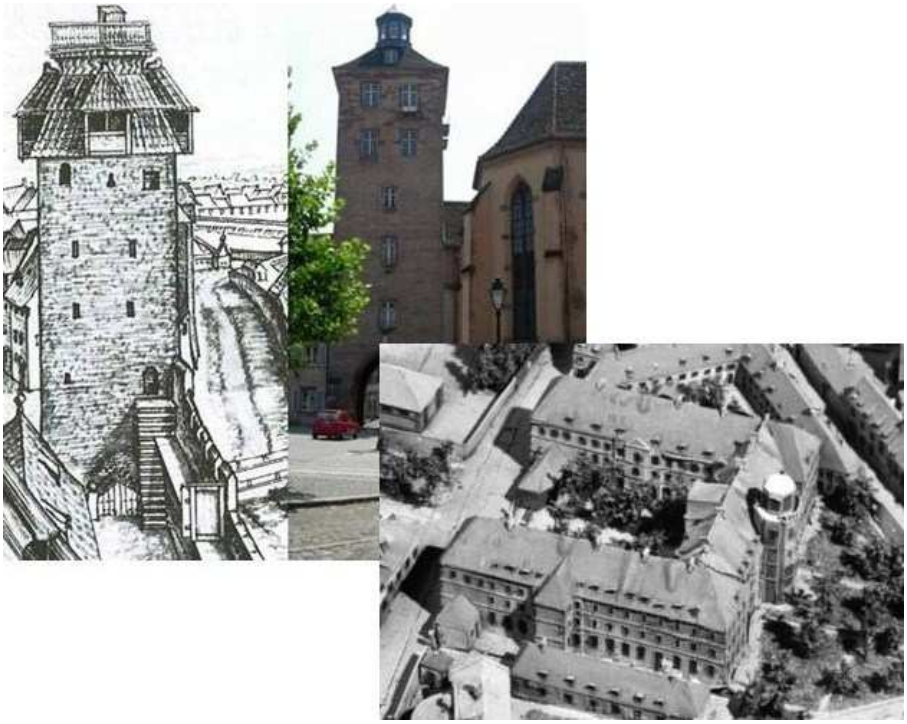


Fig. 178: The Hospital Tower (upper left and middle), identified as the first astronomical observatory in Strasbourg (17th century) served the city prestige and the university notoriety, but remained scientifically unproductive (Publ. 380). On the contrary, the turret installed at the beginning of the 19th century on top of the Academy building (white cap on lower right picture) has been the first attempt to install in Strasbourg a facility aiming at serious observing (Publ. 130).

On this matter precisely, Heck convinced Hilmar Duerbeck (p. 295), a prominent contributor to the MNHSO volume with five chapters on his own or with others, to do some research and to write a paper on *German Astronomy in the Third Reich*. This article appeared in OSA 7 (Duerbeck 2006) and was particularly praised (see Heck 2016).

The two collaborated on other issues such as contributing to the *Nouveau Dictionnaire de la Biographie Alsacienne* (NDBA[199]) gathering together biographical notices on people who played some rôle locally or had some importance in the area.

After the publication of the MNHSO volume, Heck had been approached to provide notices on the major scientists, French and German ones, from Strasbourg Observatory (including himself!) not yet appearing in the already published volumes.

He suggested to share the work with Duerbeck: the latter would deal with the astronomers from the German periods (plus Heck's – see p. 344), and our biographee would take care of the astronomers from the French times. As Duerbeck wrote in English, Heck translated his contributions into French and they cross-checked each other's writings (Publ. 358 to 361, 365 to 367, 369 to 373).

[199]New Dictionary of the Alsatian Biography.

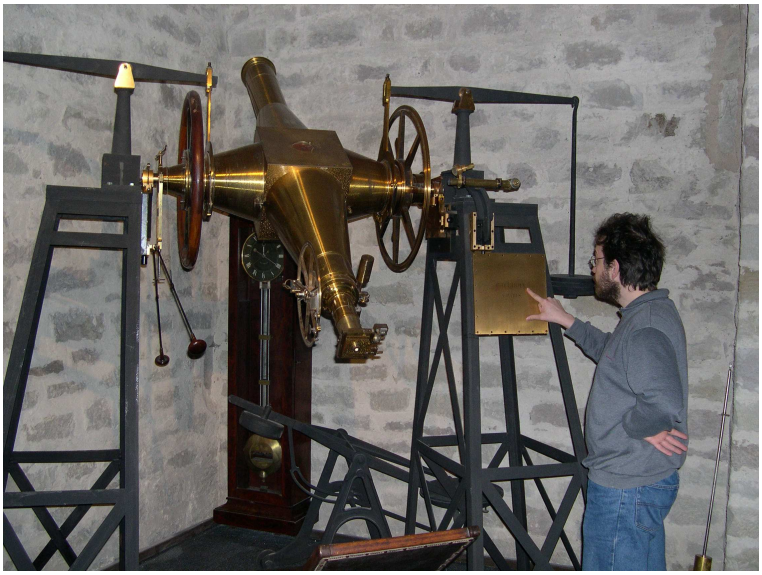


Fig. 179: Philippe Vonflie, librarian of Strasbourg Observatory since 2002, is seen here next to the old Cauchoix refractor recovered from the 19th-century "Academy" observatory. Vonflie co-authored the chapter in the MNHSO volume on the institutional publications (Publ. 355). His knowledge, interest in history, and efficiency as documentalist were particularly appreciated by our biographee.



Fig. 180: Danish Scholar Bjørn Westerbeek Dahl was most helpful in documenting the arrival at Copenhagen harbour of Strasbourg mathematician Julius Reichelt (1637-1717) on 12 August 1666, proceeding from Gdańsk (see Publ. 380 to 382).

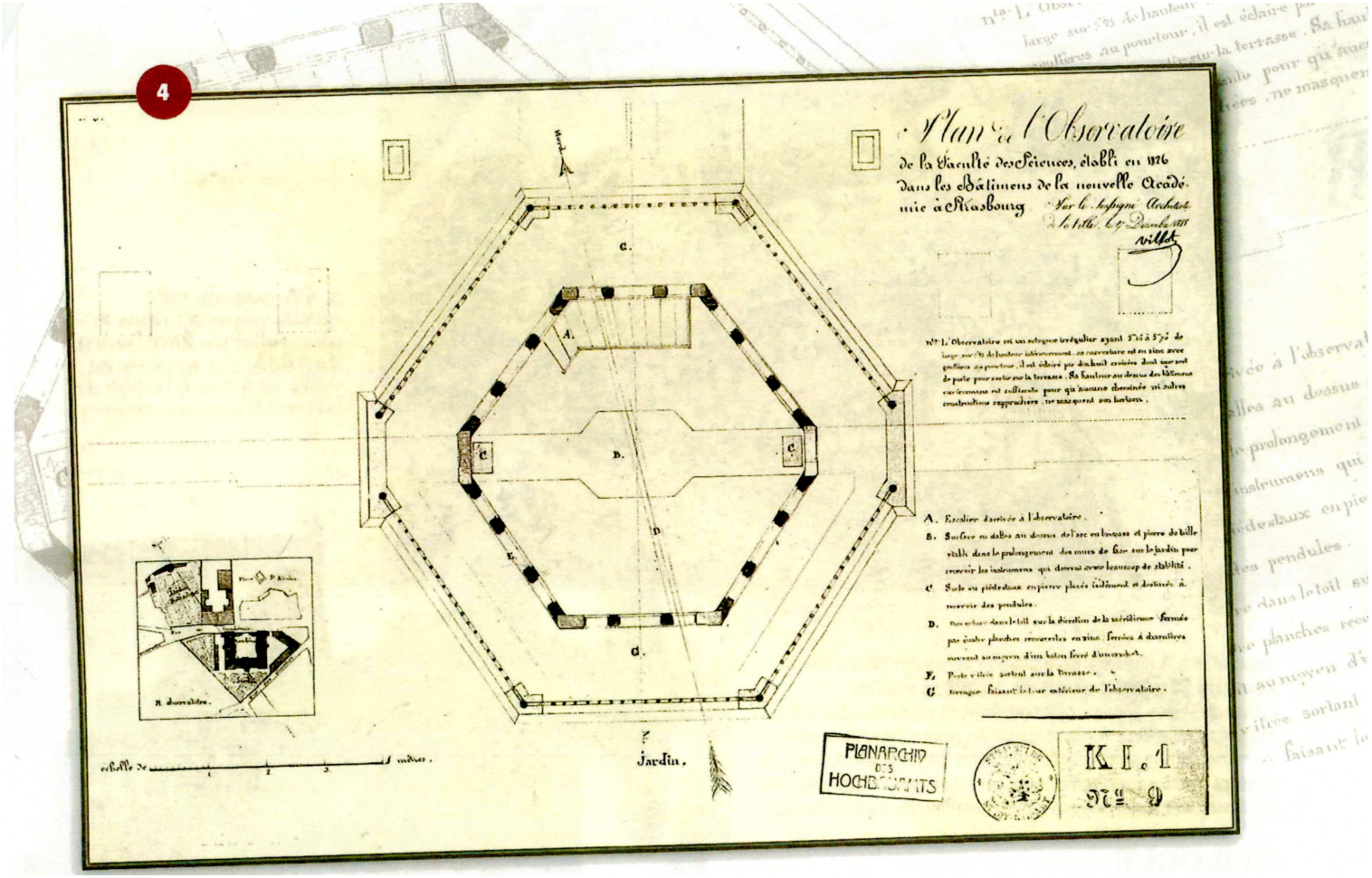


Fig. 181: One of the gold nuggets found by Heck in the local archives is this floor plan for Strasbourg 19th-century Academy observatory as reproduced here from Publ. 667. It is dated 17 December 1828 and was drawn by Architect Jean-Nicolas Villot. (Courtesy AVCUS & SAF)

Alas, the muddled (to say the least) organization or state of mind of the NDBA chief editor resulted in two of Duerbeck's notices (Hellerich's and Rosenberg's) being published under Heck's name.

Duerbeck also contributed to Wikipedia under the alias *Eifelgeist*. Among other things, he wrote a biographical page for his late wife Waltraut Seitter for the German and English versions of Wikipedia, but he needed some help for the French one. This is how Heck became in 2008 his shadow translator into French, not only for Seitter's page, but also for other pages such as Wirtz's and Wislicenus'. Other biographical contributions to Wikipedia – especially those on German Strasbourg astronomers – were envisaged, but they could not be materialized before Duerbeck's untimely death.

Heck had to get acquainted with the Germanic paleography, *Kurrentschrift* (German cursive) and the Sütterlin script for decyphering documents retrieved from the archives (see Fig. 195). Some courses were organized at Strasbourg City Archives[200], a remarkably dynamic place. Its conviviality allowed especially efficient and flexible research[201].

But our biographee needed to explore the archives and libraries at many other places in various countries. Fig. 183 illustrates a sample of his registration cards. The visits to Italian facilities were motivated by investigations into elusive traces of the contracts Vincenzo Coronelli had arranged for selling his globes.

Upon joining Strasbourg Observatory in 1983, Heck had spotted a Coronelli 108cm celestial globe, unfortunately damaged, in the rotunda of the Big Dome. The globe was moved into our biographee's directorial office to prevent further degradation (Publ. 350).

Heck could later track back the globe arrival at Strasbourg Observatory to the end of the 19th century as a donation by the Commander of the (then German) Metz fortress to the Wilhelminian University. Most likely this was originally a French property and part of the Alsace-Moselle seizure resulting from the 1870-1871 Franco-Prussian War.

In the 1980s, our biographee had obtained from the French *Musées Nationaux* a series of prints from the 1693 original copper plates etched by Jean-Baptiste Nolin (1657-1725) under contract with Coronelli then visiting Paris. Heck published several popular papers on the globes (Publ. 661 to 663).

To be complete on this historical section, several other papers should be mentioned: on the pioneering observing and archiving strategies due to IUE (Publ. 374[202]); on the shortcomings of *The Biographical Encyclopedia of Astronomers*, mainly arising from the purely American nature of the editorial team, unaware of subleties and peculiarities in other cultures and languages (Publ. 378); and a popular article (with Jean-Michel Rousseau) on the surprizing criteria for selecting the temporary site for the Liège meridian refractor in the French Pyrenees (Publ. 666).

But Heck has still plenty of material for further work with some of his closets replete with holders of copies from archives, boxes of microfilms and CDs with images and documents collected here and there.

[200] Archives de la Ville et de la Communauté Urbaine de Strasbourg.
[201] Heck still praises particularly the assistance of Benoît Jordan (see p. 360).
[202] See also the Editorial of the OSA 4 volume (Publ. 344).



Fig. 182: Heck's interest in the Coronelli globes was triggered by the presence of a damaged celestial one in his directorial office at Strasbourg Observatory (Publ. 350). He produced a number of public outreach papers (see Publ. 661, 662 & 663 on previous page), visited archives in various countries and, in the framework of still ongoing historical research, could trace the Strasbourg Observatory globe to a seizure by the Prussian army in the wake of the Franco-Prussian War, with a subsequent donation to Strasbourg (German) University in 1910, more specifically to the Imperial Observatory headed then by Julius Bauschinger. The picture above illustrates beautifully restored Coronelli globes (celestial one in the foreground, terrestrial one behind it), then at the Palais des Beaux-Arts in Lille and photographed by our biographee under special authorization.



Fig. 183: Some of the cards used by Heck to access libraries and repositories of archives in various countries. From top to bottom and left to right: Biblioteca Nazionale Marciana (Venice), Archives Départementales du Bas-Rhin (Strasbourg), Archives de la Moselle (Saint-Julien-lès-Metz), AVCUS (Strasbourg), Biblioteca Nazionale Centrale di Roma (Rome), Bibliothèque Nationale et Universitaire (Strasbourg), Bundesarchiv (Berlin-Lichterfelde), Archives Nationales (Paris), Archives Départementales des Ardennes (Charleville-Mézières), Archives Municipales (Metz), Landesarchiv Baden-Württemberg (Karlsruhe), Bibliothèque Alsatique du Crédit Mutuel (Strasbourg).The userids have been masked.

Black Holes, Gravitational Mirages, and Supernova Impostors

Why not start this chapter with a couple of exercices?

First of all, try to identify the astronomers who were members of your national Academy of Sciences over the last century, or perhaps only over the last fifty years. Are you able to remember all of them, who they were, what they brought to astronomy?

Granted, this was too much challenging.

The next query should be more comfortable: close the eyes, take the big astronomical institution nearest to you and try to name all its directors, as far as you can go in the past. Do not skip any and, for each of them, say aloud one or two of their major contributions to astronomy. Not easy either, right?

We could continue defying our memory by asking ourselves who were the last ten astronomers among the Nobel Laureates.

Heck never cared about being remembered by the future generations. Contrary to many of his colleagues, he fled notoriety and run away from the media. Through his training and his interest for decades in communication, he knew all too well how artificial, superficial and short-lived fame could be, and how powerless, sometimes dangerously helpless, could be a candid scientist in the paws of professional communicators.

Our biographee's purpose was to serve his community, keeping always a low profile. He never imposed his views to anyone, but he never accepted either to be burdened with constraints or working directions from people who had no right to do so, and certainly not from those who attempted to use him for merely strengthening their little empire.

> "Respect and collaboration have to be won," he says. "Authority is lost from the time one tries to inflict it. And I am certainly grateful to my pragmatic and egalitarian education, as well as to my life experiences: they protected me from being impressed by a function, a title, a name, a school or a degree."
>
> "Someone might be bright and know a lot of things," he adds, "but if that person behaves contemptuously, arrogantly or disrespectfully towards others, and especially colleagues, he/she does not deserve any deference. Unfortunately there are plenty of such characters in scientific institutions, believing they are the only holders of the Truth. Many managers have not been trained to handle people properly either. The resulting blunders can only hurt and demotivate, creating antagonisms, sometimes lifelong ones. At the very least, they debilitate constructive initiatives and hamper the healthy development of projects."

Even if Heck has never been attracted by glory, we could safely bet that his books will be used long into the future by the historians of astronomy. Those volumes give indeed a snapshot of how astronomy was organized and functioning at the turn of the $20^{\mathrm{th}}/21^{\mathrm{st}}$ centuries across the planet.

This was understood not only by those who granted him the Stroobant Prize (cf. p. 251), but also by the officers of the International Astronomical Union (IAU) who approached our biographee in January 2008 as a potential IAU General Secretary (GS). This meant serving three years as Assistant GS, then three years as full GS, and finally another lighter set of three years as an adviser. The job would have been so demanding that Heck's personal plans for the upcoming nine years would have had to be tuned down, if not forgotten at all.

The offer was however very tempting. It was recognizing Heck's perceptions of the astronomical community worldwide, as well as the contacts he had established not only through his books, but also by his multifarious activities along the years in various fields of astronomy. For our biographee himself, this was a great opportunity to use his talents in public relations and as an organizer, not to forget his multilingual abilities.

But he had to consult his medical environment and their answer was the same as for earlier offers: go ahead if you wish to kill yourself; you will never reach the end of your term. Taking up IAU responsibilities would have meant going beyond an acceptable load, undergoing excessive exposure, as well as, on more material considerations, increasing again his own professional expenses since no salary was attached to the function.

So, much to his regrets, Heck had to tell his IAU contacts that his physicians advised against it. On top of this, it was obvious that, locally, he would have never received the human and material assistance for carrying out such responsibilities satisfactorily.

For, as far as Heck's disability was concerned, the situation was unchanged: protective lifestyle, working isolation, and self-financing of activities. Any pejorative increase of the blood pressure could trigger a lethal CVA recurrence[203].

Stressing and conflictual situations had absolutely to be avoided, as well as people who would tend, perhaps instinctively, to take advantage of the situation, for it is well known that human groups tend to behave like packs: the weakened is ostracized.

Heck had become increasingly irritated by the way he was treated at the Observatory. For instance, there had been several attempts by his successors as Directors to move him out of his office (tailored to his disability with an increased sound insulation) and to put him in unpleasant locations such as a basement room with a small window adorned with bars, or another one right next to toilets. It is hard not to see there vexating measures, and definitely incomprehensible ones towards a senior astronomer and a former Director.

The incident with the transfer of his Star*s Family files to Kluwer – where he had been unable to get his hands on the money he had negociated (cf. p. 226) – had been a drop too much in a glass already full.

[203]Later in 2008, our biographee had an interesting exchange with W-Y. Pauchy Hwang who had shared his experience of memory loss after a CVA and of his subsequent partial recovery (Hwang 2008). Such self-investigations and accounts of incidents help understanding how memory works.



Fig. 184: ESO Director General from 1999 to 2007, Catherine Cesarsky was also IAU President from 2006 to 2009. In that capacity, she approached our biographee in January 2008 seeking whether he would agree to become IAU General Secretary. Heck had to decline the offer as explained in the text. Cesarsky wrote the Foreword of the OSA 6 volume (Cesarsky 2006) and co-authored a chapter in the OSA 7 volume (Cesarsky & Madsen 2006). (Courtesy ESO)

Heck's intellectual property and his actual rights – recognized by his direct successor (cf. Fig. 146) – had been *de facto* denied for that activity untertaken long before our biographee arrived at Strasbourg Observatory. The comparison with the wood made and sold by the gardener, as put forward by the Observatory manager in an e-mail dated 25 May 2004, was out of place, if not outright insulting.

In spite of the deadly hazard from the resulting stress, Heck decided to depart from his self-imposed reserve, sending signals here and there, but to little avail in a system heavy by nature and replete with coterie connections. Some facets of his annoyance are well summarized in the message sent on 19 October 2007 to the CDS Director (who happened to be the partner in life of the Observatory Director of the time) :

> I'd like to know what entitles you to consider me as a member of your team in the quadrennial reports [of the Observatory], hence appropriating my "merits" and publications (among which some are actually misclassified as all contributions to the books I produce are going through "referees").
> Since I must again recall History, I'll remind that I distanced myself from CDS in 1988, when I became Observatory Director, for the sake of neutrality among the various components of the house in view of the conflicts to be settled then (and that have been effectively pacified during my directorship). I never resumed working for CDS since. When the components of the Observatory were restructured by my successor Crézé and in line with the arrangement with the University under which I am operating (as a consequence of my CVA), it was agreed that I was directly reporting to the Observatory Director. That agreement has never been questioned. This, as to the principles.

> On a more material level, I must remind that I spend yearly some €25,000 to €30,000 from my own pennies in equipment, missions and other professional expenditure – expenses validated annually by the income tax office. Since you are including my productivity in your team's, you ought to indemnify me for those expenses, but I very much doubt you'd intend to do it. As a reminder, the Observatory grants me only the yearly "researcher point" [around €2000] and covers my telecom costs within the framework of the agreement with the University. I am currently renewing my aging computer equipment out of my own money.
> In case you would question the relevance of my activities and their perception outside the house, let me add – modestly and confidentially – that, only for the past year and beyond the Stroobant Prize granted by the Belgian Royal Academy, I have been "nominated" for a prize of the US Academy of Sciences (for the innovation brought by the OSA volumes) and for an AAS prize (for service to the astronomical community). This latter nomination has actually been renewed this year. As to the historical book covering the first century of the Observatory (and where the founder name is correct, contrary to that glossy in-house produced leaflet), it is for a prize of the French Academy of Sciences that it has been proposed (by others of course, as for all other nominations which are not my doing, but that are expressing an appreciation of my activities by the international community).
> The consequences of my CVA command peace of mind and low profile. I think however I managed to mantain a significant productivity ([to date] a total of 1640 publications among which 128 refereed ones, about 70 books, of the order of 147,400 pages), but nothing justifies that you appropriate it, neither indirectly my related substantial personal investments. The resulting merits should go to the Observatory as a whole, not to a specific team, and what could be opposed to this could only be convenience writing games. I hope I won't have to issue again this kind of corrective message which, believe me, costs me very much.[204]

[204] Original text in French: Je voudrais savoir de quel droit tu me classes dans ton équipe dans les rapports quadriennaux [de l'Observatoire] et t'appropries ainsi mes "mérites" et publications (dont certaines mal classées d'ailleurs, toutes les contributions aux bouquins que je produis passant par des "referees").// Puisqu'il faut une fois de plus rappeler l'Histoire, je te signale que j'ai pris mes distances par rapport au CDS en 1988, lors de mon accession à la Direction de l'Observatoire, par souci de neutralité entre les différentes composantes de la maison au vu des conflits à régler alors (et qui ont effectivement été apaisés sous ma direction). Je n'ai jamais repris ces activités pour le CDS depuis. Lors de la restructuration des équipes de la maison par mon successeur Crézé et dans le cadre de l'accord avec l'Université sous lequel je fonctionne (suite aux conséquences de mon AVC), il a été convenu que je relevais directement du Directeur de l'Observatoire. Cet accord n'a jamais été remis en cause. Ceci pour les principes. // Plus matériellement, je me dois de rappeler que je dépense annuellement de l'ordre de €25.000 à €30.000 de mes deniers personnels en équipement, missions et autres frais professionnels – dépenses validées chaque année par le service des impôts. Puisque tu inclus ma productivité dans celle de ton équipe, il conviendrait que toi, tu prennes en charge ces dépenses, mais je doute que ce soit dans tes intentions. Pour mémoire, l'Observatoire ne m'alloue actuellement que le "point chercheur" annuel [environ €2000] et couvre mes frais télécoms dans le cadre de l'accord avec l'Université. Je renouvelle progressivement l'équipement informatique vieillissant à mes frais. //

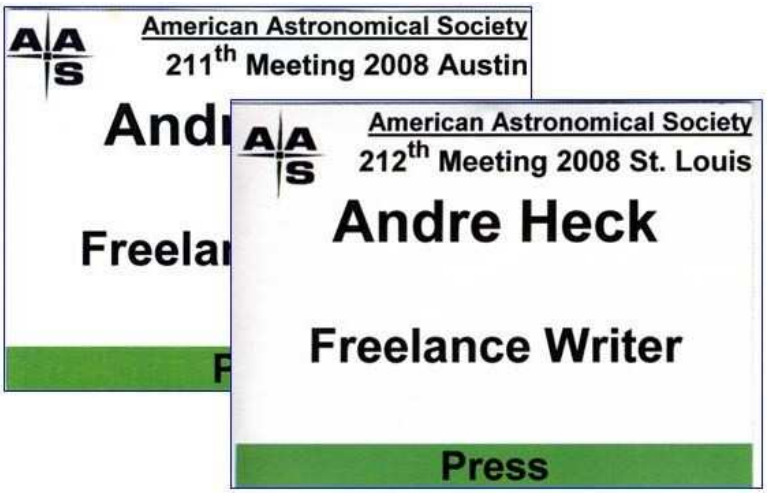


Fig. 185: Those badges delivered by the AAS recognized the publishing activities of our biographee and enabled him to access press activities (hence the unusual professional classification while being a full AAS member).

The Exceptional Class

As to his position, Heck had finally been promoted to the First Class of Astronomers in 1997 and we can only recall the unfortunate delaying *faux pas* made by the ministerial administration right after his nomination in the corps (cf. p. 147).

Since several years, our biographee had reached the top seniority within that First Class and he could apply for the next level, the Exceptional Class that no astronomer had reached so far at Strasbourg Observatory.

But before we get there, it might be interesting to mention how Heck was rated in quadrennial evaluations of Strasbourg Observatory.

Au cas où tu t'interrogerais sur le bien-fondé de mes activités et leur perception à l'extérieur de la maison, j'ajouterai – modestement et confidentiellement – que, rien que pour l'année écoulée et outre le prix Stroobant de l'Académie Royale de Belgique, j'ai été "nominé" pour un prix de la US Academy of Sciences (pour l'innovation apportée par la série des volumes OSA) et pour un prix de l'AAS (pour service à la communauté astronomique). Cette nomination a d'ailleurs été reconduite cette année. Quant à l'ouvrage historique couvrant le premier siècle de l'Observatoire (et où le nom du fondateur est correct, contrairement à cette plaquette haute en couleurs produite par la maison), c'est pour un prix de l'Académie des Sciences française qu'il a été proposé (par d'autres évidemment, comme pour toutes les nominations qui ne sont pas de mon fait mais qui traduisent une appréciation de mes activités par la communauté internationale). // Les conséquences de mon AVC m'imposent la quiétude et la discrétion. Je pense avoir néanmoins maintenu une productivité plus que notable ([à ce jour] un total de 1460 publications dont 128 dites "à referee", environ 70 ouvrages, de l'ordre de 147.400 pages), mais rien ne justifie que tu te l'appropries, ni indirectement les investissements personnels importants que j'effectue à cet effet. Les mérites résultants en reviennent à l'Observatoire dans son ensemble, pas à une équipe en particulier, et ce qu'on pourrait opposer à cela ne pourrait être que des jeux d'écriture de convenance. J'espère en tout cas ne plus avoir à faire ce genre de mise au point qui, crois-le, me coûte beaucoup.

For the period 1999-2002, Rapporteur Françoise Roques wrote (05 June 2003):

> "In spite of a partial permanent disability leading him to work with some flexibility (partially at home) and to limit some activities (teaching), André Heck has an extremely sustained research activity with very numerous publications of articles, proceedings of colloquia, synthetic volumes, encyclopaedia, in various fields: harmonization of cosmic distance scales; electronic information handling and data processing; societal aspects of astronomy; historical investigations; service tasks (half-time): maintenance of the databases StarWorlds (organizations), StarHeads (individuals), StarBits (acronyms, etc.).[205]"

The comments received at the outcome of the following evaluation exercice from CNAP Chairman Daniel Rouan were truly laudatory (21 October 2008):

> "After evaluating your activity over the past four years, the CNAP Astronomy Section congratulates you for your remarkable contribution pioneering new orientations. Your editorial production is really outstanding. The quality of the collections your are directing is recognized internationally as shown, for instance, by the Stroobant Prize 2007 that was bestowed on you for your scientific achievements and your substantial book production. You are also largely contributing to the popularization of science towards the public at large. The CNAP is thanking you and encourages you to pursue your activities.[206]"

It is actually surprizing Heck maintained such a high production rate given that his publications were hijacked by a group not financing him.

As evidenced by the previous paragraphs, things had become more "administrative" in the French astronomy world, at least for what was coming under CNAP. Regular evaluations could be seen as a good point, be it only to "wake up" those scientists who had a tendency to become unproductive. Teaching and so-called service activities were mandatory, with some flexibility at the discretion of the institution managers. All new positions had to get their service linked to projects labelled as such by INSU[207].

It was also normally part of the job of the Observatory Directors – since they were receiving the details on the CNAP promotional sessions from the Ministry – to keep informed the astronomers of their personnel, especially those who were entitled to apply, and to forward the applications with the mark of approval from the establishment council.

[205] Original text: Malgré une invalidité partielle permanente qui le conduit à travailler avec certaines facilités (partiellement à domicile) et à limiter certaines activités (enseignement), André Heck a une activité de recherche extrêmement soutenue avec de très nombreuses publications d'articles, comptes-rendus de colloques, ouvrages de synthèse, encyclopédie, dans plusieurs domaines: harmonisation des échelles de distances cosmiques; gestion électronique de l'information et traitement de donnés; aspects sociétaux de l'astronomie; études historiques; tâches de service (mi-temps): maintenance des bases de données StarWorlds (organisations), StarHeads (individus), StarBits (acronymes, etc.)

[206] Original text on p. 277 (Fig. 186).

[207] As we shall see hereafter (p. 302), from his position as an observer of the world astronomy community, especially through his books, our biographee had mixed views on the way astronomers were used in the country, for instance with teaching and service imposed onto them and not to their colleagues from CNRS with whom they were sharing offices and activities.



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Laboratoire d'Études Spatiales et d'Instrumentation en Astrophysique

Daniel ROUAN

M. André HECK
Observatoire Astronomique de Strasbourg

Meudon, le 21 Octobre 2008

Cher collègue,

Au nom du CNAP, je vous transmets le message qui a été élaboré après l'examen de votre fiche d'évaluation quadriennale et la discussion que vous avez probablement eue avec votre rapporteur.

Après évaluation de votre activité de ces quatre dernières années, la Section Astronomie du CNAP vous félicite pour votre contribution remarquable au défrichage de voies nouvelles. Votre production rédactionnelle et éditoriale est véritablement hors normes. La qualité des collections d'ouvrages que vous dirigez est reconnue internationalement, comme en témoigne, par exemple, le Prix Stroobant 2007 qui vous a été décerné pour votre oeuvre scientifique et votre importante contribution à l'édition d'ouvrages. Vous tenez également à diffuser largement la culture scientifique auprès du grand public. Le CNAP vous remercie et vous encourage à poursuivre vos efforts.

Bien cordialement,

Daniel Rouan,
Président du CNAP Astronomie-Astrophysique

Fig. 186: Laudatory comments on Heck's work from the 2008 CNAP evaluation exercise (see the translation in front).

But not all of Heck's successors as Observatory Directors complied satisfactorily with this. Our biographee could have missed some of the sessions had not conscientious CNAP member and office neighbor Laurent Cambrésy (Fig. 187) kept him duly informed.

This was particularly the case for a session taking place on 02-03 December 2008. Heck's application was reviewed by Rapporteurs Philippe Zarka and Éric Slezak who recommended his promotion to the Exceptional Class of Astronomers. Thus our biographee was the first astronomer to reach that level at Strasbourg Observatory, being also one of only ten or so for the whole country[208].

The official ministerial decree dated 26 January 2009 (see Fig. 214 on p. 330) that reached Heck a few days later was bearing an effective date for the promotion retroactively set on 01 September 2008. As our biographee wrote to his Belgian mentor Léo Houziaux, such a promotion carried the soothing satisfaction of having maintained a well-rated scientific productivity in spite of his disability and some local hostility.

If the outcome of that CNAP session was quite gratifying, Heck could not say he had always been happy with the feedback received from other sessions. Of course, he knew very well that one cannot be successful every time one applies within a selection process and that one has routinely to apply several times before being granted a promotion.

But by listening to his experiences, one could wonder whether some committee members were at the right place and interested in doing their job properly rather than caring for their own career or their protégé's – such as those rapporteurs who had obviously not examined the applications they had been put in charge of perusing.

In another – ludicrous – debriefing exercise, a rapporteur expressed displeasure at the long list of collaborators included in Heck's dossier, betraying the fact that himself would certainly have been unable to put together a similar record!

This exposed another feature: in many instances, rapporteurs were assessing situations through their own achievement measure. And, for the specific case of a promotion to the Exceptional Class, the constitution of CNAP was such that most of the members with voting power, if not all of them, had not reached themselves that level – hence the attempts to quantify criteria[209]. But it is also well known that quantified criteria are no panacea. Our prolific biographee was at the forefront of those claiming that the number of publications, even validated/refereed ones, was only of limited significance.

Adepts of armchair psychology, or amateur analysts within CNAP members, were also a nuisance, especially as they tended to put discrediting labels onto people they felt unable to outclass.

A lower-rank rapporteur – whose partial knowledge if not downright ignorance of Heck's file became quickly evident – once opened a phone conversation criticizing our biographee for his independence of mind, something he had probably heard from a gossipmonger and that was unrelated to the substance of the application. But, at least, that gentleman came back later in writing with entirely positive comments about Heck's actual activities and merits.

[208] CNAP was then managing about 230 astronomers.

[209] See the many chapters in the OSA/OPSA volumes on the evaluation processes (pp. 502ff).



Fig. 187: Conscientious CNAP member and office neighbor Laurent Cambrésy (here in July 2011 on a spectacular rock near Teide Observatory on Tenerife Island) kept our biographee informed of the CNAP sessions when the management of Strasbourg Observatory failed to do so. (Courtesy L. Cambrésy)

On the broader scope of evaluations, our biographee can also offer a couple of anecdotes. For instance, a system of allowances for scientific excellency was introduced in France towards 2009. Heck applied, not so much for the money[210], but more out of the interest to see how the process would go. After all, he had been granted an international prize for producing a series of volumes dealing, among other matters, with evaluation issues.

The results arrived towards mid-2010 and were quite edifying: our biographee had been rated (by a national committee) in the lowest category, in particular as far as publishing was concerned. It was then almost a pleasure for Heck to underscore the lack of seriousness of the evaluation by sending a copy of the ADS document (p. 353) rating him as one of the most published authors in astronomy worldwide.

Sometimes politics, when not low-level union wheeler-dealing, was interfering. Virtually anyone who has been in committees in the country could testify of one or several such cases. Evaluation bodies were then often powerless, when not simply bypassed, with the official results different from what had been recommended.

Heck's archives are holding an interesting letter, from the time he was Observatory Director, and addressed to the University President. Our biographee was literally furious after noticing that his ratings for a couple of members of his personnel had been lowered, "reducing to nothing [his] emulating attempts within [his] establishment".

[210] He was already spending yearly of the order of €30,000 from his own pennies and an allowance, albeit always welcome, would have made little difference.

Scheduling the Retirement

Part of Heck's retirement shaping exercise, under yet another successor as Director, deserves to be reported here at some length for its surprizing developments.

Because of the late hiring of our biographee in the French system (being only tenured at the age of 40), his retirement had to be prepared carefully and well ahead of time. In order to get a decent rent, and efficiently assisted by the University *ad hoc* service, Heck was able to validate some of his active years before working in France.

In practice, this meant 'purchasing' them by deducting the requested substantial contributions from his salary. He also subscribed to a couple of private pension funds. All in all, for many years, Heck never cashed his full salary, far from that, and, in spite of his senior level, he was then receiving less than some of his junior colleagues.

At that time, the normal retirement age was 65 for Heck's birthyear slot, but his seniority allowed him to go beyond it and to store a few additional trimesters – up to three years – contributing to the activity period and to the subsequent retirement rent. In practice, this meant for our biographee retiring in 2014 instead of 2011.

When phoning the University service in May 2010 on another matter, Heck learned that the documents to be completed for this last step had been sent to him quite some time ago under cover of the Observatory Director. The officers were surprized that those papers had not been returned to them already, knowing the usual diligence of our biographee on such matters.

After some enquiry, it appeared that those documents – critical ones – had been archived by the Director's office instead of being forwarded to our biographee. Once in their possession, and as explained above, Heck requested on those forms an extension for three years and passed them to the secretariat for what was supposed to be a routine approval within a standard smooth procedure.

But, much to his surprize and thanks to his good connections with the University services, Heck soon learned that the Observatory Director had issued an unfavorable opinion on the request, and this without saying a word to our biographee.

When requesting in writing some explanations, Heck received a letter replete with nonsenses and groundless allegations that he felt obliged to refute, also in writing. Not only his retirement, but mainly his honor and his probity were at stake.

As the Director had sent copies of his own letter to various authorities, our biographee had no choice but to do the same with his answer, requesting his lawyer Jung to take over. In his cover letter, the legal counselor requested Heck's answer be added to his retirement file and insisted on the "most incomprehensible attitude towards not only a former Director, but also towards the most senior, most titled and most published astronomer of the house, entirely devoted to his job in spite of a well-recognized noxious disability".

We are hereafter including a translation of Heck's answer (see pp. 331ff for the original version in French). The reader will be able to appreciate by him/herself the degree of details to which our biographee had to argument to rectify improper claims and to counter an unacceptable libeling:

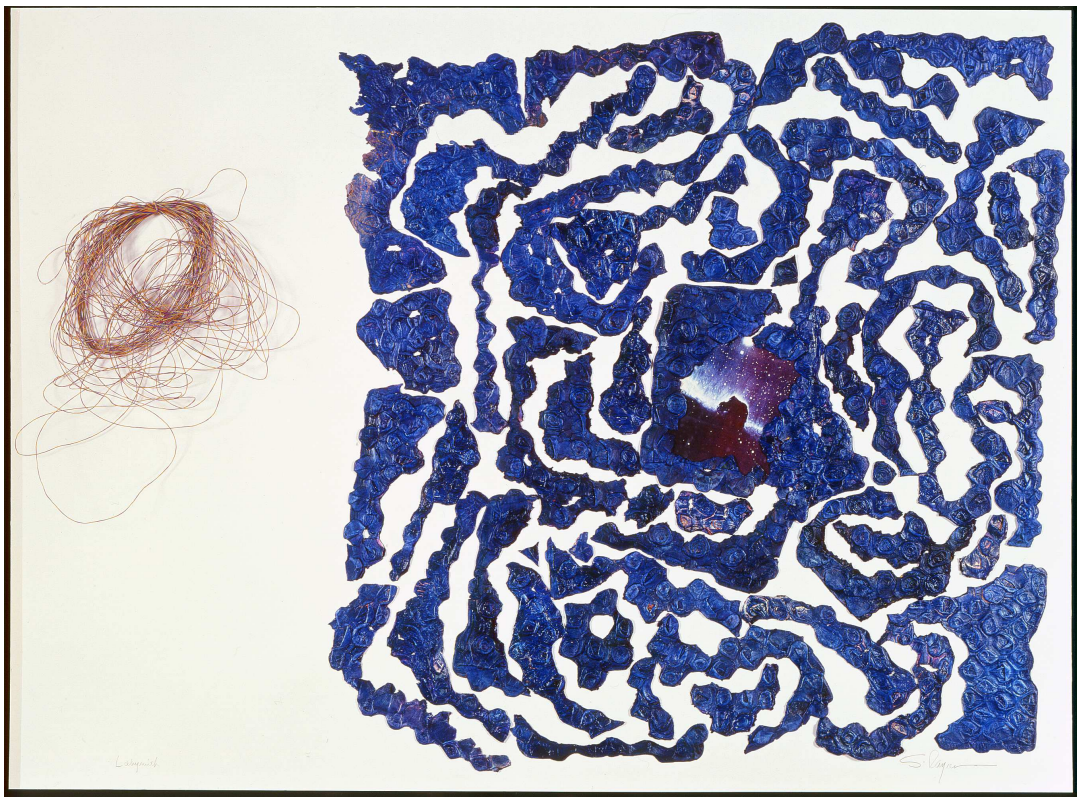


Fig. 188: This "Labyrinth" (122cm×168cm) by Stephanie Rayner (Fig. 236) is inspired from Daedalus' labyrinth designed after the pattern of man's entrails, symbolizing together internal and external fears from which it is almost impossible to escape. The Horsehead Nebula at the center represents both the beast within and the fundamental existential questions brought to man by the universe. The tangle of electrical wire on the left is a dual symbol: technological reminder of the mythological Ariadne's thread that allowed Theseus to get out of the labyrinth after killing the Minotaur ... or it can be seen as another labyrinth! See the caption of Fig. 236 for more on Rayner and her works. (Photograph by the artist)

Your letter of 24 June 2010, copied to the CNAP Chairman, expresses the wish to see me going into retirement as soon as possible in order to, to repeat your expression, "free a budgetary line" for purposes that are proper to yourself. The simulations carried out by the the University service dealing with retirements having revealed a difference of 22% in my retirement allowance depending on whether I am leaving in 2011 or 2014, everyone will understand that I wish to go, my health allowing, to the maximum of my possibilities and rights.
But your letter goes much beyond our initial exchange over my retirement case. With the purpose of justifying your negative mark on it, you are now calling up a series of points that are an offense to the honour of my career. Some of your words are outrageous not only for my own professional probity towards a job

for which I am devoting everything in the context of a pernicious disability, but also indirectly towards my successors at the Observatory directorship. Had they accepted the situation you are describing, they could be blamed for not having carried out properly their position and responsibilities. Fortunately this is not the case and, as pointed out hereafter, your claims are groundless. If you had taken to time to discuss them with me, you would have obtained the clarifications and mainly the corrections that I am now obliged to put in writing.

Your argumentation exposes also repeadtedly an ignorance of my activities in spite of the information I provided you with, of the documentation I forwarded to you, and of the books I gave you, some of which having been specifically bought for you from my publishers.

Let's now come to the main points brought up in your letter. Far from me the intention to be controversial, but the facts must be restated in their actuality.

Working arrangement: You are saying that you have no trace of the agreement under which I am functioning since about twenty years? Where are the copies of the exchanges between my successor as Director Crézé, the University General Secretary Soulas and the University Physician Duval about setting up this arrangement at the beginning of the 1990s, with, among other things, establishing the (then expensive) Numeris connection between my home and the University? What about the fate of the files and various certificates (Cotorep, etc.) that I provided? And the copies of the certificates provided by the Observatory? In the course of the twenty or so past years, the various Observatory managers certainly checked that everything was in order on that side since they *de facto* extended the ongoing agreement including the coverage by the Observatory of the digital link. I am surprized that, some two years after being in charge of the Observatory, you are now raising that point. For the time being, please find atached a last document from the University medical service confirming my teaching exemption issued by the University physician during a recent visit.

Service activities: You are saying that my service activities are not coming under CDS[211]? Since I must again recall History, I shall remind that my databases (among them *StarHeads* that you are quoting) have been installed at CDS, at the beginning of the 1990s, at the request of the then CDS Director, in order to broaden the range of the offered services[212]. These were presented as CDS services in the pages of the *CDS Information Bulletin*, as well as in the professional journal *Astronomy & Astrophysics* and in various secondary publications. Please note also the regular participation of CDS personnel (mainly G. Landais and F. Ochsenbein) to the online processes as well as their residence on a CDS machine (what yourself are acknowledging in your letter[213]), not to forget the indication

[211] CDS that, at the time you were still a student, I put on the international stage at a moment other American and European undertakings were threatening it. See for instance [Publ. 126].

[212] See for instance [Publ. 117]. As a reminder, CDS was already publishing since 1986 precursors on paper, directories and catalogs, within its *Special Publications* series.

[213] But recently tranferred on the *astro* machine to simplify the maintenance.

"On-line service provided by CDS", with a CDS logo on each of the pages since the operational exploitation of the databases in 1993. If all this was not enough, I refer you for the recent history to the last Observatory quadrennial reports where, without seeking my agreement, I have been associated to CDS, a team to which I do not belong formally. This says how much CDS continues to appreciate my contributions[214]!

The development of those resources (that kept me busy more than full time) were among the motivations for my promotion to the First Class of Astronomers[215]. My current maintenance work[216] is a daily activity and it is keeping me busy much beyond, from your comments, what you seem to imagine. Your ignorance on this matter is simply a consequence of the fact that you never enquired by myself about my service activities. They have never been a source of problems with your predecessors (nor with yourself until you had today to tentatively justify your position on my retirement case). In summary, I consider to contribute substantially, above the individual average, to the service activities astronomers have to deliver *globally* for the house.

Financing: The amount you are putting forward for 2009 (€3867.47) results from a mixture between the *point chercheur*[217] and the costs resulting from my work at home within the framework of the agreement mentioned above, expenses easily accounted for since paid directly by the Observatory (ADSL line replacing the former Numeris connection) or reimbursed to myself (some consumables). Those latter expenditures can only be meaningful if compared with similar expenses for the other scientists of the house, in which case they cannot be assessed individually since put in common.

I invite you also to put in the balance the many books, specialized or others, I delivered as donations to the library shortly after their parution and whose purchase, if we had to acquire them on institutional resources, would amount to several thousands Euros yearly[218]. I will not come back to the personal €30,000+ invested annually as professional expenses and leading to the numerous publications[219] and other productions that the successive Directors of the Observatory have always been happy to include in their activity reports.

Office: As already discussed with some of your predecessors and with the current occupant, I have no objection to migrate towards a smaller office, next to mine,

[214]The excellency of my databases is also recognized by the world reference in terms of astronomical bibliography, ADS (Harvard), institution collaborating with CDS, pointing towards them for each of the queries on its site (4.2 Millions querries for May 2010).

[215]On 1st January 1977. For the record: Exceptional Class on 1st September 2008.

[216]Not only of *StarHeads*, but also of the voluminous compilations *StarGuides* and *StarBriefs*.

[217][Yearly allowance provided to each scientist, of the order of €2000.]

[218][Heck's archives contain long lists (compiled by the Observatory librarians) of books donated by our biographee – personal books, or volumes received from publishers as member of editorial committees or for bibliographical reviewing (cf. p. 445).]

[219]According to the statistics carried out by ADS, I would be the most published astronomer of the whole history of astronomy with a normalized ADS index of 800 [see the note by M.J. Kurtz on p. 353].

not sound-proofed, but located at the quietest part of the building and therefore *a priori* compatible with my pathology. To this day, none of my successors to the directorship has deemed necessary to impose me this removal, and even less to blame me for the office I am currently occupying, tailored to my disability and corresponding to my rank.

Subventions: Contrary to what you are saying, I have never refused to apply for subventions wherever possible. On the contrary, the information pieces that you were announcing have never reached me. During our second interview, yourself appreciated that at least one of the sources you mentioned would be too belated for the colloquium *Future Professional Communication in Astronomy II* that I organized at Harvard in April 2010 and to which I proposed to associate the Observatory and the University, something that obviously did not interest you at all. For the very same reason, it is at Paris Institute of Astrophysics, in collaboration with Harvard University, that I consider organizing my next colloquium on *Facets of Professional Astronomy*.indexgeneralDocuments disappearing

Syrte group: I never received any proposal to join that group. If this is the group of historians you evoked during our second discussion, I explained then that such a group would be totally inadapted to my main activities which are of forecasting for the world astronomical community[220]. To see an exclusively historical facet in me comes down again to expose your ignorance of my actual activities, in spite of all the documentation and books that I handed you[221].

To come back briefly to that retirement file, the situation was not at all under control as your letter would lead to believe. When calling for another reason, on 6 May past, the service you are referring to, I discovered the existence of that file and that it had been sent to me on 21 April via your own hands. It appeared subsequently that the file had been archived by your office instead of being forwarded to me. Without that fortuitous phone call, I would have never heard of that file for a long time. Thus we were very far from the "without harm" of your letter. Be also kindly aware that you are not entilted to mention medical elements in the documents concerning me.

As to the difficulties to meet you, they were far from being "alleged" as demonstrated by the annex summarizing our exchanges on the matter (copies of e-messages available): a series of dilatory answers on your part, silences to my reminders or promises of recall not followed up, all this leading ultimately to a delay of six months for the first discussion since the first request and two months for the second. If it was a matter of just knocking on your door from the moment

[220] Colloquium FPCA at Harvard [cf. p. 259] and *Facets of Professional Astronomy* planned at Paris at the Spring 2012 [cancelled due to the unexpected death of John Huchra (cf. p. 261)], the seven volumes *Organizations and Strategies in Astronomy* having been granted the Stroobant Prize [cf. p. 248], the new series *Organizations, People, and Strategies in Astronomy* in preparation [cf. p. 286], etc.

[221] Among others, on 11 September 2009, the OSA 7 volume (Springer 2006), as well as the proceedings of the FPCA I colloquium (Brussels 2007) and the book *The Multinational History of Strasbourg Astronomical Observatory* (Springer 2005).

> I wanted to talk to you, why not saying it from the start? In that perspective, your call for a courtship at the coffee on Friday morning[222] where, to your own saying, you have "pleasure to meet the personnal" can only be perceived as from another epoch, sadly.
> Presence at the Observatory: In spite of what may believe the usual gossipmongers always keen to attract interest, nobody can pretend to know the detail of my presence at the Observatory, be it only because of the scattering of the buildings and of the low profile I am keeping. Consequently I recall again (cf. attached certificate [see p. 196]) that I am "authorized to work at home while being at the Observatory only whenever necessary for the exchanges with the colleagues". This is what happens as far as I am concerned. And conversely, anybody who wished to get in touch with me never had any difficulty to do so. Any other discussion on this point can only be inappropriate[223]
> As to my participation to the Observatory mundane activities, do you believe that your obvious hostility towards me favors it? Such an attitude is incomprehensible towards a disabled person totally devoted to his job.
> I had offered you my trust and friendship[224]. I had hoped ending my career at Strasbourg Observatory in a context of dynamism, openness and serenity. During our first discussion, you told me you were perceiving your rôle as that of an administrator serving the scientists of the house. The historian of this house that you want to see in me would have liked to wrote one day that this was effectively the case as far as he was concerned.

Apart from being a facet of mobbing, this attempt to hasten the departure of our biographee was in itself a psychological blunder. It exposed another ignorance, that of Heck's character who, under such an aggression, could only assert his rights and fight for his probity and honor, while attempting to stay as long as possible.

Beyond the failure to pass on to him the mandatory retirement application, the answer of our biographee pointed out also how some documents and certificates seemed to have disappeared from his administrative file.

Another similar event took place when Heck sent for information a copy of the above letter and of its annexes to the University service in charge of the retirements. They never received it.

As the parcel had been mailed via the Observatory secretariat and the internal University mail, some black hole was still obviously interfering on the way.

From then on, our biographee and the University services used only the regular public postal service to communicate with, on Heck's side, his private street and electronic addresses. From then on, everything went glitchless.

[222] Coffee gathering that I established myself, a quarter century ago ...

[223] Let it be said however that I am adapting my presence at the Observatory to avoid, on one hand, the noisy (sometimes very noisy) periods in my building and, on the other hand, for a simple optimization of my time, given the chronic traffic congestions around Strasbourg.

[224] [Welcoming e-message dated 30 October 2008.]

On 28 October 2010, Heck was informed by e-mail that the University approved his request of extension till 2014. This was confirmed in writing to himself and to his lawyer.The Ministry followed the recommendation and issued the corresponding decree on 06 December 2010 (see Fig. 216 on p. 335).

Launching Venngeist

Since the publication of the seven OSA volumes (p. 248) and their distinction through the 2007 Stroobant Prize (p. 251), suggestions, recommendations and proposals had been accumulating to continue the series. Our biographee resumed firmly to contact potential contributors and to gather material in 2010.

In view of his personal mishaps, but also from his independent observations, Heck decided to put more emphasis on the human component. The slightly modified title, with the addition of the word 'people', reflected this: "Organizations, People and Strategies in Astronomy" (OPSA).

A first volume, OPSA 1, was ready for publication in September 2011.

After delivering the material to his usual publisher Springer, our biographee was expecting that the book would be available within the usual six months. But things had changed meanwhile in the publishing world under the pressure from both the globalization and shareholders hunting profit.

The desastrous condition of the proofs received from a delocalized production in India led to an amicable divorce between Heck and Springer in April 2012 and to the search for another publisher.

After the signature of a contract with the Astronomical Society of the Pacific (ASP) and a series a steps forwards and backwards, it turned out that the ASP was unable to simply reproduce the *pdf* file of the book, leading to a second amicable divorce in July 2012.

Those misadventures led Heck to materialize a project he was keeping for after his retirement: his own non-commercial publishing venture Venngeist. He decided to produce the volume from his own pennies, ensuring the distribution of paper copies at cost price and, free of charge, the immediate availability of the electronic version on a specific web site[225].



Fig. 189: Venngeist logo.

[225] http://www.venngeist.org/



Fig. 190: The two volumes "Organizations, People and Strategies in Astronomy (OPSA)" (Venngeist 2012-2013) continued the OSA series (Fig. 231) with emphasis on the human component, including training and ethics of activities.

Everything was set in a matter of weeks in spite of the vacation period: the book was available in September 2012 (Publ. 401) as well as its electronic accessibility. All the contributions were referenced on ADS as refereed papers. More paper copies were distributed via Venngeist than through the commercial publishers for earlier books. A second bigger volume was published the following year: OPSA 2 (Publ. 402).

The range of matters covered by the 200+ chapters of the nine OSA/OPSA volumes is imposing. The organization of astronomy in 22 countries or regions round the world (including Antarctica) is described. More than fifty large institutions or experiments are at the center of contributions. Professional periodicals as well as magazines for amateurs and grand public have their dedicated chapters.

A variety of unusual matters have been tackled such as planning, coordination, evaluation, quality assurance, demography, accessibility, ethics, training, language, lobbying, not to forget creativity, art, philately. This list is far from exhaustive. The interested reader should refer to the tables of contents (pp. 502ff & 513ff.).

In his editorials, Heck touched a number of issues on the importance of the human component. In the light of the previous section, the following excerpt from the OPSA 1 Editorial (Pub. 129) takes a special resonance:

> It is sometimes necessary to remind young students that scientific knowledge does not exist *per se*, but is the result of an evolutionary process mixing facts and theories with their confirmation or invalidation via data collected by continually improved instrumentation and analyzed by ever more sophisticated tools.
> Behind all this, and behind the papers, books, colloquia, projects, experiments, successes, failures, etc., are people, with all the peculiarities of the human zoo, its bright sides, its weaknesses and its possible disabilities.
> This seems sometimes forgotten by the scientists themselves, and in particular by some managers of science handling their human material like pieces on a chess-board, equations, lines of codes or test tubes that can be manipulated at will or along mere moody whims.
> Behind humans are lives, families, projects, a past and a future that must be respected. Too often in my already long professional voyage have I seen entire careers damaged by clumsy managers believing they were the only holders of the truth in a sacrosanct mission that was merely the fruit of their own ambition or of their narrow-minded approach of our job.
> Sometimes such misdeeds – often in a context of *faits accomplis* and absence of dialogue with the persons concerned – are no more than personal greed or intrigues in favor of family members or a coterie of cronies.
> Astronomy has one of the most noble missions: understanding the universe, as well as the place and rôle of man in it.
> This can be ideally achieved by providing the best working environment to those serving astronomy, not only via sufficient funding and efficient equipment, but also by minimizing unnecessary pestering and interferences.
> Creative people should be given special attention as they develop research (often at their own expenses) outside beaten pathes and established funding channels. It requires for this a managing intelligence open to unorthodox approaches and unusual methods of work, often sources of dazzling syntheses and stunning advances. Providing adequate recognition is also of fundamental importance in a world of oversized egos versus modest remunerations.

The OPSA 2 Editorial (Publ. 131) could also be quoted at length, but we shall restrict ourselves here to just one paragraph, inviting the interested reader to download the full file from the Venngeist site:

> Too often have I seen managers primarily interested in their own careers and ignoring the legitimate aspirations of the people placed under their responsibilities, when not clumpsily if not deliberately hurting them, sometimes to the point of demotivating them, getting them to leave or, when no other choice, to simply shut down and do the strict minimum of work required. In such cases, the real loser is of course the organization itself.

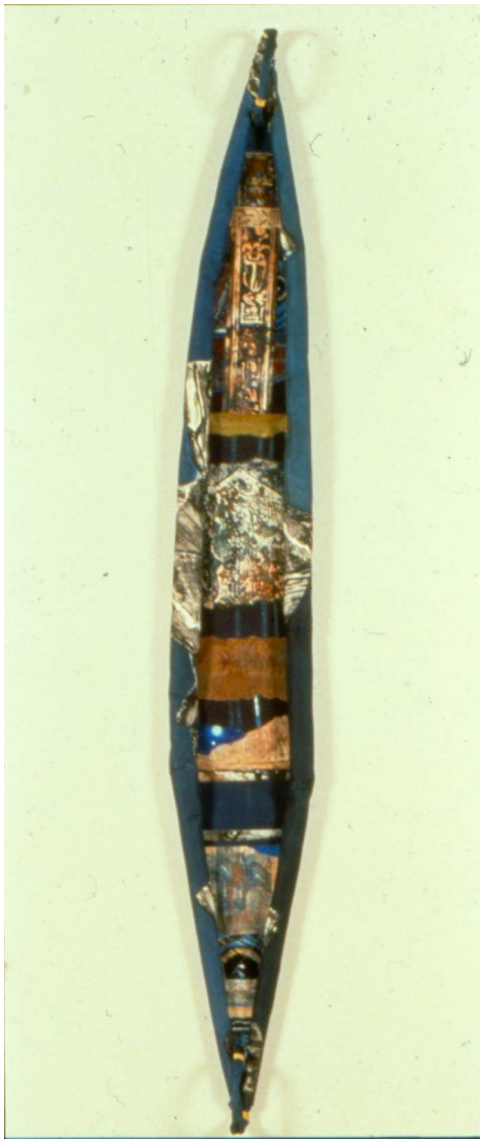


Fig. 191: Stephanie Rayner's "Solar Boat", a three-dimensional work (183cm × 30cm × 15cm) belonging to the collection of the Art Gallery of Mississauga, is composed of intaglio prints on arches paper, satellite shots of Earth, butterfly wings and copper, including also a reproduction of the plaque sent aboard the Pioneer space probe and a computer circuit board. Rayner's commentary on that work reads as follows: "Egyptian solar boats were interred in Pharaohs' tombs and were thought to go on a celestial voyage carrying prayers back to the Godhead. In this work, the idea of the Egyptian solar boat is linked with NASA's Pioneer space probe." See the caption of Fig. 236 for more on Rayner and her works. (Courtesy Stephanie Rayner – Photograph by Rob Davidson)

The OPSA volumes enjoyed an excellent reception from the astronomical community, in line with what had already known the OSA series. But, amidst the general appreciation, one gentleman expressed unhappiness through an outlet edited by his wife in charge of the AAS Committee on the Status of Women in Astronomy (CSWA).

He had suggested a theme for a book contribution, too late for the second OPSA volume and the CSWA article had obviously been written in frustration. In any case, as explained hereafter in his reply, our biographee did not consider that the gentleman was qualified for such a paper. This letter is mainly interesting for the light it sheds on the policy behind the OSA/OPSA volumes, as well as for its basic ethical reminders:

> A contributor to my books called my attention to your paper entitled "Sexism the Other Way Round" dated 25 September 2013 on the AAS CSWA website. That lady has authored several chapters in the volumes I produced, has known me for a long time as well as the spirit in which I work and shape my books. She was troubled by your paper and particularly by its conclusions. Meanwhile I received additional comments going in the same direction.
>
> First of all, Mr [Author], you had no right to quote excerpts and to refer to a private exchange, even an electronic one, without securing first my approval. In this part of the world, lawyers would bring you to court for that, forcing you into apologies and withdrawal of your blog. Your behavior has been that of a person seeking attention and oblivious of ethics. And, Ms [Editor], a clean editorial policy would have had you checking first with me for possible comments before publishing the paper of your husband. At the level of principles, these are two breaches in professional deontology.
>
> Second, the interpretation made of my words is wrong and offending. For instance, I never said nor meant that the situation of women would be satisfactory outside the USA, quite the opposite, and I tried to correct it at my own level through the books I produced. Instead of running dry statistics on the gender of authors in the two last volumes and to issue criticisms on the OSA/OPSA series (and on the Editor), you should have approached me, Mr [Author], with a more elaborate message than one obviously looking for contributing yourself to the books (anyway discontinued at the end of last year). I would have explained to you that, for each of the OSA/OPSA volumes (and for the other books I put together), I always did my best to include as many female auhors as possible (assuming qualified ones could be found) and to balance the authorship geographically over the world. It has not been easy at all and it would have been more straightforward to deal only with men.
>
> By the way, Mr [Author], you are not in charge of the CSWA, are you? And that's a keypoint as the OSA/OPSA chapters were, by the very conception of those volumes, authored (by invitation only) by officers or people in charge of organizations writing about these, and that's not the fault of the editor if most of these were men. By being focussed on the authors' gender and by failing to put two things together, you have fallen short of drawing the right conclusions.

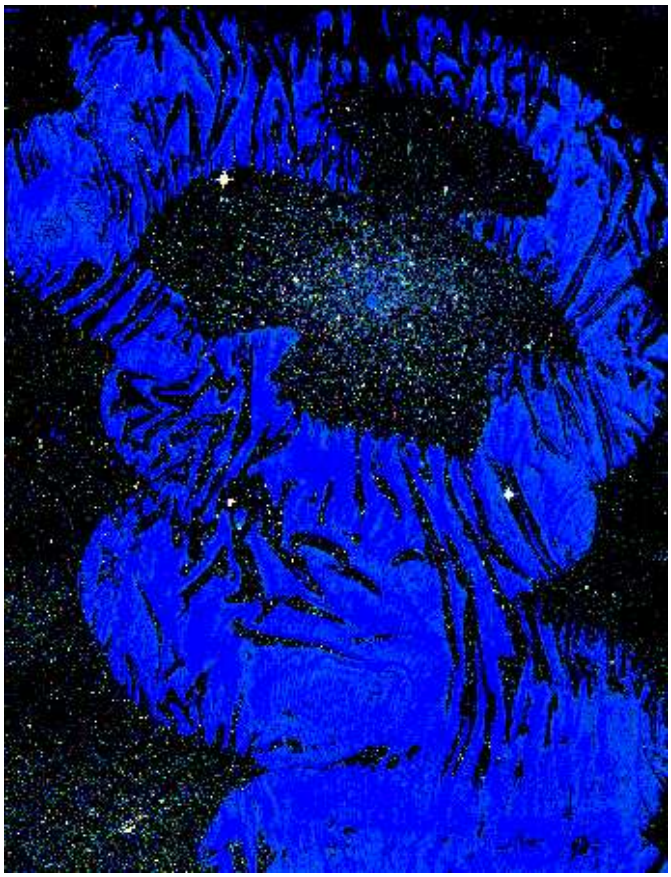


Fig. 192: Elizabeth Bohlen's "Celestial Embrace" (ink, spray & collage – 21.5cm × 28cm). See Publ. 846 on the artist and her works. (Digital file from the artist)

You should not have criticized the series, nor their Editor, but the astronomy demographics round the world that the volumes are reflecting. Don't blame the messenger if you don't like the message, or don't shoot at the mirror holder if you don't appreciate the image you see in it.
Statistics have also to be made properly, in this case on the nine volumes of the consistent OSA/OPSA sets and not only on the two last volumes, as well as on the substance and not only through figures quickly added from tables of contents.
Interestingly you didn't speak of the chapters dealing with ethics. Has none of these dealt with issues of concern to you or the CSWA? You probably did not even notice that, in one of the chapters, instead of the usual "he" for the indefinite person, the author (a man) was using "she". Properly conducted, a perusal of the volumes could have been used as another helpful illustration of the situation you are denouncing round the world.
Mr [Author], Ms [Editor][226], botched papers and conclusions do more harm than good to the cause they claim to champion. In this particular case, your paper is

[226]Or the other way round if you prefer, as I don't wish to be accused of sexism in that respect too ...

> deeply hurting someone who, through his whole career, from his education where men and women are equal, in working environments, learned societies, books produced and colloquia organized, has definitely done more (and quietly) for the cause of women than a number of people bragging about it.
> As said above, the OSA/OPSA series had been discontinued at the end of last year and there is no way I shall reactivate them one day, especially after this incident. I am deeply saddened and frustrated, reflecting on an old saying that, whatever best intentions and actions you might have, there will always be people to criticize and disparage you in order to advance their own visibility. My financial resources and publishing activities will now be oriented towards fields where people are more cautious, more respectful of ethics, and more appreciative of years spent to produce books gathering papers from world-class contributors, including from a few AAS officers.

Since the AAS banner was waving in the background, Heck sent a copy to the management of the society. Their reaction was disappointing, referring surprizingly to the CSWA outlet as a "publication peripherally related to the society". Heck resigned from the AAS as a protest against what he considered "an inadequate response". It might be appropriate to remind here his books had hosted a dozen or so chapters on the AAS activities and publications.

Our biographee has always warned that the soundest road to parity should not be a gender revenge leading to sexism the other way round as it might appear from "girls only" events or networks seen here and there, tending to set a gender against the other.

When maintaining the database StarHeads, he had received one day a message from an aged American female astronomer recommending he set up a separate database for women. Heck's answered that this would be discriminating and against his egalitarian education. He has more anecdotes on the matter in his private memories that will be available *post mortem*.

Continuing Activities

In parallel to the OPSA volumes, our biographee pursued his other publishing activities, such as writing public outreach papers.

The last installments from his "Potins d'Uranie" column appeared in the Belgian magazine *Le Ciel*, still edited by Jean Manfroid (Fig. 193), and through his own Venngeist venture, with all articles now posted on a dedicated web site[227].

Heck decided to close the series on the month of his retirement, after 255 issues spanning 35 years, from June 1977 to September 2014, published in various magazines, and having known several translations and compilations (cf. pp. 461ff).

He then initiated another column related to his native High-Plateaux[228], but not necessarily linked anymore to astronomy.

[227] http://www.potinsduranie.org/
[228] http://www.hautsplateaux.org/



Fig. 193: A few of the Potins d'Uranie published in "Le Ciel", illustrating the diversity of styles and themes tackled: Publ. 912, 909, 907, 902, 901, 906 & 908 from top to bottom and from left to right.

Taking up a suggestion made by several readers, our biographee gathered together all articles from the "Potins d'Uranie" column dealing with constellations. They were published in 2014 as a richly illustrated volume (Publ. 409, Fig. 57) that received quite positive reviews in magazines such as *l'Astronomie* (Paskoff 2014), *Ciel et Espace* (Martin 2015), *Le Ciel* (Manfroid 2014), and even in English in the *Observatory* (Dunlop 2015).

The complications arising from the cession of the StarPages files to Kluwer (cf. p. 226) had *de facto* torpedoed further developments. As potential conflicts were brewing, especially about rights, our biographee continued to maintain only the database StarHeads used by ADS (cf. p. 217).

Till his retirement, this was his "service" activity.

By now, the efficiency of the search engines on the web had made obsolete resources such as AstroWeb. Heck's directories and databases had been valued thanks to the validation and homogenization of their entries, but some data had become too volatile (telecoms, domain names, etc.). The situation was different for the database StarHeads. The statistics on queries and the numerous requests for updating entries were still good indicators of a heavy usage and were justifying pursuing the maintenance for some time.

On 26 June 2014, just before the holidays preceding his retirement, Heck put however an end to a 20y-old story by sending the following e-mail to ADS' Head Accomazzi:

> You should remove from the ADS pages all pointers towards the database StarHeads as I am stopping to maintain it. If we happen to meet again one day, I'll tell you a story that probably you'll find hard to believe, but its details will appear for sure in my memories. In short, computer people here shut down some time ago a machine where the database was maintained without warning the users of that machine, myself plus a couple of others, and they have been unable to reproduce the same environment in the new machine where my files were moved after I complained. Difficult to swallow, but real, and a pain in the neck to keep running the database.
>
> As I am retiring from this place in a couple of months, I didn't wish to start a war that would have led nowhere.
>
> On the other hand, StarHeads is not a needed resource anymore. The capabilities of search engines have dramatically progressed compared to the web beginnings when the database started its operational life (very first announcement in the NCSA Meta-Announcements dated 25 Aug 1994 with an "official" paper appearing in Astron. Astrophys. Suppl. 109, 1995, p. 265). In parallel, the web visibility of individuals, in this case professional astronomers-authors, has very sensibly increased.
>
> The database played some role in this as it was not unfrequent to provide advice for improving the layout of individual homepages and the information they should provide. Users grew also more educated as far as researching information on the web. All in all, I don't believe it is necessary to make StarHeads available anymore and most ADS queriers have certainly developed their own strategies for retrieving information on authors and on their institutions if they need so.



Hilmar Duerbeck (1948-2012) was a prolific collaborator on historical investigations.

As we saw on p. 23, Heck paid a short visit to Hoher List Observatory in April 1968 with a group of students and scientists from Liège. Their main host was Waltraut Seitter (1930-2007). Seitter and Duerbeck got married in 1975.

In May 1980, both observed dwarf novae with the IUE satellite at Vilspa where our biographee was in charge of science operations and happened to be their training R/A.

In September 1998, they contributed with a paper on Carl Wirtz (1874-1939) – a Strassburg-based pioneer on cosmic scaling – to the colloquium co-organized by Heck on the results from the Hipparcos satellite (Seitter & Duerbeck 1989).

This was the spark triggering multiple contributions by Duerbeck to the MNHSAO volume (Publ. 398): three chapters as single author (Duerbeck 2005a,b,c,) and two chapters in collaboration with others (Duerbeck & Seitter 2005 + Publ. 354).

As detailed on pp. 265ff, Duerbeck and Heck collaborated on a number of issues, in particular biographies.

Seitter passed away on 15 November 2007 after a long debilitating illness and, as an illustration of the death notice, Duerbeck used a b/w scan of Santa Helena pictured as the Cygnus constellation in Julius Schiller's "Christian sky" (1627).

Duerbeck had worked on Robert H. Van Gent's re-edition of Andreas Cellarius' "Harmonia Macrocosmica" (1660), so-called "The Finest Atlas of the Heavens", including a reproduction of Schiller's work. See also Publ. 920.

Duerbeck died suddenly and unexpectedly on 05 January 2012. A memorial service took place on 04 February 2012 in Schalkenmehren, his home village near the Hoher List Observatory.

A commemorative colloquium was organized at Bonn Institute of Astronomy on 09 March 2013 (cf. Fig. 194). Its proceedings – including Heck's (2016) contribution – are still in press at the time of compiling this volume (Dick & Sterken 2016).

> One slice of life, a couple of decades busy with updating activity, is then over for me, after quite a few other pages already turned, and more to come. In this moment, my thoughts are going to Günther [Eichhorn] who understood the interest of heaving StarHeads linked to the ADS queries, and my warmest thanks go to all of you guys for the excellent contacts we always had on this matter and others. Pls let me know when the links will be removed from the ADS pages. I'll then deactivate what remains on this end here, part of the whole process of progressively erasing all my files from the university machines.

Heck continued his frequent visits to archive centers (cf. Fig. 183) in search, among other things, of possible remnants from the contracts made by Coronelli for his globes (cf. p. 268).

Unfortunately, as said in the previous chapter, all historical projects envisaged with Hilmar Duerbeck had to be dropped because of his unexpected death (cf. p. 295).

In collaboration with Volker Witt, a historical paper on Strasbourg Observatory (Publ. 668) was published in the German magazine *Sterne und Weltraum*. Several articles appeared also in the French *l'Astronomie*, for instance on the fate of Strasbourg Observatory (then German) during WWI and just after the conflict (Publ. 669).

As shown by the specific section later in this volume (pp. 445ff), Heck devoted also part of his time to bibliographical reviews, some years being more productive than others[229]. If a specific book (or set of CDs/DVDs) could be reviewed in several magazines or journals, the comments were tailored to their specific audiences.

When Heck found that a book in French was particularly interesting, he advocated its translation into English. This had a successful outcome in at least two recent instances: Launay's masterpiece on Jules Janssen, originally published in French in 2008 jointly by Vuibert and Paris Observatory[230], knew a 2012 release in English by Springer under a translation by Storm Dunlop; and, also by Springer, an English version of Lequeux's 2008 remarkable biography of Arago in French (EDP Sciences & Paris Obs.[231]) was released in 2016. See the bibliography following directly this chapter for the full references of those publications.

In the foreword of the English version of her work, Launay is explicitely thanking our biographee for having acted as an intermediary.

Over the Last Passes into Serenity Valley

The previous chapters illustrate how complicated it could be nowadays to have or to follow a career in astronomy, and to carry out non-conventional projects, especially in a system plagued with coteries of chronies, a form of corruption. Heck started being seriously tired of having to waste his time with non-senses and counterproductive colleagues. Enough was enough.

[229] Up to 22 items in 2009.
[230] Heck's reviews in Publ. 533 & 536.
[231] Heck's reviews in Publ. 535 & 537.



Fig. 194: Saying a few words at Hilmar Duerbeck's commemorative colloquium organized at Bonn Institute of Astronomy on 09 March 2013 (see p. 295 & Heck 2016). At right, with Wilhelm Seggewiss. (Courtesy V. Schumann)

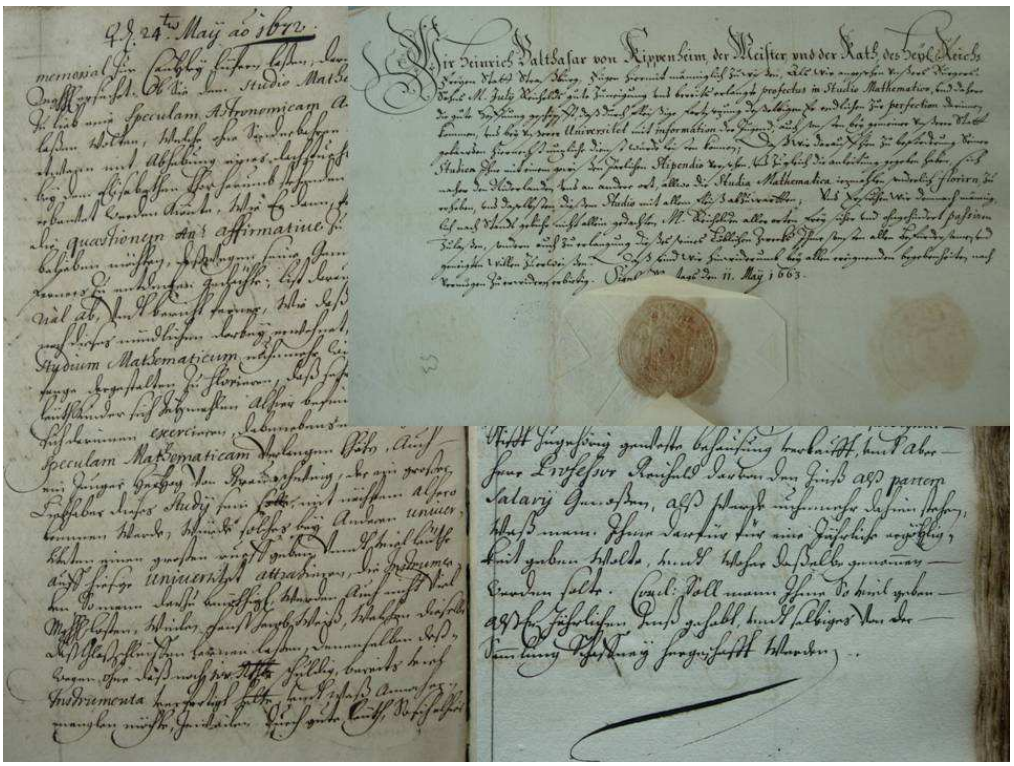


Fig. 195: Our biographee had to get acquainted with Germanic paleography, Kurrentschrift (German cursive) and Sütterlin script for decyphering documents such as those pictured above, retrieved from Strasbourg city archives (AVCUS).

Our biographee never imagined he would have to use lawyers repeatedly to fight for his rights and honor. Now over 60, he started considering seriously to leave astronomy altogether upon retirement, to devote his time and financial resources to more gratifying activities, and to interact with people more appreciative of what he would be doing.

The human spectrum Heck met during 45 years of professional activity in astronomy – be it locally, nationally or internationally – was probably no much different from what it is in other scientific fields. It had its share of characters ranging from generosity and competence to their opposite, not to forget meanness and jealousy, features far from being negligible in scientific circles and the sources of many dirty tricks.

Even if, apart from a few exceptions in international organizations, financial profit is no major motivation, some money-making activities should perhaps be planned in astronomy to ease a financing relying almost solely on public funding and foundations.

But we saw how such a suggestion (adoption of stars, p. 230) was rejected locally while meeting sympathy abroad; how academic bodies were unprepared to fight plagiarism, piracy and hacking(p. 224); how they felt uneasy with money not falling down from "helicopters"; and how scientists expected virtually everything for free.

As expressed in the *Complaint of the Publishing Astronomer* (p. 258), astronomers – and more generally scientists – are however quite right when lamenting the high cost of sharing knowledge: as producers for having to pay page charges in order to publish the results of their work; and as consumers for being able to access the published material. The FPCA meetings inspired by our biographee had tackled this kind of issues (cf. p. 259), especially the first one in Brussels.

This is not the place here for a long discussion about the astronomical systems, not even the French one in which our biographee worked for more than three decades. Heck will certainly detail a few issues in his *post mortem* memories.

Our biographee has for instance serious doubts about the perennity of a system where scientists who never had a single scientific idea of their own were able to reach the top position of large institutions just because they knew how to smile, to shake hands and to give confidence that no substantial change would take place. He also noticed that some highly luminous national "stars" or attractors – for funding, media, young collaborators, etc. – were largely unknown abroad.

Networks from elite schools should be challenged for their arrogance – if not contempt – towards not only outsiders and holders of university degrees, but also foreigners with higher degrees not existing in France, a behavior that could drift, being sometimes assimilated to a sectarian one[232], and that is at the very least a facet of corruption.

The third epigraph at the opening of the present book was extracted from a recent collective work (Attali 2016), its authors recognizing with a definite courage an evidence that all guest or immigrant intellectuals had to cope with. That book offers also more comments on the French research system, in line with our biographee's own earlier observations, such as those hereafter from the OPSA 1 Editorial (Publ. 129):

[232]If this sounds exaggerated, interested readers could refer to the declarations and analyses in *L'affaire Stéphane Kameugne* (Lefebvre 2012), as well as to the related comments on the web.



Fig. 196: In this second version of "The Phases of the Moon" (1941) by Paul Delvaux (1897-1994), the door largerly open in the center gives way to a desertic or lunar nightly landscape, with a bright comet in an abundantly starry sky and a Full Moon. Or is it rather a Full Moon at the limit of a total eclipse since stars and a comet are visible? Notice the scheme on the blackboard describing the phases of the Moon, also present in Delvaux's third version (Fig. 197), as well as in "The Astronomers" (Fig. 159). When Delvaux was about seven years old, the secretary of his father (a lawyer) gave him a copy of Jules Verne's novel "Twenty Thousand Leagues Under the Sea". His subsequent enthusiasm for Verne's works explains the frequent appearance in his paintings of Otto Lidenbrock (the geologist from the "Journey to the Centre of the Earth") from the original illustration by Édouard Riou: he is the foreground character on the right with the glasses on the forehead and examining closely something. The middle-class gentleman with the bowler hat (extreme right) is another souvenir from Delvaux's youth: a man he saw passing every day at the same hour on the sidewalk in front of his house and who became a kind of concept appearing in many of Delvaux's paintings: a civil servant from one of the numerous administrations or ministries in Brussels where he was living then (Debra 1991). See Publ. 767 and the caption of Fig. 236 for more on Delvaux and his works. (Galerie Patrick Derom, by courtesy)

> In the OSA 6 Editorial [Publ. 124], a pragmatic scientist was visiting an imaginary place called Weirdland, populated by Weirdies obeying rules edicted from the capital city, Weirdtown.
> This visitor could not help being surprized by the way the Weirdic scientists were functioning. Here are again, from his diary, a few notes falling directly under ethical considerations:
> – few scientists in charge of institutions seemed to have ever been trained in management or in human resources; they often behaved in a narrow-minded "little-chief" spirit;
> – the qualities of leaders were rarely a selection criterion for positions of responsibilities; the process was generally a kind of cooptation, sometimes through the formal election of a unique candidate;
> – the administrative structure and the resulting burden were so heavy that highly qualified scientists avoided entering the managerial career and therefore ended up being regulated by less competent people;
> – the personnel selection and promotion processes were most disturbing; under policies of transparency, it appeared that many decisions were in fact taken in advance of commission meetings, that applicants had frequently no possibility for appeal and no opportunity to get themselves heard;
> – ethical issues were largely ignored by Weirdic scientists; ethic charters were rarely heard of or ignored; guidelines to avoid conflicts of interest and collusions seemed not to exist; close relatives or people with strong connections were sometimes holding high-ranking positions within the same organizations;
> – examples abounded where immediate carreerist benefit (personal or for friends) prevailed over the long-term interest of the discipline.
> These were just a few points from the visitor's diary holding many more comments on publications, education, evaluation, and other issues. Weirdland was a virtual world, but the list above could certainly be extended by our own observations.

The above touches also a more delicate matter: ethics, and there are indeed striking shortcomings in France.

For instance, while this would be frowned upon in other countries, if not squarely outlawed, the French have no objection in having the top managerial positions of an institution in the hands of close relatives, even married couples, leaving the personnel without independent appeal resource or countervailing power within the house in case of problems. As was saying a union representative, it is definitely disturbing to have the decisions committing an institution and its personnel taken by partners in life at a kitchen table or elsewhere in a private home.

While they are prosecuted in most neighboring countries, mobbing and bullying at work are concepts ignored by French law, essentially centered on sexual harassment. There are signs towards broadening the approach though, with concepts such as moral harassment and pain at work. But this would still remain short of tackling the real issue as exposed in edifying contributions such as those by Cyprès (2014) and Duffy & Sperry (2012), or in the edited works by Lester (2013) and Tehrani (2012).



Fig. 197: This third version of the "Phases of the Moon" (1942) by Paul Delvaux (1897-1994) is a splendid composition. In the foreground, Lidenbrock in his usual position and another character are examining a small rock. On the left, one side of a square tower displays a sundial while an opening at the same level in the other wall reveals a mechanism explaining the phases of the Moon. The right-hand side is populated by characters going up and down stair flights leading to a kind of observatory. The backgound is an almost desertic landscape, with however a few of those street lamps and locomotives so dear to Delvaux. The limpid sky displays many stars and a quasi-photographic reproduction of the Moon close to the First Quarter. Notice that, as in many of Delvaux's paintings, the crescent is oriented upwards while astronomers would expect it downwards, towards the Sun under the horizon. That painting unavoidably evokes the night scenery of modern big observatories (desert, mountains in the far, limpidity of the sky, and so on), together with a special note here related with the ghost nitrate mines of Northern Chile where locomotive graveyards can still be found in the desert, largely intact[234]*– a coincidence since Delvaux has never been there? Notice also that, in this painting, women are totally and classically (almost strictly) dressed. See Publ. 767 and the caption of Fig. 236 for more on Delvaux and his works.*

The experience shared by Westhues (1998) and the process he describes, starting with ostracism and administrative harassment, might sound all too familiar to some scientists, and is similar to the DOBE concept exposed independently by Heck in his OPSA 2 Editorial (Publ. 131).

According to our biographee, the little book in French by Hirigoyen (2001) on professional bullying is a real gem. Heck tells how well he could identify some of the situations described with mishaps himself experienced, or how he could put names on characters featured in the book, such as a couple of so-called narcissistic perverts. Again here, it would be interesting to peruse his *post-mortem* memories.

> "But even with mobbing or bullying at work legally condemned, says our biographee, the next step would be most critical: what would be the measures to be taken in practice to put an end to a situation? The complexity of the issue and the difficulty to document cases, together with the slowness of justice would discourage more than one potential plaintiff."

Earlier in this book, we saw how Heck was dissuaded to bring a case to the Administrative Tribunal (p. 148); how the Mediator of the Republic had little power to resolve an issue; and how some members of personnel in hard times preferred remaining silent, lying down and waiting for better times (p. 226), when not simply leaving the house (with the imaginable consequences on their own life), rather than fighting back.

And we saw how protective Heck had to be for himself, once he had decided to stay, in view of the medical condition resulting from his CVA.

Close to his effective retirement, as one of the few Exceptional-Class Astronomers of the country, Heck (perhaps ingenuously) decided to share with the Ministry some of his views on the national organization of astronomy, emphasizing that his comments were based not only on his own international experience, but also on the many papers in the OSA/OPSA volumes dealing with astronomy systems worldwide.
Here are a couple of excerpts from his 2013 letter[235]:

[234] On this, see *e.g.* Publ. 756.

[235] Original text in French: Tout d'abord, le corps français des astronomes et le Conseil qui le gère sont des structures obsolètes. Rien ne justifie au XXIe siècle le maintien d'une organisation séparée pour cette profession. C'est là typiquement un possible élément de simplification de structures administratives si l'on se décide un jour à en faire une dans ce pays. Les astronomes français (environ 230 personnes) ont tout naturellement leur place dans des organismes scientifiques tels que le CNRS, le CNES, le CEA, etc. Les tâches d'enseignement qui leur sont demandées (et qui les détournent de leur activités scientifiques principales) relèvent plutôt d'un personnel universitaire. Les activités dites "de service" figurant dans leurs statuts peuvent très bien rentrer dans le cadre des organismes scientifiques cités ou faire l'objet de contrats spécifiques. // La suggestion serait donc de ne plus recruter dans ce corps, de le laisser s'éteindre par départs en retraite, tout en favorisant des transferts vers les organismes scientifiques ou les universités selon les vocations plutôt de chercheurs ou d'enseignants des personnes concernées. // Deuxième commentaire, le renouvellement par totalité du CNAP tous les quatre ans ne favorise pas la lisibilité et la continuité de sa politique. [...] Il est certes souhaitable que de tels organismes évoluent, mais en conservant une certaine mémoire. La suggestion serait donc de ne renouveler ce Conseil, pour le reste de son existence, que par tiers ou par moitié. [...] Enfin, et ce commentaire pourrait aussi s'appliquer à nombre de dirigeants de nos institutions scientifiques, il serait hautement souhaitable que

> First of all, the French corps of astronomers and the Council that manages them [CNAP] are obsolete structures. Nothing can justifies to maintain in the 21st century a separate organization for that profession. This is typically a possible facet for simplifying the administrative structures if one decides to undertake it one day in this country.
> The French astronomers (about 230 persons) can quite naturally fit within organizations such as CNRS, CNES, CEA, etc. The teaching tasks requested from them (and that are taking them away from their main scientific activities) fall rather under university personnel. The so-called 'service' activities appearing in their statutes can very well be included in the framework of the scientific organizations just mentioned or be the matter of specific contracts.
> The suggestion would then be to not recruit anymore in that corps, to let it extinguish itself by retirement of the existing personnel while favoring transfers towards scientific organizations or universities in line with the profiles – either rather researchers or educators – of the concerned persons.
> Second comment, the total renewal of CNAP every fourth year is not facilitating the lisibility nor the continuity of its policies. [...] It is certainly desirable that such an evaluation body evolve, but it should retain some memory. The suggestion would be to renew that Council, for the remainder of its life, by only one third or one half of it. [...]
> Finally, and this comment could also be of application to many a manager of our scientific institutions, it would be highly desirable that the members of the selection and evaluation committees be chosen among people with an effective training to the handling of human resources.

The Ministry, in a typically incomprehensible reaction, answered that they could do nothing about another promotion for our biographee. Understand who can. At the very least, the ministerial officers (or their advisers?) were faithful to themselves, rejecting outside input.

Heck had contemplated the possibility to use some of his financial resources to set up a couple of grants for young astronomers having original ideas not falling within the pre-defined channels or who would be active in socio-strategical astronomy.

But in view of the treatment he received in the last years, our biographee changed his mind and decided to use those financial resources for more gratifying activities. He progressively resigned from all his astronomy-related professional societies.

On Sunday 21 September 2014, after visiting for a last time his office at the Observatory, Heck left definitively the Eastern Building where he had been based for a quarter century. When locking the garden gate giving onto *rue de l'Observatoire* [Observatory Street], he told himself he would never cross it again. His keys were returned the next day to the Observatory secretariat per registered mail to avoid any potential complication from the local characters.

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les membres de comités de sélection et d'évaluation soient choisis parmi les personnes dotées d'une réelle formation à la gestion des ressources humaines.

The first Exceptional-Class Astronomer of the place, its first foreign Director (under French rule), its scientist whose impressive publication record had been celebrated abroad, that man left Strasbourg Observatory without any regret, closing the book of his 45 years in professional astronomy.

A new slice of life begun. With immensely more serene perspectives.

Io sono tra coloro che non rimpiangono la giovinezza
Sono lieto di averla vissuta, ma non vorrei ricominciare da capo[236].
(Eco 2004)

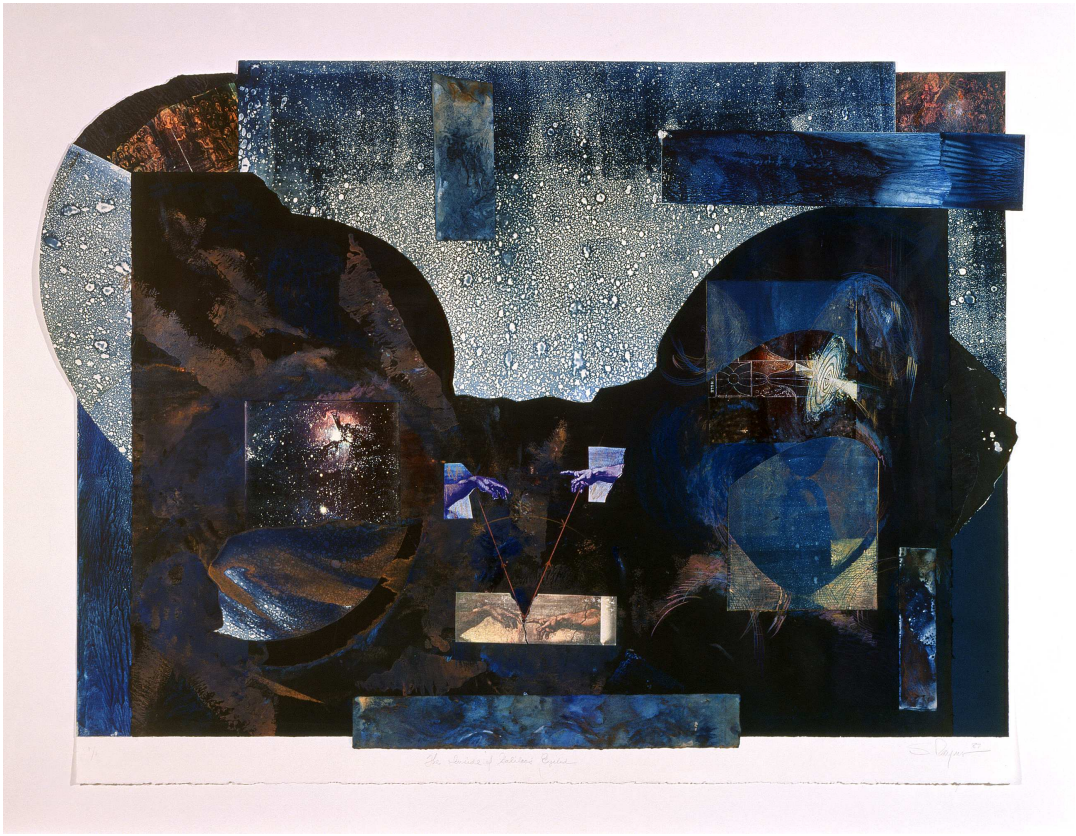


Fig. 198: Stephanie Rayner's (Fig. 236) says the following about her 'Galileo's Eyelid' reproduced above: "The swirling image (whitish) on the right of the work is a conceptual drawing of the energy at the event horizon of a black hole. You can just see the edge of BLACK HOLE lettered down the side. The [middle V] shape reminds me of the night sky when an observatory [dome] is beginning to be opened." Notice the Trifid Nebula (M20/NGC6514) from the Sagittarius constellation reproduced in the left eye. See the caption of Fig. 236 for more on Rayner and her works. (Photograph by the artist)

[236] I belong to those who do not regret their youth. I am happy to have lived it, but I would not like to start again from the beginning.

Epilogue

After examining the previous chapters, our biographee wisely advised to remind that this book is no biography, but merely an account, as factual as possible, of professional activities within context.

Such a detailed cataloguing might be a matter of displeasure for some of his colleagues, for various reasons, including (or mainly) envy. But Heck has done many things, right? And much more varied than the average astronomer. Quite a number of minor achievements have actually been left out of this book to avoid overloading an already crowded exposé.

Heck's prolific publishing activity might also be unsettling for those unable to understand that it comes under a total dedication, including financially, from someone who needed little sleep and was excellent at setting up collaborations. And he has certainly not to apologize for his hyperorganized working power and the resulting volume of his production.

This independent-minded scientist has never been a man of coteries and repeats whenever necessary that he did not work *for* others, but *with* others.

The present volume has been conceived essentially for future historians of astronomy. It should be complemented by our biographee's *post-mortem* memories where he will have his own comments and first-hand anecdotes, possibly also letting loose the typical Belgian humor and self-derision, often clumpsily misinterpreted by foreigners with a high opinion of themselves.

The reader should not be mistaken: Heck is well aware he is no ignored Nobel Laureate, knowing exactly where he is standing, what he has been able to accomplish (at the cost of his health) and what were his limitations.

He expresses deep gratefulness towards people who played a positive rôle in his professional life. They have been named in the previous chapters.

His occasional wrath is directed towards people who were entrusted with responsibilities they were not up to carrying properly and who, worst of all, dealt carelessly with the human resources they were in charge of.



Fig. 199: Just before leaving Spain in March 1983, Heck had met Roy Lichtenstein (1923-1997) at the Foundation Juan March (cf. p. 135). The "Eclipse of the Sun II" (1975) reproduced above (by authorization of the artist) is oil and magna on canvas (70"×54") in private collection, believed to be derived from Giacomo Balla's "Mercury Passing in Front of the Sun as Seen from the Telescope" (1964). See also Publ. 768.

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For the full list of papers and books by A. Heck during his professional career (1969-2014), please refer to the section entitled "Publications by A. Heck" (pp. 401ff).

Documents

This section gathers together copies of significant diplomas together with a few other relevant documents.

ROYAUME DE BELGIQUE

MINISTÈRE DE L'ÉDUCATION NATIONALE ET DE LA CULTURE

L'UNION FAIT LA FORCE

LE JURY

Chargé de procéder aux examens de sortie de la classe de
l^e LATIN-MATHEMATIQUES
ATHENÉE ROYAL - VERVIERS ;
Vu les dispositions réglementaires concernant cet objet ;
Attendu que M^s HECK André
né à JALHAY, le 20 Septembre 1946,
a subi l'examen prescrit ;
Vu la somme des points obtenus à cet examen et aux compositions de l'année ;
Confère à M^s HECK André
le présent

DIPLÔME

attestant qu' il a fait avec le plus grand fruit
des études moyennes du degré SUPERIEUR
dont le programme comprend les branches suivantes :
Religion et Morale - Latin - Français - Allemand - Anglais - Histoire - Géographie - Mathématiques - Physique - Chimie - Biologie - Dessin descriptif géométrique - Education physique

Donné à VERVIERS, le 27 Juin 1964.

Pour le Ministre :
Le Directeur Général,

Le Jury,

Fig. 200: Diploma (32cm × 45cm) ratifying with the highest grade the secondary studies (cf. p. 8) and carrying the signatures of all ARV teachers (27 June 1964).



UNIVERSITÉ DE L'ÉTAT A LIÈGE

Nous, Président, Secrétaire et Membres du Jury chargé par la Faculté des Sciences de l'Université de l'Etat à Liège, de procéder aux examens du grade de licencié en sciences, pour le groupe des Sciences Mathématiques.

Attendu que Monsieur Heck André, né à Jalhay le 6 septembre 1946 est porteur d'un diplôme de candidat en sciences, pour le groupe des Sciences Mathématiques, à lui décerné par l'Université de l'Etat à Liège le 19 juillet 1967 et dûment entériné le 10 mai 1968

Attendu qu'il a subi avec grande distinction la 1re épreuve le 11 juillet 1968 et avec distinction la 2e le 15 juillet 1969 sur les matières suivantes : l'analyse supérieure ; la géométrie infinitésimale ; les compléments de mécanique analytique ; le calcul des probabilités et la théorie des erreurs d'observation ; la physique mathématique ; l'astronomie sphérique et l'astronomie mathématique ; la méthodologie mathématique, ainsi qu'un examen approfondi sur l'astronomie et la géodésie les deux épreuves de l'examen du grade de licencié en Sciences, pour le groupe des Sciences Mathématiques.

Attendu qu'il a, en outre, subi des épreuves pratiques sur les matières qui en comportent.

Attendu qu'il a présenté un mémoire sur "Mouvement apsidal et structure interne des étoiles" question scientifique se rapportant à l'astronomie et la géodésie

Avons conféré et conférons à Monsieur Heck André le grade de licencié en sciences pour le groupe des Sciences Mathématiques.

En foi de quoi, nous lui avons délivré le présent diplôme, attestant en même temps que Monsieur Heck André a été régulièrement élève de l'Université de Liège et que les prescriptions légales et réglementaires, quant à la durée des études et à la publicité des examens, ont été observées.

Fait à Liège, le 15 juillet 1969

Le Secrétaire. Les Membres du Jury. Le Président.

Au nom de Sa Majesté le Roi des Belges,

Nous, Président et Membres de la Commission spéciale d'enseignement institués en vertu de la loi du 31 mai 1920. Attestons que le présent diplôme a été délivré régulièrement et que toutes les conditions prescrites par la loi ont été observées. 17-3-1970

En foi de quoi, nous l'avons contresigné aujourd'hui

et enregistré sous le N° 2282 folio 56 du registre.

Bruxelles, le 17-3-1970

Pour la Commission.

Le Membre Secrétaire. Le Président.

Signature du Porteur. André Heck

Le Recteur.

Fig. 201: Diploma (36cm × 53cm) for the Master in Maths degree (cf. p. 24) awarded by Liège University (15 July 1969).



UNIVERSITÉ DE L'ÉTAT A LIÈGE

Nous, Président, Secrétaire et Membres de la Commission chargée par la Faculté des Sciences de l'Université de l'État à Liège, de procéder aux examens d'agrégé de l'enseignement secondaire supérieur.

Attendu que Monsieur Heck André, né à Jalhay, le 6 septembre 1946 est porteur d'un diplôme de licencié en sciences, pour le groupe des sciences mathématiques délivré par l'Université de l'Etat à Liège, le 15 juillet 1969

Attendu qu'il a subi avec distinction sur les matières suivantes : la pédagogie expérimentale ; l'histoire de la pédagogie ; la méthodologie générale ; la méthodologie spéciale des sciences mathématiques l'examen constituant l'épreuve unique de l'agrégation de l'enseignement secondaire supérieur.

Attendu qu'il a fait deux leçons publiques en français sur 1) Analyse combinatoire ; 2) Longueur de la circonférence sujets indiqués par le jury.

Attendu qu'il a justifié, par certificat, avoir suivi pendant un an au moins, sous la direction de son professeur de méthodologie, des exercices didactiques dans un établissement d'enseignement moyen.

Avons conféré et conférons à Monsieur Heck André le grade d'agrégé de l'enseignement secondaire supérieur.

En foi de quoi, nous lui avons délivré le présent diplôme, attestant en même temps que Monsieur Heck André a été réellement élève de l'Université de Liège, et que les prescriptions légales et réglementaires quant à la durée des études et à la publicité des examens ont été observées.

Fait à Liège, le 18 juillet 1969.

Le Secrétaire. Les Examinateurs, Le Président.

Au nom de Sa Majesté le Roi des Belges,

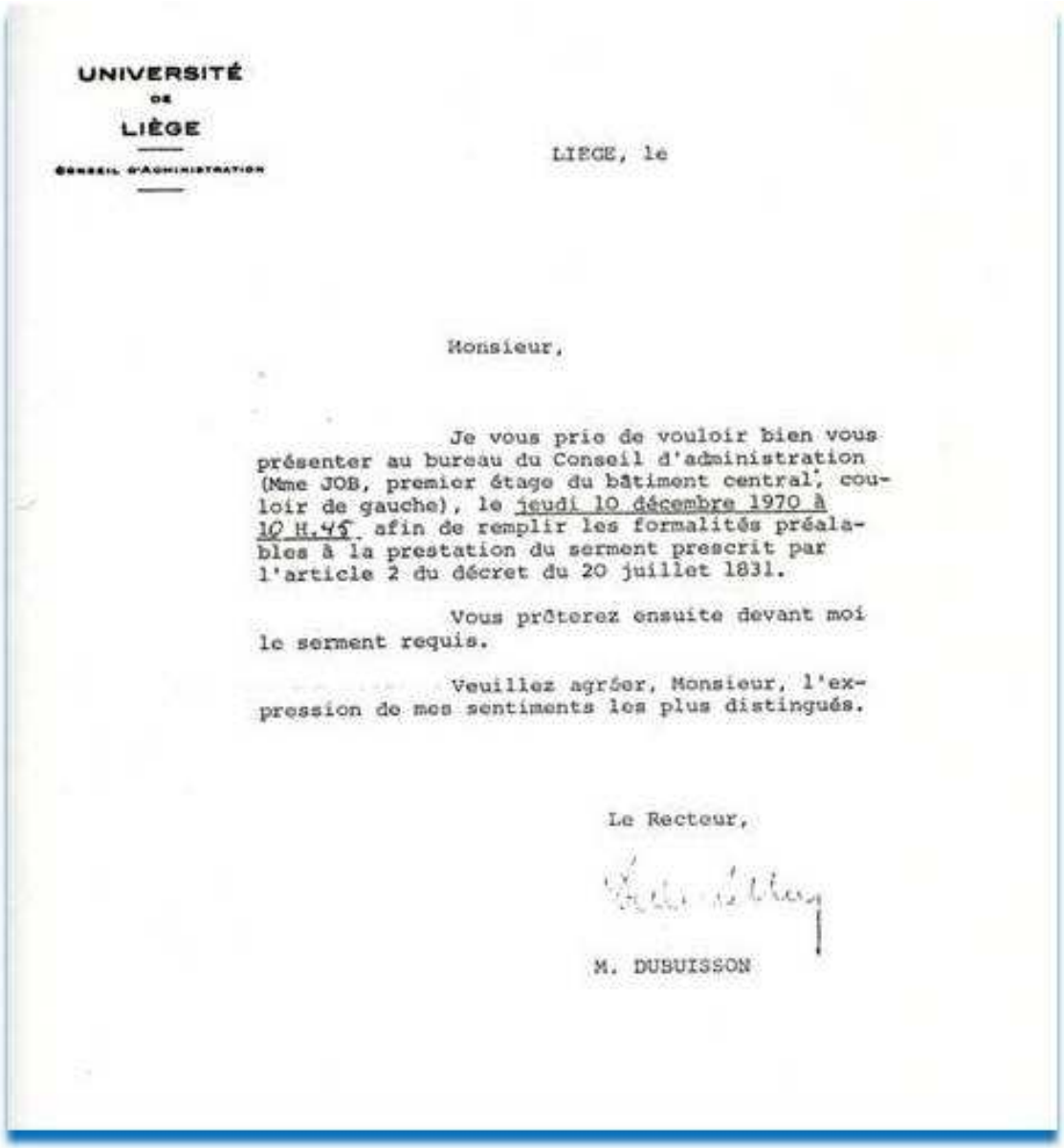
17-3-1970

Signature du Porteur,

André Heck.

Vu par nous, Recteur de l'Université,

Fig. 202: Diploma (36cm × 53cm) for the Master of Education degree (cf. p. 24) awarded by Liège University (18 July 1969).



UNIVERSITÉ
DE
LIÈGE

CONSEIL D'ADMINISTRATION

LIEGE, le

Monsieur,

Je vous prie de vouloir bien vous présenter au bureau du Conseil d'administration (Mme JOB, premier étage du bâtiment central, couloir de gauche), le jeudi 10 décembre 1970 à 10 H.45, afin de remplir les formalités préalables à la prestation du serment prescrit par l'article 2 du décret du 20 juillet 1831.

Vous prêterez ensuite devant moi le serment requis.

Veuillez agréer, Monsieur, l'expression de mes sentiments les plus distingués.

Le Recteur,

M. DUBUISSON

Fig. 203: Letter requiring Heck's presence on 10 December 1970 at Liège University central building for taking an oath of fidelity to the King and to the laws of the Belgian people with reference to an 1831 decree (cf. p. 88).



UNIVERSITÉ DE L'ÉTAT A LIÈGE

Nous, Président, Secrétaire et Membres de la Commission, chargée par la Faculté des Sciences de l'Université de l'État à Liège, de procéder aux examens de docteur en sciences

Attendu que Monsieur Heck André, né à Jalhay le 20 Septembre 1946 est porteur d'un diplôme de licencié en sciences, pour le groupe des sciences mathématiques délivré par l'Université de l'État à Liège, le 15 juillet 1969 et dûment entériné le 17 mars 1970

Attendu qu'il a subi avec succès les examens portant sur des enseignements totalisant 75 heures minimum et 150 heures maximum, à savoir : 1) Problèmes de cinématique céleste - 2) Astrophysique générale - 3) Techniques modernes de documentation 4) Astrophysique générale (partim : Méthodes modernes d'observation astrophysique) - 5) Structure et dynamique de la galaxie

Attendu qu'il a présenté et défendu publiquement avec la plus grande distinction une dissertation sur "Applications du principe de maximum de vraisemblance à la calibration des critères de luminosité stellaire"

et une thèse annexe sur "L'analyse statistique multivariée permet d'obtenir des indications sur la signification d'indices photométriques"

Avons conféré et conférons à Monsieur Heck André le grade de docteur en sciences, ~~pour le groupe des sciences~~

En foi de quoi, nous lui avons délivré le présent diplôme, attestant en même temps que Monsieur Heck André a été réellement élève de l'Université de Liège et que les prescriptions légales et réglementaires quant à la durée des études et à la publicité des examens ont été observées.

Fait à Liège, le 1er juillet 1975

Au nom de Sa Majesté le Roi des Belges,

13-1-1976

Le Secrétaire,

Les Examinateurs,

Le Président,

Le Porteur,

Le Recteur,

Fig. 204: Diploma (36cm × 53cm) for the PhD degree (cf. p. 64) awarded by Liège University (01 July 1975).



UNIVERSITÉ DE L'ÉTAT À LIÈGE

Au nom de S.M.

LE ROI DES BELGES

Nous, Arthur Dodson, Recteur de l'Université de l'Etat à Liège.

Vu la requête de Monsieur André Heck né à Jalhay le 20 septembre 1946 portant: docteur en Sciences par le jury de l'Université de l'Etat à Liège le 1er juillet 1975.

Vu l'Arrêté royal du 10 mars 1931;

Vu la déclaration de la Faculté des Sciences de laquelle il résulte:

Que Monsieur André Heck a présenté à son approbation et défendu publiquement devant elle une dissertation originale et inédite intitulée: "Quelques nouvelles contributions à la statistique astronomique"

ainsi que des thèses en questions accessoires;

Qu'il a, en séance solennelle, traité sous forme de leçon orale: "La rotation de la Galaxie",

sujet indiqué par la Faculté;

Sur l'avis de cette Faculté concluant à l'admission à l'unanimité;

Avons conféré et conférons à Monsieur André Heck le grade d'Agrégé de l'Enseignement Supérieur en Sciences;

En foi de quoi nous lui avons délivré le présent diplôme en séance solennelle tenue le quatre novembre mil neuf cent quatre-vingt cinq à l'Université de Liège

Donné le 4 novembre 1985.

Le Président et les Membres du jury.

Au nom de Sa Majesté le Roi des Belges,

Bruxelles, le 19

Le Membre Secrétaire. Le Président.

Pour la Commission

Signature du Porteur. Le Secrétaire du Conseil Académique. Le Recteur.

Fig. 205: Diploma (35cm × 54cm) for the ProfDSc degree (cf. p. 157) signed by all members of the Faculty of Sciences from Liège University (04 November 1985).



0 8 NOV. 1985

UNIVERSITÉ DES SCIENCES
JURIDIQUES, POLITIQUES, SOCIALES
ET DE TECHNOLOGIE
DE STRASBOURG

INSTITUT UNIVERSITAIRE DE TECHNOLOGIE
STRASBOURG-SUD

Tél. (88) 67.05.05

S.F.C. Langues et Techniques

67400 ILLKIRCH-GRAFFENSTADEN, le 5 novembre 1985
72, Route du Rhin

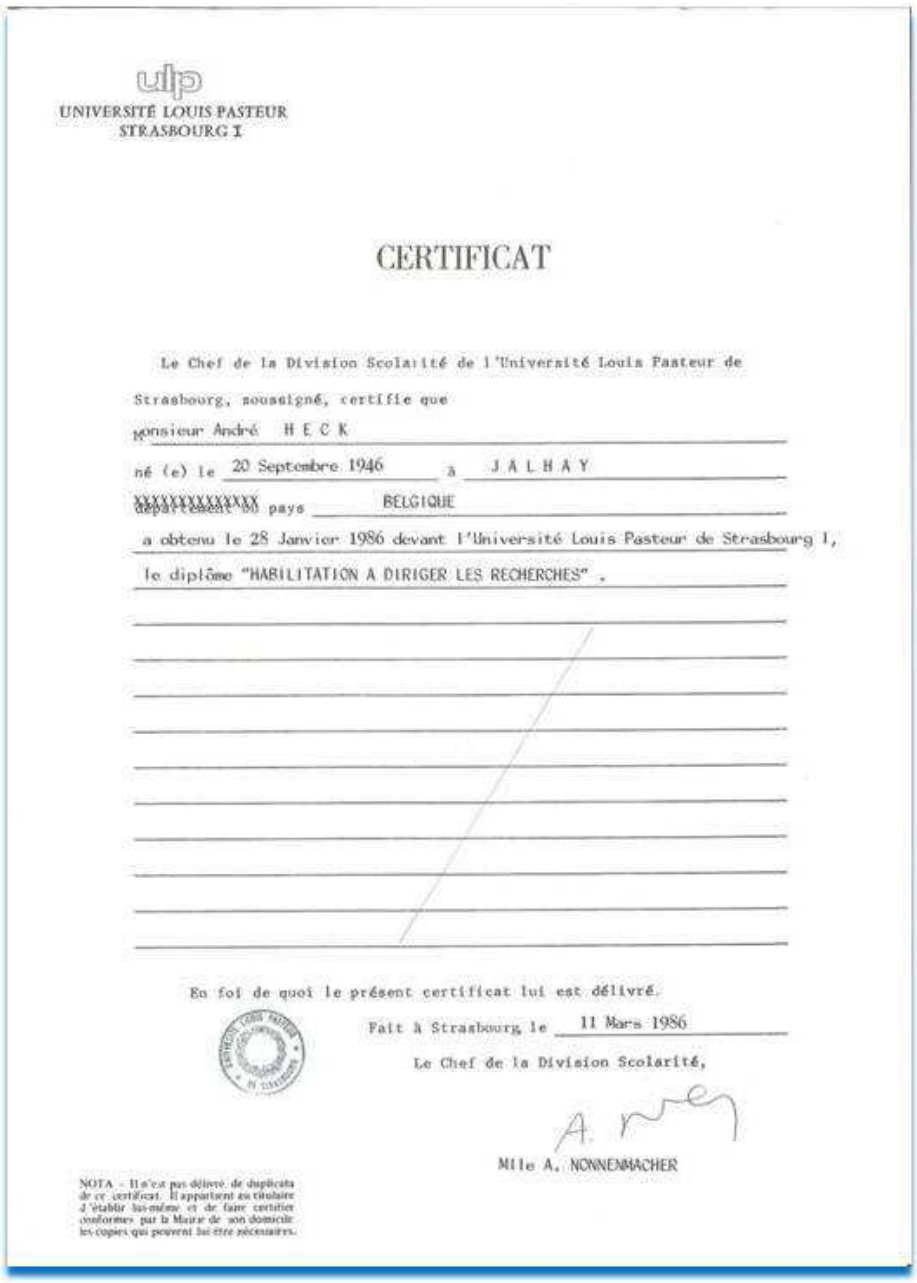
ATTESTATION

Monsieur André HECK a suivi les cours de Marketing et de Publicité, soit une centaine d'heures environ, pendant l'année universitaire 1984/1985 en tant qu'auditeur libre.
Il a manifesté un vif intérêt pour ces matières et a participé très activement aux travaux de groupes et aux études de cas pratiques.

Responsable des Enseignements
de Communication Commerciale

Jean-Luc DREYFUS

Fig. 206: Unusual graduation for an astronomer: marketing and advertizing at Strasbourg III University (05 November 1985).



ulp
UNIVERSITÉ LOUIS PASTEUR
STRASBOURG I

CERTIFICAT

Le Chef de la Division Scolarité de l'Université Louis Pasteur de Strasbourg, soussigné, certifie que

Monsieur André H E C K

né (e) le 20 Septembre 1946 à J A L H A Y

XXXXXXXXXXXXX pays BELGIQUE

a obtenu le 28 Janvier 1986 devant l'Université Louis Pasteur de Strasbourg I,

le diplôme "HABILITATION A DIRIGER LES RECHERCHES" .

En foi de quoi le présent certificat lui est délivré.

Fait à Strasbourg, le 11 Mars 1986

Le Chef de la Division Scolarité,

Mlle A. NONNENMACHER

NOTA - Il n'est pas délivré de duplicata de ce certificat. Il appartient au titulaire d'établir lui-même et de faire certifier conformes par la Mairie de son domicile les copies qui peuvent lui être nécessaires.

Fig. 207: This A4 certificate from Strasbourg University for the "Habilitation to Direct Researches" (cf. p. 157 and Fig. 111) obtained on 28 January 1986 looks lustreless in comparison with the glossy Belgian diplomas.



29 OCT. 1987

RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'ÉDUCATION NATIONALE

MINISTERE DE LA RECHERCHE ET DE L'ENSEIGNEMENT SUPERIEUR

DPES n°33

Ampliation certifiée conforme Pour le Secrétaire Général du Gouvernement

DÉCRET du 26 AOUT 1987

Portant nomination
(Enseignement supérieur)

NOR : RESP 8700535 D

LE PRÉSIDENT DE LA RÉPUBLIQUE

SUR LE RAPPORT DU PREMIER MINISTRE

DU MINISTRE DE L'EDUCATION NATIONALE ET DU MINISTRE DELEGUE AUPRES DU MINISTRE DE L'EDUCATION NATIONALE, CHARGE DE LA RECHERCHE ET DE L'ENSEIGNEMENT SUPERIEUR,

VU l'article 13 de la Constitution de la République française ;

VU l'ordonnance n° 58-1136 du 28 novembre 1958 portant loi organique concernant les emplois civils et militaires de l'Etat ;

VU le décret du 31 juillet 1936 fixant le statut des observatoires astronomiques ;

VU le décret du 25 décembre 1936 fixant le statut des instituts et observatoires de physique du globe ;

VU le décret n° 86-434 du 12 mars 1986 portant statuts du corps des astronomes et physiciens et du corps des astronomes adjoints et physiciens adjoints ;

VU l'arrêté du 20 mars 1984 portant nomination de M. CISTERNAS en qualité de physicien associé ;

VU l'arrêté du 9 janvier 1984 portant nomination de M. TARANTOLA en qualité de physicien adjoint associé ;

VU l'arrêté du 6 mars 1986 portant nomination de M. HECK en qualité d'astronome adjoint associé ;

VU l'arrêté du 6 mars 1986 portant nomination de M. STAUDACHER en qualité de physicien adjoint associé ;

- 2 -

VU l'avis du Conseil des observatoires astronomiques et des Instituts et observatoires de physique du globe dans sa séance du 25 novembre 1986 ;

DECRETE:

ARTICLE 1.-

.../...

ARTICLE 2.-

M. HECK André, astronome adjoint à l'observatoire astronomique de Strasbourg est nommé et titularisé en qualité d'astronome au même établissement à compter du 1er avril 1986.

ARTICLE 3.-

Le Premier Ministre, le Ministre de l'Education nationale, et le Ministre délégué auprès du Ministre de l'Education nationale chargé de la Recherche et de l'Enseignement supérieur sont chargés, chacun en ce qui le concerne de l'exécution du présent décret qui sera publié au Journal officiel de la République française.

Fait à PARIS, le 28 août 1987

François MITTERRAND
LE PRESIDENT DE LA REPUBLIQUE
LE PREMIER MINISTRE ;

Jacques CHIRAC

LE MINISTRE DELEGUE AUPRES DU MINISTRE DE L'EDUCATION NATIONALE, CHARGE DE LA RECHERCHE, ET DE L'ENSEIGNEMENT SUPERIEUR

Jacques VALADE

LE MINISTRE DE L'EDUCATION NATIONALE ;

René MONORY

Le Contrôleur financier

1.7.87
43661

Pour Ampliation
L'Administrateur Civil
Chef du Bureau DPES II

signé : Aline AUERBACH

UNIVERSITE LOUIS PASTEUR
STRASBOURG I

Division du Personnel

N° 004602 EMB/

- Monsieur le Directeur de l'Observatoire (2 ex. dont un destiné à l'intéressé)
- Division des Traitements (2 ex.)
- Archives
- Chrono

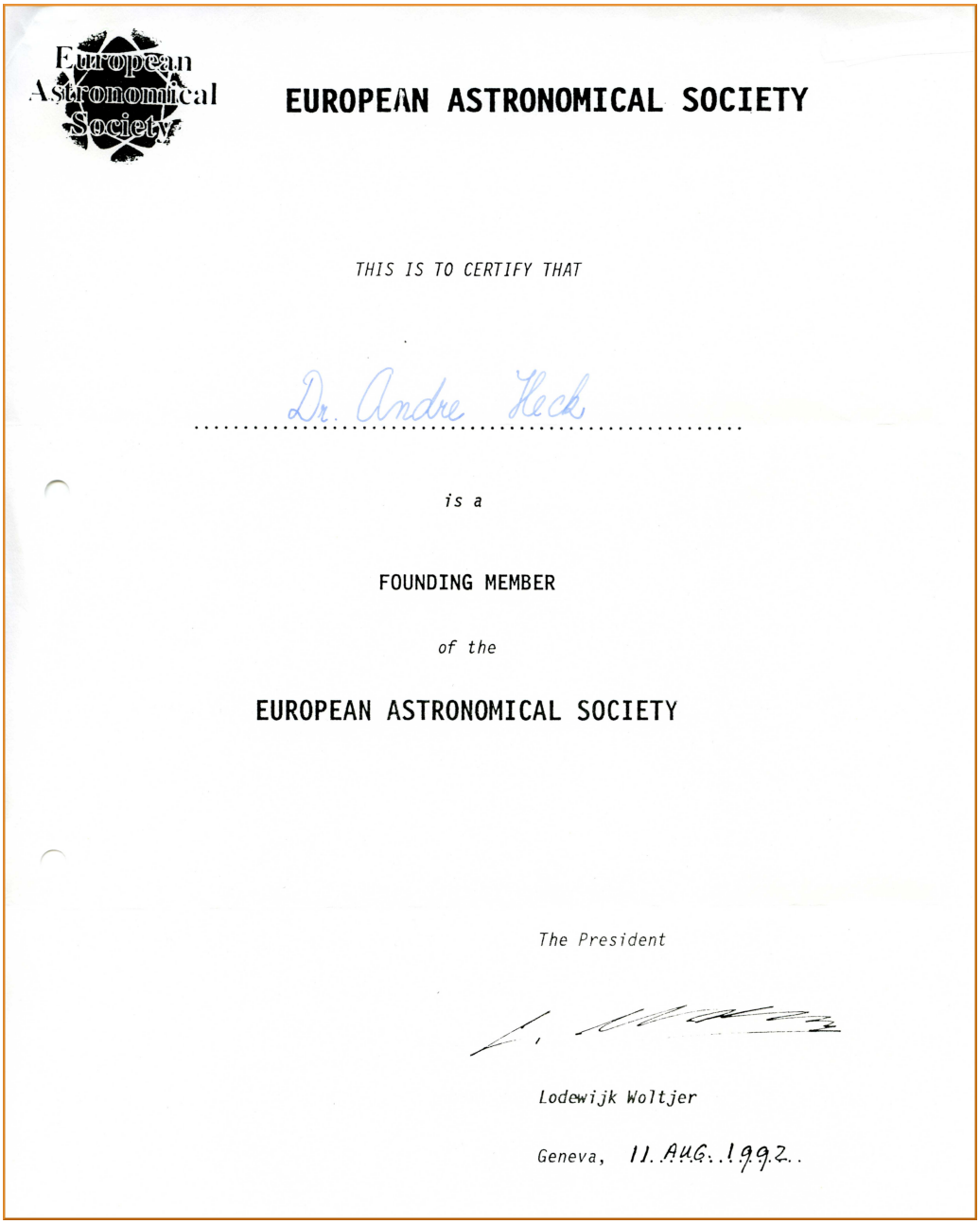
POUR EXTRAIT CONFORME

Strasbourg, le

P. Le Chef de Division,
Le Chef de Bureau,

YL SCHWENG

Fig. 208: Decree of unconditional tenured nomination in the French system of astronomers and geophysicists (18 August 1987, with retroactive effect on 01 April 1986) with base at Strasbourg Observatory. Notice François Mitterand's and Jacques Chirac's as official signatories, respectively as French President and Prime Minister during the first so-called "cohabitation". The concerned person never receives the original paper, but a copy of a copy of a copy, countersigned by a number of intermediaries – which explains the various surcharges on the document above.



EUROPEAN ASTRONOMICAL SOCIETY

THIS IS TO CERTIFY THAT

Dr. Andre Heck

is a

FOUNDING MEMBER

of the

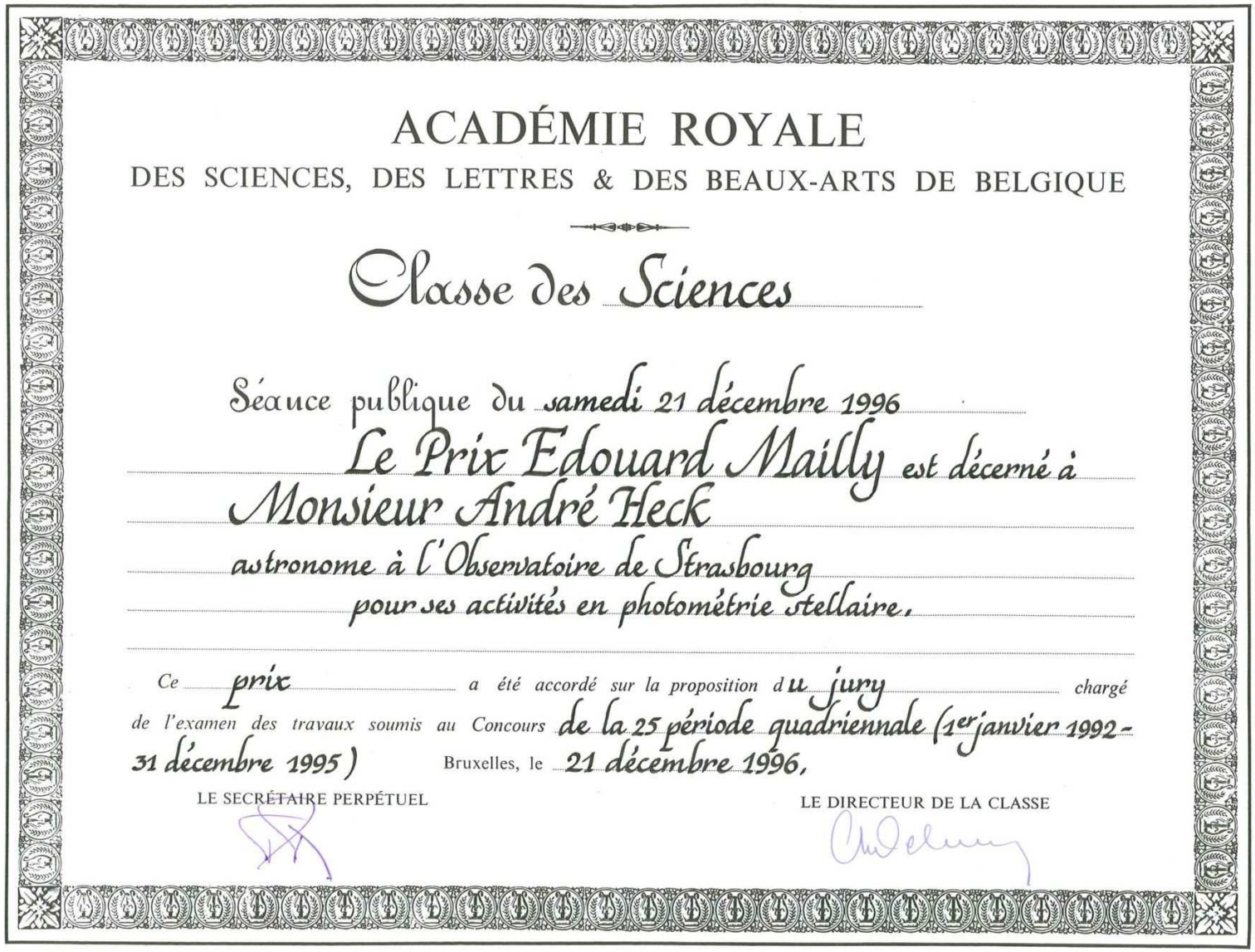
EUROPEAN ASTRONOMICAL SOCIETY

The President

Lodewijk Woltjer

Geneva, 11. AUG. 1992

Fig. 209: This document dated 11 August 1992 certified Heck as a Founding Member of the European Astronomical Society (EAS). It was signed by Lodewijk Woltjer, EAS President. Heck became a life member of the society (in fact till his retirement).



ACADÉMIE ROYALE

DES SCIENCES, DES LETTRES & DES BEAUX-ARTS DE BELGIQUE

Classe des Sciences

Séance publique du samedi 21 décembre 1996

Le Prix Edouard Mailly est décerné à

Monsieur André Heck

astronome à l'Observatoire de Strasbourg

pour ses activités en photométrie stellaire.

Ce prix a été accordé sur la proposition du jury chargé de l'examen des travaux soumis au Concours de la 25 période quadriennale (1er janvier 1992 - 31 décembre 1995)

Bruxelles, le 21 décembre 1996.

LE SECRÉTAIRE PERPÉTUEL

LE DIRECTEUR DE LA CLASSE

Fig. 210: Diploma (29cm × 40.5cm) for the Mailly Prize awarded by the Belgian Royal Academy in 1996.



esa

IUE

Certificate of recognition

The European Space Agency presents this certificate of recognition
in gratitude for the exceptional contributions made by

André Heck

to the 18.5 years of science operations at the Villafranca del Castillo
Satellite Tracking Station VILSPA of the

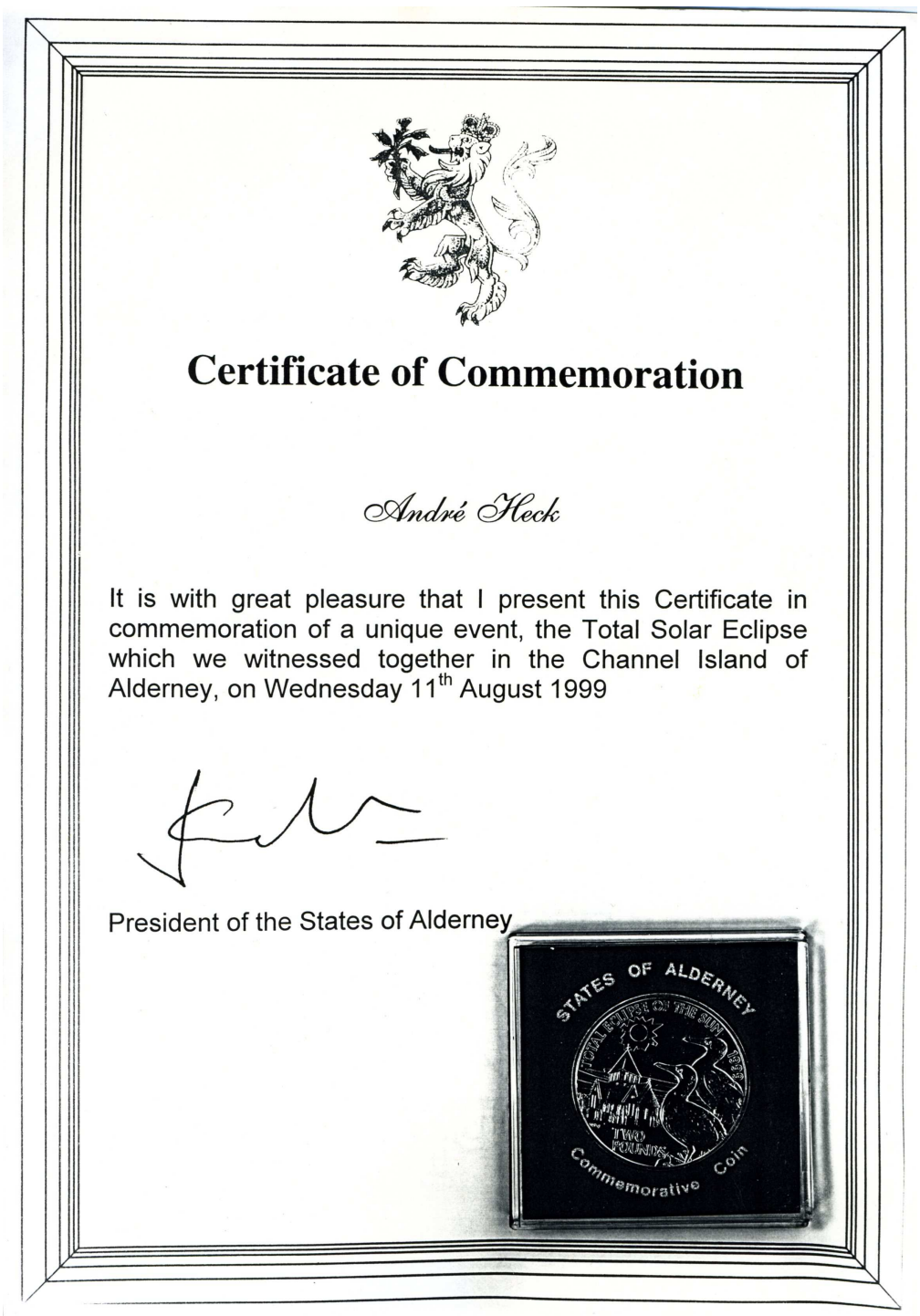
International Ultraviolet Explorer Satellite IUE

J.-M. Luton
Director General
ESA

R.M. Bonnet
Director of Science
ESA

F. Garcia-Castañer
Director of Operations
ESA

Fig. 211: Certificate of recognition for exceptional contributions issued by the European Space Agency at the termination of the IUE mission in 1996.



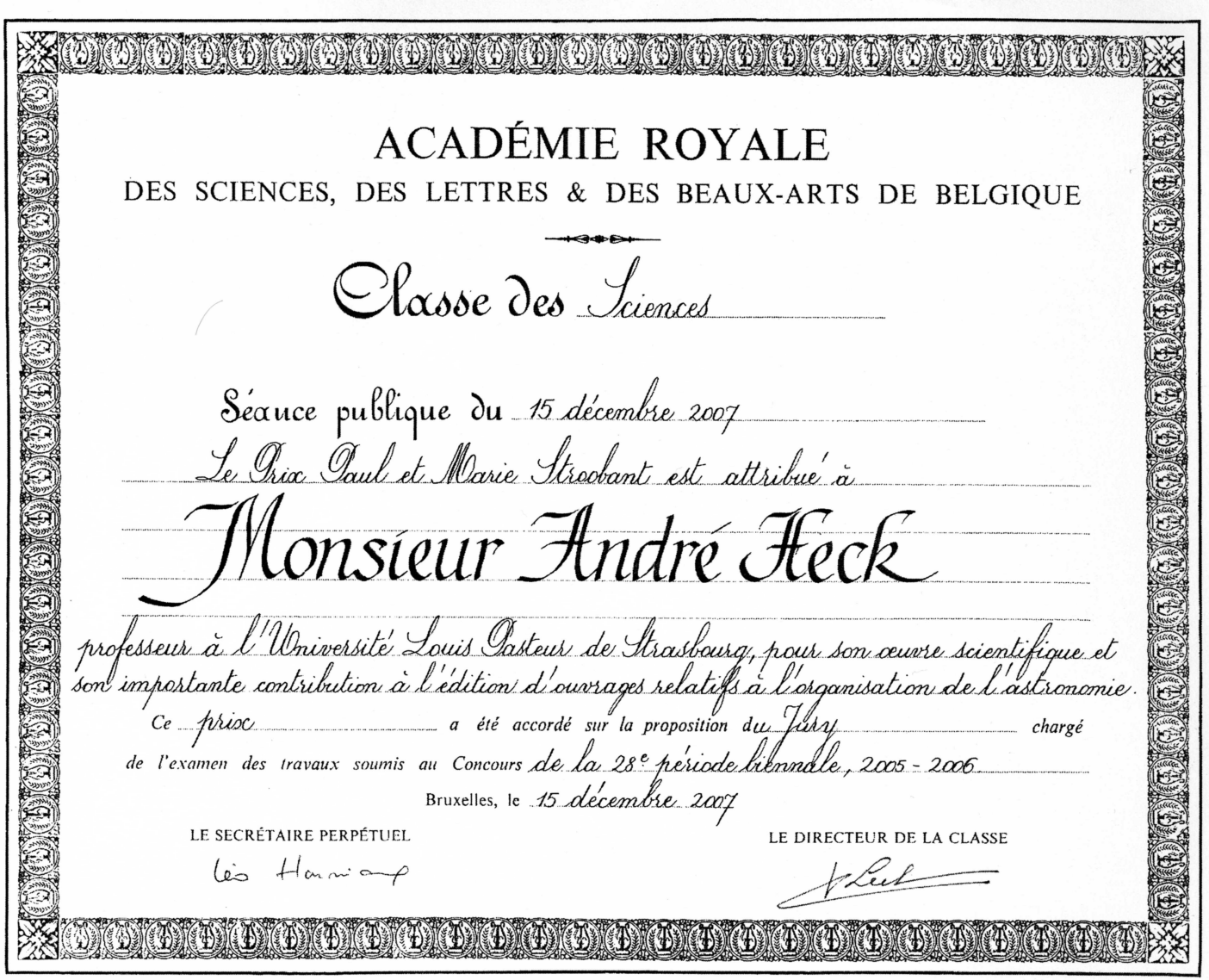
Certificate of Commemoration

André Heck

It is with great pleasure that I present this Certificate in commemoration of a unique event, the Total Solar Eclipse which we witnessed together in the Channel Island of Alderney, on Wednesday 11th August 1999

President of the States of Alderney

Fig. 212: Document certifying the observation of the 11 August 1999 total solar eclipse signed by the President of the States of Alderney (Channel Islands).



ACADÉMIE ROYALE

DES SCIENCES, DES LETTRES & DES BEAUX-ARTS DE BELGIQUE

Classe des Sciences

Séance publique du 15 décembre 2007

Le Prix Paul et Marie Stroobant est attribué à

Monsieur André Heck

professeur à l'Université Louis Pasteur de Strasbourg, pour son œuvre scientifique et son importante contribution à l'édition d'ouvrages relatifs à l'organisation de l'astronomie.

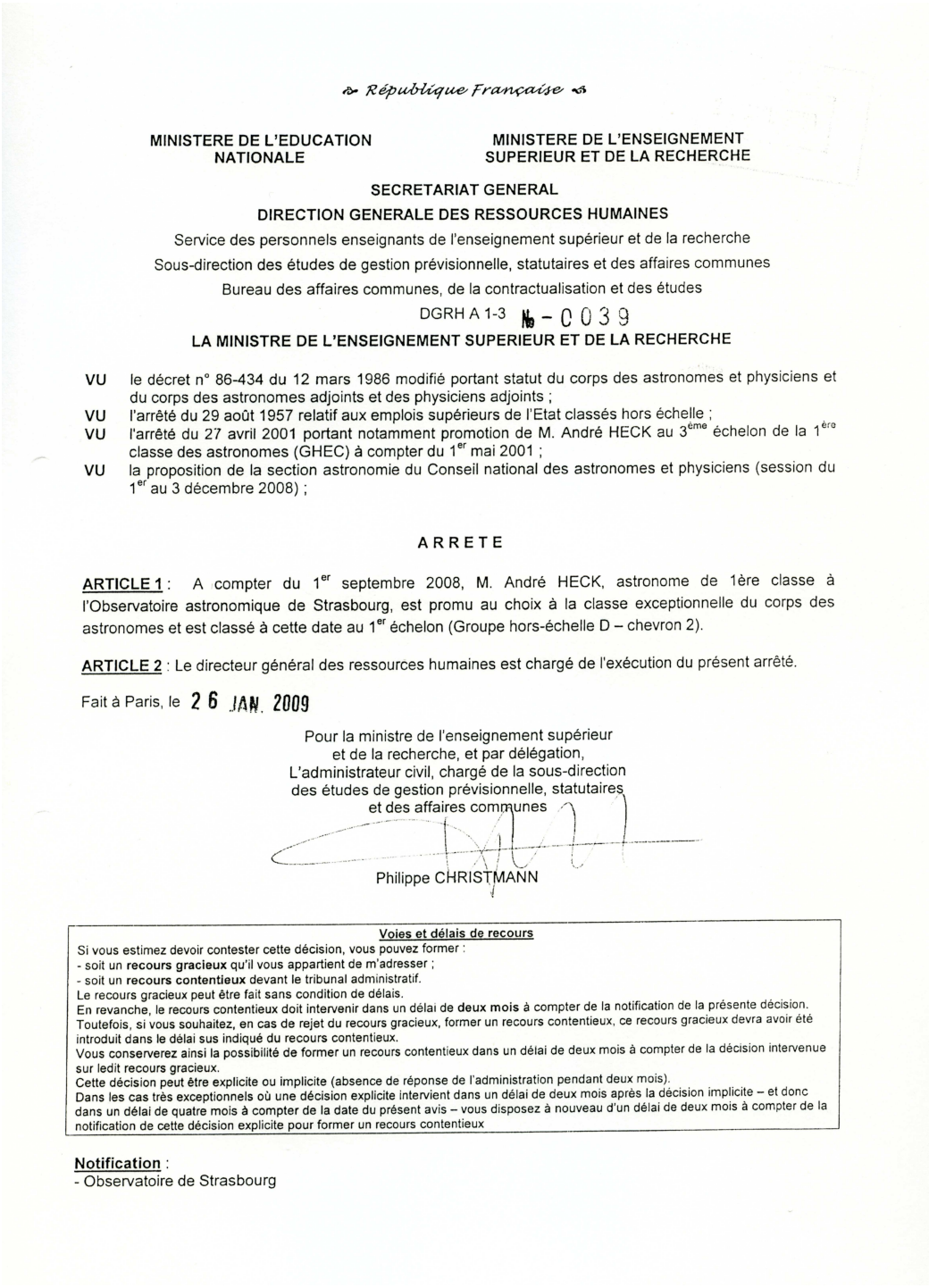
Ce prix a été accordé sur la proposition du Jury chargé de l'examen des travaux soumis au Concours de la 28e période biennale, 2005 - 2006.

Bruxelles, le 15 décembre 2007

LE SECRÉTAIRE PERPÉTUEL

LE DIRECTEUR DE LA CLASSE

Fig. 213: Diploma (34.5cm × 45cm) for the Stroobant Prize awarded by the Belgian Royal Academy in 2007.



République Française

MINISTERE DE L'EDUCATION NATIONALE — **MINISTERE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE**

SECRETARIAT GENERAL

DIRECTION GENERALE DES RESSOURCES HUMAINES

Service des personnels enseignants de l'enseignement supérieur et de la recherche

Sous-direction des études de gestion prévisionnelle, statutaires et des affaires communes

Bureau des affaires communes, de la contractualisation et des études

DGRH A 1-3 N° - C 0 3 9

LA MINISTRE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE

VU le décret n° 86-434 du 12 mars 1986 modifié portant statut du corps des astronomes et physiciens et du corps des astronomes adjoints et des physiciens adjoints ;
VU l'arrêté du 29 août 1957 relatif aux emplois supérieurs de l'Etat classés hors échelle ;
VU l'arrêté du 27 avril 2001 portant notamment promotion de M. André HECK au 3ème échelon de la 1ère classe des astronomes (GHEC) à compter du 1er mai 2001 ;
VU la proposition de la section astronomie du Conseil national des astronomes et physiciens (session du 1er au 3 décembre 2008) ;

ARRETE

ARTICLE 1 : A compter du 1er septembre 2008, M. André HECK, astronome de 1ère classe à l'Observatoire astronomique de Strasbourg, est promu au choix à la classe exceptionnelle du corps des astronomes et est classé à cette date au 1er échelon (Groupe hors-échelle D – chevron 2).

ARTICLE 2 : Le directeur général des ressources humaines est chargé de l'exécution du présent arrêté.

Fait à Paris, le 26 JAN. 2009

Pour la ministre de l'enseignement supérieur
et de la recherche, et par délégation,
L'administrateur civil, chargé de la sous-direction
des études de gestion prévisionnelle, statutaires
et des affaires communes

Philippe CHRISTMANN

Voies et délais de recours

Si vous estimez devoir contester cette décision, vous pouvez former :
- soit un **recours gracieux** qu'il vous appartient de m'adresser ;
- soit un **recours contentieux** devant le tribunal administratif.

Le recours gracieux peut être fait sans condition de délais.
En revanche, le recours contentieux doit intervenir dans un délai de **deux mois** à compter de la notification de la présente décision.
Toutefois, si vous souhaitez, en cas de rejet du recours gracieux, former un recours contentieux, ce recours gracieux devra avoir été introduit dans le délai sus indiqué du recours contentieux.
Vous conserverez ainsi la possibilité de former un recours contentieux dans un délai de deux mois à compter de la décision intervenue sur ledit recours gracieux.
Cette décision peut être explicite ou implicite (absence de réponse de l'administration pendant deux mois).
Dans les cas très exceptionnels où une décision explicite intervient dans un délai de deux mois après la décision implicite – et donc dans un délai de quatre mois à compter de la date du présent avis – vous disposez à nouveau d'un délai de deux mois à compter de la notification de cette décision explicite pour former un recours contentieux

Notification :
- Observatoire de Strasbourg

Fig. 214: Ministerial decree (dated 26 January 2009) promoting our biographee as Exceptional-Class Astronomer retroactively as of 01 September 2008.

(Prof. Dr.) André Heck
Observatoire Astronomique
11, rue de l'Université
F-67000 Strasbourg
France
Phone/fax: +33 (0)388 50 87 72
andre.heck@astro.unistra.fr
http://vizier.u-strasbg.fr/~heck

M. le Directeur de
l'Observatoire de Strasbourg
11, rue de l'Université
67000 Strasbourg

Strasbourg, le 30 août 2010.

Cher Monsieur,

Votre lettre du 24 juin dernier, avec copie au Président du CNAP, transpire du souhait de me voir partir en retraite dès que possible de façon à, pour reprendre votre expression, "libérer un support budgétaire" pour des desseins qui vous sont propres. Les simulations effectuées par le service universitaire traitant des retraites indiquant une différence de 22% dans ma rente de retraite entre des départs en 2011 et en 2014, chacun comprendra que je souhaite aller, ma santé le permettant, au maximum des possibilités et de mes droits.

Mais votre lettre dépasse largement le cadre de notre échange initial sur mon dossier de retraite. Dans le souci de justifier votre avis défavorable sur celui-ci, vous évoquez maintenant toute une série de points dont certains portent atteinte à l'honneur de ma carrière. Certains de vos propos sont outrageants non seulement pour ma propre probité professionnelle envers un métier auquel je consacre tout dans le contexte d'un handicap pernicieux, mais aussi indirectement pour celle de mes successeurs à la direction de l'Observatoire. Auraient-ils accepté la situation que vous présentez, ils pourraient être blâmés pour n'avoir pas assumé leurs fonctions et responsabilités correctement. Il n'en est heureusement rien et, comme indiqué ci-après, vos allégations ne sont pas fondées. Si vous aviez pris la peine d'en discuter avec moi, vous auriez obtenu les clarifications et surtout les rectifications que je me vois maintenant obligé de faire par écrit.

Votre discours trahit aussi répétitivement une méconnaissance de mes activités en dépit des indications que je vous ai fournies, de la documentation que je vous ai livrée et des ouvrages que je vous ai remis, ouvrages achetés spécifiquement à votre intention chez mes éditeurs.

Venons-en aux principaux points soulevés dans votre lettre. Loin de moi l'idée de polémiquer, mais les faits doivent être rétablis dans leur réalité.

Aménagement de travail: Vous dites n'avoir aucune trace du régime sous lequel je fonctionne depuis bientôt vingt ans? Où sont passées les copies d'échanges entre mon successeur à la direction Crézé, le Secrétaire Général Soulas et le médecin du travail Duval de l'Université sur la mise en place de cet aménagement au début des années 1990, avec notamment l'établissement (alors onéreux) par l'Université d'une connexion Numéris entre mon domicile et l'université? Que sont devenus les dossiers et diverses attestations (Cotorep, etc.) que j'ai fournis? Et les copies de celles délivrées par l'Observatoire à mon endroit? Au cours de la vingtaine d'années écoulées, les différents gestionnaires de l'Observatoire se sont certainement assurés que tout était en ordre de ce côté puisqu'ils ont reconduit de facto l'accord en question

Fig. 215: Letter (dated 30 August 2010 and continuing over the next four pages) from Heck to one of his successors as Director of Strasbourg Observatory. For the translation into English, see text on pp. 281ff.

comprenant la couverture par l'Observatoire de la connexion informatique. Je m'étonne que, près de deux ans après votre prise de fonctions, vous souleviez ce point. Dans l'immédiat, vous trouverez en annexe un dernier document sur la prolongation de ma dispense d'enseignement émise par le médecin du travail de l'Université lors d'une récente visite de routine.

Activités de service: Vous dites que mes activités de service ne relèvent pas du CDS[1]? Puisqu'il faut à nouveau invoquer l'histoire, je rappellerai que mes bases de données (dont *StarHeads* que vous mentionnez) ont été installées au CDS, au début des années 1990, à la demande du directeur du CDS de l'époque, de façon à élargir la gamme des services offerts[2]. Elles furent présentées comme des services du CDS dans les pages du *Bulletin du CDS*, de même que dans la revue professionnelle *Astronomy & Astrophysics* et différentes publications secondaires. A noter également la participation régulière, jusqu'à aujourd'hui, de membres du personnel du CDS (principalement G. Landais & F. Ochsenbein) pour les processus d'interrogation en ligne, ainsi que la résidence sur une machine du CDS (ce que vous reconnaissez vous-même dans votre lettre[3]), sans oublier l'indication *"On-line service provided by CDS"*, avec un logo de celui-ci sur chacune des pages, depuis la mise en phase opérationnelle des bases en 1993. Si tout cela ne suffisait pas, je vous renvoie pour l'histoire toute récente aux derniers rapports quadriennaux de l'Observatoire où, sans que l'on me demande mon avis, j'ai été associé au CDS, une équipe à laquelle je n'appartiens pourtant pas formellement. C'est donc dire si le CDS continue à apprécier mes apports[4]!

Le développement de ces ressources (qui m'avait occupé plus qu'à plein temps) fut parmi les motivations de ma promotion par le CNAP à la Première Classe des astronomes[5]. Mon travail actuel de maintenance[6] est quotidien et m'occupe bien au-delà de ce que, d'après vos commentaires, vous semblez imaginer. Votre méconnaissance de cette affaire résulte tout simplement du fait que vous ne vous êtes jamais intéressé auprès de moi à mes activités de service. Elles n'ont jamais été source de difficultés avec vos prédécesseurs (ni d'ailleurs avec vous-même jusqu'à ce que vous ayiez aujourd'hui à justifier votre position sur mon dossier de retraite). En résumé, j'estime contribuer très largement, au-delà des moyennes individuelles, aux prestations de service que les astronomes doivent, *globalement*, fournir pour la maison.

Financement: La somme que vous avancez pour 2009 (€3867,49) résulte d'un amalgame entre le point chercheur et les frais découlants de mon travail à domicile dans le cadre de l'accord évoqué plus haut, frais aisément comptabilisables puisque soit réglés directement par l'Observatoire (ligne ADSL ayant succédé à la connexion Numéris), soit remboursés à moi-même (certains consommables). Ces derniers frais ne peuvent cependant prendre leur pleine signification que s'ils pouvaient être comparés avec les dépenses équivalentes pour les autres scientifiques de la maison, non évaluables individuellement puisque mises en commun. Je vous invite également à mettre dans la balance les nombreux ouvrages, spécialisés et autres,

---

[1] CDS que, lorsque vous étiez encore étudiant, j'ai assis sur la scène internationale à un moment où d'autres initiatives américaines et européennes le menaçaient de disparition. Voir par ex. l'article "The Progressive World Penetration of the Strasbourg Astronomical Data Center", in *Organizations and Strategies in Astronomy Vol. 7*, Springer, Dordrecht (2006), 315-354 (http://astro.u-strasbg.fr/~heck/s7_cds.pdf).

[2] Voir par ex. l'article "From Early Directories to Current Yellow-Page Services", in *Information Handling in Astronomy*, Kluwer, Dordrecht (2003), 183-205 (http://astro.u-strasbg.fr/~heck/hv_yp.pdf). Pour mémoire, le CDS publiait déjà depuis 1986 des précurseurs sur papier, répertoires et catalogues, dans le cadre de ses *Publications Spéciales* (une trentaine).

[3] Mais transférée récemment sur la machine *astro* pour simplifier la maintenance.

[4] L'excellence de mes bases de données est aussi reconnue par la référence mondiale en matière de bibliographie astronomique, ADS (Harvard), institution collaborant avec le CDS, qui pointe vers elles pour chacune des interrogations effectuées sur son site (4,2 millions d'interrogations pour mai 2010).

[5] Au 1er janvier 1997. Pour mémoire: Classe Exceptionnelle au 1er septembre 2008.

[6] Non seulement de *StarHeads*, mais aussi des volumineuses compilations *StarGuides* et *StarBriefs*.

remis en dons à la bibliothèque peu après leur parution et dont le montant à l'achat, si nous devions les acquérir sur nos fonds institutionnels, s'élèverait à plusieurs milliers d'Euros annuellement. Je ne reviendrai pas sur les €30.000+ personnels investis annuellement en frais professionnels et débouchant sur de multiples publications[7] et autres productions que les directeurs successifs de l'Observatoire ont toujours été heureux d'inclure dans leurs rapports d'activités.

Bureau: Comme déjà discuté avec certains de vos prédécesseurs et l'occupante actuelle de ce bureau, je ne suis pas opposé à migrer vers un bureau plus petit, voisin du mien, non pas insonorisé, mais situé à l'endroit le plus calme du bâtiment et donc a priori compatible avec ma pathologie. A ce jour, aucun de mes successeurs à la direction n'a jugé nécessaire de m'imposer ce déménagement, et encore moins de me reprocher le bureau que j'occupe actuellement, adapté à mon handicap et correspondant à mon rang.

Subventions: Contrairement à ce que vous affirmez, je n'ai jamais refusé de déposer des demandes de subventions où que cela soit. Par contre, les informations que vous m'avez annoncées ne me sont jamais parvenues. Pendant notre deuxième entretien, vous avez d'ailleurs vous-même reconnu qu'au moins une de deux sources que vous aviez évoquées serait trop tardive par rapport au colloque *Future Professional Communication in Astronomy II* que j'ai organisé à Harvard en avril 2010 et pour lequel je vous proposais d'associer l'Observatoire et l'Université, ce qui visiblement ne vous intéressait pas. Pour cette même raison, c'est à l'Institut d'Astrophysique de Paris, en collaboration avec l'Université de Harvard, que j'envisage d'organiser mon prochain colloque sur les *Facets of Professional Astronomy*.

Groupe Syrte: Je n'ai jamais eu de proposition de me rapprocher de ce groupe. S'il s'agit du groupe d'historiens auquel vous avez fait allusion durant ce même deuxième entretien, je vous ai expliqué alors que ce groupe serait totalement inadapté à mes activités principales qui sont de prospective pour la communauté astronomique mondiale[8]. Voir exclusivement une facette historique chez moi revient à nouveau à montrer votre méconnaissance de mes activités réelles, en dépit de toute la documentation et des ouvrages que je vous ai remis[9].

Pour revenir brièvement à ce dossier de retraite, la situation n'était pas du tout aussi sous contrôle que ce que vous donnez à penser dans votre lettre. Lors d'un appel téléphonique de ma part pour un autre motif, le 6 mai dernier, au service auquel vous vous référez, j'ai découvert l'existence de ce dossier et qu'il m'avait été expédié le 21 avril sous votre couvert. Il est apparu ensuite que ce dossier de retraite avait été archivé par votre bureau au lieu de m'être transmis. Sans ce coup de fil providentiel, je n'aurais probablement pas eu connaissance pendant longtemps de ce dossier. On était donc très loin du "sans préjudice" de votre lettre. Veuillez par ailleurs noter qu'il ne vous revient pas de mentionner des éléments médicaux dans des documents me concernant.

---

[7] Suivant des statistiques effectuées récemment par ADS, je serais l'astronome ayant le plus publié de toute l'histoire de l'astronomie avec un indice ADS normalisé de 800 (cf. http://astro.u-strasbg.fr/~heck/prom10.pdf pour un dossier personnel complet).

[8] Colloques FPCA mentionné ci-dessus et organisé à Harvard (http://conf.adsabs.harvard.edu/FPCA2), colloque *Facets of Professional Astronomy* prévu au printemps 2012 à Paris, les sept volumes *Organizations and Strategies in Astronomy* ayant reçu le Prix International Stroobant (http://astro.u-strasbg.fr/~heck/osabooks.htm), nouvelle série *People, Organizations and Strategies in Astronomy* en préparation, etc.

[9] Notamment, le 11 septembre 2009, le volume *Organizations and Strategies in Astronomy 7* (Springer 2006), de même que les comptes-rendus du colloque *Future Professional Communication in Astronomy I* (Bruxelles 2007) et l'ouvrage *The Multinational History of Strasbourg Astronomical Observatory* (Springer 2005).

Quant aux difficultés à vous rencontrer, elles furent loin d'être "prétendues" comme le montre en annexe le rappel de nos échanges à ce sujet (copies de courriels disponibles): une suite de réponses dilatoires de votre part, de silences à mes relances ou de promesses de rappel de votre part non suivies d'effet induisant des délais de six mois pour le premier entretien depuis la première sollicitation et de deux mois pour le second. S'il suffisait d'aller frapper à la porte de votre bureau dès lors que je souhaitais avoir un entretien, pourquoi ne l'avoir pas dit dès le départ? Dans cette perspective, votre appel du pied à la courtisanerie au café du vendredi matin[10] où, selon l'expression de votre lettre, vous avez "plaisir à rencontrer le personnel" ne peut que paraître d'un autre âge, tristement.

Présence à l'Observatoire: N'en déplaise aux habituelles commères toujours avides de se rendre intéressantes, personne ne peut prétendre connaître le détail de mes présences à l'Observatoire, ne serait-ce qu'à cause de la dispersion des bâtiments et de ma discrétion. Je rappelle donc à nouveau (cf. attestation jointe) que je suis "autorisé à travailler à domicile en ne faisant acte de présence que dans la mesure nécessaire aux échanges d'information avec les collègues". C'est le cas pour ce qui me concerne. Et inversément, toute personne ayant souhaité me contacter n'a jamais eu de difficulté à le faire. Toute autre discussion sur ce point ne peut donc être qu'inappropriée[11].

Quant à ma participation à la vie mondaine de l'Observatoire (qui ne relève pas de mes obligations statutaires), pensez-vous que votre hostilité manifeste à mon égard y soit propice? Cette attitude est incompréhensible face à une personne handicapée totalement dédiée à sa profession. Je vous avais offert ma confiance et mon amitié. J'avais espéré terminer ma carrière à Strasbourg dans un contexte de dynamisme, d'ouverture et de sérénité. Lors de notre premier entretien, vous m'avez dit percevoir votre rôle comme celui d'un administrateur au service des scientifiques de la maison. L'historien de celle-ci que vous voulez voir en moi aurait aimé pouvoir écrire que ce fut effectivement le cas pour ce qui le concernait.

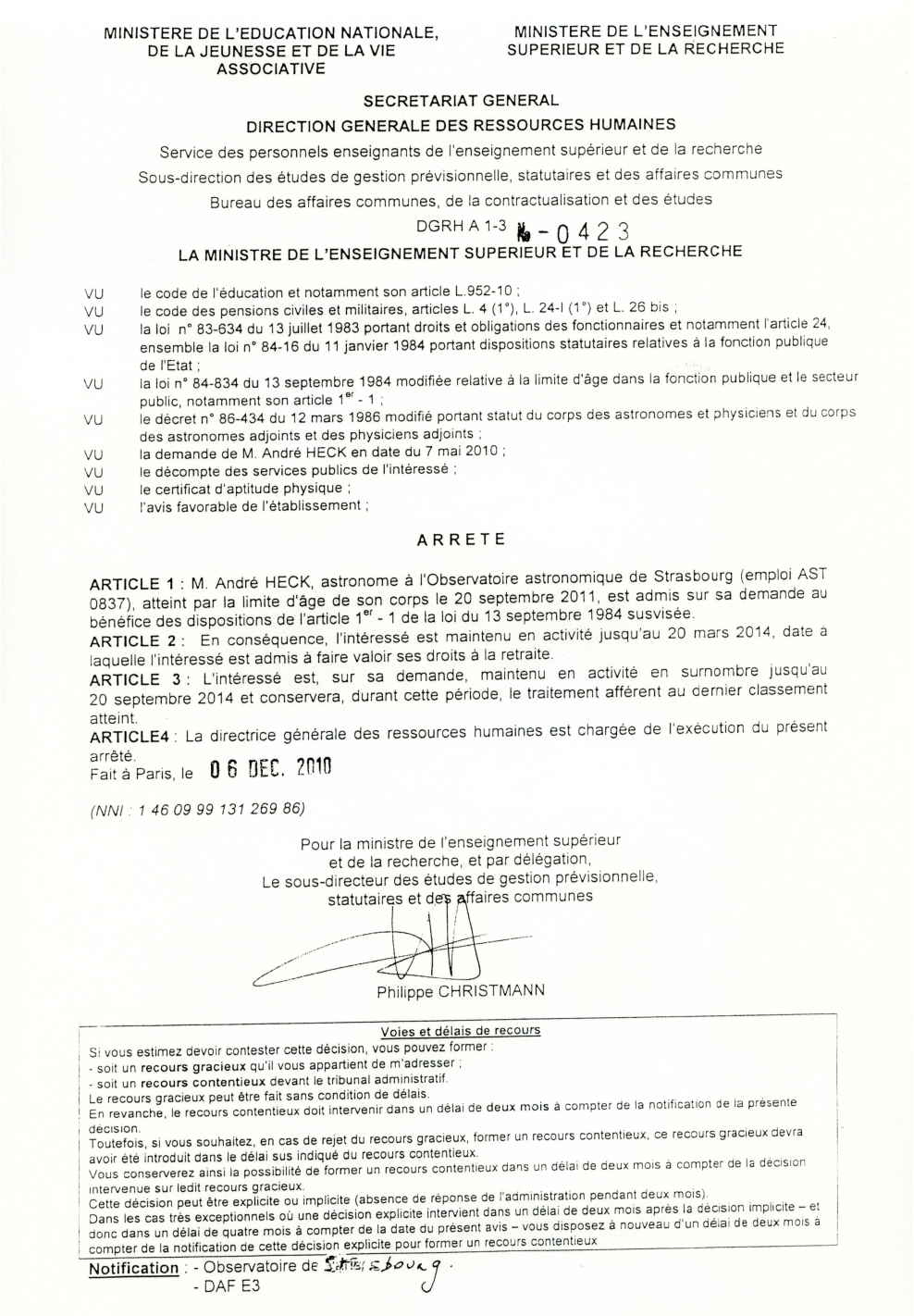
Bien à vous,

André Heck.

cc: Dr. D. Rouan, Président du CNAP

[10] Café dont j'ai moi-même instauré la coutume, il y a maintenant un quart de siècle ...

[11] Qu'il soit néanmoins dit que j'adapte mes présences à l'Observatoire de façon à éviter, d'une part, les périodes les plus bruyantes (parfois très bruyantes) dans mon bâtiment et, d'autre part, pour une simple optimisation de mon temps, les congestions chroniques de trafic autour de Strasbourg.



MINISTERE DE L'EDUCATION NATIONALE, DE LA JEUNESSE ET DE LA VIE ASSOCIATIVE

MINISTERE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE

SECRETARIAT GENERAL

DIRECTION GENERALE DES RESSOURCES HUMAINES

Service des personnels enseignants de l'enseignement supérieur et de la recherche

Sous-direction des études de gestion prévisionnelle, statutaires et des affaires communes

Bureau des affaires communes, de la contractualisation et des études

DGRH A 1-3 N° - 0423

LA MINISTRE DE L'ENSEIGNEMENT SUPERIEUR ET DE LA RECHERCHE

VU le code de l'éducation et notamment son article L.952-10 ;
VU le code des pensions civiles et militaires, articles L. 4 (1°), L. 24-I (1°) et L. 26 bis ;
VU la loi n° 83-634 du 13 juillet 1983 portant droits et obligations des fonctionnaires et notamment l'article 24, ensemble la loi n° 84-16 du 11 janvier 1984 portant dispositions statutaires relatives à la fonction publique de l'Etat ;
VU la loi n° 84-834 du 13 septembre 1984 modifiée relative à la limite d'âge dans la fonction publique et le secteur public, notamment son article 1er - 1 ;
VU le décret n° 86-434 du 12 mars 1986 modifié portant statut du corps des astronomes et physiciens et du corps des astronomes adjoints et des physiciens adjoints ;
VU la demande de M. André HECK en date du 7 mai 2010 ;
VU le décompte des services publics de l'intéressé ;
VU le certificat d'aptitude physique ;
VU l'avis favorable de l'établissement ;

ARRETE

ARTICLE 1 : M. André HECK, astronome à l'Observatoire astronomique de Strasbourg (emploi AST 0837), atteint par la limite d'âge de son corps le 20 septembre 2011, est admis sur sa demande au bénéfice des dispositions de l'article 1er - 1 de la loi du 13 septembre 1984 susvisée.
ARTICLE 2 : En conséquence, l'intéressé est maintenu en activité jusqu'au 20 mars 2014, date à laquelle l'intéressé est admis à faire valoir ses droits à la retraite.
ARTICLE 3 : L'intéressé est, sur sa demande, maintenu en activité en surnombre jusqu'au 20 septembre 2014 et conservera, durant cette période, le traitement afférent au dernier classement atteint.
ARTICLE4 : La directrice générale des ressources humaines est chargée de l'exécution du présent arrêté.
Fait à Paris, le 06 DEC. 2010

(NNI : 1 46 09 99 131 269 86)

Pour la ministre de l'enseignement supérieur
et de la recherche, et par délégation,
Le sous-directeur des études de gestion prévisionnelle,
statutaires et des affaires communes

Philippe CHRISTMANN

Voies et délais de recours

Si vous estimez devoir contester cette décision, vous pouvez former :
- soit un **recours gracieux** qu'il vous appartient de m'adresser ;
- soit un **recours contentieux** devant le tribunal administratif.
Le recours gracieux peut être fait sans condition de délais.
En revanche, le recours contentieux doit intervenir dans un délai de **deux mois** à compter de la notification de la présente décision.
Toutefois, si vous souhaitez, en cas de rejet du recours gracieux, former un recours contentieux, ce recours gracieux devra avoir été introduit dans le délai sus indiqué du recours contentieux.
Vous conserverez ainsi la possibilité de former un recours contentieux dans un délai de deux mois à compter de la décision intervenue sur ledit recours gracieux.
Cette décision peut être explicite ou implicite (absence de réponse de l'administration pendant deux mois).
Dans les cas très exceptionnels où une décision explicite intervient dans un délai de deux mois après la décision implicite – et donc dans un délai de quatre mois à compter de la date du présent avis – vous disposez à nouveau d'un délai de deux mois à compter de la notification de cette décision explicite pour former un recours contentieux

Notification : - Observatoire de Strasbourg
- DAF E3

Fig. 216: Ministerial decree extending Heck's position until his 68th anniversary.

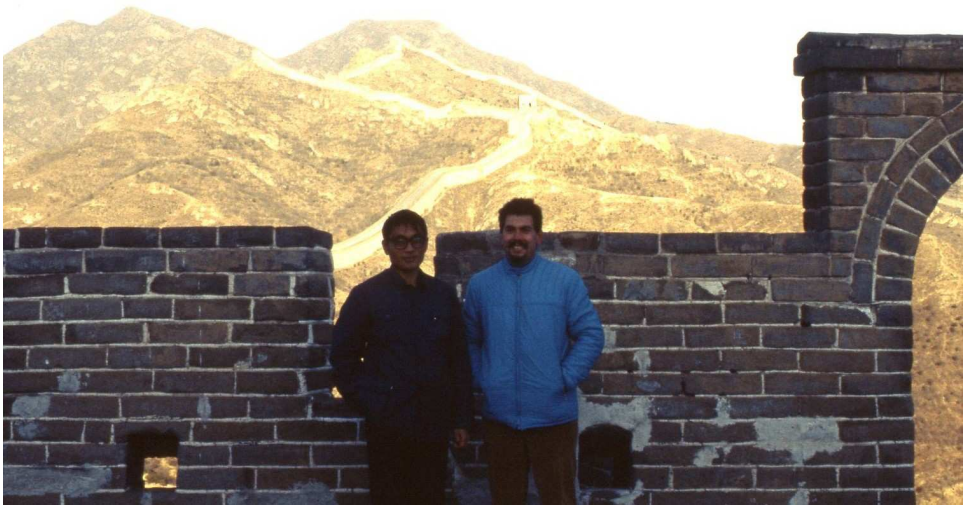


Fig. 217: A birthplace matters: with Chang (left) at the Great Wall shortly after China had re-opened herself (05 December 1981). Chang had just come back from the countryside where he had been displaced by the Cultural Revolution. He had learned some English at night from magazine issues he was reading with a flashlight under the blankets. This guy had been toughened: see how light he is dressed while it was freezing (patches of frozen snow on the Wall).



Fig. 218: Heck was taking advantage of private trips round the world to visit unusual places for an astronomer. He is pictured here at the "Centro de Estudios del Hombre Austral" [Center for Studies of the Southern Man], University of Punta Arenas (22 November 1995).

Brief Curriculum Vitae

Surname:	**HECK**
First names:	André Hubert Joseph
Place and date of birth:	Jalhay (Belgium), 20 September 1946
Nationalities:	Belgian & French
WWW:	http://www.aheck.org/
Languages:	Walloon (mother tongue)
	French (education language) English, Spanish (excellent knowledge) German (good knowledge) practical notions of several other languages

Currently:

- Manager, Venngeist[238]

Degrees (most recent to oldest):

- Habilitation to Direct Researches – Strasbourg I (Louis Pasteur) Univ. (1986)
- ProfDSc (Sciences/Astronomy) – Liège Univ. (1985)
- Ph.D. (Sciences/Astronomy) – Liège Univ. (1975)
- Master of Mathematics – Liège Univ. (1969)
- Master of Education – Liège Univ. (1969)
- several certificates in general astrophysics (Liège), celestial mechanics (Liège), modern observational techniques (Liège), structure and dynamics of stellar systems (Liège & Saas-Fee), modern documentation techniques (Liège), computational stellar evolution (Liège), statistics (Liège & Paris), stellar statistics (Paris), usage of computers and auxiliary devices (Liège), management (MCE), marketing (Strasbourg), communication strategies (Strasbourg), advertising (Strasbourg), and foreign languages (Liège & Strasbourg)

[238] http://www.venngeist.org/

Positions held:

1969-1970: Junior Research Associate, Belgian Fund for Scientific Research (FNRS), Liège Institute of Astrophysics, Belgium
1970-1978: Assistant Professor, Liège Institute of Astrophysics, Belgium
1st Semester 1971: Visiting Astronomer, Paris Observatory, France
May 1976: Associated Astronomer, Strasbourg Observatory, France
1977-1980: Resident Astronomer, ESA IUE Observatory, Vilspa, Spain
1980-1983: Deputy Observatory Director, ESA IUE Observatory, Vilspa, Spain
1983-1986: Associated Astronomer, Strasbourg Observatory, France
1986-1997: Astronomer, Strasbourg Observatory, France
October-November 1990: Invited Chair Professor, Porto University, Portugal
1997-2008: First-Class Astronomer, Strasbourg Observatory, France
2008-2014/retirement: Exceptional-Class Astronomer, Strasbourg Observatory, France

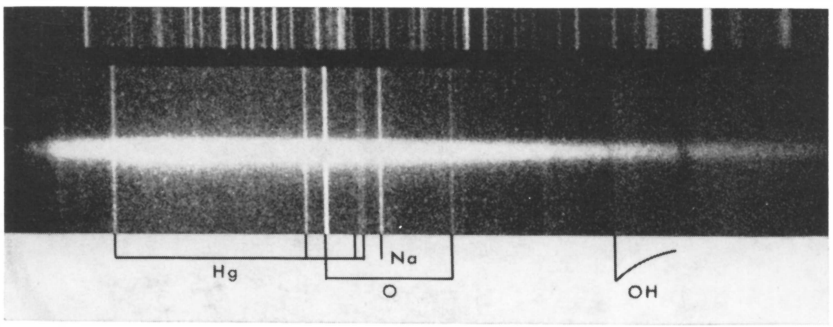


Fig. 219: Comet 1972VIII/1973a was discovered in January 1973 by our biographee when observing with the Big Schmidt telescope at Haute Provence Observatory (OHP). Refer to p. 50 for the story and to Fig. 36 for the discovery field. First comet discovered at OHP, the object was then of magnitude 12 and moving away at about 2.2 AU from the Earth and about 2.7 AU from the Sun. The spectrum above has been obtained at the 193cm OHP telescope. It shows a continuum from 3700Å in the violet (left) to 8700Å in the near infrared. Mercury and sodium emissions are due to city lighting; oxygen and hydroxyl ones are from the night sky. (© Sky & Telescope, May 1973)

Varia:

- Resident Astronomer in charge of science operations, ESA IUE Observatory (1977-1983)
- Acting Observatory Director, ESA IUE Observatory (1981-1983)
- Director, Strasbourg Astronomical Observatory, France (1988-1990)
- CDS "salesman" (1983-1988)
- IAU Representative by ICSU/CODATA (1991-1994)



Fig. 220: Left to right and top to bottom: memoir concluding the university studies (Liège 1969) on the apsidal motion and internal structure of close binary stars (in French: Mouvement Apsidal et Structure Interne des Etoiles); PhD memoir (Liège, 1975) on the applications of the maximum-likelihood principle to the calibration of stellar luminosity criteria (in French: Application du Principe du Maximum de Vraisemblance à la Calibration de Critères de Luminosité Stellaire), presented together with a secondary thesis on the application of multivariate statistical analysis to photometric catalogues; memoir for the ProfDSc degree ("Agrégation de l'Enseignement Supérieur Universitaire", Liège 1985) on new contributions to astronomical statistics (in French: Quelques Nouvelles Contributions à la Statistique Astronomique), presented together with three secondary theses on the irregular variable V348 Sgr, the very slow Nova RR Tel and a recalibration of the HR diagramme by statistical parallaxes; and finally a memoir for the Habilitation to Direct Researches ("Habilitation à Diriger des Recherches", Strasbourg 1986) offering a synthesis of some fifteen years of research on various matters.

- Compilation and maintenance of databases including:
  - StarWays (ESA/ESRIN, 1992),
  - StarGates & StarWords (ESO, 1993),
  - MediaTheque (CDS, 1993),
  - StarWorlds, StarBits & StarHeads (CDS, 1994),
    the latter one being also linked to NASA/CfA ADS querries till 2014.
- Discoveries:
  - Comet 1972 VIII (January 1973)
  - object close to the Sun (June 1973 eclipse)
- Teaching and thesis supervision
  (Liège, Madrid, Porto, Strasbourg, CNED, Goutelas, Luminy, Sant'Agata, ISU)
- Vice-President (1972-1975) & President (1975-1977), Liège Astronomical Society (SAL)
- Administrator (1977-1979), Société Royale Belge d'Astronomie (SRBA)

Working Groups and Advisory Bodies:

- Astronomical Data (IAU) (1979-2000)[239]
- Astrophysics Data System Panel (NASA) (1987)
- CODATA (IAU Representative 1991-1994)
- Communicating Astronomy with the Public (IAU) (2006)
- Converging Computing Methodologies in Astronomy (ESF) (1995-1997)
- Electronic Information Transfer (CODATA) (1994-1999)
- Electronic Publishing (Academia Europaea) (1997-1998)
- Electronic Publishing (EU DG XIII) (1998-2000)
- Pattern Recognition in Astronomy and Astrophysics (IAPR/TG13) (1995-1997)
- Modern Astronomical Methodology (1985-1990)
- Science Data Archive Study Panel (ESA) (1985)
- Standard Stars (IAU) (1982-1992)

Editorial Committees:

- Astrophysics and Space Science Library (Kluwer/Springer) (2004-)
- CODATA (1992-1999)
- ESA IUE Newsletter (1979) (Editor)
- New Astronomy (Elsevier) (1995-1997)
- Newsletter, IAU Comm. 5 Working Group on Astronomical Data (1991-1994) (Editor)
- Newsletter, Working Group for Modern Astronomical Methodology (1985-1989) (Editor)
- Organizations and Strategies in Astronomy (OSA)(2000-2006) (Editor)
- Organizations, People and Strategies in Astronomy (OSA)(2012-2014) (Editor)
- Orion (2005-2007) (Associated Editor)
- Vistas in Astronomy (Pergamon/Elsevier) (1992-1997)

[239]Organizing Committee (OC) Member: 1985-2000, OC Vice-Chairman: 1988-1991, OC Chairman: 1991-1994.



IUE esa NEWSLETTER

NO. 1 JANUARY 1979

Hello ... (and Goodbye)

I am very pleased to write a few words to introduce this first issue of the IUE ESA Newsletter. IUE has come a long way since I was first involved in the project in 1969. At that time the name IUE was not yet conceived and we were planning for something called UVAS. Now of course we have an established and successful observatory with the satellite working well and the ground station at Villafranca and its staff being in a position to give visiting observers the support they need to direct the activities of IUE for their own programmes.

I am sad, of course, to leave the IUE project but believe that by devoting my energies fully to Space Telescope I can serve the European ultraviolet astronomy community best. Meanwhile I leave IUE in the good hands of the new Observatory Controller Michael Penston and all the Resident Astronomers and other staff at VILSPA.

F. Macchetto

ESA IUE Newsletter
Editor : A. Heck
Published by : The ESA IUE Observatory
Villafranca Satellite Tracking Station
Apartado 54065, Madrid, Spain
Telephone: (1) 4019661 Telex: 42555 VILS E
Typing : C. Ramirez Palacios
Drawings : J. Garcia Palacios, J.M. Martinez del Valle
Photograph : J.L. Casero

Fig. 221: Example of launched periodicals: the newsletter for the European users of the International Ultraviolet Explorer (IUE).

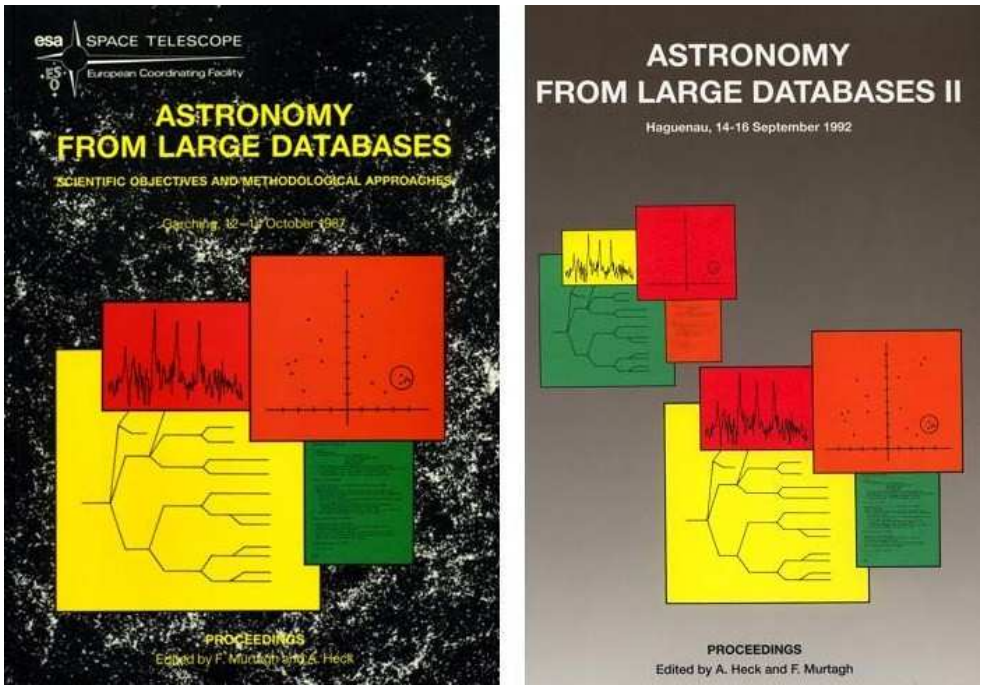


Fig. 222: Examples of organized scientific meetings (p. 342): the two "Astronomy from Large Databases" conferences, in collaboration with ESO and ST-ECF, centered on the scientific usage of large amounts of astronomical data.

Organized Scientific Meetings:

- Ultraviolet Stellar Classification [UVSC] (Villafranca del Castillo 1981)
- Third European IUE Conference [EIUEC-III] (Madrid 1982)
- Statistical Methods in Astronomy [SMA] (Strasbourg 1983)
- Astronomy from Large Databases: Scientific Objectives and Methodological Approaches [ALD-I] (Garching 1987) (Fig. 222)
- Artificial Intelligence Techniques for Astronomy [AITA] (Strasbourg 1989)
- Errors, Bias and Uncertainties in Astronomy [EBUA] (Strasbourg 1989)
- Fractals in Astronomy [FiA] (Strasbourg 1990)
- DeskTop Publishing in Astronomy and Space Sciences [DTP] (Strasbourg 1991) (Fig. 132)
- DeskTop Publishing in Astronomy and Intelligent Information Retrieval [DTP/IIR] (Strasbourg 1992)
- Astronomy from Large Databases II [ALD-II] (Haguenau 1992) (Fig. 222)
- Long-Term Electronic Publishing [LTEP] (Strasbourg 1993)
- Weaving the Astronomy Web [WAW] (Strasbourg 1995)
- Library and Information Systems in Astronomy II [LISA-II] (Garching 1995)
- Strategies and Techniques of Information for Astronomy [STIA] (Strasbourg 1996)
- Fifth Workshop on Data Analysis in Astronomy [DAA-V] (Erice 1996)
- Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era (Haguenau 1998)
- Communicating Astronomy (La Laguna 2002)
- Future Professional Communication in Astronomy [FPCA] (Bruxelles 2007)
- Future Professional Communication in Astronomy II [FPCA-II] (Harvard 2010)

Main Professional Societies:

- American Astronomical Society (AAS)
- Association for Computational Machinery (ACM)
- Astronomical Society of the Pacific (ASP)
- Astronomische Gesellschaft (AG)
- College of Alumni, Belgian Royal Academy
- European Association for the Study of Science and Technology (EASST)
- European Astronomical Society (EAS)
- International Astronomical Union (IAU)
- Royal Astronomical Society (RAS)
- Society for Industrial and Applied Mathematics (SIAM)

Honors:

- Victor Quoilin Prize, Belgian Ministry of Education (1961 & 1964)
- Patronym assigned to Comet 1972VIII (as discoverer), IAU (1973)
- Recognition for Exceptional Contributions, ESA (1996)

- Édouard Mailly Prize, Belgian Royal Academy (1996)
- Paul and Marie Stroobant Prize, Belgian Royal Academy (2007)
- inclusion in various biographical compilations (year of first mention):
  - Dictionary of International Biography (1998)
  - Distinguished Leadership (1995)
  - European R&D Database (1996)
  - International Scientist of the Year (1998)
  - International Who's Who of Information Technology (1996)
  - Living Science (2004)
  - Men and Women of Achievement (1997)
  - Nouveau Dictionnaire de la Biographie Alsacienne [NDBA] (2005)
  - Outstanding People of the 20$^{\rm th}$ Century (1999)
  - Outstanding People of the 21$^{\rm st}$ Century (2001)
  - Outstanding Scientists of the 20$^{\rm th}$ Century (1999)
  - Outstanding Scientists of the 21$^{\rm st}$ Century (2001)
  - Who's Who in America (2001)
  - Who's Who in Science and Engineering (1991)
  - Who's Who in the World (1981)

Main Fields of Research:

- Galactic distance scale (statistical parallaxes)
- Comets (monitoring, discovery of Comet 1972VIII/1973a)
- uvbyβ photometry (variable stars – monitoring, discovery, interpretation)
- UV astrophysics (IUE – various objects, spectral classification, standard stars)
- Information mining (methodologies MDA, KBS, IIR, PR, etc.)
- Electronic information handling (including e-pub, hubs, etc.)
- Socio-strategies in astronomy and related sciences (OSA/OPSA volumes, etc.)
- Future professional communication in astronomy (FPCA)
- History (XVII-XX$^{\rm th}$ centuries)

Publications:

Refer to the extensive bibliography at pp. 401ff gathering together papers, books produced, edited periodicals and proceedings, as well as popularization papers, atlas, catalogues, dictionaries and directories.

Biographical Notices

NDBA Biographical Notice (2006)

André HECK was born on 20 September 1946 in Jalhay (Belgium). After secondary schooling at Verviers Royal Atheneum, he entered Liège University where he obtained in 1969 a Master of Mathematics (with a thesis on the apsidal motion and internal structure of stars) and a Master of Education.

After joining Paul Ledoux's group at Liège Institute of Astrophysics as Junior Research Associate of the Belgian Fund for Scientific Research, he was hired the following year as Assistant Professor in Pol Swings' group, completing his training in both theoretical and observational astrophysics. In January 1973, he discovered the first comet of Haute Provence Observatory. A few months later, he detected an object close to the Sun during a total solar eclipse at Loyengalani (Kenya). He also devoted numerous observing runs in Chile to the photometric study of variable stars.

But during all those years Heck mainly developed applications of modern statistical methodologies to astronomical data, starting with a long stay at Paris Observatory in 1971. He subsequently visited frequently this establishment as well as Strasbourg Observatory where he became the first scientific user of the Data Center (CDS), even before its official founding in 1972. He also resuscitated the Liège Astronomical Society (SAL), equiped it with an observatory, and ensured its regional and national visibility.

In 1975, Heck got his PhD with a main thesis on the application of the maximum-likelihood principle to the calibration of stellar luminosity criteria and with a secondary thesis on the statistical relationships between photometric indices and spectral classifications. In 1977, Heck joined the European Space Agency (ESA) then setting up, at Villafranca del Castillo near Madrid (Spain), an observatory for operating the International Ultraviolet Explorer (IUE) in collaboration with NASA and UK's SERC. First in charge of science operations, Heck became Deputy Director of that observatory in 1980 and Acting Director in 1981-1983. In parallel to those managerial activities, he took part in numerous scientific investigations, including the compilation of an atlas of stellar reference sequences in the ultraviolet.

At the end of 1982, Heck accepted an invitation of Strasbourg Observatory where he became associated astronomer in April 1983 and tenured astronomer from 1986 on. He served as Observatory Director from 1988 to 1990. In 1985, he unanimously received a ProfDSc ("Agrégation de l'Enseignement Supérieur Universitaire") from Liège University

with a main thesis reviewing his contributions to astronomical multivariate statistics and three secondary theses respectively devoted to the irregular variable V348 Sgr, to the very slow nova RR Tel, and to a synthesis of the galactic distance determinations carried out with the algorithm he had developed. The title of his academic lesson was "The Rotation of the Galaxy". The following year, Heck was bestowed the first Habilitation to Direct Researches granted by Strasbourg Louis Pasteur University. In parallel, and as an example of his varied centers of interest (among others for scientific public outreach), he had obtained in 1985 a degree in communication techniques.

Already before his arrival in Strasbourg, and thanks to his numerous contacts in the space research field, Heck had managed to get CDS acknowledged as a world center of excellence, an activity he continued with total success. He kept on with investigating advanced statistical methodologies, knowledge-based systems and information mining techniques. Towards the end of the 1980s, a partial permanent disability forced him to re-orient his activities. Thus, he organized in 1991 the first international colloquium on professional electronic publishing in astronomy, from which originate many of today's materializations and collaborations in the field. His editorial production is impressive with some 70 books as author or editor and more than 1400 papers to date, quite a few of them being directed to the public at large – a return towards the society that he never neglected.

The advent of the new electronic media enabled making available world-wide the StarPages, a set of directories, dictionaries, databases and online services that Heck had started to compile already back in the 1970s – their distribution being ensured by organizations such as ESA, NASA, ESO and CDS. Heck recently produced an edited book on the multinational history of Strasbourg Observatory. He launched also a novel series of volumes devoted the organizational, strategical and sociological issues in astronomy and related disciplines: the "Organizations and Strategies in Astronomy" (OSA) series to which he himself contributed with his editorials, reviews and interviews.

[The references listed included Publ. 388 to 400, 427 & 449, as well as Heck's Personal file 2006[240] and web site[241].]

[H.W. Duerbeck (Vrije Univ. Brussel) *NBDA* **45** (2006) 4668-4669]

[240] Univ. Louis Pasteur, Strasbourg, x + 126 pp.
[241] http://www.aheck.org/

Stroobant Prize Press Release (2007)

Académie Royale des Sciences,
des Lettres et des Beaux-Arts de Belgique
Palais des Académies
Rue Ducale 1
B-1000 Bruxelles
Belgium

PRESS RELEASE

André HECK, 60, currently astronomer at Strasbourg Observatory (France), has been awarded the Paul and Marie Stroobant[242] Prize 2007 by the Royal Academy of Sciences, Letters and Fine Arts of Belgium.

Created in 1950, the Stroobant prize is awarded every other year to a Belgian or French citizen who has authored the most remarkable astronomy-related work. The 2007 Academy's Stroobant Prize has been awarded to Heck for his impressive professional production and in particular for his pioneering series of volumes entitled "Organizations and Strategies in Astronomy (OSA)", initiated in Year 2000.

Born Belgian, Heck has been first researcher at the Liège, Belgium, Institute of Astrophysics before becoming in 1977 one of the founding members of the observatory set up in Spain by the European Space Agency (ESA) to exploit the International Ultraviolet Explorer (IUE) satellite [a joint venture with the US NASA and the UK SERC, now PPARC]. He served as Deputy and Acting IUE Observatory Director from 1981 to 1983. Heck took up a position at Strasbourg Observatory in 1983 where he served as Director from 1988 to 1990.

Heck obtained his PhD in sciences from the University of Liège in 1975 and a ProfDSc in 1986. The following year, he got a degree as Research Director from the Louis Pasteur University in Strasbourg. Unconventionally he also secured degrees in management and communication strategies.

Over his career, Heck moved successfully from field to field, both in observational and theoretical astrophysics. He became a skilled observer with Schmidt telescopes (discovering a comet in 1973), spent innumerable nights carrying out photometric measurements (mainly in Chile) and pioneered new techniques of UV spectroscopy while being in charge of science operations on the IUE spacecraft (leading to a substantial increase of the satellite's useful life).

Beyond exploiting his own observations of quite a variety of astrophysical objects, Heck developed methodologies of various kinds: statistical parallaxes (galactic distance scale), multivariate data analysis (relationships between photometric and spectroscopic

[242]Belgian Astronomer Paul Stroobant (1868-1936) directed the Royal Observatory in Brussels (1925-1936) and had been nominated Professor of Astronomy at Brussels University as early as 1896. He presided the "Classe des Sciences" of the Academy in 1931-1932.

data), and more generally information handling and mining techniques applied to the large amounts of data collected by modern instruments and made available today via "virtual observatories".

Heck played a key role in getting Strasbourg astronomical Data Center (CDS) recognized as a world centre of excellence. He was also instrumental in acting as a catalyst for advances and collaborations in the field of electronic publishing for astronomy.

Heck has organized numerous international conferences and is currently preparing another one to be held in June 2007 at the Palace of the Academies in Brussels on the "Future Professional Communication in Astronomy (and its impact on evaluation)". Heck has been himself an invited speaker at many meetings round the world. He is a prolific author, an editor of reference books and an active science communicator. Among his editorial production, his latest and successful volumes entitled Organizations and Strategies in Astronomy (OSA) (Kluwer/Springer) deserve a special mention. Interestingly Heck's opening chapter in Volume OSA 1 had reproduced – in a premonitory connection with the prize he just received – a world map of astronomy-related organizations drawn by Stroobant and published in 1907.

More details on Heck's activities (as well as contact elements, lists of publications, photographs, etc.) can be found on his web site[243] as well as a brief CV[244].

(Brussels, March 2007)

Possible quotations:

Prof. Léo Houziaux, Permanent Secretary of the Belgian Royal Academy:
"The prize committee was impressed by Prof. Heck's scientific production and in particular by his important and pioneering publications on astronomy-related organizations."

Recipient André Heck:
"I am deeply honoured by this renowned prize awarded by an international jury. It recognizes the appropriateness of pioneering new astronomy-related fields, such as organizational, strategical and sociological issues. As the initiator and catalyst of the series Organizations and Strategies in Astronomy (OSA), I feel this recognition should be echoed over all contributors: the authors of some 150 chapters so far, the interviewees, as well as the grandees of astronomy who wrote the forewords to the volumes."

[243] http://www.aheck.org/
[244] http://www.aheck.org/cvbrief.pdf

Selected Citations

"In gratitude for the exceptional contributions made by André Heck to the 18.5 years of science operations of the International Ultraviolet Explorer Satellite."
[Recognition by the European Space Agency (1997) (cf. p. 91)]

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"Une belle brochette de *'premières'* : première comète de l'année, première comète découverte à l'Observatoire de Haute Provence, et première comète découverte par un membre de l'Institut d'Astrophysique de Liège."[245]
[*Le Soir*, January 1973, on Comet 1973a (cf. p. 50)]

***

"Pour ses travaux de photométrie stellaire et ses activités liées à la diffusion de l'astronomie à l'aide des techniques contemporaines.[246]
[Citation of Mailly Prize 1996 by the Royal Academy of Belgium (cf. p. 230)]

***

"Pour son oeuvre scientifique et son imposante contribution à l'édition d'ouvrages relatifs à l'organisation de l'astronomie."[247]
[Citation of the International Stroobant Prize 2007 (cf. p. 251)]

***

"C'est l'occasion de rendre hommage à l'immense effort de clarification que vous faites au bénéfice de notre profession."[248] [P. Léna (January 2008)]

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"Après évaluation de votre activité de ces quatre dernières années, la Section Astronomie du CNAP vous félicite pour votre contribution remarquable au défrichage de voies nouvelles. Votre production rédactionnelle et éditoriale est véritablement hors normes. La

[245] A nice set of *firsts*: first comet of the year, first comet discovered at Haute Provence Observatory, and first comet discovered by a member of the Liège Institute of Astrophysics.
[246] For his work in stellar photometry and his activities linked to the popularization of astronomy via today's techniques.
[247] For his scientific work and his impressive production of books related to the organization of astronomy.
[248] It is the opportunity to pay tribute to the immense clarification you are undertaking for the benefit of our profession.

qualité des collections d'ouvrages que vous dirigez est reconnue internationalement, comme en témoigne, par exemple, le Prix Stroobant 2007 qui vous a été décerné pour votre oeuvre scientifique et votre importante contribution à l'édition d'ouvrages. Vous tenez également à diffuser largement la culture scientifique auprès du grand public. Le CNAP vous remercie et vous encourage à poursuivre vos efforts."[249]

[D. Rouan, Chairman of CNAP Astronomy-Astrophysics (October 2008), quadriennial evaluation of activities by the French National Council of Astronomers and Physicists (CNAP) – see also Fig. 186]

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"An excellent overview of cosmic distance scales."

[Th. Barnes, *Observatory* 119 (1999), on the book *Post-Hipparcos Cosmic Candles* (cf. p. 86 & 435)]

***

"A needed and useful introduction into the use of statistical methods on collected data."

[H. Nieuwenhuizen, *Space Sc. Reviews* 47 (1988), on the book *Multivariate Data Analysis* (cf. Publ. 405 & Fig. 102)]

***

"This is a fundamental contribution to astrophysics!"

[R.N. Thomas, waving the *IUE Low-Dispersion Spectra Reference Atlas* at the *NASA GSFC IUE Symposium* (April 1984) (cf. p. 152 & Publ. 413)]

***

"Both this colloquium and its precursor, FPCA-I, were the brainchildren of Prof. André Heck, who, as the prolific author of over 1,500 papers, knows a thing or two about scholarly communication. Over the past two decades, André has authored and edited several seminal books about the sociology of organizations and collaborations in astronomy and related fields."[A. Accomazzi, ADS Head/Harvard Center for Astrophysics (April 2011), in the Editorial of *Future Professional Communication in Astronomy II*]

***

"The leading master of this [OSA] series should be warmly congratulated for having taken the initiative and having led this set of useful tools. There is a need for pursuing this activity in the future given the rapid status of evolution of astronomy as the new century promises to be one of even more numerous and extraordinary discoveries, as the tools described in the OSA books become operational and deliver their promises."

[R.M. Bonnet, ISSI Executive Director & COSPAR President, on the OSA Books series (2006, cf. p. 248 & Fig. 231)]

[249] After evaluation of your activity over the past four years, the CNAP Astronomy Section congratulates you for your remarkable contribution pioneering new orientations. Your editorial production is truly outstanding. The quality of the collections your are directing is recognized internationally as shown, for instance, by the Stroobant Prize 2007 that was bestowed on you for your scientific achievements and your substantial book production. You are also largely contributing to the popularization of science towards the public at large. The CNAP is thanking you and encouraging you to pursue your activities.

***

"I relish the series *Organizations and Strategies in Astronomy*, which help us recover our memories, reconstitute our own story. [...] The other keyword these days, and André is clearly a precursor here, is strategy." [C. Cesarsky, ESO Director General & IAU President-Elect, on the OSA Books series (2005, cf. p. 248 & Fig. 231)]

***

"*Organizations and Strategies in Astronomy* plays a key role in recording the current history of our field." [C. Pilachowski, President 2002-2004 of the *American Astronomical Society*, on the OSA Books series (2004, cf. p. 248 & Fig. 231)]

***

"A valuable contribution to any serious astronomical library."
[D.J. Stickland, *Observatory* 123 (2003), on the OSA Books series (cf. p. 248 & Fig. 231)]

***

"Your book arrived and it is beautiful! Somehow the smooth cover is nice. You did everything just right." [H.A. Abt (September 2012), on the OPSA I volume (cf. p. 248 & Fig. 190)]

***

"Congratulations on the excellency of the layout and production."
[J. Meadows (September 2012), on the OPSA I volume (cf. p. 248 & Fig. 190)]

***

"Congratulations to you for this achievement and for launching your own publishing venture!" [C. Sterken (September 2012), on the launch of *Venngeist* and the *OPSA I* volume (cf. p. 248 & Fig. 190)]

***

"Astronomer André Heck at the Strasbourg Observatory [...] has encouraged the scientific community to go beyond traditional publishing and provide a wide variety of information in various forms. As both a publishing astronomer and a database provider, Heck stresses the need to maintain the quality of information on the World-Wide Web. It is not enough to prepare the input information with great care, he insists. It is also essential to maintain files and archives in a usable state once you have them."
[P. Boyce & H. Dalterio (AAS), *Physics Today* **49** (January 1996) 42-47]

***

"I commend this volume to all as essential, urgent reading."
[D. McNally, *Observatory* 118 (1998), on the book *Electronic Publishing for Physics and Astronomy* (cf. p. 435 & Fig. 132)]

***

"A very valuable tool for everybody involved in the astronomical community, and especially for librarians." [F. Martines, Osservatorio Astronomico di Palermo (June 2005), on the *StarPages* (cf. p. 207 & 473)]

***

"Une oeuvre monumentale."[250]
[DNA (12 September 2004), about *StarGuides Plus* & *StarBriefs Plus* (cf. p. 207, 439 & 441)]

***

"You are providing a wonderful service and it is much appreciated. As an *Astrophysical Journal* Editor, I need this more than you can imagine."
[S.N. Shore (December 2001), on the *StarPages* (cf. p. 207 & 473)]

***

"Such a work you did (and still do) is very important for the community because it brings people together." [R. Supper, Max-Planck-Institut für extraterrestrische Physik (October 2001), on the *StarPages* (cf. p. 207 & 473)]

***

"If there were a 'yellow pages' of astronomy, this massive book would be it."
[*Sky & Telescope* (April 2001), on the directory *StarGuides 2001* (cf. p. 207 & 441)]

***

"I've tried other databases, but Starbits is the most complete (of course sometimes it's hard to choose among the many possibilities – an embarassment of riches!)."
[St. Hutchings, Lockheed Martin Corp. (August 1997) on the *StarPages* (cf. p. 207 & 473)]

***

"André is a superb collector and organizer of astronomical information."
[D.C. Wells (February 1994), on the *StarPages* (cf. p. 207 & 473)]

***

"Wir halten die Veröffentlichung für sehr gelungen und nützlich."[251].
[G.D. Roth, Redaktion *Sterne und Weltraum* (March 1991), on *ASpScROW 1991* (cf. p. 207 & 441)]

***

"Una utilità senza pari!"[252]
[P. Cinzano, *Unione Astrofili Italiani* (November 1990), on the directory *IDAAS 1990* (cf. p. 207 & 441)]

***

[250] A monumental piece.
[251] We consider this publication as a useful achievement.
[252] A utility without par!

"These three publications are providing an invaluable service to the astronomical community." [E. Lastovica, South African Astronomical Observatory (August 1990), on the directories *IDAAS 1990* & *IDPAI 1990* and on the list of *Acronyms and Abbreviations in Astronomy and Space Sciences* (cf. p. 207, 441 & 439)]

***

"Congratulations for these immensely useful and most comprehensive and up-to-date reference books!" [H. Hefele, Editor of *Astronomy and Astrophysics Abstracts* (September 1989), on the directories *IDAAS 1988* and *IDPAI 1989* (cf. p. 207 & 441)]

***

"I'm *very impressed* with your astronomical directories – a real service to the astronomical community!" [R.M. Genet, AutoScope Corp. (May 1989) on the directories *IDPAI 1987* and *IDAAS 1988* (cf. p. 207 & 441)]

***

"Finally, someone undertook such a long-needed and most useful compilation!"
[N. Sperling, *Sky & Telescope* (May 1979), on the directory *IDAAS 1978* (cf. p. 207 & 441)]

***

"Faszinierend! Verzaubernd! Entzuckend!"[253]
[H.U. Hunger, *Kulturbild* (February 2002), on *Das grosse Feuer* (cf. p. 461 & 471)]

***

"Un livre à se procurer pour un vrai plaisir de lecteur."[254]
[M.C. Paskoff, *l'Astronomie* (October 2014), on the book *Les Constellations des Potins d'Uranie* (cf. p. 437)]

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"Ouvrage de qualité, très bien écrit, abondamment illustré et que l'on peut lire d'une traite, ou par morceau au hasard des 50 chapitres."[255]
[J. Manfroid, *Le Ciel* (December 2014) on the book *Les Constellations des Potins d'Uranie* (cf. p. 437)]

***

"Délicieuses histoires. Un régal."[256]
[EM, *Ciel et Espace* (February 2015) on the book *Les Constellations des Potins d'Uranie* (cf. p. 437)]

[253] Fascinating! Enchanting! Delightful!
[254] A book to be acquired for a real reading pleasure.
[255] A high-quality book, very well written, copiously illustrated, with 50 chapters that can be read in a stretch or randomly.
[256] Delicious stories. A treat.

References

To whom it may concern:

André Heck is a unique and extraordinary scientist. His work has been, and continues to be, instrumental to the long term growth of astrophysics in particular and science in general.

We are at present undergoing a historical transition, similar in scope, but much more rapid, than that which followed the invention of movable type and modern printing. Both in his technical work, and in his organizational endeavors Professor Heck has made, and continues to make, seminal contributions toward enabling these developments.

Professor Heck's early work on multivariate analysis was an inspiration to me as a graduate student. These techniques have since become standard for many type of data analysis, and are the subject of numerous papers and conferences currently. André Heck literally wrote the book on this important subject (Murtagh & Heck, *Multivariate Data Analysis*, 1987). Without the methods he pioneered the rigorous analysis of modern, huge digital data-sets would be impossible.

The new forms of electronic publication, at the core of the e-science paradigm shift, have been substantially improved by Andre's work. Beginning more than two decades ago, before most had even considered the possibility, his work has both informed and facilitated these fundamental changes. To the present day, his work continues to be at the heart of these developments.

To the extent that this unique time in the history of science is documented through the experience of astronomy, it is primarily André Heck who is actually conceiving the vehicles, and doing the work which enables this historical record to be created. In the future, when this period is studied, his work will be invaluable.

Professor Heck has conceived and organized approximately three dozen volumes of conference proceedings and invited articles. These activities have had an enormous influence. As an example: the Smithsonian/NASA *Astrophysics Data System* is astronomy's digital library, it is by far the most heavily used professional resource by astronomers, and is additionally heavily used by physicists and the general public. As I described ten years ago, (Kurtz *et al.*, *Astron. Astrophys. Suppl.* **143**, 41, 2000) the development of the ADS happened due to personal relationships forged at the conference Astronomy from

Large Databases in 1987. André Heck conceived and organized this meeting, and invited me to attend.

He has been an extraordinarily prolific author. One of the standard measures of individual productivity offered by the ADS system is the normalized number of publications for an individual, where co-authorship is directly taken into account by dividing by the number of authors (on a per paper basis). By this measure André Heck (with a current normalized paper score of 800) is the most published author in the history of astronomy; his output exceeds the entirety of many entire departments.

His current work, dealing with science and publishing policy, fills a void in areas where technology is rapidly making old techniques and policies obsolete.

Respectfully,

Michael J. Kurtz
Harvard-Smithsonian Center for Astrophysics
60 Garden Street
Cambridge, MA 02138, USA
(May 2010)

To whom it may concern:

I have been following André Heck since his years as student at the University of Liège (Belgium) and I have always been impressed by the quality of his achievements and by the variety of his scientific production.

Heck was first researcher at the Liège Institute of Astrophysics before becoming in 1977 one of the founding members of the observatory set up in Spain by the European Space Agency (ESA) to exploit the International Ultraviolet Explorer (IUE) satellite. He served as Deputy and Acting IUE Observatory Director from 1981 to 1983. Heck took up a position at Strasbourg Observatory in 1983 where he served as Director from 1988 to 1990.

Over his career, Heck moved successfully from field to field, both in observational and theoretical astrophysics. He became a skilled observer with Schmidt telescopes (discovering a comet in 1973), spent innumerable nights carrying out photometric measurements (mainly in Chile) and pioneered new techniques of UV spectroscopy while being in charge of science operations on the IUE spacecraft (leading to a substantial increase of the satellite's useful life).

Beyond exploiting his own observations of quite a variety of astrophysical objects (for instance publishing an extremely useful atlas of ultraviolet spectra), Heck developed methodologies of various kinds: statistical parallaxes (galactic distance scale), multivariate data analysis (relationships between photometric and spectroscopic data), and more generally information handling and mining techniques applied to the large amounts of data collected by modern instruments and made available today via "virtual observatories".

Heck played a key role in getting Strasbourg astronomical Data Center (CDS) recognized as a world centre of excellence. He was also instrumental as a catalyst of advances and collaborations in the field of electronic publishing for astronomy.

Heck has organized numerous international conferences and has been himself an invited speaker at many meetings round the world. He is a prolific author, an editor of reference books and an active science communicator. He is the recipient of several prizes, such as the Mailly one (development of original methods in stellar photometry) and the Stroobant one (his important and pioneering publications on astronomy-related organizations).

Sincerely,

Léo Houziaux, Permanent Secretary
Belgian Royal Academy
Palais des Académies
B-1000 Brussels, Belgium
(May 2010)

To whom it may concern:

Among astronomy librarians, Prof. André Heck is well-known and highly respected as an astronomer who tirelessly works in favor of combining all aspects of astronomy by bringing together scientists, information providers, librarians, publishers, computer scientists, database experts as well as historians and media experts.

I first met Prof. Heck in the context of the conference *Astronomy from Large Databases II* which took place in Haguenau, France, in 1992. Prof. Heck was the main organizer as well as the first editor of the conference proceedings. At that time, I was still relatively new to the field of astronomy, and this conference provided an excellent overview of the systems and technologies applied in astronomy, which typically were and still are ahead of other subject areas. For me, the Haguenau conference became a symbol of Prof. Heck's work and approach towards astronomy: always looking at the large picture by including as many viewpoints as possible. Naturally, this included also librarians who often were not represented at astronomers' conferences. The Haguenau conference was the beginning of a long and fruitful collaboration with Prof. Heck.

Astronomy from Large Databases is just one example of the many conferences Prof. Heck has been actively involved in throughout his career. He has been and still is remarkably creative and efficient regarding organizing international meetings of representatives from various fields of expertise, like the *Future Professional Communication in Astronomy II (FPCA-II)* conference that took place recently at the University of Harvard. Besides the numerous conferences organized by himself, he also has been a valued invited speaker at other meetings, for instance the series of *LISA (Library and Information Services in Astronomy)* conferences which are the most important meetings in the field of astronomy libraries.

In the mid-1990ies, an increasing number of web sites became available through the internet, but tools were lacking to trace and retrieve specific information. At that time, Prof. Heck started to publish a series of directories commonly known as the *Star*s Family*, among them *StarGuides Plus*, a world-wide directory of organizations in astronomy, and *StarBriefs Plus*, a dictionary of abbreviations, acronyms and symbols in astronomy. These directories soon became "must-haves" in astronomy libraries as they constituted essential reference tools in librarians' day-to-day work.

In his work as book editor, it is essential for Prof. Heck to explain latest tools and cutting-edge technology; however, he pays equal attention to historic developments and the large-scale context in order to be able to evaluate recent developments. This approach is well illustrated in the *Organizations and Strategies in Astronomy (OSA)* book series. Between 2000 and 2006, Prof. Heck has edited seven OSA volumes in which a wide range of authors elaborate on topics such as history, characteristics and strategies of organizations in astronomy; professional communication and interactions among astronomers as well as with other scientific communities and the general public; and the sociological evolution of astronomy at large. Each of these volumes has become a milestone as it describes how astronomy and the professions involved in its study work, interact, and evolve.

I am happy and proud to have been involved in some of Prof. Heck's past endeavors, and look forward to many more years of collaboration in the context of conferences and book projects.

Sincerely,

Uta Grothkopf, ESO Head Librarian
European Southern Observatory
Karl-Schwarzschild-Straße 2
D-85748 Garching, Germany
(May 2010)

To whom it may concern:

André Heck realized many years ago that professional scientific communication was changing rapidly and that organizations, publications, and publishers needed to change or they would be left out.

He has organized a long series of conferences and workshops to introduce publishers and organizations to the new methods of communication. For instance, most communication now is being done digitally and on-line, so if publishers insist on ignoring that and continue to publish books and journals only on paper, they will be ignored. The statistics verify that: references to books have declined drastically in recent years and publishers are finally beginning to make their books available on-line.

André has been the leader in seeing that those changes are being made. He also has realized that extremely large data sets will become available in science and that we need to have efficient ways to distribute those.

André has engineered these changes in a gentle way. Rather than preach himself, he has persuaded the practitioners of the new methods to attend his workshops and persuaded the publishers to attend, so that they can convince each other. This has been done on an international scale, and then his conference proceedings are distributed widely.

This process is not complete yet. On the one hand, we hear that the young people never go to libraries nor read printed journals and books, whereas some publishers still have not learned that reality. There are still changes that need to be made, and we need André to lead in making those changes.

Sincerely,

Helmut A. Abt, Astronomer
Kitt Peak National Observatory
Tucson, AZ 85726-6732, USA
(June 2010)

To whom it may concern:

I have been privileged to collaborate with Professor André Heck for a number of years on issues related to the future of astronomical publishing. Since the earliest days of electronic publishing, Professor Heck has had the foresight and vision to lead important elements of the astronomical community in productive discussion concerning the rapidly evolving role of publishing in the digital age. Heck's contributions in this area have been fundamental.

But his activities have been far more wide-ranging than just astronomical publishing. With his editorship of the numerous volumes of the series *Organizations and Strategies in Astronomy* (published by Kluwer/Springer), he has produced an extensive survey of what may justifiably be termed the sociology of astronomy.

These volumes are unique in their breadth and depth of treatment of multifarious aspects of the social aspects of astronomy, ranging from bibliometrics, peer review and broader issues of astronomy communication to the functioning of national and international research centres. With the demise of such journals as *Vistas in Astronomy* and *Quarterly Journal of the Royal Astronomical Society*, the OSA series have provided astronomers with a unique outlet for discussion of such important topics as the future organization of astronomical research.

Heck has been the prime mover in organizing two highly successful meetings on *Future Professional Communication in Astronomy*, the first being held at the Palace of the Academies in Brussels in 2007 and the second at Harvard College Observatory in Cambridge in April of this year. These meetings were attended by the principal stakeholders in astronomical publishing (learned societies, publishers, librarians and astronomers) and dealt with the rapidly changing nature of astronomical publishing (Open Access being a key issue at this time).

Throughout his career, Heck has played a key role in identifying new areas of endeavour in astronomy, from his pioneering work on multivariate analysis and large databases to his thorough assaying of the communication of astronomy in all its aspects and at all levels (from outreach to professional research publishing).

But Heck has been no voice of one crying in the wilderness: the recent burgeoning of meetings on astronomical outreach in the last decade are directly descended from his many edited works on this subject – my own meeting on *Communicating Astronomy* (Ed. T.J. Mahoney), published in 2005 was the forerunner of the *Communicating Astronomy with the Public* series of meetings but drew its inspiration from Heck's earlier work in this field).

Those who have known and worked with Heck on his numerous projects look forward to many more years of collaboration with him.

Sincerely,

T.J. Mahoney, Scientific Editorial Service
Instituto de Astrofísica de Canarias
E-38200 La Laguna, Tenerife, Spain
(June 2010)

To whom it may concern:

Prof. André Heck, former Director of Strasbourg Astronomical Observatory, conducted research on the history of astronomy and related institutions in Strasbourg.

In the course of these investigations, he visited frequently the Strasbourg city archives where he used very critically and most carefully all available sources.

In his research, Prof. Heck displayed a remarkable ability in the usage of archive sources that he cross-checked with other sources discovered by himself in other European centres and that he completed with data from monumental archaeology.

The outcome enabled to correct a number of conclusions admitted so far and to put in a new perspective an important section of the history of Strasbourg University since the 17th century.

As a consequence of all this work and his forthcoming projects, Prof. Heck positioned himself among the reference names of contemporaneous historiography.

Sincerely,

Dr. Benoît Jordan, Chief Curator
Strasbourg City and Urban Community Archives
32 Avenue du Rhin
F-67076 Strasbourg, France
(June 2010)

To whom it may concern:

André Heck has always shown an extreme concern for communication. One of his first papers, at the age of 18, was dealing with an international language facilitating exchanges between peoples of the world.

That unrefrained propensity for communication, Heck gives it its full expansion through public outreach, in particular of astronomy: books, atlases, multiple articles on a variety of themes, and so on. Indefatigable writer, he has no difficulty to ensure monthly columns in various magazines from various countries.

Heck never hesitates to walk out of the beaten pathes. He never repeats the nth description of phenomena already well described by numerous authors. He continually shed a different light, offers an unusual approach, leads to an unexpected perspective. His presentation of the constellations through stories from his native marshy High-Plateaux, within his column *Les Potins d'Uranie* under his pen name *Al Nath*, is only one example among many.

Far from limiting himself to astronomy, André Heck also devotes a great interest to History, as well as to the sociology and to the organization of Science.

He produced an authoritative book on *The Multinational History of Strasbourg Astronomical Observatory* and has different other related productions in the works. His pioneering series of volumes on *Organizations and Strategies in Astronomy* has been awarded the international Stroobant Prize.

His mastering of communication together with a literally extra-ordinary gift for organization allowed him to quickly set up again and running the *Liège Astronomical Society* in the 1970s, transforming it into one of the most important associations of the kind, fully equipped with observatories and operating a full spectrum of activities.

Those talents enabled him also to get for instance the *Strasbourg Data Center* recognized as a world center of excellence when he was the center's de facto "salesman", or earlier to extend significantly the operational lifetime of the *International Ultraviolet Explorer* when he was in charge of the science operations on the satellite.

By easily mastering professional communications means, by often investigating and preparing their future through the reference books he produced and the conferences he organized (such as the recent *Future Professional Communication in Astronomy II (FPCA II)* at Harvard University), Heck asserted himself as a key figure in the history and development of astronomy communication.

Respectfully,

Jean Manfroid, Research Director FNRS
Institut d'Astrophysique
B-4000 Liège/Sart Tilman, Belgium
(May 2010)

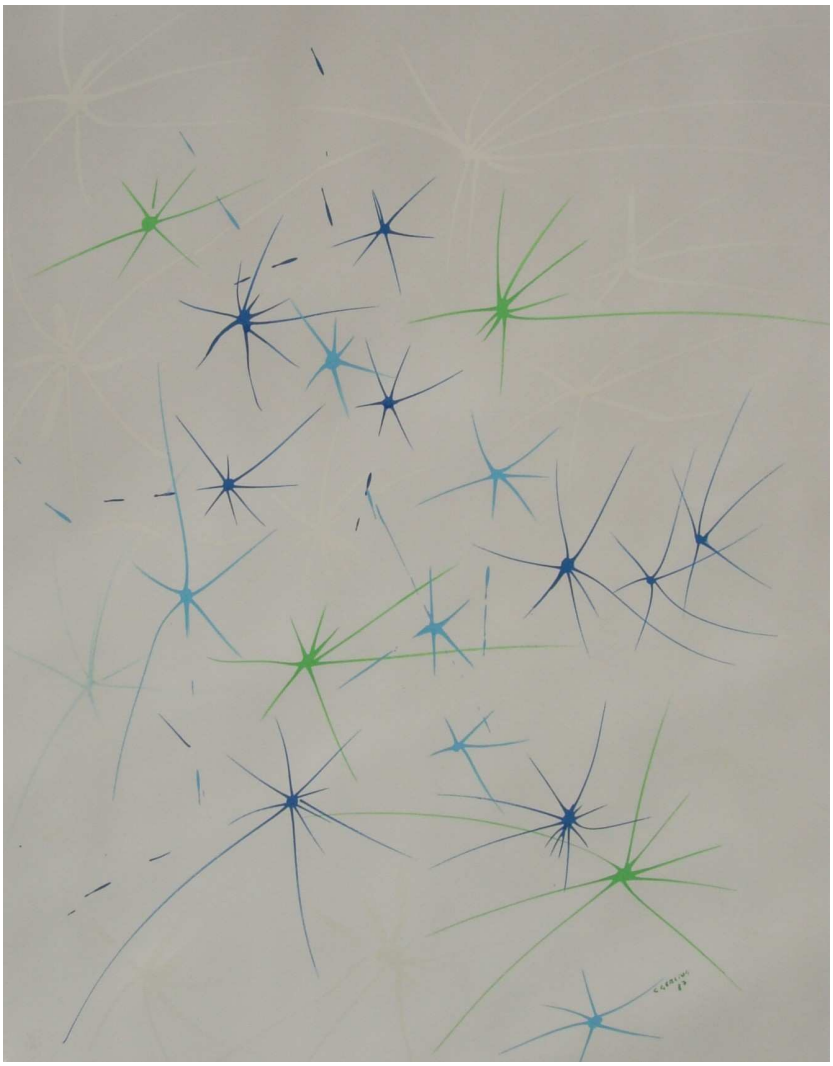


Fig. 223: Corinne Gerling's "Constellation" (1987, watercolor, 50cm × 70cm). Gerling's "Emergence of Knowledge" illustrated the cover of the Kluwer book "Information Handling in Astronomy – Historical Vistas" (Publ. 394, Fig. 163) and her "Pavé de Saint-Jacques" (an ancient name for the Milky Way) was used in Publ. 817.

Collaborators

Note: The following pages list the names of people involved with Heck in collaborations leading to scientific papers (refer to the Index of People[257] for pointers to details). The same person may be listed under several affiliations, depending of his/her own career. Some institutions moved, such as the *Royal Greenwich Observatory* (Herstmonceux, then Cambridge, then shut down) or the *European Southern Observatory (ESO)*, with its European Headquarters first at CERN before their current location in Garching.

Argentina

- Observatorio Astronómico, La Plata
  (A. Feinstein)

Australia

- Mount Stromlo and Siding Spring Observatories
  (K.C. Freeman, A. Koekemoer)

Austria

- Universitätssternwarte, Wien
  (R. Albrecht, H.M. Maitzen)

Belgium

- Académie Royale de Belgique
  (L. Houziaux)
- Astronomy Group, Vrije Universiteit Brussel
  (C. Sterken)
- Koninklijke Sterrenwacht van België , Ukkel
  (M. Burger, H. Hensberge)
- Institut d'Astronomie de Université Libre de Bruxelles
  (Y.K. Ng)
- Institut d'Astrophysique de l'Université de Liège
  (A. Cucchario, F. Dossin, L. Houziaux, M. Klutz, J.M. Lakaye, J. Manfroid, G. Mathys, J.M. Perdang, P. Renson, J. Surdej, J.P. Swings, J.M. Vreux)
- Institut de Chimie Médicale de l'Université de Liège
  (A. Albert)

[257] Authors/contributors to the books produced appear in a dedicated section (pp. 497ff) as well as in the downloadable web file <http://www.aheck.org/authbks.pdf>.

- Institut de Mathématique de l'Université Liège
  (G. Mersch)
- Institut de Psychologie de l'Université de Liège
  (D. Defays)

Brazil

- Observatorio Nacional, Rio de Janeiro
  (L. Da Silva)

Chile

- European Southern Observatory, Santiago
  (R. Garnier, J. Manfroid, N. Vogt)
- Pontificia Universidad Católica de Chile, Santiago
  (N. Vogt)

China (PRC)

- Beijing Astronomical Observatory
  (L. Zongli)

Denmark

- Copenhagen University Observatory
  (B. Reipurth)

France

- Observatoire de Haute Provence
  (Y. Andrillat, G. Sause)
- Observatoire de Lyon
  (J. Bergeat, M. Lunel)
- Observatoire de Nice
  (A. Bijaoui, M. Hénon)
- Observatoire de Paris
  (R. Foy, A.E. Gómez, S. Grenier, J. Jung, M.O. Mennessier, F. Querci,
  M. Querci)
- Observatoire de Bordeaux
  (J.M. Rousseau)
- Université de Paris VI
  (C. Gordon)
- Centre d'Études Statistiques, Strasbourg
  (Ph. Nobelis, J.C. Turlot)
- Observatoire de Strasbourg
  (M. Crézé, D. Egret, C. Jaschek, M. Jaschek, G. Jasniewicz, J. Jung, S. Lesteven,
  F. Ochsenbein, J.L. Vergely)

Germany

- Astronomisches Institut der Ruhr-Universität Bochum
  (R. Albrecht, H.M. Maitzen)
- Max-Planck-Institut für Radioastronomie, Bonn
  (P. Matzik, K.W. Weiler)
- European Southern Observatory, Garching
  (M.A. Albrecht, W. Eichendorf, U. Kinkel, J. Lub, C. Madsen, M. Pakull, D.J. Ponz)
- Max-Planck-Institut für extraterrestrische Physik, Garching
  (H.U. Zimmermann)
- Space Telescope European Coordinating Facility, Garching
  (H.M. Adorf, R. Albrecht, F. Murtagh, R. Rampazzo, G. Russo)
- Institut für theoretische Astrophysik der Universität Heidelberg
  (B. Baschek, J. Köppen, M. Scholz, R. Wehrse)
- Landessternwarte Königstuhl, Heidelberg
  (K. Anton, A. Barzewski, A. Juettner, F. Spiller, T. Szeifert)
- Institut für theoretische Physik und Sternwarte der Universität Kiel
  (D. Reimers, U. Heber, K. Hempe, D. Schönberner)
- Astronomisches Institut der Universität Münster
  (A. Bruch, R. Duemmler, H.W. Duerbeck, M. Hiesgen)
- Universität München
  (V. Witt)
- Institut für Astronomie und Astrophysik der Universität Würzburg
  (J. Isserstedt)

Greece

- University of Athens
  (P. Niarchos)

India

- Indian Institute of Astrophysics, Bangalore
  (M.V. Mekkaden)

Israel

- Wise Observatory, Tel Aviv
  (D. Maoz, H. Netzer)

Italy

- Osservatorio Astrofisico, Asiago
  (F. Ciatti, S. Ortolani, P. Rafanelli, L. Rosino)
- Istituto di Astronomia, Bologna
  (C. Cacciari, B. Marano)

- Istituto di Radioastronomia, Bologna
  (N. Panagia, G. Vettolani)
- Istituto di Tecnologie e Studio delle Radiazioni Extraterrestri/CNR, Bologna
  (G.G.C. Palumbo)
- Osservatorio Astronomico, Bologna
  (F. Fusi-Pecci, C. Zavorani)
- Osservatorio Astrofisico, Catania
  (C. Blanco)
- ESA/ESRIN, Frascati
  (A. Ciarlo, H. Stokke)
- Osservatorio Astronomico di Brera, Milano
  (R. Rampazzo)
- Osservatorio Astronomico di Capodimonte, Napoli
  (B. Caccin, F. Caputo, G. Russo, G. Sollazzo)
- Istituto di Fisica Cosmica ed Applicazioni dell'Informatica/CNR, Palermo
  (M.C. Maccarone)
- Università di Palermo
  (V. Di Gesú, L. Scarsi)
- Osservatorio Astronomico, Trieste
  (F. Pasian)

Japan

- Tokyo Astronomical Observatory
  (T. Mikami)

Netherlands

- Sterrenkundig Instituut Anton Pannekoek, Universiteit Amsterdam
  (E. Bibo, F. Inklaar, M. Püttmann)
- Space Research Institute, Groningen
  (E. Raimond)
- Space Research Institute, Leiden
  (R. van Dijk)
- Sterrenwacht Leiden
  (A. Jorissen, A.M. van Genderen)
- ESA/ESTEC Astronomy Division, Noordwijk
  (P. Barr, F. Beeckmans de Westmeerbeek, S. di Serego Alighieri, F. Macchetto, M. Perryman)
- Space Research Institute, Utrecht
  (H.J.G.L.M. Lamers)

Spain

- Universidad de Granada
  (R. Molina)

- Universidad Complutense, Madrid
  (P. Rodríguez, J. Zamorano)
- ESA IUE Observatory, Villafranca del Castillo
  (M. Barylak, P. Benvenuti, L. Bianchi, C. Cacciari, A. Cassatella, J. Clavel, J. Darius, C. Driessen, J. Fernley, B.J.M. Hassall, J.P. Muñoz, P. Patriarchi, M.V. Penston, P.L. Selvelli, A. Talavera, W. Wamsteker)
- Instituto Nacional de Técnica Aeroespacial, Villafranca del Castillo
  (D.J. Ponz)
- UK IUE Project, Villafranca del Castillo
  (J.C. Blades, P. Gondhalekar, D.J. Stickland)

Sweden

- Lunds Observatorium, Lund
  (P. Linde)
- Astronomiska Observatoriet, Uppsala
  (I. Wanders)

Switzerland

- European Southern Observatory, Genève
  (J. Bergeron, J. Manfroid, M. Tarenghi)
- Observatoire de Genève
  (G. Burki, N. Cramer, G. Mathys, F. Rufener)
- ETHZ Institut für Astronomie, Zürich
  (G. Mathys)

United Kingdom

- Queen's University, Belfast
  (F. Murtagh)
- Astronomy Centre, University of Sussex, Brighton
  (J. Fernley)
- Institute of Astronomy, Cambridge
  (R. McMahon)
- Royal Greenwich Observatory, Cambridge
  (B.J.M. Hassall)
- University of Ulster, Londonderry
  (F. Murtagh)
- Rutherford Appleton Laboratory, Didcot
  (E. Dunford, P. Gondhalekar, J. Murray, M.B. Oliver, M.C.W. Sandford, D.J. Stickland)
- Mullard Space Science Laboratory, Dorking
  (A.N. Parmar, G.S.W. Pollard, P.W. Sanford)
- Royal Observatory, Edinburgh
  (J. Dawe, K. Nandy)

- Royal Greenwich Observatory, Herstmonceux
  (P.J. Andrews, S.V.M. Clube, D.H.P. Jones)
- University College, London
  (A. Boksenberg, C.I. Coleman, M.J.B. Duff, M.A.J. Snijders, R. Wilson)
- Department of Theoretical Astrophysics, Oxford University
  (C. Jordan)

U.S.A.

- Department of Astronomy, University of Texas, Austin TX
  (B.J. Wills, D. Wills)
- Space Telescope Science Institute, Baltimore MD
  (R. Gilmozzi, R.E. Jackson)
- Joint Institute for Laboratory Astrophysics, Boulder CO
  (T.R. Ayres, G.S. Basri, J.L. Linsky, N.D. Morrison)
- Harvard-Smithsonian Center for Astrophysics, Cambridge MA
  (A. Accomazzi, A.K. Dupree, G. Eichhorn, M.J. Kurtz)
- Smithsonian Astrophysical Observatory, Cambridge MA
  (J.R. Watson)
- National Radio Astronomy Observatory, Charlottesville VA
  (D.C. Wells)
- Astronomy Department, Ohio State University, Columbus OH
  (P.C. Keenan, R.F. Wing)
- Perkins Observatory, Delaware OH
  (P.C. Keenan)
- NASA Goddard Space Flight Center, Greenbelt MD
  (A. Boggess, R.C. Bohlin, D.C. Evans, H.R. Freeman, T.R. Gull, S.R. Heap, A.V. Holm, D.A. Klinglesmith, G.R. Longanecker, F.H. Schiffer III, W. Sparks, D.K. West, C.C. Wu)
- Department of Astronomy, University of Wisconsin, Madison WI
  (B.D. Savage)
- Department of Astronomy, California Institute of Technology, Pasadena CA
  (W.L.W. Sargent)
- Jet Propulsion Laboratory, Pasadena CA
  (A.L. Lane)
- Computer Sciences Corp., Silver Spring MD
  (A.V. Holm, P.M. Perry, F.H. Schiffer III, B.E. Turnrose, C.C. Wu)
- National Radio Astronomy Observatory, Socorro NM
  (R.A. Sramek)

Missions

Note: This section is listing most of the official missions carried out by Heck round the world, including observing runs, during the period covered by this volume. Local/regional trips and visits have been omitted. Refer also to the meetings attended (pp. 383ff) and to the abbreviations (pp. 523ff) for acronyms of institutions, projects, expeditions, etc. Note that the years following the CVA – basically the decade of the 1990s – are strikingly "lighter", with some recovery gradually taking place in the 2000s. Within a given year, the date format is MM.DD-MM.DD or MM.DD for single-day events.

1970 (based at IALg)

05.12-05.13 Centre de Documentation du CNRS/Paris
09.09-09.27 OHP/Saint-Michel-l'Observatoire
11.05-11.06 Observatoire/Paris
12.01-12.03 ESO/Genève

1971 (based at IALg)

02.15-02.20 Observatoire/Paris
03.12 ORB/Uccle
03.15-03.23 Observatoire/Paris
03.29-04.02 Observatoire/Paris
04.19-04.23 Observatoire/Paris
04.26-05.06 Observatoire/Paris
05.10-05.12 Observatoire/Paris
05.13-05.17 CERGA/Saint-Vallier-de-Thiey
05.24-06.09 Observatoire/Paris
06.21-06.26 Observatoire/Paris
09.08-09.24 Observatoire/Bordeaux & Station méridienne/Dorres
11.02-11.19 ESO/La Silla & CARSO/Las Campanas & AURA/Cerro Tololo
11.30-12.02 Observatoire/Paris

1972 (based at IALg)

02.16-02.17 Observatoire/Meudon
02.28-02.29 RGO/Herstmonceux
04.01-04.20 OHP/Saint-Michel-l'Observatoire
10.29-11.15 OHP/Saint-Michel-l'Observatoire

11.15-11.17 Observatoire/Strasbourg

1973 (based at IALg)

01.03-01.15 OHP/Saint-Michel-l'Observatoire
02.05-02.08 CDS/Strasbourg
03.04-03.14 OHP/Saint-Michel-l'Observatoire
04.26-04.29 CDS/Strasbourg
04.29-05.11 OHP/Saint-Michel-l'Observatoire
06.03-06.06 CDS/Strasbourg
06.23-07.09 EAGB 73/Loyengalani, Kenya
11.19-11.22 CDS/Strasbourg

1974 (based at IALg)

01.10-01.11 Carl Zeiss/Oberkochen
01.19-01.31 OHP/Saint-Michel-l'Observatoire
02.04-02.06 Observatoire/Meudon
02.25-02.27 Observatoire/Strasbourg
03.21-03.22 Observatoire/Meudon
03.22-03.29 OHP/Saint-Michel-l'Observatoire
03.30-03.31 Observatoire/Strasbourg
05.21-05.22 Observatoire/Meudon
06.10-06.21 CDS/Strasbourg
07.08-07.13 CDS/Strasbourg
08.13-08.14 Observatoire/Meudon
08.16 Observatoire/Besançon
08.16-08.27 OHP/Saint-Michel-l'Observatoire
09.23-09.27 CDS/Strasbourg
10.07-10.12 CDS/Strasbourg
10.21-10.26 CDS/Strasbourg

1975 (based at IALg)

01.28-02.22 ESO/La Silla
03.04-03.07 Observatoire/Meudon
04.07-04.11 CDS/Strasbourg
05.01-05.03 CDS/Strasbourg
05.15-05.17 Observatoire/Besançon
08.04-08.06 CDS/ Strasbourg
10.06-10.26 ESO/La Silla
10.28-11.12 OHP/Saint-Michel-l'Observatoire
11.13-11.14 CDCA/Nice
12.02-12.31 ESO/La Silla

1976 (based at IALg & Strasbourg Obs.)

01.01-01.09 ESO/La Silla

01.31-02.09 OHP/Saint-Michel-l'Observatoire
03.15 CNRS/Paris
03.15-03.19 Observatoire/Meudon
05.03-06.02 CDS/Strasbourg
07.11-08.10 ESO/La Silla
10.15-10.31 EAGB 76/Mkaja, Tanzania
11.09 CNRS/Paris
11.09-11.15 Observatoire/Meudon
11.14 Collège de France/Paris
11.15-11.25 Observatoire/Besançon
12.05-12.24 ESO/La Silla

1977 (based at IALg, ESTEC & Vilspa)

01.18-01.29 OHP/Saint-Michel-l'Observatoire
02.16 Observatoire/Besançon
02.17-02.25 OHP/Saint-Michel-l'Observatoire
02.26 Observatoire/Nice
02.27-02.28 ESO/Genève
04.22-04.23 CDS/Strasbourg
06.24 ESTEC/Noordwijk
06.29-07.27 ESO/La Silla
10.02-10.14 Vilspa/Madrid
10.23-11.06 GSFC/Greenbelt
11.22-11.30 Vilspa/Madrid
12.05-12.09 Vilspa/Madrid
12.14-12.31 ESO/La Silla

1978 (based at Vilspa)

01.01-01.08 ESO/La Silla
06.07-06.26 ESO/La Silla
10.06-10.10 Observatoire/Genève & ESO/Genève
10.10-10.12 Observatoire/Besançon
10.12-10.14 CDS/Strasbourg
10.14-11.02 Institut d'Astrophysique/Liège
11.02-11.05 Observatoires/Paris & Meudon

1979 (based at Vilspa)

01.04-01.05 ESA/Paris
01.25-01.30 Instituts d'Astrophysique et de Mathématique/Liège
11.02-11.10 OHP/Saint-Michel-l'Observatoire
12.09-12.23 OHP/Saint-Michel-l'Observatoire

1980 (based at Vilspa)

02.07-02.12 ESTEC/Noordwijk

03.28-03.31 CDS/Strasbourg
03.31-04.08 Institut d'Astrophysique/Liège
05.14-05.19 Observatoire/Meudon
05.19-05.22 CDS/Strasbourg
05.22-05.27 Institut d'Astrophysique/Liège
08.27-09.04 ESO/La Silla
11.21-11.24 Institut d'Astrophysique/Liège
11.24-11.25 MPIA/Heidelberg
11.25-11.29 ESA/Paris

1981 (based at Vilspa)

01.25-02.06 OHP/Saint-Michel-l'Observatoire
03.04-03.11 Instituts d'Astrophysique et de Mathématique/Liège
08.16-08.29 ESO/La Silla

1982 (based at Vilspa)

01.12-01.13 Observatoire/Meudon
04.14-04.21 Instituts d'Astrophysique et de Mathématique/Liège
07.10.07.15 CDS/Strasbourg
07.16 ORB/Uccle
07.16-07.21 Institut d'Astrophysique/Liège
09.17-09.19 Observatoire/Genève
09.20-09.21 Observatoire/Meudon
09.21 INAG/Paris
09.21-09.23 CDS/Strasbourg
09.24-09.26 Instituts d'Astrophysique et de Mathématique/Liège
09.30-10.01 ESTEC/Noordwijk
10.10-10.12 Institut d'Astrophysique/Liège
10.13-10.14 INAG/Paris
10.15-10.17 CDS/Strasbourg
11.15-11.16 ORB/Uccle
11.17-11.20 STScI/Baltimore
11.21-11.23 Institut d'Astrophysique/Liège

1983 (based at Vilspa & Strasbourg Obs.)

01.13-01.16 Institut d'Astrophysique/Liège
01.17-01.21 CDS/Strasbourg
02.10.02.11 ESTEC/Noordwijk
02.11-02.13 Institut d'Astrophysique/Liège
02.14-02.18 CDS/Strasbourg
04.02-04.08 Institut d'Astrophysique/Liège
04.15.04.19 Institut d'Astrophysique/Liège
04.19-04.20 ORB/Uccle
05.08-05.10 Instituts d'Astrophysique et de Mathématique/Liège

06.19-07.05 Vilspa/Madrid
07.11-07.12 Observatoire/Meudon
07.24-08.09 ESO/La Silla
08.19-08.23 Vilspa/Madrid
08.27-08.31 Instituts d'Astrophysique et de Mathématique/Liège
12.09-12.14 Vilspa/Madrid
12.31 OHP/Saint-Michel-l'Observatoire

1984 (based at Strasbourg Obs.)

01.01-01.05 OHP/Saint-Michel-l'Observatoire
01.24 ESTEC/Noordwijk
02.18-02.27 Instituts d'Astrophysique et de Mathématique/Liège
02.27-02.28 ESTEC/Noordwijk
04.01-04.09 GSFC/Greenbelt & STScI/Baltimore
04.15-04.17 INAG & CNRS/Paris
06.10-06.18 Instituts d'Astrophysique et de Mathématique/Liège
08.04-08.05 Institut d'Astrophysique/Liège
08.21-08.26 OHP/Saint-Michel-l'Observatoire
09.27-09.30 Instituts d'Astrophysique et de Mathématique/Liège
11.01-11.04 Instituts d'Astrophysique et de Mathématique/Liège
11.07 ESA/Paris
11.28-12.02 Instituts d'Astrophysique et de Mathématique/Liège
12.21-12.27 Institut d'Astrophysique/Liège

1985 (based at Strasbourg Obs.)

03.29-03.31 Institut d'Astrophysique/Liège
05.21-05.25 Instituts d'Astrophysique et de Mathématique/Liège
06.11-06.13 Institut d'Astrophysique/Liège
06.17-06.22 OHP/Saint-Michel-l'Observatoire
07.03-07.31 ESO/La Silla
08.25-08.30 Institut d'Astrophysique/Liège
09.18-09.19 ESO & ST-ECF/Garching
10.10-10.11 Instituts d'Astrophysique et de Mathématique/Liège
10.18-10.19 Université/Liège
10.31 Institut d'Astrophysique/Liège
11.04-11.05 Université/Liège
12.04-12.08 ESO & ST-ECF/Garching

1986 (based at Strasbourg Obs.)

04.06-04.07 Institut d'Astrophysique/Liège
06.02-06.10 OHP/Saint-Michel-l'Observatoire
06.27-06.30 Institut d'Astrophysique/Liège
08.07-08.11 ESO & ST-ECF/Garching
08.28-08.29 Institut d'Astrophysique/Liège

08.29 Unité statistique de la CEE/Luxembourg
11.23-12.21 ESO/La Silla

1987 (based at Strasbourg Obs.)

03.23 Observatoire/Nice
04.21-04.22 ST-ECF/Garching
05.07-05.13 Institut d'Astrophysique/Liège
05.26-05.27 ST-ECF/Garching
07.02-07.07 Institut d'Astrophysique/Liège
07.09 Observatoire/Paris
08.11-08.13 ST-ECF/Garching
08.27-08.28 Institut d'Astrophysique/Liège
10.27-10.28 ST-ECF/Garching
10.29-11.04 Institut d'Astrophysique/Liège

1988 (based at Strasbourg Obs.)

03.30 INSU/Paris
04.06 INSU/Paris
04.13-04.14 ST-ECF/Garching
07.26-07.28 ST-ECF/Garching
09.22 MEN/Paris
10.03-10.05 ST-ECF/Garching
10.24-10.26 ST-ECF/Garching
10.27 INSU/Paris
11.09 Observatoire/Besançon

1989 (based at Strasbourg Obs.)

01.11-01.13 ESO & ST-ECF/Garching
07.25-07.28 ST-ECF/Garching
08.16-08.19 ST-ECF/Garching

1990 (based at Strasbourg Obs. & Porto Univ.)

02.12-02.14 ST-ECF/Garching
08.15-08.18 ST-ECF/Garching
09.20-09.23 ST-ECF/Garching
11.07-11.08 ESRIN/Frascati

1991 (based at Strasbourg Obs.)

03.25-03.29 ST-ECF/Garching
06.12-06.14 ESRIN/Frascati
07.22-07.25 ESRIN/Frascati
09.13 ESTEC/Noordwijk
11.26-11.29 ESO & ST-ECF/Garching

1992 (based at Strasbourg Obs.)

04.07-04.09 ESO & ST-ECF/Garching
08.10-08.13 ESO & ST-ECF/Garching
11.12-11.17 ESO & ST-ECF/Garching

1993 (based at Strasbourg Obs.)

01.07-01.08 NASA/Washington
01.31-02.07 ESO & ST-ECF/Garching
02.27 AAO/Sydney
07.13-07.16 ESO & ST-ECF/Garching

1994 (based at Strasbourg Obs.)

09.06-09.09 ESO & ST-ECF/Graching
11.24 Elsevier/Amsterdam

1995 (based at Strasbourg Obs.)

08.02-08.04 ESO & ST-ECF/Garching

1996 (based at Strasbourg Obs.)

01.09-01.10 ESO & ST-ECF/Garching
02.26-02.28 Sternwarte/Sonneberg

1997 (based at Strasbourg Obs.)

11.08-11.10 UU/Londonderry

1999 (based at Strasbourg Obs.)

03.09-03.14 ADS/Cambridge
11.15-11.17 Institut d'Astronomie/Lausanne

2000 (based at Strasbourg Obs.)

01.10 OST/Paris

2001 (based at Strasbourg Obs.)

01.26 Astro-Ausstellung/Stuttgart
03.06 OST/Paris
11.07-11.09 Observatoire/Genève

2002 (based at Strasbourg Obs.)

04.15-04.17 Observatoire/Genève
06.04-06.07 Académie Royale/Bruxelles
09.04 Observatoire/Paris
10.07-10.09 Observatoire/Genève

2003 (based at Strasbourg Obs.)

03.08 ADA project/Paris
03.21-03.22 Observatoire/Genève

04.25 Observatoire/Paris
05.31-06.06 ADA project/Toronto
07.02-07.04 Sternwarte/Hamburg-Bergedorf
07.16-07.17 Académie Royale/Bruxelles
07.23-07.25 Académie des Sciences/Paris
08.04 Sternwarte & Planetarium/Nürnberg
08.21 Cité de l'Espace/Toulouse
09.01 Musée des Beaux-Arts/Lille
09.04 Sternwarte & Planetarium/Köln
09.11 Académie des Sciences/Paris
10.13-10.14 Observatoire/Genève
10.14-10.15 Université/Montpellier
10.30 Académie des Sciences/Paris

2004 (based at Strasbourg Obs.)

02.04 Académie des Sciences/Paris
03.11 Académie des Sciences & Observatoire/Paris
03.18 Académie Royale/Bruxelles
03.29-03.31 Observatoire/Genève
05.11 Académie Royale/Bruxelles
05.13 Académie des Sciences & Ateliers du Louvre/Paris
06.23-06.24 Académie Royale/Bruxelles
06.24 Musée des Beaux-Arts/Lille
07.02 Deutsches Filmmuseum/Frankfurt
07.07 Académie des Sciences & Observatoire/Paris
08.04-08.05 Springer/Dordrecht
09.05-09.08 Observatoire/Genève
09.09-09.10 Université/Vannes
09.23 SIM/Mulhouse
09.30 Académie des Sciences & Observatoire/Paris
10.17-10.22 Observatoire/Genève
11.07-11.12 Universidad/Santander

2005 (based at Strasbourg Obs.)

02.14 Académie Royale/Bruxelles
02.21 Académie des Sciences & Observatoire/Paris
03.14-03.15 Université/Montpellier
03.16-03.17 Observatoire/Genève
05.24-05.26 Universidad/Santander
05.27-05.28 Université/Montpellier
06.01-06.02 Académie Royale/Bruxelles
06.08 Académie des Sciences/Paris
07.20 Observatoire/Genève
08.10-08.11 Observatoire/Genève

08.17 Académie des Sciences/Paris
09.06-09.08 Université/Orléans
10.13 Verkehrshaus/Luzern
10.20 Académie des Sciences/Paris
11.10 Académie des Sciences & BNF/Paris
11.14 ISSI/Berne
11.26-11.30 Universidad/Valencia
12.15 Académie des Sciences & BNF/Paris

2006 (based at Strasbourg Obs.)

01.07-01.14 Universidad/Sevilla
01.19 BNF & Institut du Monde Arabe/Paris
01.24 Académie Royale/Bruxelles
01.30 Universität/Basel
02.03-02.09 Universidad/Madrid
03.18-03.22 Ciudad de las Ciencias/Valencia
04.25-04.26 Observatoire/Genève
05.08-05.12 Universidad/Santander
05.12-05.14 Université/Montpellier
07.06 Université/Liège
07.20-07.21 Observatoire/Genève
08.08 Historisches Museum/Basel
09.05 Académie des Sciences/Paris
09.12 Université/Liège
09.15-09.25 OMSI/Portland
10.17-10.20 Université/Sophia-Antipolis
10.26 Historisches Museum/Basel
11.09 Académie des Sciences/Paris
11.27-12.01 Universidad/Córdoba
12.14 Académie Royale & EU DG XII/Bruxelles

2007 (based at Strasbourg Obs.)

02.06-02.07 Académie Royale/Bruxelles
03.13 Académie Royale/Bruxelles
03.22 Académie des Sciences/Paris
04.14-04.19 Universidad/Santander
05.03 Académie Royale/Bruxelles
05.20-05.23 Université/Toulouse
07.05 Université/Bordeaux
08.07 Institut d'Astrophysique/Paris
08.09 Académie Royale/Bruxelles
08.22-08.23 Université/Dijon
09.10 ISSI/Berne
09.16-09.21 Universidad/Santander

10.09 Observatoire/Paris
10.15 Institut d'Astrophysique/Paris
10.30-10.31 Royal Astronomical Society/London
11.03-11.12 ADS/Cambridge
11.15 AMOS/Liège
11.28 Institut d'Astrophysique/Paris

2008 (based at Strasbourg Obs.)

01.27-02.01 Universidad/Granada
02.26-02.27 Royal Astronomical Society/London
03.03 Académie Royale/Bruxelles
03.31 Académie Royale/Bruxelles
04.06-04.09 Universidad/Santander
04.24 Institut d'Astrophysique/Paris
04.29 Université/Nice
05.07 Musée des Beaux-Arts/Lille
05.14 Académie Royale/Bruxelles
06.23 Observatoire/Paris
07.10 Institut d'Astrophysique/Liège
08.27 Institut d'Astrophysique/Paris
09.03 Université/Nice
09.13-09.17 Universidad/Santander
09.18-09.19 Archivo General/Simancas
10.12-10.13 Paul Delvaux Museum/Sint-Idesbald
10.13-10.14 Musée des Beaux-Arts/Lille
11.16-11.20 Universidad/Valencia

2009 (based at Strasbourg Obs.)

02.15 Université/Nice
02.24 Institut d'Astrophysique/Liège
02.28-03.08 ADS/Cambridge
04.18-04.22 Universidad/Santander
04.29 Rigsarkivet & Kongelige Bibliotek/København
05.07 Académie des Sciences/Paris
05.26 Observatoire/Paris
06.12-06.14 Institut d'Astrophysique/Liège & Académie Royale/Bruxelles
07.02 Rigsarkivet & Kongelige Bibliotek/København
07.15 Institut d'Astrophysique/Liège
07.20 Institut d'Astrophysique/Liège
08.19 Institut d'Astrophysique/Paris
08.23-08.26 Universität/Leipzig
09.19-09.24 Universidad/Santander
10.07 Académie des Sciences/Paris
10.15 Musée d'Optique/Biesheim

10.25 Académie Royale/Bruxelles
11.18-11.19 Académie Royale/Bruxelles
11.12 Landesarchiv Baden-Württemberg/Karlsruhe

2010 (based at Strasbourg Obs.)

01.23 Landesmuseum für Technik/Mannheim
01.28 Universitätsbibliothek/Basel
02.02 Académie des Sciences/Paris
02.06 Institut d'Astrophysique/Liège & Académie Royale/Bruxelles
03.05-03.07 Archives Nationales/Paris
03.15-03.17 Royal Observatory/Edinburgh
03.23 Institut d'Astrophysique/Liège
05.02-05.05 Universität/Dresden & Sternwarte/Gotha
05.15-05.19 Universidad/Santander
06.07 Institut d'Astrophysique/Liège
06.13-06.14 Musée de l'Art Brut/Lausanne
06.14-06.15 Universität/Salzburg
06.15-06.16 ESO/Garching
06.24 Dornier Museum/Friedrichshafen
07.01 Technik Museum/Speyer
07.16 Institut d'Astrophysique/Paris
08.05 Observatoire/Paris
08.12 Archives Départementales/Charleville-Mézières
08.19 Institut d'Astrophysique/Paris
08.21-23 Universität/Dresden & Sternwarte/Gotha
08.24-25 Bundesarchiv/Berlin
09.02 Technische Universität/Darmstadt
09.16 Institut d'Astrophysique/Paris
09.25-30 Universidad/Santander
10.06 Institut A. Koyré/Paris
11.04 Archives Départementales/Charleville-Mézières
11.10-12 Rigsarkivet & Kongelige Bibliotek/København
11.16-18 Royal Astronomical Society/London
11.26-29 Archives Nationales/Paris
12.01-03 ESO/Garching
12.07-10 Biblioteca Nazionale Centrale/Roma
12.13-16 Auswärtiges Amt/Berlin
12.19-22 Stadsarchief/Amsterdam

2011 (based at Strasbourg Obs.)

01.24-29 Universidad/Granada
02.15 Institut d'Astrophysique/Paris
03.03 Institut d'Astrophysique/Liège
03.12-21 Springer/New York & AAS/Washington

04.07 Universitätsbibliothek/Basel
04.11-15 Auswärtiges Amt/Berlin
05.03 Institut d'Astrophysique/Paris
05.11 Technik Museum/Sinsheim
06.17-22 Universität/Leipzig & Bundesarchiv/Berlin
07.18-20 Académie Royale/Bruxelles
08.08-11 Sternwarte/Bonn
08.24 Institut d'Astrophysique/Liège
09.11-17 Archivi del Veneto/Padova & Venezia
10.02-07 Bundesarchiv/Berlin
10.13 Universitätsbibliothek/Basel
10.22-28 Universidad/Madrid
11.10 INSU/Paris
11.17 Institut d'Astrophysique/Liège

2012 (based at Strasbourg Obs.)

01.08-13 Universidad/Granada
01.24 Archives Départementales/Saint-Julien-lès-Metz
01.26 Observatoire/Paris
02.04 Sternwarte/Daun
02.13-17 Biblioteca Nazionale Centrale/Roma
02.29 Institut d'Astrophysique/Liège
03.01-11 Springer/New York & AAS/Washington
04.14-21 Archivi del Veneto/Padova & Venezia
05.06-17 Bundesarchiv/Berlin
06.07 Institut d'Astrophysique/Liège
06.13 MPIfR/Effelsberg
07.24-28 Kuffner Sternwarte/Wien
08.19-25 Bundesarchiv/Berlin
09.01-09 Springer/New York & AAS/Washington
09.17 ESO/Garching
09.20 INSU/Paris
09.22-23 Universidad/Madrid
10.07-13 Archivi del Veneto/Padova & Venezia
10.20-28 Adler Planetarium/Chicago
11.05 Institut d'Astrophysique/Liège

2013 (based at Strasbourg Obs.)

01.06-07 Institut d'Astrophysique/Liège & Académie Royale/Bruxelles
02.09-17 Springer/New York
03.08-10 Astronomisches Institut/Bonn
03.16-25 Adler Planetarium/Chicago
04.27-05.05 AAS & Nature/Washington
05.19-25 Archivi del Veneto/Padova & Venezia

06.08-13 Universidad/Madrid
07.07-13 Bundesarchiv/Berlin
07.23-25 Institut d'Astrophysique/Liège & Académie Royale/Bruxelles
08.05 INSU/Paris
08.16-17 Rijksmuseum/Amsterdam
08.18-25 OMSI/Portland
08.26-27 Institut d'Astrophysique/Liège
09.05 Institut d'Astrophysique/Paris
09.21-29 AAS/Washington
10.13-14 ESO/Garching
11.08-12 Universidad/Madrid
11.18-20 Institut d'Astrophysique/Liège

2014 (based at Strasbourg Obs.)

01.04-12 Universidad/Granada
02.06 Staatsgalerie/Suttgart
02.15-23 Nature & AAS/Washington
04.01-08 University/Berkeley
05.13 Institut d'Astrophysique/Liège
06.19-23 Bundesarchiv/Berlin
06.24-25 Institut d'Astrophysique/Liège
07.20-25 Universität/Dresden
08.19-20 Observatoire/Paris
08.26-29 Gutenberg Museum/Mainz
09.01-03 Universität/Göttingen
09.04-05 Institut d'Astrophysique/Liège
09.14-19 Archivi del Veneto/Padova & Venezia
09.20 Last day of service



Fig. 224: Three Chairmen of the IAU Comm. 5 WG on Astronomical Data in Viking hands at York on 12 August 2000 during the XXIVth IAU General Assembly held in Manchester: Heck (right) with Bernard Hauck (left) and Gart Westerhout (center).

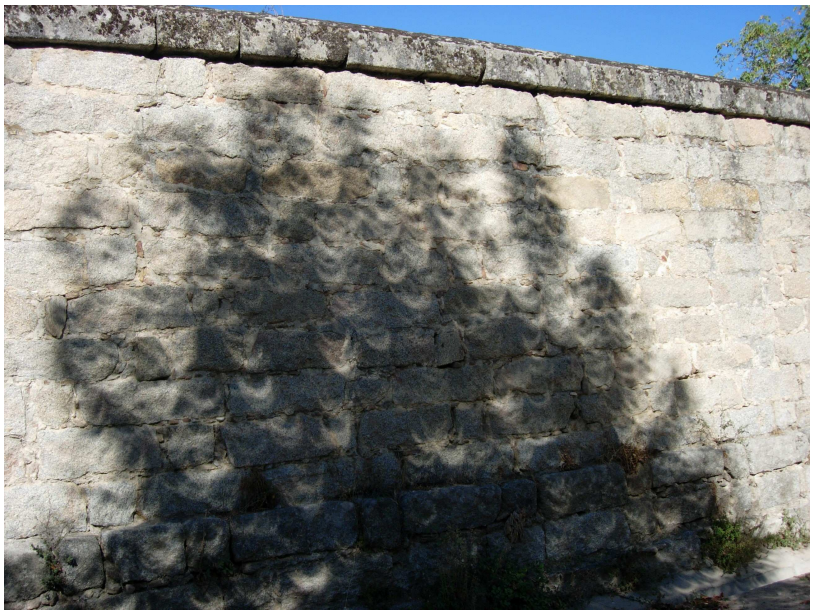


Fig. 225: Heck photographed this crescent effect on shadows during the partial solar eclipse on 03 October 2005 while attending the "Astronomical Data Analysis Software and Systems 2005" (ADASS XV) conference (02-07 October 2005, San Lorenzo de El Escorial – home of our biographee for the period 1978-1983).

Meetings, Conferences, Seminars & Lectures

Note: This section lists most of the conferences and scientific meetings attended by Heck, as well the the events at which communications or posters have been presented (titles and possible co-authors are also mentioned[258]). Refer to the abbreviations (pp. 523ff) for acronyms of all kinds. A number of lectures and seminars given during the period covered by this volume are also listed here, but numerous other talks, speeches, etc. – either for specialists or the public at large – are not included. Within a given year, the date format is MM.DD-MM.DD or MM.DD for single-day events.

1970

- 08.17-08.27: XIV$^{\rm th}$ IAU General Assembly (Brighton)

1971

- 06.28-06.30: 17$^{\rm th}$ Liège International Astrophysical Colloquium

1972

- 04.23-04.26: Séance inaugurale du CDS (Strasbourg)
- 06.26-06.28: 18$^{\rm th}$ Liège International Astrophysical Colloquium
- 09.03-09.09: First European Regional IAU Meeting (Athens)
- 09.12-09.15: IAU Symposium 54 *Problems of Calibration of Absolute Magnitudes and Temperature of Stars* (Genève)
  – Magnitude absolue moyenne des étoiles du type RR Lyrae (Publ. 148)
- 09.17-09.22: IAU Colloquium *L'âge des étoiles* (Meudon)

1973

- 04.02-04.07: Advanced Course *Dynamical Structure and Evolution of Stellar Systems* (Saas-Fee)
- 06.16: Première Réunion du Groupe de Contact du FNRS pour l'Astronomie et l'Astrophysique (Brussels)
  – La comète Heck-Sause 1973a (Publ. 149)
- 09.11-09.19: Students in Astronomy Meeting *Copernicalia 73* (Toruń)
- 10.26: Séminaire à l'Institut d'Astrophysique de Liège
  – L'éclipse solaire du 30 juin 1973 à Loyengalani (Kenya) (with F. Dossin)

[258] The resulting publications, sometimes appearing years later, are included in the "secondary publications" section (pp. 415ff).

1974

- 03.31: Second séminaire d'astronomie pratique (Strasbourg)
  - Les comètes et leur observation par les amateurs (Publ. 605)
- 05.27-05.31: ESO/SRC/CERN Conference *Research Programs for the New Large Telescopes* (Genève)
- 09.01-09.06: Second European Regional IAU Meeting (Trieste)
- 10.04: Séminaire à l'Institut d'Astrophysique de Liège
  - Application du principe du maximum de vraisemblance à la détermination de la magnitude absolue
- 10.19: Troisième Réunion du Groupe de Contact du FNRS pour l'Astronomie et l'Astrophysique (Leuven)
  - Magnitude absolue moyenne des RR Lyrae par une méthode basée sur le principe du maximum de vraisemblance (Publ. 156)

1975

- 01.17: Séminaire à l'Institut d'Astrophysique de Liège
  - Étude comparative de méthodes de maximisation
- 03.13: Séminaire à l'Observatoire Royal de Belgique (Brussels)
  - Problèmes de détermination de la magnitude absolue
- 04.08: Réunion Scientifique du CDS (Strasbourg)
- 04.10: Séminaire à l'Observatoire de Strasbourg
  - Résultats préliminaires relatifs à la calibration en luminosité du groupe intermédiaire de Stroemgren
- 05.12-05.14: Journées d'études *Données et Théories Galactiques* (Villars-Saint-Georges)
- 05.16: Séminaire à l'Observatoire de Besançon
  - Calibration en luminosité du groupe intermédiaire de Stroemgren
- 06.17-06.20: 20th Liège International Astrophysical Colloquium
- 07.08-07.11: IAU Symposium 72 *Abundance Effects in Classification* (Lausanne)
  - Some Comments on the Age-Abundance Relation (with L. Da Silva & S. Grenier) (Publ. 158)

1976

- 03.09: Séminaire du Ministère de l'Éducation Nationale (Han/Lesse)
  - L'instrumentation de l'astronomie moderne
- 05.11: Séminaire à l'Observatoire de Strasbourg
  - Quelques méthodes de détermination de la magnitude absolue. I. Parallaxes trigonométriques (Publ. 403)
- 05.18: Séminaire à l'Observatoire de Strasbourg
  - Quelques méthodes de détermination de la magnitude absolue. II. Parallaxes d'amas (Publ. 403)
- 05.25: Séminaire à l'Observatoire de Strasbourg
  - Quelques méthodes de détermination de la magnitude absolue. III. Parallaxes statistiques (Publ. 403)
- 05.28: Séminaire à l'Observatoire de Strasbourg
  - L'expédition astrophysique et géophysique belge 1973 à Loyengalani (Kenya)

- 08.18-08.21: IAU Colloquium 35 *Compilation, Critical Evaluation and Distribution of Stellar Data* (Strasbourg)
- 08.23-09.02: XVI$^{\rm th}$ IAU General Assembly (Grenoble)

1977

- 03.07-03.11: Journées d'études du CDCA (Lanslebourg)
- 04.22-04.23: Réunion scientifique du CDS (Strasbourg)
- 05.13: Réunion du Groupe de Contact du FNRS pour l'Astronomie et l'Astrophysique (Louvain-la-Neuve)
  - Classification spectrale par cluster analysis (Publ. 159)
- 09.12-09.16: IUE Users' Meeting (Madrid)
- 11.02-11.05: IAU Symposium 80 *The HR-Diagram* (Washington)
  - Absolute Magnitudes by Statistical Parallaxes (Publ. 162)
- 11.18-11.19: Réunion scientifique du CDS (Genève)
  - The Needs for Space Astronomy in Ground-Based Data (Publ. 163)
  - A Few Utilizations of the uvby Catalogue (Publ. 164)
- 12.01-12.02: ESA Space Science Department Bilderberg Meeting
- 12.13: Conférence au Planétarium de Bruxelles
  - Les moyens d'investigation de l'astronomie moderne (Publ. 612)

1978

- 07.11-07.15: IAU Colloquium 47 *Spectral Classification of the Future* (Vatican City)
  - Spectral Classification, Photometry and Statistical Analysis (Publ. 166)
  - The International Ultraviolet Explorer (Publ. 167)
- 10.11: Séminaire à l'Observatoire de Besançon
  - L'International Ultraviolet Explorer
- 10.12: Workshop *Preliminary Results Obtained with IUE* (Udine)
  - Support Activity at the IUE Ground Station (with P. Benvenuti, F. Beeckmans, A. Cassatella, J. Clavel, F. Macchetto, M.V. Penston, P.L. Selvelli & D.J. Stickland) (Publ. 168)
  - On the Ultraviolet Spectrum of P Cygni (with A. Cassatella, F. Beeckmans, P. Benvenuti, J. Clavel, H.J.G.L.M. Lamers, F. Macchetto, M.V. Penston, P.L. Selvelli & D.J. Stickland) (Publ. 169)
  - IUE Observations of the Nebular Spectrum of RR Tel (with P.L. Selvelli, F. Beeckmans, P. Benvenuti, A. Cassatella, J. Clavel, F. Macchetto, M.V. Penston & D.J. Stickland) (Publ. 170)

1979

- 04.04: Symposium *The First Year of IUE* (London)
  - On the UV Spectrum of RR Tel (with A. Cassatella, P. Benvenuti, J. Clavel, C. Jordan, F. Macchetto, M.V. Penston & P.L. Selvelli) (Publ. 171)
- 04.08-04.14: École de Goutelas *La classification stellaire*
- 08.14-08.24: XVII$^{\rm th}$ IAU General Assembly (Montréal)

  - The Absolute Magnitude of the Am Stars (with A.E. Gomez, S. Grenier, M. Jaschek & C. Jaschek)
- 10.11-10.12: ESA Space Science Department Bilderberg Meeting (Berg-en-Dal)
- 10.15: Autumnal Meeting Japan Astronomical Society (Tokyo)
  - Absolute Luminosity Calibration by the Maximum-Likelihood method (with T. Mikami) (Publ. 172)

1980

- 01.11: IIe Journée de Strasbourg *Les étoiles supergéantes*
  - Variabilité de la perte de masse de la supergéante extrême HR6262 à partir des mesures IUE (with G. Burki, P. Benvenuti, A. Cassatella, J. Clavel, M.V. Penston & P.L. Selvelli) (Publ. 175)
- 03.26-03.28: Second European IUE Conference (Tübingen)
  - Simultaneous Spectroscopic (UV MgII and AlII lines) & Photometric Variations of ζ^1 Sco (HD152236) (with G. Burki, L. Bianchi, A. Cassatella & J. Clavel) (Publ. 176)
  - Changes in Post-Maximum Spectra of the Mira Variable χ Cygni (with A. Cassatella, F. Querci, M. Querci & D.J. Stickland) (Publ. 177)
  - IUE Observations of the Crab Pulsar (with P. Benvenuti, L. Bianchi, A. Cassatella, J. Clavel, J. Darius, M.V. Penston, F. Macchetto, P.L. Selvelli & J. Zamorano) (Publ. 178)
- 03.28: Spring Meeting Japan Astronomical Society (Tokyo)
  - Determination of Absolute Magnitude and Dispersion by the Maximum-Likelihood Method (with T. Mikami) (Publ. 179)
- 05.07: Symposium *The Universe at Ultraviolet Wavelength: The First Two Years of IUE* (GSFC, Greenbelt)
  - IUE and Other New Observations of the Slow Nova RR Tel (with M.V. Penston, P. Benvenuti, A. Cassatella, J. Clavel, P.L. Selvelli, D.J. Ponz, F. Macchetto, C. Jordan, N. Cramer, F. Rufener & J. Manfroid) (Publ. 187)
  - IUE Observations of the Crab pulsar (with P. Benvenuti, L. Bianchi, A. Cassatella, J. Clavel, J. Darius, F. Macchetto, M.V. Penston, P.L. Selvelli & J. Zamorano) (Publ. 188)
- 07.28-08.01: Fifth European Regional IAU Meeting (Liège)
  - Simultaneous Spectroscopic and Photometric Observations of ζ^1 Scorpii (with G. Burki, L. Bianchi, A. Cassatella & J. Clavel) (Publ. 180)
- 11.11-11.14: IUE Three-Agency Meeting (Vilspa)
- 11.26: Joint ESA/SRC IUE Programme Selection Committee Meeting (Paris)
- 11.27-11.28: ESA IUE Programme Selection Committee Meeting (Paris)

1981

- 03.26: Conférence à la Société Astronomique de Liège
  - IUE: le précurseur des télescopes spatiaux (Publ. 614)
- 04.06: IAU Symposium 98 *Be Stars* (München)
  - The Spectrum of HD51585 in the Blue and in the Ultraviolet (with L. Houziaux, Y. Andrillat & K. Nandy) (Publ. 197)

- 05.18-05.22: IUE Three-Agency Meeting (GSFC, Greenbelt)
- 06.22-06.26: MCE Course *Management, Men and Organization* (Nice)
- 06.23: 23$^{\rm rd}$ Liège International Astrophysical Colloquium
  - Preliminary Results of a Statistical Study of Some Period Determination Methods (with G. Mersch) (Publ. 189)
  - The Absolute Magnitude of δ Scuti and δ Del Type Stars (with S. Grenier, A.E. Gomez, C. Jaschek & M. Jaschek) (Publ. 190)
- 07.06-07.10: IAU Colloquium 64 *Automated Data Retrieval* (Strasbourg)
  - IUE Data Distribution (Publ. 198)
- 09.18: IAU Symposium 99 *Wolf-Rayet Stars: Observations, Physics and Evolution* (Cozumel)
  - Carbon Abundance in the WC11 Star CPD-56°8032 (with L. Houziaux) (Publ. 199)
- 10.20-10.22: IUE Three-Agency Meeting (Vilspa)
- 10.26-10.28: Vilspa Workshop *UV Stellar Classification* (Publ. 452, Fig. 85 & 234)
  - IUE Observation Statistics (Publ. 200)

1982

- 01.14-01.15: Joint ESA/SERC IUE Programme Selection Committee Meeting (Paris)
- 03.30: Symposium *Advances in Ultraviolet Astronomy: Four Years of IUE Research* (GSFC, Greenbelt)
  - The Ultraviolet Variability of T CrB (with A. Cassatella, P. Patriarchi, P.L. Selvelli, L. Bianchi, C. Cacciari, M. Perryman & W. Wamsteker) (Pub. 202)
- 05.10-05.13: Third European IUE Conference (Madrid) (Publ. 451, Fig. 234)
  - UV Observations of V348 Sgr (with L. Houziaux, A. Cassatella, S. di Serego Alighieri & F. Macchetto) (Publ. 203)
  - The UV Variability of T CrB (with A. Cassatella, P. Patriarchi, P.L. Selvelli, L. Bianchi, C. Cacciari, M. Perryman & W. Wamsteker) (Pub. 204)
  - The UV Stellar Classification Programme (with P. Benvenuti, L. Bianchi, J.C. Blades, J.C. Cacciari, A. Cassatella, A. Cucchiaro, D. Egret, C. Jaschek, M. Jaschek, K. Nandy, P. Patriarchi, W. Wamsteker & C.C. Wu) (Pub. 205)
  - Optical and Ultraviolet Spectrophotometry of Globular Clusters in the Magellanic Clouds (with C. Cacciari, F. Fusi-Pecci, C. Zavorani, K.C. Freeman, A. Cassatella, P. Benvenuti, L. Bianchi, P. Patriarchi & W. Wamsteker) (Pub. 206)
- 08.16-08.26: XVIII$^{\rm th}$ IAU General Assembly (Patras)
  - The UV Stellar Classification Programme
- 09.06-09.08: IUE Three-Agency Meeting (Vilspa)

1983

- 01.20: V$^{\rm e}$ Journée de Strasbourg *Les étoiles binaires*
- 05.03-05.05: Workshop *Calibration of Luminosities by Astrometric Techniques* (RGO, Hertsmonceux) (Fig. 100)
  - Statistical Parallaxes by the Maximum-Likelihood Method
- 06.05-06.12: Workshop *MK Spectral Classification: Criteria and Applications* (Toronto)

  - Predicting Stellar Classification from Photometric Data? (Publ. 221)
- 09.12-09.16: Colloquium *Statistical Methods in Astronomy* (Strasbourg) (Fig. 102)
  - Preliminary Results of a Statistical Classification of Ultraviolet Stellar Spectra (with D. Egret) (Publ. 209)
  - Comparative Study of Period Determination Methods (with J. Manfroid & G. Mersch) (Publ. 210)
  - Predictions: Also an Astronomical Tool (Publ. 51)
  - Statistical Determination of the Precision Obtained by a Photometric Reduction Algorithm (with J. Manfroid) (Publ. 211)
  - Prediction of Spectral Classification from Photometric Data. Application to the MK Spectral Classification and the Geneva Photometric System. Progress Report (with D. Egret) (Publ. 212)
- 09.19: Workshop *Population Synthesis* (Vulcano)
  - The UV Stellar Classification Programme (with C. Cacciari, D. Egret, C. Jaschek & M. Jaschek) (Publ. 213)
- 09.19-09.23: Congrès de la Société Française de Physique (Grenoble)
- 10.28: Seminar at the South African Astronomical Observatory (Cape Town)
  - Predictions: Also an Astronomical Tool
- 11.17-11.18: Réunion Scientifique du CDS (Strasbourg)
  - Statistical Classification of Ultraviolet Stellar Spectra (IUE satellite) (with D. Egret, Ph. Nobelis & J.C. Turlot) (Publ. 222)
- 11.23-11.25: Journées de la SFSA (Strasbourg)

1984

- 03.06: Ve Journée de Strasbourg *L'avenir des données non-stellaires*
- 04.03-04.05: Symposium *Future of Ultraviolet Astronomy Based on Six Years of IUE Research* (GSFC, Greenbelt)
  - IUE Low-Dispersion Reference Atlas (with D. Egret, M. Jaschek & C. Jaschek) (Publ. 216)
  - Statistical Classification of IUE Low-Dispersion Stellar Spectra: Progress Report (with D. Egret, Ph. Nobelis & J.C. Turlot) (Publ. 217)
- 05.07-05.08: Colloque des planétariums européens (Strasbourg)
- 05.15-05.18: Fourth European IUE Conference (Roma)
  - Statistical Classification of IUE Stellar Spectra by the Variable Procrustean Bed (VPB) Approach (with D. Egret, Ph. Nobelis & J.C. Turlot) (Publ. 218)
  - IUE Low-Dispersion Spectra Reference Atlas (with B.J.M. Hassall, A. Talavera, D. Egret, C. Jaschek & M. Jaschek) (Publ. 219)
  - An Estimate of V348 Sgr Effective Temperature (with U. Heber, L. Houziaux, J. Manfroid & D. Schönberner) (Publ. 220)
- 05.24-05.29: IAU Symposium 111 *Calibration of Fundamental Stellar Quantities* (Como)
  - On the Homogenization of Photometric Data (with J. Manfroid) (Publ. 229)
  - Fifteen Years of Statistical Parallaxes by Maximum Likelihood (Publ. 227)

  - UV Standard Stars by the Variable Procrustean Bed Approach (with D. Egret, Ph. Nobelis & J.C. Turlot) (Publ. 228)
  - Final Resolution (with several participants) (Publ. 230)
- 06.21-06.24: Séminaire à l'Institut d'Astronomie de Lausanne
  - Un standard visible est-il un standard UV?
- 07.03-07.06: Colloquium *Cool Stars with Excesses of Heavy Elements* (Strasbourg)
  - Mira's Role in RR Tel Revisited (with J. Manfroid) (Publ. 233)
  - The IUE Low-Dispersion Spectra Reference Atlas (with D. Egret, B.J.M. Hassall, C. Jaschek, M. Jaschek & A. Talavera) (Publ. 231)
  - The Absolute Magnitude of the Barium Stars (with C. Jaschek, S. Grenier, M. Jaschek & A.E. Gomez) (Publ. 232)
- 11.06-11.07: Réunion de l'ATP *Télescope spatial* (Paris)
- 11.15-11.16: Réunion Scientifique du CDS (Strasbourg)
- 11.27: Assemblée Générale de la SFSA (Paris)

1985

- 01.24: VIIe Journée de Strasbourg *La composition chimique des étoiles dans le voisinage solaire*
- 01.29-01.31: European Workshop *Space Telescope Long-Term Programs* (Garching)
- 03.07-03.08: Spacenet Advisory Panel (ESRIN, Frascati)
- 03.28: Réunion du Conseil de la SFSA (Paris)
- 04.18-04.19: Spacenet Advisory Panel (ESTEC, Noordwijk)
- 04.21-04.24: V348 Sgr Workshop (Liège)
  - Photometric Behavior of V348 Sgr
- 05.14-05.15: Réunion Scientifique du CDS (Bordeaux)
- 05.30-05.31: Seminar (ESO/Garching)
  - Predictions as an Astronomical Tool and their Applications to the Classification of IUE Spectra
- 09.24: Réunion du Conseil de la SFSA (Paris)
- 09.25-09.26: Réunion *Surveys avec le Télescope Spatial* (Besançon)
- 09.30: Séminaire à l'Observatoire de Strasbourg
  - Le droit spatial
- 10.08: Conférence au Foyer Culturel de Duttlenheim)
  - Voyage dans l'univers
- 11.07-11.08: Réunion Scientifique du CDS (Strasbourg) (Fig. 114)
- 11.09: Conférence à la SAFGA (Strasbourg)
  - Les instruments de l'astronomie moderne
- 11.13: Séminaire à l'Observatoire de Marseille
  - Conflits entre classifications spectrales visible et ultraviolette
- 11.15-11.30: XIXth IAU General Assembly (New Delhi)
  - The IUE UV Classification System (Commission 45)
  - Strasbourg Meeting on a European Astronomical Data Network (WG on Astronomical Data)
- 12.03: Conférence au Club d'Astronomie de Duttlenheim

  - La carte d'identité des étoiles
- 12.12: Séminaire à l'OPMT (Toulouse)
  - Conflits entre classifications spectrales visible et ultraviolette
- 12.13: Séminaire à l'Observatoire de Bordeaux
  - Conflits entre classifications spectrales visible et ultraviolette
- 12.16: Séminaire à l'Observatoire de Strasbourg
  - Impressions Delhi-A-U
- 12.17-12.18: Journées de la SFSA (Paris)

1986

- 01.07: Conférence au Club d'Astronomie de Duttlenheim
  - L'instrumentation de l'astronomie moderne
- 01.29: Conférence au Rotary Club du Kronthal (Marlenheim)
  - L'instrumentation de l'astronomie moderne
- 02.04: Conférence au Club d'Astronomie de Duttlenheim
  - Lunettes et télescopes
- 03.04: Conférence au Club d'Astronomie de Duttlenheim
  - Trajet sur le ciel de la comète de Halley
- 03.07: Conférence à l'Union Royale Belge de Strasbourg
  - Voyage dans l'Univers
- 03.20: European Space Information System Meeting (Cobham)
- 04.14: Séminaire à l'Observatoire de Strasbourg
  - The European Space Information System and the CDS Rôle in it
- 04.20-04.30: II$^{\rm nd}$ International Workshop on Data Analysis in Astronomy (Erice)
  - The Strasbourg Astronomical Data Center and the European Space Information System (Publ. 235)
- 05.06: Réunion du Conseil de la SFSA (Paris)
- 05.12: Séminaire à l'Observatoire de Strasbourg
  - Le futur du CDS dans la perspective de la réunion sur l'analyse des données en astronomie d'Erice
- 05.13: Réunion scientifique du CDS (Montpellier)
  - A Few Comments on the Archival of Space Data (Publ. 237)
- 05.15: Séminaire au CERGA (Grasse)
  - Conflits entre classifications spectrales visible et ultraviolette
- 05.29-05.30: European Astronomical Data Networks Meeting (Strasbourg)
- 06.24: Réunion du Conseil de la SFSA (Paris)
- 07.13-07.17: Colloquium *New Insights in Astrophysics: Eight Years of UV Astronomy with IUE* (London)
  - IUE Low-Dispersion Spectra Reference Atlas. Volume II. Peculiar Stars (with D. Egret, B.J.M. Hassall, C. Jaschek, M. Jaschek & A. Talavera) (Publ. 236)
- 09.15: Séminaire à l'Observatoire de Strasbourg
  - Les répertoires astronomiques (with D. Egret & J. Manfroid)
- 09.18: Réunion du Conseil de la SFSA (Paris)
- 11.04: Conférence au Foyer Culturel de Duttlenheim
  - Sommes-nous seuls dans l'univers?

- 11.14: Réunion scientifique du CDS (Strasbourg)
  - Rapport d'activités
- 11.20: Forum VLT de la SFSA (Paris)

1987

- 01.02-01.11: 169th American Astronomical Society Meeting (Pasadena)
  - SIMBAD Demonstrations (with W.H. Warren Jr & J. Rey-Watson) (Fig. 115)
- 01.12-01.16: Colloque ESA/Université Philosophique Européenne *Frontières et conquête spatiale* (Paris)
- 02.02: Séminaire à l'Observatoire de Strasbourg
  - Compte-rendu de la réunion de l'American Astronomical Society à Pasadena
- 02.03: Réunion du Conseil de la SFSA (Paris)
- 03.17-03.18: Forum SFSA *Hoziron 2000* (Orsay)
- 04.13: Conférence au Lions Club Entzheim Airport (Blaesheim)
  - Voyage aux confins de l'univers
- 06.20-06.23: Colloque UAI/SAF *La contribution des astronomes amateurs à l'astronomie* (Paris)
  - La contribution des astronomes amateurs aux observations cométaires (Publ. 635)
  - Répertoires astronomiques (with J. Manfroid)
- 08.17-08.22: NASA Astrophysics Data System Workshop (Annapolis) (Fig. 116)
  - SIMBAD, the CDS Database
- 09.22: Réunion du Conseil de la SFSA (Paris)
- 10.11-10.14: ST-ECF Colloquium *Astronomy from Large Databases: Scientific Objectives and Methodological Approaches* (Garching) (Publ. 454, Fig. 222)
  - Mass Analysis of Tycho Photometric Data for Variable Stars (with G. Jasniewicz & C. Jaschek) (Publ. 248)
  - Neglected Parametrical Extragalactic Clustering (Publ. 249)
  - Rule-based Classification of IUE Spectra (with R. Rampazzo, F. Murtagh & R. Albrecht) (Publ. 250)
  - SIMBAD: Surface Distributions of Fundamental Data (with D. Egret) (Publ. 251)
  - A Few Considerations on Photometric Databases (with J. Manfroid) (Publ. 252)
- 11.05-11.06: École du CNRS *L'analyse des Données en Astronomie* (Luminy)
  - Analyse statistique multivariée. Applications astronomiques. I. (Publ. 406)
  - Analyse statistique multivariée. Applications astronomiques. II. L'exemple IUE

1988

- 02.18: Réunion du Conseil de l'Observatoire de Strasbourg
- 03.21: European SPAN Steering Committee Meeting (Paris)
- 04.21: IntelliCorp Manufacturing Seminar (Paris)
- 04.27-04.28: École de Goutelas de la SFSA *Traitement de l'information: Méthodes et concepts*
  - Analyse statistique multivariée. Applications astronomiques. I. (Publ. 407)
  - Analyse statistique multivariée. Applications astronomiques. II. L'exemple IUE
- 05.02: Réunion du Conseil de l'Observatoire de Strasbourg
- 05.20: Réunion du Conseil du CDS (Grenoble)

- 11.14-11.17: Colloquium *Artificial Intelligence for Space Projects* (ESTEC, Noordwijk)
  - Classification of IUE Spectra: A Rule-based Approach (with R. Rampazzo & F. Murtagh) (Publ. 247)

1989

- 01.17: Réunion du Conseil de l'Observatoire de Strasbourg
- 04.04: XIe Journée de Strasbourg *Artificial Intelligence Techniques for Astronomy* (Strasbourg) (Publ. 455, Fig. 134)
- 04.05-04.06: Réunion du Conseil de l'Observatoire de Strasbourg
- 07.19: International Space University 1989 Summer Session (Strasbourg) (Fig. 127)
  - AI Applications to Space Projects (Publ. 257)
- 08.28-08.30: Colloquium *Atomic Spectra and Oscillator Strengths for Astrophysics and Fusion Research* (Amsterdam)
  - How Can Artificial Intelligence Help Spectral Classification (with F. Murtagh) (Publ. 263)
- 09.19-09.23: Journées *Le ciel et l'espace* (Montpellier) (Fig. 128)
  - Applications of Artificial Intelligence to Astronomical and Space Projects
  - Astronomical Directories

1990

- 01.06-01.16: 176th American Astronomical Society Meeting (Washington)
  - Astronomical Directories (Publ. 258)
- 06.26: XIIe Journée de Strasbourg *Fractals in Astronomy* (Strasbourg) (Publ. 456)
- 09.08-09.16: TEX'90 Conference (Cork)
- 10.15-11.26: Lectures (Porto)
  - Multivariate Statistical Analysis and Astronomical Applications

1991

- 02.07: Conférence à l'Université du Troisième Âge et du Temps Libre (Barr)
  - Voyage dans l'univers
- 03.14: Conférence à l'Université du Troisième Âge et du Temps Libre (Haguenau)
  - Voyage dans l'univers
- 04.12-04.19: IVth International Workshop on Data Analysis in Astronomy (Erice)
  - Astronomical Databases: A User Approach (Publ. 76)
- 07.08-07.17: Second OAC-FORMEZ Advanced School *Pattern Recognition: Theory and Applications to Astronomy* (Sant'Agata)
  - Astronomical Applications of Multivariate Statistical Analysis (Publ. 408)
- 10.01-10.03: Colloquium *DeskTop Publishing in Astronomy and Space Sciences* (Strasbourg) (Publ. 458, Fig. 132)
  - An Introduction to the Colloquium (Publ. 272)
  - Results of a Desktop Publishing Survey (Publ. 273)
  - From Compuscripts to Intelligent Information Retrieval (Publ. 274)
- 10.28-10.30: ESIS/SPAN Users Meeting (ESRIN, Frascati)



Fig. 226: Astronomy Librarian Meeting at Paris Institute of Astrophysics (27 July 1992) with Heck's head sticking out from behind in the center.

1992

- 03.26.03.27: European EP/IIR Expert Meeting (Strasbourg)
- 06.21-06.24: ACM/SIGIR '92 – 15$^{\rm th}$ International Conference on Research and Development in Information Retrieval (København)
- 06.29-07.07: ST-ECF/STScI Workshop *Science with the Hubble Space Telescope* (Chia Laguna)
- 07.27: Astronomy Librarian Meeting (Paris) (Fig. 226)
- 09.13-09.17: Conference *Astronomy from Large Databases II* (Haguenau) (Publ. 459, Fig. 222)
  - Electronic Publishing: A Key to Advanced Information Retrieval? (Publ. 275)
  - Yellow-page Services: Where Are We Going? (Publ. 276)
  - StarWays – A Database of Astronomy, Space Sciences and Related Organizations of the World (with A. Ciarlo & H. Stokke) (Publ. 277)
  - The Increasing Rôle of Librarians in Information Retrieval (panel) (Publ. 278)
- 10.19-10.22: CODATA '92 *New Data Challenges in Our Information Age* (Beijing)
  - The Star*s Family (Publ. 293 & Fig. 135)
- 10.23-10.24: 18$^{\rm th}$ CODATA General Assembly (Beijing)
- 11.02-11.04: ADASS '92 (Boston)
  - Electronic Publishing and Advanced Information Retrieval (Publ. 79)
- 11.30-12.04: ACM/ECHT '92 – Fourth ACM Conference on Hypertext and Hypermedia (Milano)

1993

- 01.03-01.07: 181$^{\rm st}$ American Astronomical Society Meeting (Phoenix)

- 03.24-03.25: ESIS Astronomy Workshop (ESRIN, Frascati)
- 04.20-04.24: ESO-OAT International Workshop *Handling and Archiving Data from Ground-based Telescopes* (Trieste)
- 06.06-06.10: 182nd American Astronomical Society Meeting (Berkeley)
  - The Star*s Family – An Update (Publ. 282)
- 10.11-10.19: ADASS '93 (Victoria)
  - A Review of the Star*s Family Products (Publ. 86)
- 11.12-11.20: Hypertext '93 – The Fifth ACM Conference on Hypertext (Seattle)

1994

- 01.20: Meeting of CODATA France Board (Paris)
- 01.26: ENSSIB round table *Connaissance des médias* (Lyon)
- 02.25: Meeting of CODATA France Board (Paris)
- 06.01: IDT '94 (Paris)
- 08.17-08.24: XXIInd IAU General Assembly (Den Haag)
  - Working Group on Astronomical Data
  - Astronomical Data
  - Information Handling
- 09.20-09.24: CODATA '94 *Data and Knowledge in a Changing World* (Chambéry)
  - A Few Facets of the Kaleidoscope of Scientific Information (Publ. 97)
- 09.25-09.29: ADASS '94 (Baltimore)
  - AstroWeb – Internet Resources for Astronomers (with R.E. Jackson, H.M. Adorf, D. Egret, A. Koekemoer, F. Murtagh & D.C. Wells) (Publ. 311)
- 10.16-10.21: Second International WWW Conference (Chicago)
  - WWW in Astronomy and Related Space Sciences (with D. Egret) (Publ. 302)

1995

- 01.08-01.15: 185th American Astronomical Society Meeting (Tucson)
  - Electronic Information Handling in Astronomy and Related Space Sciences (Publ. 300)
- 02.06: Committee Meeting of the ESF Network *Converging Computing Methodologies in Astronomy* (Strasbourg)
  - Electronic Information Handling
- 03.24: Séminaire à l'Observatoire de Strasbourg
  - Quelques facettes et challenges de la gestion électronique de l'information
- 04.06-04.07: Workshop *Weaving the Astronomy Web* (Strasbourg) (Publ. 460)
  - About this WAW Conference ... and More Generally on the WWW Practice (Publ. 95)
  - The Star*s Family of Astronomy Resources on the Web (with D. Egret & F. Ochsenbein) (Pub. 312)
- 04.09-04.13: Third International WWW Conference (Darmstadt)
  - WWW in Astronomy and Related Space Sciences (with D. Egret) (Publ. 314)
- 05.10-05.13: LISA II (Garching)
  - Electronic Publishing or Electronic Information Handling? (Publ. 96)
  - The Star*s Family – Status Report (Publ. 313)

- 06.15: Séminaire à l'Observatoire de Paris
  - Des centres de données aux serveurs d'information (with D. Egret)
- 10.06: ESF/CCMA Workshop *Vision Modelling and Information Coding* (Nice)
- 12.09-12.16: Fourth International WWW Conference (Boston)

1996

- 02.19-02.23: UNESCO/ICSU Press Conference *Electronic Publishing in Science* (Paris)
  - From an Early Electronic-Publishing Concept Towards an Advanced Information Handling (Publ. 99)
- 05.23: IDT '96 & ATM '96 (Paris)
- 05.27-06.03: NATO School *Cosmic Radiation Background* (Strasbourg)
- 06.21-06.22: ESF/CCMA Workshop *Strategies and Techniques of Information for Astronomy* (Strasbourg) (Publ. 461)
  - A Few Comments on Information Strategies and Techniques for Astronomy (Publ. 316)
- 07.28-07.31: Genetic Programming 1996 Conference (Palo Alto)
- 10.08: Seminar at ESO (Garching)
  - Electronic Publishing: Roses and Thorns
- 10.27-11.03: $V^{\rm th}$ International Workshop on Data Analysis in Astronomy (Erice) (Publ. 462)
  - Electronic Astronomical Information Handling and Flexible Publishing (Publ. 102)
- 11.29: Séminaire à l'Observatoire de Strasbourg
  - Gestion électronique de l'information et publication souple

1997

- 01.11: Exposé à la Classe des Sciences de l'Académie Royale de Belgique (Brussels)
  - La publication électronique (Publ. 319)
- 02.20-02.21: Expert Meeting of EU DG XIII *Information Engineering* (Brussels)
- 03.01-03.05: Conference *ACM '97 – The Next 50 Years of Computing* (San Jose)
- 03.15-03.16: Euroscience Constitutive General Assembly (Strasbourg)
- 04.18-04.20: ESF/CCMA Workshop *From Information Fusion to Data Mining* (Granada) (Publ. 463)
- 05.12-05.17: Symposium *Hipparcos Venice '97* (Venezia)
  - The HR Diagram of G5-M3 Stars Near the Giant Branch from Hipparcos Trigonometric Parallaxes (with D. Egret, J.L. Vergely & P.C. Keenan) (Publ. 320)
- 06.06: IDT '97 (Paris)
- 06.25-06.26: Workshop *How Far Can We Go?* (La Petite Pierre)
- 09.03-09.06: Colloquium *Views on Distance Indicators* (Sant'Agata)
- 09.14-09.17: ADASS '97 (Sonthofen)
- 09.18-09.19: ESF/CCMA Network Conference *Advanced Techniques and Methods for Astronomical Information Handling* (Sonthofen)
  - Diversified Scientific Publishing
- 09.25: Astronomische Gesellschaft Tagung (Innsbruck)
  - Electronic Publishing in its Context and in a Professional Perspective (Publ. 105)

- 10.30: Meeting of the EU/Academia Europaea Working Group *Electronic Publishing* (Brussels)
- 12.13: Séance publique de la Classe des Sciences de l'Académie Royale de Belgique (Brussels)

1998

- 02.04-02.07: Conference *European Telematics: Advancing the Information Society* (Barcelona)
- 04.15-04.17: EU/Academia Europaea colloquium *Electronic Communication and Research in Europe* (Seeheim-Jugenheim)
  - Context and Future of Electronic Publishing (Publ. 109)
- 06.10: IDT '98 (Paris)
- 09.13-09.16: Colloquium *Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era* (Haguenau) (Publ. 464)

1999

- 01.07-01.15: Colloquium *Inspiration of Astronomical Phenomena II* (Malta)
  - Socio-Dynamics of Astronomy
  - Delvaux in Urania
- 01.27: 20e Anniversaire de la SFSA (Paris)
- 04.15-04.18: Colloque Ochs-Lefebvre *Réflexions sur les sciences du 19e siècle* (Brussels)
- 05.30-06.03: 194th American Astronomical Society Meeting (Chicago)
  - Characteristics of Astronomy-Related Organizations (Publ. 324)
- 06.09: IDT '99 (Paris)
- 08.07-08.13: RAS National Astronomy Meeting '99 (Guernsey)
  - Characteristics of Astronomy-Related Organizations (Publ. 330)
- 10.01: Séminaire à l'Observatoire de Strasbourg
  - Quelques caractéristiques d'organisations astronomiques et connexes
- 11.17: Séminaire à l'Institut d'Astronomie de Lausanne
  - Sociodynamique de la communauté astronomique et caractéristiques de ses organisations

2000

- 03.23-03.26: Academia Europaea Colloquium *Virtuality in Europe* (Paderborn)
  - Round-Table Initial Comments
- 03.27-03.30: ESO/SPIE Conference *Astronomical Telescopes and Instrumentation 2000* (München)
- 03.31-04.01: 2nd CERN Workshop *Electronic Publishing: New Schemes for Electronic Publishing in Physics* (Genève)
  - Diversified Publishing – The Example of the Star*s Family
- 08.09-08.17: XXIVth IAU General Assembly (Manchester)
- 09.26-10.01: 4S/EASST Conference *Worlds in Transition* (Wien)
- 11.11-11.17: ADASS X (Boston)
- 12.30-01.07: Colloquium *Inspiration of Astronomical Phenomena III* (Palermo) [see hereafter]

2001

- 12.30-01.07: Colloquium *Inspiration of Astronomical Phenomena III* (Palermo)
  - Recent Ramblings in Astro-Art Relationships (Publ. 342)
- 02.16: Séminaire à l'Observatoire de Strasbourg
  - Astronomie, art, créativité et société
- 03.06: IDT '01 (Paris)
- 03.07-03.21: IAU Symposium 207 *Extragalactic Star Clusters* (Pucón)
- 09.09-09.15: AG Tagung + JENAM 2001 (München)
  - The Impact of New Media on 20$^{\rm th}$-Century Astronomy – From Individual Records to Catalogues, Data Centres, Information Hubs and so-called Virtual Observatories (Publ. 115)
  - Strasbourg Astronomical Observatory: Its People through its Multinational History
- 11.09: Séminaire à l'Observatoire de Genève
  - Créativité en arts et sciences: mêmes recettes?
- 11.16-11.18: Academia Europaea Meeting *European Citizens in a 'Virtual' World* (Venezia)
  - Quality in an e-Environment
- 12.07: Séminaire à l'Observatoire de Strasbourg
  - Créativité en arts et sciences: mêmes recettes?

2002

- 01.04-01.12: 199$^{\rm th}$ American Astronomical Society Meeting (Washington)
  - Strasbourg Astronomical Observatory: Its People through its Multinational History (Publ. 336)
- 02.28-03.11: International Conference *Light Pollution: The Global View* (La Serena)
  - Advertising from Space: A Real Danger? (Publ. 118)
- 03.22: Séminaire à l'Observatoire de Strasbourg
  - Pollution lumineuse: une lutte désespérée?
- 04.17: Séminaire à l'Observatoire de Genève
  - Pollution lumineuse: une lutte désespérée?
- 09.23-09.27: Astronomische Gesellschaft Tagung (Berlin)

2003

- 01.03-01.11: 201$^{\rm st}$ American Astronomical Society Meeting (Seattle)
  - Strasbourg Observatory Archives Revisited (Publ. 343)
- 09.15-09.18: Astronomische Gesellschaft Tagung (Freiburg im Breisgau)

2004

- 01.02-01.10: 203$^{\rm rd}$ American Astronomical Society Meeting (Atlanta)
- 05.28-06.05: 204$^{\rm th}$ American Astronomical Society Meeting (Denver)
- 09.12-09.17: JENAM 2004 (Granada)
- 12.11-12.19: Texas Symposium (Palo Alto)

2005

- 04.17-04.21: ESLAB 2005 (ESTEC, Noordwijk)

- 06.13-06.17: Conference *Communicating Astronomy with the Public* (ESO, Garching)
- 07.22-08.03: ICHS 2005 (Beijing)
- 09.25-09.29: Astronomische Gesellschaft Tagung (Köln)
- 10.02-10.07: ADASS XV (San Lorenzo de El Escorial)
- 10.29-11.07: Colloquium *Six Years of Science with Chandra* (Boston) (Fig. 166)

2006

- 03.27-03.28: Space Days (Liège)
- 05.17-05.25: LISA V (Boston)
  - Concept for a Peer-Reviewed Community-Supported Web Site (with R. Albrecht) (Publ. 377)
- 08.14-08.25: XXVI$^{\rm th}$ IAU General Assembly (Praha)

2007

- 01.05-01.14: 209$^{\rm th}$ American Astronomical Society Meeting (Seattle)
- 01.22-01.26: Astronet Meeting (Poitiers)
- 03.04: CAPj Meeting (ESO, Garching)
- 05.28-06.02: ESLAB 2007 (ESTEC, Noordwijk)
- 06.10-06.13: Colloquium *Future Professional Communication in Astronomy* (Brussels) (Publ. 465, Fig. 175)
  - Future Professional Communication in Astronomy: Questions and Challenges (Publ. 127)
- 06.10-06.13: Kolloquium *Neue Wellenlängen* (Würzburg)
  - IUE: Also Pioneering Observing and Archiving Archives
- 12.14-12.16: Réunion de la Classe des Sciences de l'Académie Royale de Belgique (Brussels)
  - Remise du Prix Stroobant (Fig. 170 & 213)

2008

- 01.08-01.13: 211$^{\rm th}$ American Astronomical Society Meeting (Austin)
- 05.29: Colloque *La (re)fondation des observatoires astronomiques sous la IIIe République* (Bordeaux)
  - La républicanisation de l'Observatoire de Strasbourg
- 05.30-06.08: 212$^{\rm th}$ American Astronomical Society Meeting (Saint Louis)
- 09.28-10.03: Colloquium *400 Years of Astronomical Telescopes* (ESTEC, Noordwijk) (Fig. 227)

2009

- 01.03-01.11: 213$^{\rm th}$ American Astronomical Society Meeting (Long Beach)
  - The Strasbourg Large Refractor and Dome: Significant Improvements and Failed Attempts (Publ. 379)
- 01.14-01.17: IYA 2009 Opening Ceremony (Paris)

2010

- 01.02-01.10: 215$^{\rm th}$ American Astronomical Society Meeting (Washington)

- 04.10-04.23: Colloquium *Future Professional Communication in Astronomy II* (Cambridge) (Fig. 175)
  - Opening Remarks (Publ. 128)
- 07.18-07.21: COSPAR 2010 ($38^{\rm th}$ Assembly, Bremen)

2011

- 01.07-01.15: $217^{\rm th}$ American Astronomical Society Meeting (Washington)
- 05.20-05.29: $218^{\rm th}$ American Astronomical Society Meeting (Boston)

2012

- 05.17-05.18: $6^{\rm th}$ World Skeptics Congress (Berlin)
- 07.01-07.07: EWASS 2012 (Roma)

2013

- 03.08-03.10: Gedenk-Kolloquium für Hilmar Duerbeck (Bonn)
  - Recollections of W. Seitter & Hilmar Duerbeck



Fig. 227: With Jean Clavel (left) and Pierluigi Selvelli (center). Taken at the colloquiun on the "400 Years of Astronomical Telescopes" (ESTEC, 28 September – 03 October 2008), this photograph gathers together three founders of the European IUE Observatory (Vilspa, Spain). ESTEC (Netherlands) had been their formal base during the training phase some 31 years earlier. (Courtesy A. Talavera)



Fig. 228: Heck appears here together with the collection of books he produced and (almost all) his other publications sorted annually. Some of the years required several boxes.

Publications by A. Heck

Totus in illis.
(Quintus Horatius Flaccus)

Presentation

The following pages gather together the most important contributions:

- the validated ("refereed") and review papers (pp. 403ff);
- the secondary scientific publications (pp. 415ff);
- the atlases and catalogues (pp. 439ff), as well as the directories (pp. 441ff);
- the monographs (p. 437), the books produced (pp. 435ff), the edited newsletters, and the proceedings of scientific meetings (pp. 443ff);
- the bibliographical reviews (pp. 445ff);
- the public outreach papers (pp. 453ff),
- the *Potins d'Uranie* column (pp. 461ff).

The databases (p. 473) and the main communications at scientific meetings (pp. 383ff) are listed in separate sections. See also the main international collaborations (pp. 363ff) as well as the summaries of a few representative contributions (pp. 475ff).

The tables of contents of the books produced are detailed on pp. 497ff.

The names of the authors appear sequentially as published (with the biographee's name in bold).

See also the note by M.J. Kurtz (Harvard) in the references (pp. 353ff).

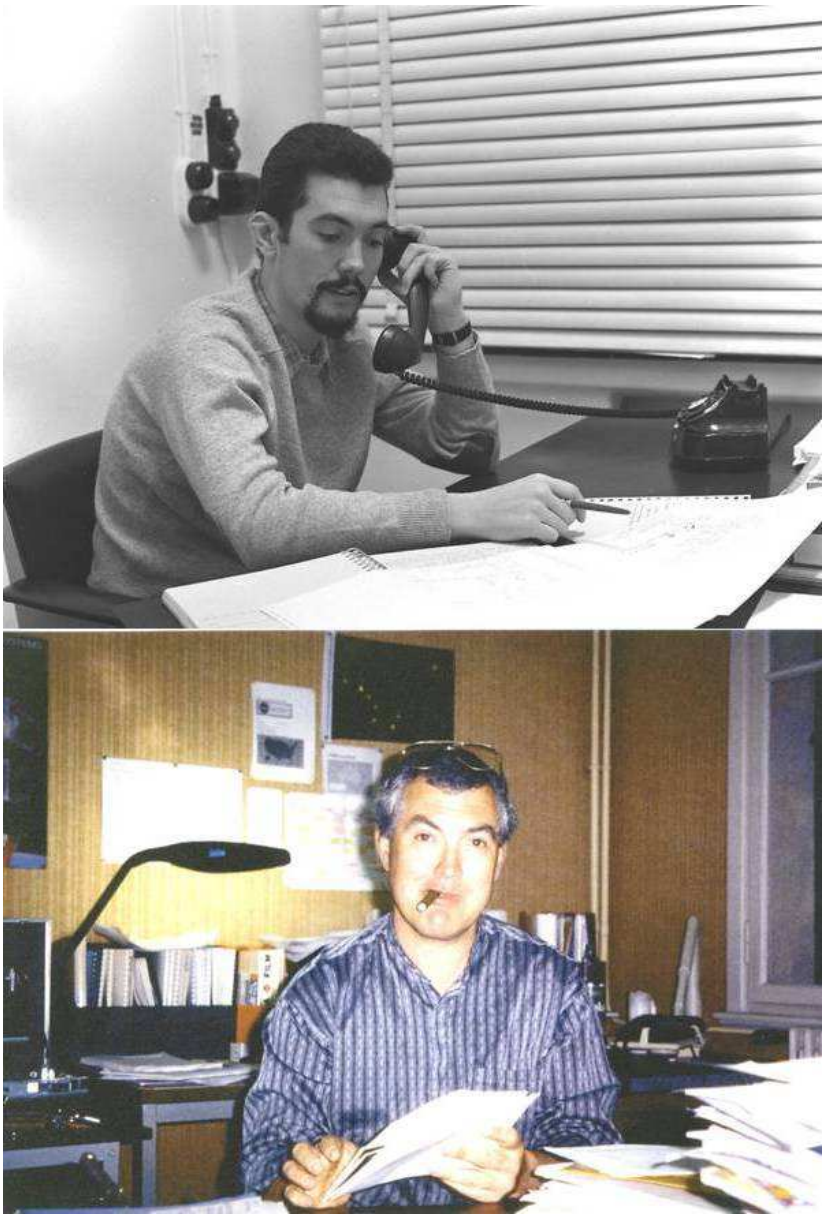


Fig. 229: Twenty years separate those two photographs taken (top) in late 1975 in the IALg office ("Mr Spock") and (bottom) in November 1995 in the office at Strasbourg Observatory. The upper picture reveals a slight deformation of Heck's right ear that puzzled some Star Trek addicts about his origins! In the lower picture, notice a rare cigar during a brief smoker period as well as, on the wall right above the head, the Alaska flag with the Big Dipper (Ursa Major).

Main Papers

Note: The following list gathers together the validated ("refereed") papers with the authors in published sequence. A few other publications have also been included as representative of fields not covered by the former ones. Review papers have been flagged with an asterisk.

1972

1. Détermination de la magnitude absolue moyenne des RR Lyrae (**A. Heck**), *Astron. Astrophys.* **21** (1972) 231-238

1973

2. Magnitude absolue des étoiles du type RR Lyrae (**A. Heck**), *Astron. Astrophys.* **24** (1973) 313-316
3. The First New Comet of 1973 (F. Dossin, **A. Heck**), *Sky & Tel.* **45** (1973) 291 [summary p. 485]

1974

4. A Comparative Study of Maximization Methods (**A. Heck**), *Acad. Roy. Belg. Bull. Cl. Sc. 5ème Série* **60** (1974) 927-943

1975

5. On the Method of Statistical Parallaxes (**A. Heck**, J. Jung), *Astron. Astrophys.* **40** (1975) 323-326
6. Relations Between Luminosity, Period and Metallicity in RR Lyrae Stars (**A. Heck**), *Astron. Astrophys.* **42** (1975) 131-133 [summary p. 476]
7. Absolute Luminosity Calibration of Stroemgren's Intermediate Group (**A. Heck**), *Astron. Astrophys.* **43** (1975) 111-126 [summary p. 476]
8. A Study of Mira Variables – Implications for OH Stars and Galactic Evolution (R. Foy, **A. Heck**, M.O. Mennessier), *Astron. Astrophys.* **43** (1975) 175-188 [summary p. 477]
9. uvby Photometry of Some Southern Field Stars (**A. Heck**, J. Manfroid), *Astron. Astrophys. Suppl.* **22** (1975) 323-325

1976

10. An Application of Multivariate Analysis to a Photometric Catalogue (**A. Heck**), *Astron. Astrophys.* **47** (1976) 129-135 [summary p. 480]
11. Variations photométriques de quelques étoiles Ap (P. Renson, J. Manfroid, **A. Heck**), *Astron. Astrophys. Suppl.* **23** (1976) 413-417

12. Photométrie uvby de quelques étoiles Ap (**A. Heck**, J. Manfroid, P. Renson), *Astron. Astrophys. Suppl.* **25** (1976) 143-149
13. Variations in the U, B, V and u, v, b, y Magnitudes of the Peculiar Be Star HD45677 (A. Feinstein, R. Garnier, N. Vogt, **A. Heck**, J. Manfroid, J.P. Swings), *Astron. Astrophys.* **51** (1976) 269-273
14. Surface Distributions of Some Basic Astronomical Data (D. Egret, **A. Heck**, F. Ochsenbein), *Astron. Astrophys. Suppl.* **26** (1976) 65-87
15. On the Luminosity Criteria Relative to Late-Type Stars (S. Grenier, **A. Heck**, J. Jung), *Astron. Astrophys.* **52** (1976) 385-395

1977

16. uvbyβ Photometry of Equatorial and Southern Bright Stars (**A. Heck**), *Astron. Astrophys. Suppl.* **27** (1977) 47-53
17. Kinematical Data of Two Samples of Late-Type Stars (S. Grenier, **A. Heck**, J. Jung), *Astron. Astrophys. Suppl.* **27** (1977) 267-276
18. Photometric Observations of HD50169 (**A. Heck**, H.M. Maitzen, P. Renson), *Astron. Astrophys.* **54** (1977) 635-637
19. Absolute Luminosity Calibration of Stroemgren's Late Group (**A. Heck**), *Astron. Astrophys.* **56** (1977) 235-243 [summary p. 477]
20. Detection of Errors in Spectral Classification by Cluster Analysis (**A. Heck**, A. Albert, D. Defays, G. Mersch), *Astron. Astrophys.* **61** (1977) 563-566 [summary p. 480]
21. A Bibliographical Catalogue of Field RR Lyrae Stars (**A. Heck**, J.M. Lakaye), *Astron. Astrophys. Suppl.* **30** (1977) 397-398

1978

22. HD72968 (3 Hya) – Another Low-Amplitude Photometric Double-Wave Ap Star (H.M. Maitzen, R. Albrecht, **A. Heck**), *Astron. Astrophys.* **62** (1978) 199-204 [summary p. 485]
23. Variations photométriques et période de la variable spectrale HR3413 (P. Renson, **A. Heck**, J. Manfroid), *Astron. Astrophys. Suppl.* **31** (1978) 199-203
24. Absolute Luminosity Calibration of F Stars (**A. Heck**), *Astron. Astrophys.* **66** (1978) 335-342 [summary p. 478]
25. A Note on the Relation Between Metallicity and Luminosity in Field RRab Lyrae Stars (**A. Heck**, J.M. Lakaye), *Monthly Not. Roy. Astron. Soc.* **184** (1978) 17-24 [summary p. 476]
26. * Some Methods of Determining the Stellar Absolute Magnitude (**A. Heck**), *Vistas in Astron.* **22** (1978) 221-264 [summary p. 475]

27. In-Flight Performance of the IUE (A. Boggess, R.C. Bohlin, D.C. Evans, H.R. Freeman, T.R. Gull, S.R. Heap, D.A. Klinglesmith, G.R. Longanecker, W. Sparks, D.K. West, A.V. Holm, P.M. Perry, F.H. Schiffer III, B.E. Turnrose, C.C. Wu, A.L. Lane, J.L. Linsky, B.D. Savage, P. Benvenuti, A. Cassatella, J. Clavel, **A. Heck**, F. Macchetto, M.V. Penston, P.L. Selvelli, E. Dunford, P. Gondhalekar, M.B. Oliver, M.C.W. Sandford, D.J. Stickland, A. Boksenberg, C.I. Coleman, M.A.J. Snijders, R. Wilson), *Nature* **275** (1978) 377-385 [summary p. 482]
28. IUE Observations of Cool Stars: α Aur, HR1099, λ And, and ϵ Eri (J.L. Linsky, T.R. Ayres, G.S. Basri, N.D. Morrison, A. Boggess, F.H. Schiffer III, A.V. Holm, A. Cassatella, **A. Heck**, F. Macchetto, D.J. Stickland, R. Wilson, C. Blanco, A.K. Dupree, C. Jordan, R.F. Wing), *Nature* **275** (1978) 389-394

1979

29. On the Ultraviolet Spectrum of Nova Cygni 1978 (A. Cassatella, P. Benvenuti, J. Clavel, **A. Heck**, M.V. Penston, P.L. Selvelli, F. Macchetto), *Astron. Astrophys.* **74** (1979) L18-L19 [summary p. 485]
30. On the High-Resolution Ultraviolet Spectrum of P Cygni (A. Cassatella, F. Beeckmans, P. Benvenuti, J. Clavel, **A. Heck**, H.J.G.L.M. Lamers, F. Macchetto, M.V. Penston, P.L. Selvelli, D.J. Stickland), *Astron. Astrophys.* **79** (1979) 223-229 [summary p. 486]

1980

31. The Absolute Magnitude of the Hg-Mn Stars (M. Jaschek, C. Jaschek, S. Grenier, A.E. Gomez, **A. Heck**), *Astron. Astrophys.* **81** (1980) 142-144 [summary p. 478]
32. About the Consistency of Absolute Luminosity Calibrations (**A. Heck**), *Astron. Astrophys.* **82** (1980) 370-372 [summary p. 475]
33. Prediction of Spectral Classification from Photometric Observations – Application to the uvbyβ Photometry and the MK Spectral Classification. I. Prediction Assuming a Luminosity Class (**A. Heck**, G. Mersch), *Astron. Astrophys.* **83** (1980) 287-296 [summary p. 481]
34. Prediction of Spectral Classification from Photometric Observations – Application to the uvbyβ Photometry and the MK Spectral Classification. II. General Case (G. Mersch, **A. Heck**), *Astron. Astrophys.* **85** (1980) 93-100 [summary p. 481]
35. The UV Spectrum of the Narrow Emission-Line X-ray Emitting Nucleus of the Galaxy NGC7582 (J. Clavel, P. Benvenuti, A. Cassatella, **A. Heck**, M.V. Penston, P.L. Selvelli, F. Beeckmans, F. Macchetto), *Monthly Not. Roy. Astron. Soc.* **192** (1980) 769-777 [summary p. 486]
36. Coordinated Optical, Ultraviolet, Radio and X-Ray Observations of Supernova 1979c in M100 (N. Panagia, G. Vettolani, A. Boksenberg, F. Ciatti, S. Ortolani, P. Rafanelli, L. Rosino, C. Gordon, D. Reimers, K. Hempe, P. Benvenuti, J. Clavel,

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37. Simultaneous Spectroscopic (UV MgII and AlII lines) and Photometric Variations of ζ^1 Sco (HD152236) (**A. Heck**, G. Burki, L. Bianchi, A. Cassatella, J. Clavel), *Monthly Not. Roy. Astron. Soc.* **192** (1980) 59P-65P [summary p. 487]
38. Tests of Two Different Maximum-Likelihood Algorithms for Determining Statistical Parallaxes (D.H.P. Jones, **A. Heck**, J. Dawe, S.V.M. Clube), *Astron. Astrophys.* **89** (1980) 225-226 [summary p. 475]
39. uvbyβ Photometry of Equatorial and Southern Bright Stars II (**A. Heck**, J. Manfroid), *Astron. Astrophys. Suppl.* **42** (1980) 311-318

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40. The Absolute Magnitude of the Am Stars (A.E. Gomez, S. Grenier, M. Jaschek, C. Jaschek, **A. Heck**), *Astron. Astrophys.* **93** (1981) 155-159 [summary p. 478]
41. On the Nature of the 125-Day Cepheid V810 Cen (= HR4511): IUE Spectra (W. Eichendorf, **A. Heck**, J. Isserstedt, J. Lub, M. Pakull, B. Reipurth, A.M. van Genderen), *Astron. Astrophys.* **93** (1981) L5-L6
42. The Absolute Magnitudes of the Ap Stars (S. Grenier, M. Jaschek, A.E. Gomez, C. Jaschek, **A. Heck**), *Astron. Astrophys.* **100** (1981) 24-27 [summary p. 479]

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43. The Absolute Magnitudes of G5-M3 Stars Near the Giant Branch (D. Egret, P.C. Keenan, **A. Heck**), *Astron. Astrophys.* **106** (1982) 115-120 [summary p. 479]
44. Variability and Mass Loss in the Extreme Supergiant ζ^1 Sco (G. Burki, **A. Heck**, L. Bianchi, A. Cassatella), *Astron. Astrophys.* **107** (1982) 205-210
45. UV, Optical and IR Observations of the Cepheid R Mus (W. Eichendorf, **A. Heck**, B. Caccin, G. Russo, C. Sollazzo), *Astron. Astrophys.* **109** (1982) 274-278
46. On the Structure of the Outer Layers of Cool Carbon Stars (F. Querci, M. Querci, R.F. Wing, A. Cassatella, **A. Heck**), *Astron. Astrophys.* **111** (1982) 120-124
47. The Far-UV Spectrum of the Low-Excitation Planetary Nebula HD138403 (J. Surdej, **A. Heck**), *Astron. Astrophys.* **116** (1982) 80-88
48. Absolute Magnitudes of F-, G-, K- and M-type Stars from Maximum-Likelihood Statistical Parallaxes (T. Mikami, **A. Heck**), *Publ. Astron. Soc. Japan* **34** (1982) 529-539 [summary p. 478]

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49. IUE and Other New Observations of the Slow Nova RR Tel (M.V. Penston, P. Benvenuti, A. Cassatella, **A. Heck**, P.L. Selvelli, F. Macchetto, D.J. Ponz, C. Jordan, N. Cramer, F. Rufener, J. Manfroid), *Monthly Not. Roy. Astron. Soc.* **202** (1983) 833-857 [summary p. 483]
50. A Generalized Algorithm for Efficient Photometric Reductions (J. Manfroid, **A. Heck**), *Astron. Astrophys.* **120** (1983) 302-306 [summary p. 479]
51. * Predictions: Also an Astronomical Tool (**A. Heck**), in *Statistical Methods in Astronomy*, **ESA SP-201** (1983) 135-143 [summary p. 481]

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52. Période photométrique de l'étoile Ap HR3831 (P. Renson, J. Manfroid, **A. Heck**, G. Mathys), *Astron. Astrophys.* **131** (1984) 63-66
53. The Ultraviolet (IUE) Spectra of the λ Bootis Stars (B. Baschek, **A. Heck**, C. Jaschek, M. Jaschek, J. Köppen, M. Scholz, R. Wehrse), *Astron. Astrophys.* **131** (1984) 378-384
54. On the Accuracy of the Reduction of the uvby Photometry (J. Manfroid, **A. Heck**), *Astron. Astrophys.* **132** (1984) 110-114 [summary p. 480]
55. IUE Low-Dispersion Spectra Flux Catalogue. Part 1. Normal Stars (magnetic tape) (**A. Heck**, D. Egret, M. Jaschek, C. Jaschek), *Astron. Astrophys. Suppl.* **57** (1984) 213-216

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56. On Period Determination Methods (**A. Heck**, J. Manfroid, G. Mersch), *Astron. Astrophys. Suppl.* **59** (1985) 63-72 [summary p. 480]
57. Variations in the Variability of RR Tel (**A. Heck**, J. Manfroid), *Astron. Astrophys.* **142** (1985) 341-345 [summary p. 484]
58. Photometric Variations of HD25267 (J. Manfroid, G. Mathys, **A. Heck**), *Astron. Astrophys.* **144** (1985) 251-253
59. Absolute-Magnitude Calibration of Normal Stars (Paper V) (S. Grenier, A.E. Gomez, C. Jaschek, M. Jaschek, **A. Heck**), *Astron. Astrophys.* **145** (1985) 331-338
60. Photometric Variations of the Irregular Variable V348 Sgr (**A. Heck**, L. Houziaux, J. Manfroid, D.H.P. Jones, P.J. Andrews), *Astron. Astrophys. Suppl.* **61** (1985) 375-385 [summary p. 484]
61. Observation of λ1600 and λ3040 Features in the Spectra of Field Horizontal-Branch Stars (M. Jaschek, B. Baschek, C. Jaschek, **A. Heck**), *Astron. Astrophys.* **152** (1985) 439-440

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62. Statistical Confirmation of the UV Spectral Classification System Based on IUE Low-Dispersion Stellar Spectra (**A. Heck**, D. Egret, Ph. Nobelis, J.C. Turlot), *Astrophys. Sp. Sc.* **120** (1986) 223-237 [summary p. 482]

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63. An Annotated Bibliographical Catalogue of Multivariate Statistical Methods and of their Astronomical Applications (magnetic tape) (F. Murtagh, **A. Heck**), *Astron. Astrophys. Suppl.* **68** (1987) 113-115
64. Evolution of the Periodicity of the W UMa System ϵ CrA (J. Manfroid, **A. Heck**, J. Bergeat, M. Lunel), *Astron. Astrophys.* **176** (1987) 180-182 [summary p. 488]
65. * UV Stellar Spectral Classification (**A. Heck**), in *Exploring the Universe with the IUE Satellite*, Eds. Y. Kondo, W. Wamsteker, A. Boggess, M. Grewing, C. de Jager, A.L. Lane, J.L. Linsky & R. Wilson, D. Reidel Publ. Co., Dordrecht (1987) 121-137 [summary p. 483]
66. Photometric Variability of Some CP Stars (**A. Heck**, G. Mathys, J. Manfroid), *Astron. Astrophys. Suppl.* **70** (1987) 33-48
67. Hot Carbon Stars: More about V348 Sgr (L. Houziaux, P. Bouchet, **A. Heck**, J. Manfroid), *Quart. J. RAS* **28** (1987) 231-238 [summary p. 485]

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68. A Bibliographical Catalogue of RR Lyrae Stars (**A. Heck**), *Astron. Astrophys. Suppl.* **75** (1988) 237-238 [summary p. 476]
69. Classification of IUE Spectra: A Rule-Based Approach (R. Rampazzo, **A. Heck**, F. Murtagh), *ESA Journal* **12** (1988) 385-394

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70. IUE-ULDA/USSP: The On-line Low-resolution Spectral-data Archive of the International Ultraviolet Explorer (W. Wamsteker, C. Driessen, J.P. Muñoz, B.J.M. Hassall, F. Pasian, M. Barylak, G. Russo, D. Egret, J. Murray, A. Talavera, **A. Heck**), *Astron. Astrophys. Suppl.* **79** (1989) 1-10

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72. A List of Acronyms and Abbreviations in Astronomy and Space Sciences (**A. Heck**), *Astron. Astrophys. Suppl.* **86** (1990) 189-190

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73. * Astronomical Directories (**A. Heck**), in *Databases & On-line Data in Astronomy*, Eds. M.A. Albrecht & D. Egret, Kluwer Acad. Publ., Dordrecht (1991) 211-224
74. * The Real Stuff (**A. Heck**), in *Applying Fractals in Astronomy*, Eds. **A. Heck** & J.M. Perdang, *Lecture Notes in Physics* **m3**, Springer-Verlag, Heidelberg (1991) 201-210
75. A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Astron. Astrophys. Suppl.* **90** (1991) 103-104

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76. * Astronomical Databases: A User Approach (**A. Heck**), in *Data Analysis in Astronomy IV*, Eds. V. Di Gesú, L. Scarsi, R. Buccheri, Ph. Crane, M.C. Maccarone & H.U. Zimmermann, Plenum Press, New York (1992) 21-28
77. * Electronic Publishing and 'Intelligent' Information Retrieval in Astronomy and Space Sciences (**A. Heck**), *Vistas in Astron.* **35** (1992) 215-237 [summary p. 488]
78. StarWays – A Database of Astronomy, Space Sciences and Related Organizations of the World (announcement of a database) (**A. Heck**, A. Ciarlo, H. Stokke), *Astron. Astrophys. Suppl.* **92** (1992) 565-566 [summary p. 489]

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79. * Electronic Publishing & Advanced Information Retrieval (**A. Heck**), in *Astron. Data Analysis Software and Systems II*, Eds. R.J. Hanisch, R.J.V. Brissenden & J. Barnes, *Astron. Soc. Pacific Conf. Series* **52** (1993) 121-132
80. Long-term Photometry of Variables at ESO. II. The Second Data Catalogue (1986-1990) (C. Sterken, J. Manfroid, K. Anton, A. Barzewski, E. Bibo, A. Bruch, M. Burger, H.W. Duerbeck, R. Duemmler, **A. Heck**, H. Hensberge, M. Hiesgen, F. Inklaar, A. Jorissen, A. Juettner, U. Kinkel, Liu Zongli, M.V. Mekkaden, Y.K. Ng, P. Niarchos, M. Püttmann, T. Szeifert, F. Spiller, R. van Dijk, N. Vogt, I. Wanders), *Astron. Astrophys. Suppl.* **102** (1993) 79-83
81. StarGuides. A Directory of Astronomy, Space Sciences and Related Organizations of the World (announcement of a catalogue) (**A. Heck**), *Astron. Astrophys. Suppl.* **102** (1993) 85-86 [summary p. 489]
82. StarBriefs. A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences, and Related Fields (announcement of a catalogue) (**A. Heck**), *Astron. Astrophys. Suppl.* **102** (1993) 87 [summary p. 490]

1994

83. StarWords. A Database of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences, and Related Fields (announcement of a database) (M.A. Albrecht, **A. Heck**), *Astron. Astrophys. Suppl.* **103** (1994) 471 [summary p. 490]

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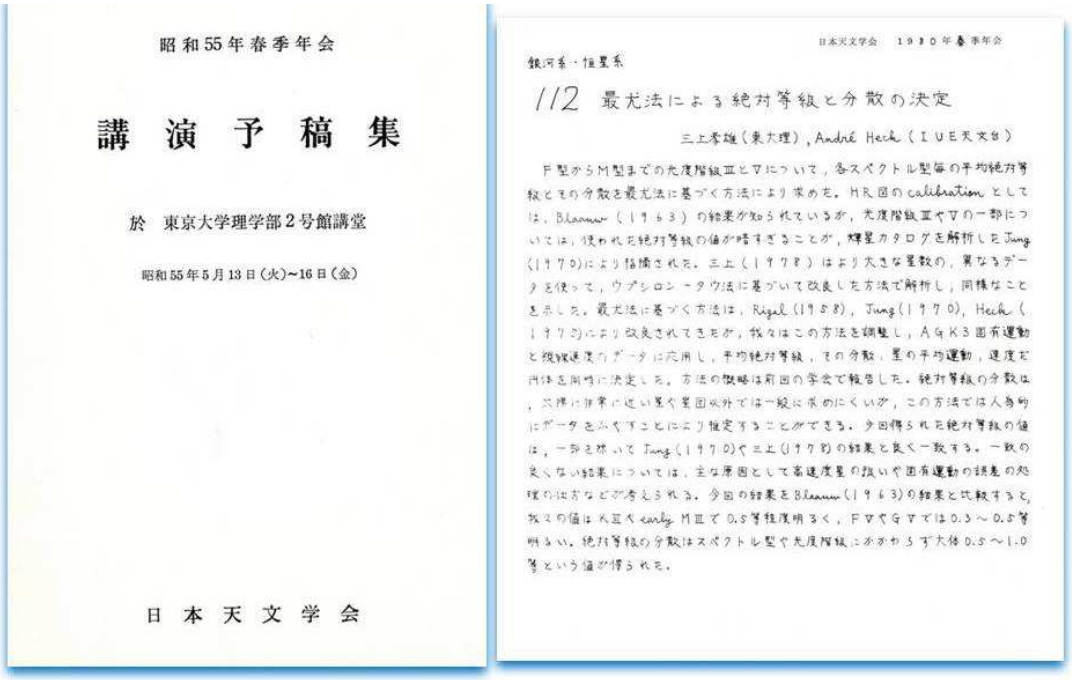
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昭和55年春季年会

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昭和55年5月13日(火)~16日(金)

日 本 天 文 学 会

日本天文学会 1980年春季年会

銀河系・恒星系

112 最尤法による絶対等級と分散の決定

三上孝雄(東大理), André Heck (IUE天文台)

F型からM型までの光度階級Ia, Vについて, 各スペクトル型毎の平均絶対等級とその分散を最尤法に基づく方法により求めた。HR図のcalibrationとしては, Blaauw (1963) の結果が知られているが, 光度階級Ia, Vの一部については, 使われた絶対等級の値が暗すぎることが, 輝星カタログを解析したJung (1970)により指摘された。三上 (1978) はより大きな星数の, 異なるデータを使って, ウプシロン-タウ法に基づいて改良した方法で解析し, 同様なことを示した。最尤法に基づく方法は, Rigel (1958), Jung (1970), Heck (1977)により改良されてきたが, 我々はこの方法を調整し, AGK3固有運動と視線速度のデータに応用し, 平均絶対等級, その分散, 星の平均運動, 速度楕円体を同時に決定した。方法の概略は前回の学会で報告した。絶対等級の分散は, 太陽に非常に近い星や星団以外では一般に求めにくいが, この方法では人為的にデータをふやすことにより推定することができる。今回得られた絶対等級の値は, 一部を除いてJung (1970)や三上 (1978)の結果と良く一致する。一致の良くない結果については, 主な原因として高速度星の扱いや固有運動の誤差の処理の仕方などが考えられる。今回の結果をBlaauw (1963)の結果と比較すると, 我々の値はIa, Ia-O, early IIIで0.5等程度明るく, F V, G Vでは0.3~0.5等明るい。絶対等級の分散はスペクトル型や光度階級にかかわらず大体0.5~1.0等という値が得られた。

Fig. 230: Communication with Takao Mikami on the absolute luminosity calibration of cool stars (1980 Spring Meeting of the Japan Astronomical Society – Publ. 179).

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342. Recent Ramblings in Astro-Art Relationships (**A. Heck**), in *INSAP III – The Inspiration of Astronomical Phenomena*, Ed. S. Serio, *Mem. Soc. Astron. Ital.* **73** (Spec. Num. 1-2002) 221-224

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343. Strasbourg Observatory Archives Revisited (**A. Heck**), *Bull. Amer. Astron. Soc.* **35** (2003) 566
344. Editorial (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 4*, Kluwer Acad. Publ., Dordrecht (2003) 1-12
345. Updated Bibliography of Socio-Astronomy (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 4*, Kluwer Acad. Publ., Dordrecht (2003) 305-325
346. Wrong Impact! (**A. Heck**), *European Astron. Soc. Newsl.* **26** (2003) 4-5

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347. Updated Bibliography of Socio-Astronomy (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 5*, Kluwer Acad. Publ., Dordrecht (2004) 287-309
348. Strasbourg Astronomical Observatory: Its People through its Multinational History (**A. Heck**), *Beitr. Astronomiegeschichte* **7** (2004) 292-294

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349. Strasbourg Observatory, Astronomical Phenomena and the Regional Press (W. Bodenmuller, **A. Heck**), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 227-244
350. The Coronelli Globe of Strasbourg Observatory (**A. Heck**), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 245-254
351. Strasbourg Green Rays (**A. Heck**), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 255-261
352. Strasbourg Observatory Council Members (**A. Heck**, Ch. Bruneau), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 263-269
353. CDS Council Members (Ch. Bruneau, **A. Heck**), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 271-275
354. Strasbourg Observatory Personnel (B. Traut, **A. Heck**, H.W. Duerbeck), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 277-292
355. Strasbourg Observatory Publications (Ph. Vonflie, **A. Heck**), in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht (2005) 293-310

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356. AFOEV: Serving Variable-Star Observers since 1921 – An Interview with Émile Schweitzer/AFOEV (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 6*, Springer, Dordrecht (2006) 243-252
357. Updated Bibliography of Socio-Astronomy (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 6*, Springer, Dordrecht (2006) 321-344
358. HELLERICH Hermann Hinrich Peter Johannes, *Nouv. Dict. Biogr. Alsacienne* **45** (2006) 4674-4675 [translation of H.W. Duerbeck's original text (not author as wrongly printed in that paper)]
359. JASCHEK Karl (Otto Rüdiger) dit Carlos (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **45** (2006) 4713-4714

360. LALLEMAND André (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **46** (2006) 4762-4763
361. MULLER Paul (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **46** (2006) 4829-4830
362. The International Space Science Institute – An Interview with Roger M. Bonnet (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 7*, Springer, Dordrecht (2006) 116-124
363. The ADS Success Story – An Interview with Günther Eichhorn (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 7*, Springer, Dordrecht (2006) 307-314
364. Updated Bibliography of Socio-Astronomy (**A. Heck**), in *Organizations and Strategies in Astronomy – Vol. 7*, Springer, Dordrecht (2006) 565-594
365. ROSENBERG Hans Oswald, *Nouv. Dict. Biogr. Alsacienne* **47** (2006) 4896-4897 [translation of H.W. Duerbeck's original text (not author as wrongly printed in that paper)]
366. ROUGIER Gilbert (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **47** (2006) 4900 - 4901
367. SCHUR Adolf Christian Wilhelm, *Nouv. Dict. Biogr. Alsacienne* **47** (2006) 4937 [translation of H.W. Duerbeck's original text]

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368. Future Professional Communication in Astronomy (and its impact on evaluation) – Colloque(**A. Heck**), *La Lettre des Académies* **6** (2007) 1 + 12
369. COUDER André (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **48** (2007) 5077 - 5078
370. ESCLANGON Ernest (**A. Heck**), *Nouv. Dict. Biogr. Alsacienne* **48** (2007) 5087-5088
371. WINNECKE Friedrich August Theodor,*Nouv. Dict. Biogr. Alsacienne* **48** (2007) 5028-5029 [translation of H.W. Duerbeck's original text]
372. WIRTZ Carl Wilhelm, *Nouv. Dict. Biogr. Alsacienne* **48** (2007) 5030-5031 [translation of H.W. Duerbeck's original text]
373. WISLICENUS Walter Friedrich, *Nouv. Dict. Biogr. Alsacienne* **48** (2007) 5031 [translation of H.W. Duerbeck's original text]
374. IUE – Also Pioneering Observing and Archiving Strategies (**A. Heck**), *Astron. Nachr.* **328** (2007) 694
375. Organizations and Strategies in Astronomy (**A. Heck**), *Observatory* **127** (2007) 336-337
376. Future Professional Communication in Astronomy (**A. Heck**), *Observatory* **127** (2007) 375-379

377. Concept for a Peer-Reviewed Community-Supported Web Site Serving Professional Astronomy (R. Albrecht, **A. Heck**), in *Library and Information Services in Astronomy V – Common Challenges, Uncommon Solutions*, Eds. S. Ricketts, Chr. Birdie & E. Isaksson, Astron. Soc. Pacific Conf. Series **377** (2007) 155-158

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378. Compiling Biographical Encyclopediae of Astronomers (**A. Heck**), *Observatory* **128** (2008) 495-499

2009

379. The Strasbourg Large Refractor and Dome: Significant Improvements and Failed Attempts (**A. Heck**), *Bull. Amer. Astron. Soc.* **41** (2009) 186-187

380. La Tour de l'Hôpital de Strasbourg: un observatoire astronomique? (**A. Heck**, J.P. Beck), *Cahiers Alsaciens d'Archéologie, d'Art et d'Histoire* **LII** (2009) 129-138

2010

381. Strasbourg's First Astronomical Observatories – From Prestige to Real Science (**A. Heck**), *ICHA Newsletter* **10** (2010) 1-7

2011

382. Strasbourg's "First" Astronomical Observatory (**A. Heck**), *Beitr. Astronomiegeschichte* (2011) **11**, 208-219

383. Strasbourg's "Academy" Observatory (**A. Heck**), *Beitr. Astronomiegeschichte* (2011) **11**, 220-231

384. L'observatoire astronomique de l'Académie de Strasbourg (XIXe siècle) (**A. Heck**), *Cahiers Alsaciens d'Archéologie, d'Art et d'Histoire* **LIV** (2011) 141-151

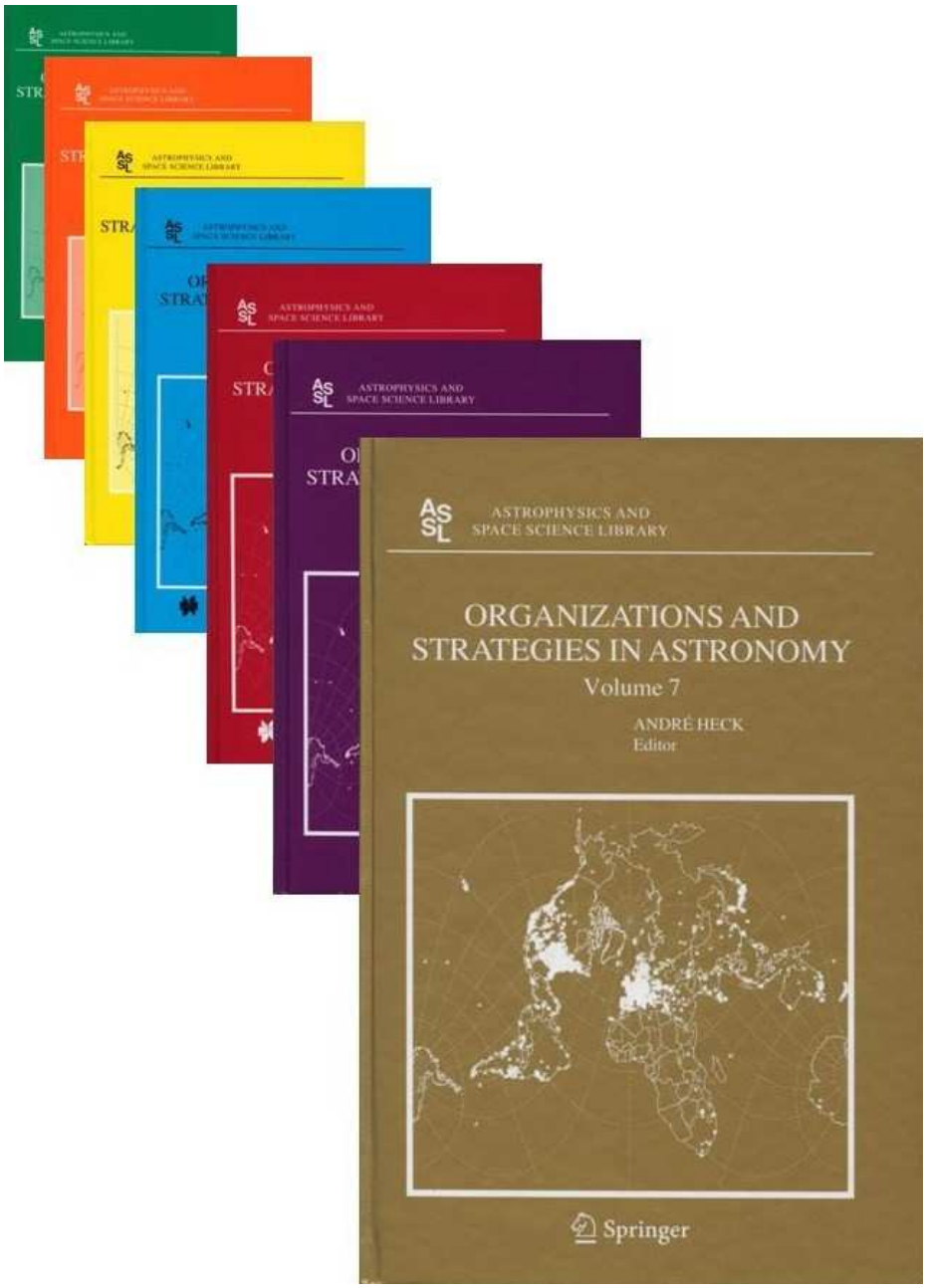


Fig. 231: The seven volumes of the series "Organizations and Strategies in Astronomy (OSA)" (Kluwer/Springer 2000-2006) are presented on pp. 248ff. They have been distinguished by the International Stroobant Prize 2007 (p. 251).

Books Produced

Note: See also the monographs (p. 437), the edited newsletters and proceedings of scientific meetings (pp. 443ff), the directories (pp. 441ff), as well as the atlases and catalogues (pp. 439ff). An alphabetical list of authors-contributors to the edited books is downloadable from the web[259]. The tables of contents of the books produced are detailed on pp. 497ff. Note also that some fifteen edited scientific books, unrelated to astronomy, are not included hereafter.

385. Knowledge-Based Systems in Astronomy (with F. Murtagh),
Lecture Notes in Physics **329**,
Springer-Verlag, Heidelberg (1989) ii + 280 pp. (Fig. 134)
(ISBN 3-540-51044-3 & 0-387-51044-3) [table of contents at p. 497]

386. Applying Fractals in Astronomy (with J.M. Perdang),
Lecture Notes in Physics **m3**,
Springer-Verlag, Heidelberg (1991) x + 210 pp. (Fig. 134)
(ISBN 3-540-54353-8 & 0-387-54353-8) [table of contents at p. 498]

387. Intelligent Information Retrieval:
The Case of Astronomy and Related Space Sciences (with F. Murtagh),
Astrophys. Sp. Sc. Library **182**,
Kluwer Acad. Publ., Dordrecht (1993) iv + 214 pp. (Fig. 134)
(ISBN 0-7923-2295-9) [table of contents at p. 498]

388. Electronic Publishing for Physics and Astronomy,
Astrophys. Sp. Sc. Library **224**,
Kluwer Acad. Publ., Dordrecht (1997), viii + 250 pp. (Fig. 132)
(ISBN 0-7923-4820-6) [table of contents at p. 499]
+ *Astrophys. Sp. Sc.* **247** (1997) viii + 250 pp.

389. Post-Hipparcos Cosmic Candles (with F. Caputo),
Astrophys. Sp. Sc. Library **237**,
Kluwer Acad. Publ., Dordrecht (1999) x + 284 pp. (Fig. 241)
(ISBN 0-7923-5348-X) [table of contents at p. 500]

390. Information Handling in Astronomy,
Astrophys. Sp. Sc. Library **250**,
Kluwer Acad. Publ., Dordrecht (2000) x + 242 pp. (Fig. 163)
(ISBN 0-7923-6494-5) [table of contents at p. 501]

391. Organizations and Strategies in Astronomy [OSA 01],
Astrophys. Sp. Sc. Library **256**,
Kluwer Acad. Publ., Dordrecht (2000) x + 222 pp. (Fig. 231)
(ISBN 0-7023-6671-9) [table of contents at p. 502]

[259] http://www.aheck.org/authbks.pdf

392. Organizations and Strategies in Astronomy II [OSA 02],
Astrophys. Sp. Sc. Library ,
Kluwer Acad. Publ., Dordrecht (2001) x + 280 pp. (Fig. 231)
(ISBN 0-7923-7172-0) [table of contents at p. 503]

393. Organizations and Strategies in Astronomy III [OSA 03],
Astrophys. Sp. Sc. Library **280**,
Kluwer Acad. Publ., Dordrecht (2002) x + 234 pp. (Fig. 231)
(ISBN 1-4020-0812-0) [table of contents at p. 504]

394. Information Handling in Astronomy – Historical Vistas,
Astrophys. Sp. Sc. Library **285**,
Kluwer Acad. Publ., Dordrecht (2003) xii + 294 pp. (Fig. 163)
(ISBN 1-4020-1178-4) [table of contents at p. 505]

395. Astronomy Communication (with Cl. Madsen),
Astrophys. Sp. Sc. Library **290**,
Kluwer Acad. Publ., Dordrecht (2003) xii + 226 pp. (Fig. 164)
(ISBN 1-4020-1345-0) [table of contents at p. 506]

396. Organizations and Strategies in Astronomy – Vol. 4 [OSA 04],
Astrophys. Sp. Sc. Library **296**,
Kluwer Acad. Publ., Dordrecht (2003) xii + 326 pp. (Fig. 231)
(ISBN 1-4020-1526-7)
[table of contents at p. 507]

397. Organizations and Strategies in Astronomy – Vol. 5 + CD [OSA 05],
Astrophys. Sp. Sc. Library **310**,
Kluwer Acad. Publ., Dordrecht (2004) xii + 309 pp. (Fig. 231)
(ISBN 1-4020-2570-X) [table of contents at p. 508]

398. The Multinational History of Strasbourg Astronomical Observatory,
Astrophys. Sp. Sc. Library **330**,
Springer, Dordrecht (2005) viii + 310 pp. (Fig. 176)
(ISBN 1-4020-3643-4) [table of contents at p. 509]

399. Organizations and Strategies in Astronomy – Vol. 6 [OSA 06],
Astrophys. Sp. Sc. Library **335**,
Springer, Dordrecht (2006) xii + 344 pp. (Fig. 231)
(ISBN 1-4020-4555-5) [table of contents at p. 510]

400. Organizations and Strategies in Astronomy – Vol. 7 [OSA 07],
Astrophys. Sp. Sc. Library **343**,
Springer, Dordrecht (2006) xii + 594 pp. (Fig. 231)
(ISBN 1-4020-5300-2) [table of contents at p. 512]

401. Organizations, People and Strategies in Astronomy – Vol. 1 [OPSA 1],
Venngeist, Duttlenheim (2012) ii + 324 pp. (Fig. 190)
(ISBN 978-2-9542677-0-8) [table of contents at p. 513]

402. Organizations, People and Strategies in Astronomy – Vol. 2 [OPSA 2], Venngeist, Duttlenheim (2013) ii + 474 pp. (Fig. 190)
(ISBN 978-2-9542677-1-5) [table of contents at p. 515]

Monographs

403. Quelques méthodes de détermination de la magnitude absolue (**A. Heck**), Centre Données Stellaires, Strasbourg (1976) 52 pp.
404. Potins d'Uranie (Al Nath), Soc. Astron. Liège (1985) ii + 132 pp.
405. Multivariate Data Analysis with Astronomical Applications (with F. Murtagh, **A. Heck**), *Astrophys. Sp. Sc. Library* **131**, D. Reidel Publ. Co., Dordrecht (1987) xvi + 210 pp. (Fig. 102)
(ISBN 90-277-2425-3, hardbound)
(ISBN 90-277-2426-1, paperback)
(ISBN 90-277-9154-6, source programs floppy disk)
406. Analyse statistique multivariée. Applications astronomiques, Analyse des Données en Astronomie (2-7 nov. 1987) (**A. Heck**), *Formation Permanente CNRS*, Marseille-Luminy, 74 pp.
407. Analyse statistique multivariée. Applications astronomiques (**A. Heck**), *École de Goutelas "Traitement de l'information: méthodes et concepts"* (25-30 avril 1988) 82 pp.
408. Astronomical Applications of Multivariate Statistical Analysis (**A. Heck**), *OAC-FORMEZ School – Sant'Agata* (1991) 30 pp.
409. Les Constellations des Potins d'Uranie (Al Nath), Venngeist, Duttlenheim (2014) 300 pp. (ISBN 978-2-9542677-2-2) (Fig. 57)



Fig. 232: Working on plates while preparing the "Astronomical Photographic Atlas" (Publ. 410) at IALg. (© J. Manfroid)

Atlases & Catalogues

Note: See also the directories on pp. 441ff and the databases on p. 473.

410. Astronomical Photographic Atlas [in five languages] (**A. Heck**, J. Manfroid), Éd. Desoer, Liège (1977) 224 pp. (Fig. 58)

411. A Bibliographical Catalogue of Field RR Lyrae Stars (magnetic tape + microfiche) (**A. Heck**, J.M. Lakaye), *Astron. Astrophys. Suppl.* **30** (1977) 397-398 (CDS-NASA ref. C6008)

412. IUE Meeting Bibliography for Peculiar Stars (**A. Heck**), *Inform. Bull. Strasbourg Stellar Data Center* **27** (1984) 145-157

413. IUE Low-Dispersion Spectra Reference Atlas. Part 1. Normal Stars (book) (**A. Heck**, D. Egret, M. Jaschek, C. Jaschek), **ESA SP-1052** (1984) 476 pp. + 34 plates (ISSN 0379-6566) (Fig. 105 & 106) [summary on p. 482]

414. IUE Low-Dispersion Spectra Flux Catalogue. Part 1. Normal Stars (magnetic tape) (**A. Heck**, D. Egret, M. Jaschek, C. Jaschek), *Inform. Bull. Strasbourg Stellar Data Center* **26** (1984) 127 (CDS-NASA ref. C3083) [summary on p. 482]

415. An Annotated Bibliographical Catalogue of Multivariate Statistical Methods and of their Astronomical Applications (magnetic tape) (F. Murtagh, **A. Heck**), *Astron. Astrophys. Suppl.* **68** (1987) 113-115 (CDS-NASA ref. C6037) & *Inform. Bull. Strasbourg Stellar Data Center* **31** (1986) 183-184

416. A Bibliographical Catalogue of RR Lyrae Stars (**A. Heck**), *Publ. Spéc. CDS* **11** (1988) 190 pp. (ISSN 0764-9614 – ISBN 2-908064-09-X) & *Comm. 27 IAU Inform. Bull. Var. Stars* **3184** (1988) 2 pp. & *Inform. Bull. Strasbourg Stellar Data Center* **34** (1988) 137-139 (CDS/NASA ref. C6045)

417. Acronyms & Abbreviations in Astronomy and Space Sciences (**A. Heck**), *Publ. Spéc. CDS* **15** (1990) ii + 254 pp. (ISSN 0764-9614 – ISBN 2-908064-13-8)

418. Acronyms & Abbreviations in Astronomy, Space Sciences & Related Fields (**A. Heck**), *Publ. Spéc. CDS* **18** (1991) iv + 592 pp. (ISSN 0764-9614 – ISBN 2-908064-16-2)

419. StarBriefs 1992 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**),, *Publ. Spéc. CDS* **19** (1992) xxxiv + 774 pp. (ISSN 0764-9614 – ISBN 2-908064-17-0)

420. StarBriefs 1993 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**), *Publ. Spéc. CDS* **21** (1993) xxxiv + 778 pp. (ISSN 0764-9614 – ISBN 2-908064-19-7)

421. Second Catalogue of Stars Measured in the Long-term Photometry of Variables Project (1986-1990) (C. Sterken, J. Manfroid, K. Anton, A. Barzewski, E. Bibo, A. Bruch, M. Burger, H.W. Duerbeck, R. Duemmler, **A. Heck**, H. Hensberge,

M. Hiesgen, F. Inklaar, A. Jorissen, A. Juettner, U. Kinkel, Liu Zongli, M.V. Mekkaden, Y.K. Ng, P. Niarchos, M. Püttmann, T. Szeifert, F. Spiller, R. van Dijk, N. Vogt, I. Wanders), *ESO Sc. Report* **12** (1993) 456 pp.

422. StarBriefs 1994 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**), *Publ. Spéc. CDS* **22** (1994) vi + 818 pp. (ISSN 0764-9614 - ISBN 2-908064-20-0)

423. StarBriefs 1995 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**), *Publ. Spéc. CDS* **26** (1995) vi + 744 pp. (ISSN 0764-9614 - ISBN 2-908064-24-3)

424. StarBriefs 1996 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**), *Publ. Spéc. CDS* **28** (1996) vi + 906 pp. (ISSN 0764-9614 - ISBN 2-908064-26-X)

425. StarBriefs 2000 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences and Related Fields (**A. Heck**), *Publ. Spéc. CDS* **33** (2000) vi + 802 pp. (ISSN 0764-9614 - ISBN 2-908064-31-6)

426. StarBriefs 2001 – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Related Space Sciences and Other Related Fields (**A. Heck**), Kluwer Acad. Publ., Dordrecht (2000) viii + 814 pp. (ISBN 0-7923-6510-0) (Fig. 140)

427. StarBriefs Plus – A Dictionary of Abbreviations, Acronyms and Symbols in Astronomy and Related Space Sciences (**A. Heck**), Kluwer Acad. Publ., Dordrecht (2004) viii + 1114 pp. (ISBN 1-4020-1925-4) (Fig. 140)



*Fig. 233: The Star*s Family logo (web pages, directories, dictionaries). **

Directories

Note: See also the atlases & catalogues (p. 439), as well as the databases (p. 473).

428. International Directory of Amateur Astronomical Societies 1978 (**A. Heck**, J. Manfroid), Ed. Heck-Manfroid (1978) ii + 110 pp.
429. International Directory of Amateur Astronomical Societies 1979 (**A. Heck**, J. Manfroid), Ed. Heck-Manfroid (1979) ii + 288 pp.
430. International Directory of Amateur Astronomical Societies 1981 (**A. Heck**, J. Manfroid), Ed. Heck-Manfroid (1981) iv + 300 pp.
431. International Directory of Amateur Astronomical Societies 1982 (**A. Heck**, J. Manfroid), Ed. Heck-Manfroid (1981) iv + 304 pp.
432. International Directory of Amateur Astronomical Societies 1984 (**A. Heck**, J. Manfroid), Ed. Heck-Manfroid (1984) iv + 278 pp.
433. International Directory of Astronomical Associations and Societies 1986 (**A. Heck**, J. Manfroid), *Publ. Spéc. CDS* **8** (1985) iv + 266 pp. (ISSN 0764-9614 – ISBN 2-908064-06-5)
434. International Directory of Professional Astronomical Institutions 1987 (**A. Heck**, J. Manfroid), *Publ. Spéc. CDS* **9** (1986) iv + 276 pp. (ISSN 0764-9614 – ISBN 2-908064-07-3)
435. International Directory of Astronomical Associations and Societies 1988 (**A. Heck**, J. Manfroid), *Publ. Spéc. CDS* **10** (1987) vi + 516 pp. (ISSN 0764-9614 – ISBN 2-908064-08-1)
436. International Directory of Professional Astronomical Institutions 1989 (**A. Heck**), *Publ. Spéc. CDS* **12** (1988) vi + 492 pp. (ISSN 0764-9614 – ISBN 2-908064-10-3)
437. International Directory of Astronomical Associations and Societies together with Related Items of Interest – Répertoire international d'associations et sociétés astronomiques ainsi que d'autres entrées d'intérêt général – IDAAS 1990 (**A. Heck**), *Publ. Spéc. CDS* **13** (1989) vi + 716 pp. (ISSN 0764-9614 – ISBN 2-908064-11-1)
438. International Directory of Professional Astronomical Institutions together with Related Items of Interest – Répertoire international des institutions astronomiques professionnelles ainsi que d'autres entrées d'intérêt général – IDPAI 1990 (**A. Heck**), *Publ. Spéc. CDS* **14** (1989) vi + 658 pp. (ISSN 0764-9614 – ISBN 2-908064-12-X)
439. Astronomy, Space Sciences and Related Organizations of the World – ASpScROW 1991 (**A. Heck**), *Publ. Spéc. CDS* **16** (1991) x + 1182 pp. (ISSN 0764-9614 – ISBN 2-908064-14-6) (two volumes)

440. StarGuides 1993 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **20** (1993) x + 1174 pp. (ISSN 0764-9614 – ISBN 2-908064-18-9) (two volumes)

441. StarGuides 1994 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **23** (1994) viii + 880 pp. (ISSN 0764-9614 – ISBN 2-908064-21-9)

442. StarGuides 1995 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **25** (1995) viii + 814 pp. (ISSN 0764-9614 – ISBN 2-908064-23-5)

443. StarGuides 1996 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **27** (1996) viii + 916 pp. (ISSN 0764-9614 – ISBN 2-908064-25-1)

444. StarGuides 1997 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **29** (1997) viii + 1018 pp. (ISSN 0764-9614 – ISBN 2-908064-27-8)

445. StarGuides 1998 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **30** (1998) viii + 1022 pp. (ISSN 0764-9614 – ISBN 2-908064-28-6)

446. StarGuides 1999 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **31** (1999) viii + 1124 pp. (ISSN 0764-9614 – ISBN 2-908064-29-4)

447. StarGuides 2000 – A Directory of Astronomy, Space Sciences and Related Organizations of the World (**A. Heck**), *Publ. Spéc. CDS* **32** (2000) viii + 1140 pp. (ISSN 0764-9614 – ISBN 2-908064-30-8)

448. StarGuides 2001 – A World-Wide Directory of Organizations in Astronomy, Related Space Sciences and Other Related Fields (**A. Heck**), Kluwer Acad. Publ., Dordrecht (2000) xiv + 1224 pp. (ISBN 0-7923-6509-7) (Fig. 140)

449. StarGuides Plus – A World-Wide Directory of Organizations in Astronomy and Related Space Sciences (**A. Heck**), Kluwer Acad. Publ., Dordrecht (2004) xiv + 1140 pp. (ISBN 1-4020-1926-2) (Fig. 140)

Edited Newsletters & Proceedings of Scientific Meetings

Note: See also the list of organized astronomical meetings (p. 342). A global alphabetical list of authors-contributors to the proceedings can be found on the web[260]. Edited proceedings of non-astronomical meetings are not included in those lists. Newsletters are flagged with an asterisk.

450. * ESA IUE Newsletter **1-4** (1979) (Fig. 221)
451. Third European IUE Conference (**A. Heck**, E. Rolfe & B. Battrick), **ESA SP-176** (1982) xiv + 622 pp. (ISSN 0379-6566) (Fig. 234)
452. UV Stellar Classification (**A. Heck**, B. Battrick), **ESA SP-182** (1982) vi + 136 pp. (ISSN 0379-6566) (Fig. 234)
453. * Newsletter of the Working Group for Modern Astronomical Methodology (**A. Heck**, F. Murtagh) **1-8** (1985-1989)
454. Astronomy from Large Databases – Scientific Objectives and Methodological Approaches. Garching, 12-14 October 1987 (F. Murtagh, **A. Heck**), *ESO Conf. & Workshop Proc.* **28** (1988) xiv + 512 pp. (ISBN 3-923524-28-5) (Fig. 222)
455. Artificial Intelligence Techniques for Astronomy – Techniques d'Intelligence Artificielle pour l'Astronomie (XI$^{\rm e}$ Journée de Strasbourg – XI$^{\rm th}$ Strasbourg Astronomical Day) (**A. Heck**), Obs. Astron. Strasbourg (1989) viii + 82 pp. (ISSN 0989-621X – ISBN 2-906361-04-6) (Fig. 134)
456. Fractals in Astronomy – Fractales en Astronomie (XII$^{\rm e}$ Journée de Strasbourg – XII$^{\rm th}$ Strasbourg Astronomical Day) (**A. Heck**), *Vistas in Astron.* **33** (1990) 245-424
457. * Newsletter of the IAU Comm. 5 Working Group on Astronomical Data (**A. Heck**) (1991-1994)
458. DeskTop Publishing in Astronomy and Space Sciences (**A. Heck**), World Scientific, Singapore (1992) xii + 240 pp. (ISBN 981-02-0915-0) (Fig. 132)
459. Astronomy from Large Databases II. Haguenau, 14-16 September 1992 (**A. Heck**, F. Murtagh), *ESO Conf. & Workshop Proc.* **43** (1992) x + 534 pp. (ISBN 3-923524-47-1) (Fig. 222)
460. Weaving the Astronomy Web (**A. Heck**, D. Egret), *Vistas in Astron.* **39** (1995) i-x + 1-126
461. Strategies and Techniques of Information for Astronomy (**A. Heck**, F. Murtagh), *Vistas in Astron.* **40** (1996) 361-440

[260] http://www.aheck.org/authproc.pdf

462. Proceedings of the Fifth Workshop on Data Analysis in Astronomy (V. Di Gesú, M.J.B. Duff, **A. Heck**, M.C. Maccarone, L. Scarsi, H.U. Zimmermann), World Scientific, Singapore (1997) xiv + 422 pp. (ISBN 981-02-3171-7) (Fig. 162)
463. From Information Fusion to Data Mining (R. Molina, F. Murtagh, **A. Heck**), *Vistas in Astron.* **41** (1997) 327-461
464. Harmonizing Cosmic Distance Scales in a Post-Hipparcos Era (D. Egret, **A. Heck**), *Astron. Soc. Pacific Conf. Ser.* **167** (1999) xxiv + 342 pp. (ISBN 1-886733-88-0) (Fig. 162)
465. Future Professional Communication in Astronomy (**A. Heck**, L. Houziaux), Mém. Acad. Royale Belgique in 8° **XXVII** (2007) 256 pp. (ISBN 978-2-8031-0238-9) (Fig. 175)

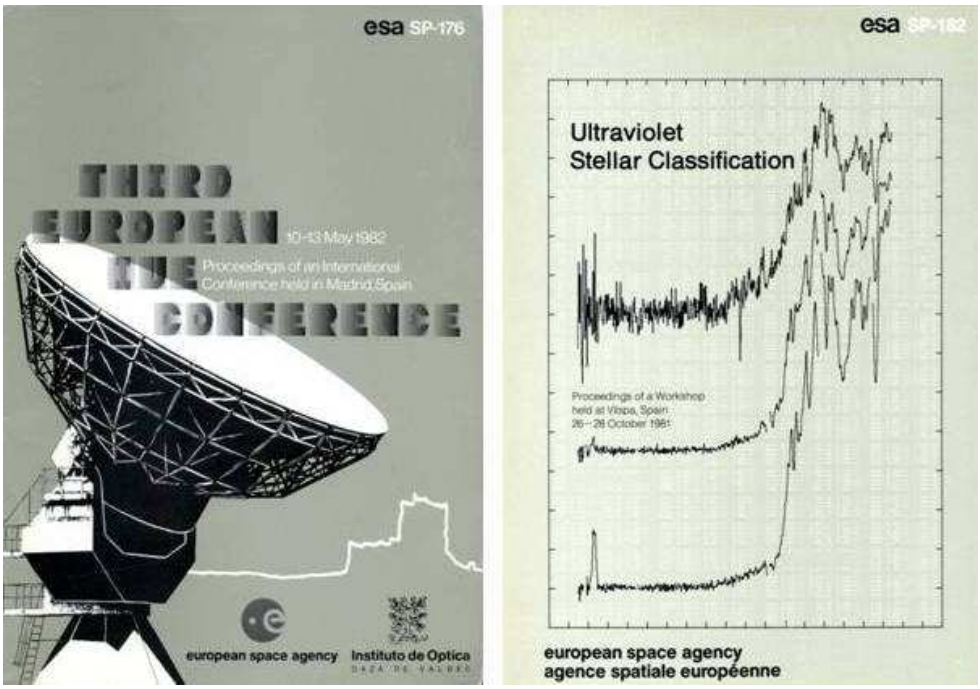


Fig. 234: Proceedings of two meetings organized with Heck's involvment: ESA SP-176 (Publ. 451) gathering together the contributions to the "Third European IUE Conference" (Madrid, 10-13 May 1982 – see also Fig. 87) and ESA SP-182 (Publ. 452) for the colloquium on UV spectral classification (Vilspa, 26-28 October 1981 – see also Fig. 85). Note that due to the way the ESA Special Publications were numbered at that time, the earlier colloquium has a higher number ...

Bibliographical Reviews

Note: The following list gathers together bibliographical reviews of books and occasionally of CDs and DVDs.

1976

466. Galaxies and the Universe, *Bull. Soc. Astron. Liège* (septembre-octobre 1976) 7-8

1977

467. Compilation, Critical Evaluation and Distribution of Stellar Data, *Ciel et Terre* **93** (1977) 239-240

1984

468. Understanding the Universe. The Impact of Space Astronomy, *Ciel et Terre* **100** (1984) 179
469. Early Evolution of the Universe and its Present Structure, *Ciel et Terre* **100** (1984) 180-181

1985

470. Check a Possible Supernova, *Ciel et Terre* **101** (1985) 22
471. Clusters and Groups of Galaxies, *Ciel et Terre* **101** (1985) 64

1986

472. Le château des étoiles, *Ciel et Terre* **102** (1986) 28
473. Check a Possible Supernova. Set 2, *Ciel et Terre* **102** (1986) 29
474. The MK Process and Stellar Classification, *Ciel et Terre* **102** (1986) 65
475. Histoire de l'astronomie (occidentale), *CAD-Astres* **4** (juin 1986) 5-6 + *Ciel et Terre* **102** (1986) 93
476. Calibration of Fundamental Stellar Quantities, *Ciel et Terre* **102** (1986) 96
477. The Search for Extraterrestrial Life, *Ciel et Terre* **102** (1986) 132-133
478. The Observatories of the Canaries, *Ciel et Terre* **102** (1986) 134-135
479. Celnikier (Ludwig Marian), Histoire de l'astronomie occidentale, *Lectures* **32** (1986) 46
480. The Return of the Comet (activity book), *Ciel et Terre* **102** (1986) 173-174
481. The Mystery of Comets, *Ciel et Terre* **102** (1986) 174-175
482. Comet Fever, *Ciel et Terre* **102** (1986) 175

483. La comète et les prophéties, *Ciel et Terre* **102** (1986) 176-177

1987

484. Caro (Paul), L'oiseau-jardinier: la science est-elle un humanisme?, *Lectures* **35** (1987) 34
485. Cool Stars with Excesses of Heavy Elements, *Ciel et Terre* **103** (1987) 26-27
486. Longitude Zero 1884-1984, *Ciel et Terre* **103** (1987) 29
487. L'oiseau-jardinier, *Ciel et Terre* **103** (1987) 62-63
488. The Cosmic Enquirers, *Ciel et Terre* **103** (1987) 65
489. Goldsmith (Donald), Némésis, l'étoile du destin, *Lectures* **36** (1987) 48
490. Némésis, l'étoile du destin, *Ciel et Terre* **103** (1987) 93-94
491. Astronomical Observations. An Optical Perspective, *Ciel et Terre* **103** (1987) 96
492. Begegnung mit Halley, *Ciel et Terre* **103** (1987) 125
493. RS Ophiuchi (1985) and the Recurrent Nova Phenomenon, *Ciel et Terre 103* (1987) 127
494. Galilée, *Ciel et Terre* **103** (1987) 163
495. Leslie Peltier's Guide to the Stars, *Ciel et Terre* **103** (1987) 163-164
496. Selling Science, *Ciel et Terre* **103** (1987) 164
497. The Amateur Astronomer's Catalog of 500 Deep-sky Objects. Volume One, *Ciel et Terre* **103** (1987) 165

1988

498. Webb Society Deep-sky Observer's Handbook. Volume 7: The Southern Sky, *Ciel et Terre* **104** (1988) 27
499. Patrick Moore's Astronomy Quiz Book, *Ciel et Terre* **104** (1988) 60
500. Webb Society Deep-sky Observer's Handbook. Volume 6: Anonymous Galaxies, *Ciel et Terre* **104** (1988) 61-62
501. Extraterrestrials – Science and Alien Intelligence, *Ciel et Terre* **104** (1988) 92-93
502. Davoust (Emmanuel), Silence au point d'eau, *Lectures* **45** (1988) 47-48
503. Silence au point d'eau, *Ciel et Terre* **104** (1988) 145-146

1989

504. N.I. Fisher, T. Lewis, and B.J.J. Embleton, Statistical Analysis of Spherical Data, *Sp. Sc. Reviews* **50** (1989) 386

1991

505. Friedmann, Herbert: The Astronomer's Universe – Stars, Galaxies, and Cosmos, *Orion* **49** (1991) 129

1992

506. Béatrice Lacoste: L'Europe à la découverte de l'espace, *Orion* **50** (1992) 49

1996

507. Internet – Armand Dufour, *Ciel et Terre* **112** (1996) 164
508. Internet – Armand Dufour, *Orion* **54** (1996) 196

1997

509. La Lumière – Émile Biémont, *Ciel et Terre* **113** (1997) 42
510. Météores et effets lumineux dans l'atmosphère terrestre – Émile Biémont, *Ciel et Terre* **113** (1997) 174

1998

511. La Lumière – Émile Biémont, *Orion* **56/1** (1998) 38
512. Météores et effets lumineux dans l'atmosphère terrestre – Émile Biémont, *Orion* **56/5** (1998) 40
513. D. Maoz, A. Sternberg, and E.M. Leibowitz (Eds.), Astronomical Time Series, Proceedings of The Florence and George Wise Observatory $25^{\rm th}$ Anniversary Symposium, *Sp. Sc. Reviews* **85** (1998) 549

1999

514. La cosmologie de la folie amoureuse, *Orion* **57/4** (1999) 30

2000

515. Astrophysics with the NOT – Eds. H. Karttunen & V. Piirola), *Orion* **58/3** (2000) 45

2001

516. Ce que je sais de vous ... disent-ils, Gérard Miller, Stock, Paris, *Orion* **59/2** (2001) 29
517. Sun Symbolism and Cosmology in Michelangelo's 'Last Judgment', Valerie Shrimplin, Truman State Univ. Press, Kirksville, *Observatory* **121** (2001) 184-185

2002

518. Astronomical Observatories and Planetariums of the World, Map Link, Santa Barbara, CA, *Observatory* **122** (2002) 111-113

2004

519. Muller, Ch.: La langue française vue d'Orthonet, Presses Univ. Strasbourg, *Orion* **62/6** (2004) 54

2005

520. Brüggenthies, W. & Dick, W.R.: Biographischer Index der Astronomie – Biographical Index of Astronomy, Acta Historica Astronomiae Vol. 26, Verlag Harri Deutsch, Frankfurt/Main, *Orion* **63/6** (2005) 36

2006

521. Monier R.: Les étoiles et le milieu interstellaire – Introduction à l'astrophysique (cours, exercices et problèmes résolus), Éd. Ellipses, Paris, 2006, xvi + 504 pp., ISBN 2-7298-2786-2, €45, *Le Ciel* **68** (2006) 352

522. Monier R.: Les étoiles et le milieu interstellaire – Introduction à l'astrophysique (cours, exercices et problèmes résolus), Éd. Ellipses, Paris, 2006, xvi + 504 pp., ISBN 2-7298-2786-2, €45, *Orion* **64/6** (2006) 28

2007

523. Kommandosache "Sonnengott" – Geschichte der deutschen Sonnenforschung im Dritten Reich und unter alliierter Besatzung, par Michael P. Seiler, *Acta Historica Astronomiae* Vol. 31, Verlag Harri Deutsch, Frankfurt/Main, 2007, 246 pp., ISBN 978-3-8171-1797-0, €22.80, *Le Ciel* **69** (2007) 98-99

524. Kommandosache "Sonnengott" – Geschichte der deutschen Sonnenforschung im Dritten Reich und unter alliierter Besatzung, par Michael P. Seiler, *Acta Historica Astronomiae* Vol. 31, Verlag Harri Deutsch, Frankfurt/Main, 2007, 246 pp., ISBN 978-3-8171-1797-0, €22.80, *Orion* **65/2** (2007) 33-34

525. Chapati et l'astronome en Inde, par Crézé, Michel, L'Harmattan, Paris, 2007, 48 pp., ISBN 978-2-296-02727-5, €9, *Le Ciel* **69** (2007) 135

526. The Hands-On Guide for Science Communicators – A Step-by-Step Approach to Public Outreach, par Lars Lindberg Christensen, Springer, New York, 2007, xvi + 270 pp., ISBN 0-387-26324-1, €24.95, *Le Ciel* **69** (2007) 135-136

527. The Hands-On Guide for Science Communicators – A Step-by-Step Approach to Public Outreach, par Lars Lindberg Christensen, Springer, New York, 2007, xvi + 270 pp., ISBN 0-387-26324-1, €24.95, *Orion* **65/3** (2007) 34

528. The Hands-On Guide for Science Communicators – A Step-by-Step Approach to Public Outreach, by Lars Lindberg Christensen (Springer, New York), 2007, xvi + 270 pp., 23.5 × 18cm, €24.95 (paperback; ISBN 0-387-26324-1), *Observatory* **127** (2007) 249-250

529. Kommandosache "Sonnengott" – Geschichte der deutschen Sonnenforschung im Dritten Reich und unter alliierter Besatzung, by M.P. Seiler (Acta Historica Astronomiae Vol. 31, Verlag Harri Deutsch, Frankfurt/Main), 2007, 246 pp., 14.5cm × 21cm, €22.80 (paperback; ISBN 978-3-8171-1797-0), *Observatory* **127** (2007) 260-261

530. German Astronomy during Nazi Times (multi-book and article review), *HAD News* **71** (2007) 9-11

2008

531. Von Sonnenuhren, Sternwarten und Exoplaneten – Astronomie in Jena, by R.E. Schielicke (Verlag Dr. Bussert & Stadeler, Jena-Quedlinburg), 2008. Pp. 354, 11.5 × 22.5 cm. Price €24.90 (hardcover, ISBN 978-3-932906-80-0), *HAD News* **72** (2008) 5

532. Von Sonnenuhren, Sternwarten und Exoplaneten – Astronomie in Jena, par R.E. Schielicke, Verlag Dr. Bussert & Stadeler, Jena-Quedlinburg, 2008. 364 pp., ISBN 978-3-932906-80-0, €24.90, *Le Ciel* **70** (2008) 255-256

533. Un globe-trotter de la physique céleste – L'astronome Jules Janssen, by Fr. Launay (Ed. Vuibert & Obs. Paris), 2008, Pp. 282, 15.5 × 24.0 cm. Price €30 (paperback, ISBN 978-2-7117-7069-4 (Vuibert), and 978-2-901057-57-4 (Obs. Paris)), *Observatory* **128** (2008) 413-414

534. Von Sonnenuhren, Sternwarten und Exoplaneten – Astronomie in Jena, by R.E. Schielicke (Verlag Dr. Bussert & Stadeler, Jena-Quedlinburg), 2008. Pp. 354, 11.5 × 22.5 cm. Price €24.90 (hardcover, ISBN 978-3-932906-80-0), *Observatory* **128** (2008) 243-244

535. François Arago, un savant généreux – Physique et astronomie au XIXe siècle, by James Lequeux (Ed. EDP Sciences & Obs. Paris, Paris, 2008), *HAD News* **73** (2008) 5

536. Un globe-trotter de la physique céleste – L'astronome Jules Janssen, by Françoise Launay (Ed. Vuibert & Obs. Paris), *HAD News* **73** (2008) 8-9

537. François Arago, un savant généreux – Physique et astronomie au XIXe siècle, by James Lequeux (EDP Sciences & Observatoire de Paris, Paris), 2008. Pp. 524, 16 × 24 cm. Price €35 (paperback, ISBN 978-2-86883-999-2 & 978-2-901057-56-7), *Observatory* **128** (2008) 501-502

538. La méridienne de France et l'aventure de sa prolongation jusqu'aux Baléares, by Pierre Bayart, with a foreword by Jean-Claude Pecker (L'Harmattan, Paris), 2007.

Pp. 250, 13.5 × 21.5 cm. Price €21.50 (paperback, ISBN 978-2-296-03874-5), *Observatory* **128** (2008) 502-503

539. L'observation en astrophysique, 3rd Edition, by Pierre Léna, Daniel Rouan, François Lebrun, François Mignard & Didier Pelat, with the collaboration of Laurent Mugnier (Ed. EDP Sciences/CNRS Éditions, Paris), 2008. Pp. 742, 15.5 × 32.0 cm. Price €64 (paperback, ISBN 978-2-86883-877-3 [EDP Sciences] & 978-2-271-06744-9 [CNRS Éditions]), *Observatory* **128** (2008) 514

2009

540. Guide de données astronomiques 2009 pour l'observation du ciel – Annuaire du Bureau des Longitudes (EDP Sciences, Paris); 15,5cm × 24cm; broché; 2008, 416 pp., prix: €29 (ISBN 978-2-7598-0352-1), *Le Ciel* **71** (2009) 10-11

541. Agenda astronomique 2009 (EDP Sciences, Paris); 16cm × 21cm; reliure spirale; 2008, 180 pp., prix: €14 (ISBN 978-2-7598-0094-0), *Le Ciel* **71** (2009) 11

542. Un astronome des lumières – Jérôme Lalande, by Simone Dumont with a foreword by Jean-Claude Pecker (Ed. Vuibert/Observatoire de Paris, Paris), 2007. Pp. 360, 15.5 × 24.0 cm. Price €35 (paperback, ISBN 978-2-7117-4028-4 & 978-2-901057-54-3), *Observatory* **129** (2009) 35-36

543. La Carte du Ciel, edited by Jérôme Lamy (EDP Sciences, Paris, 2008), *HAD News* **74** (2009) 3+6

544. Un Astronome des Lumières: Jérôme Lalande, by Simone Dumont (Ed. Vuibert/Observatoire de Paris, Paris, 2007), *HAD News* **74** (2009) 7-8

545. Lettres à Madame du Pierry et au Juge Honoré Flaugergues – Lalandiana I by Jérôme Lalande, edited, annotated and commented by Simone Dumont and Jean-Claude Pecker (Ed. Vrin, Paris), *HAD News* **74** (2009) 8

546. La carte du ciel, ouvrage collectif édité par J. Lamy (EDP Sciences, Paris); 16cm × 24cm; broché; 2008, 252 pp., prix: €29 (ISBN 978-2-7598-0057-5), *Le Ciel* **71** (2009) 163-164

547. Le méridien de Paris – Une randonnée à travers l'Histoire, par Philip Freriks (Éd. EDP Sciences & Obs. Paris, Paris), 2009, 132 p., 13,5 × 24 cm, €19 (broché, ISBN 978-2-901057-62-8), *Le Ciel* **71** (2009) 204

548. Hidden Universe, par Lars Lindberg Christensen, Robert Fosbury & Robert Hurt (Wiley-VCH, Weinheim), 30 cm × 25 cm, cartonné, 2009, 146 pp., prix: env. €20 (ISBN 978-3-527-40-866-5), *Le Ciel* **71** (2009) 205

549. Guide de localisation des astres, par Chr. Gentili (EDP Sciences, Paris); 16 cm × 24 cm, broché; 2008, 288 pp., prix: €39 (ISBN 978-2-7598-0059-9), *Le Ciel* **71** (2009) 205

550. Un astronome des lumières – Jérôme Lalande, par Simone Dumont avec un avant-propos de Jean-Claude Pecker (Éd. Vuibert/Observatoire de Paris, Paris), 2007,

viii + 360 p., 15,5 × 24.0 cm. Prix €35 (broché, ISBN 978-2-7117-4028-4 & 978-2-901057-54-3) et Lettres à Madame du Pierry et au Juge Honoré Flaugergues – Lalandiana I, par Jérôme Lalande – Textes édités, annotés et commentés par Simone Dumont et Jean-Claude Pecker (Éd. Vrin, Paris), 2007, 272 pp., 13,5 × 20,5 cm. Prix €25 (broché, ISBN 978-2-7116-1939-9), *Le Ciel* **71** (2009) 205-206

551. La Carte du Ciel, edited by J. Lamy (EDP Sciences, Paris), 2008. Pp. 252, 24 × 16 cm. Price €29 (paperback; ISBN 978-2-7598-0057-5), *Observatory* **129** (2009) 222-223

552. Astronomical Applications of Astrometry – Ten Years of Exploitation of the Hipparcos Satellite Data, by M. Perryman (Cambridge University Press), 2009, Pp. 672, 25 × 19.5 cm. Price £70/$140 (hardbound; ISBN 978-0-521-51489-7), *Observatory* **129** (2009) 223

553. Astronomical Applications of Astrometry: Ten Years of Exploitation of the Hipparcos Satellite Data, by Michael Perryman (Cambridge Univ. Press, Cambridge, UK, 2009), *HAD News* **75** (2009) 7

554. Tours du monde. Tours du ciel. Une exploration de l'univers à travers les âges, film by Robert Pansard-Besson (Arkab Productions & EDP Sciences, Paris; set of 4 DVDs + booklet of 274 pp., 2009), *HAD News* **75** (2009) 7

555. Lettres à Madame du Pierry et au Juge Honoré Flaugergues – Lalandiana I, by Jérôme Lalande; texts edited, annotated, and commented by Simone Dumont and Jean-Claude Pecker (Ed. Vrin, Paris), 2007, Pp. 272, 20.5 × 13.5 cm. Price €25 (paperback; ISBN 978-2-7116-1939-9), *Observatory* **129** (2009) 288

556. Le méridien de Paris – Une randonnée à travers l'Histoire, by Philip Freriks (Ed. EDP Sciences & Obs. Paris, Paris), 2009, Pp. 132, 24 × 13.5 cm, Price €19 (paperback; ISBN 978-2-901057-62-8), *Observatory* **129** (2009) 288-289

557. Tours du monde. Tours du ciel. Une exploration de l'univers à travers les âges, film de Robert Pansard-Besson (Arkab Productions & EDP Sciences, Paris); coffret de 4 DVDs + livret de 274 pp.; 2009, prix: €49 (ISBN 978-2-7598-0357-6), *Le Ciel* **71** (2009) 346

558. Guide de données astronomiques 2010 pour l'observation du ciel – Annuaire du Bureau des Longitudes (IMCCE/BDL & EDP Sciences, Paris); 15,5cm × 24cm; broché; 2009, 386 pp.+ 12 cartes, prix: €29 (ISBN 978-2-7598-0466-5), *Le Ciel* **71** (2009) 346

559. Agenda astronomique 2010 (EDP Sciences, Paris); 16cm × 21cm; reliure spirale; 2009, 188 pp. + encart dépliable, prix: €12 (ISBN 978-2-7598-0467-2), *Le Ciel* **71** (2009) 346

560. Tours du monde. Tours du ciel. Une exploration de l'univers à travers les âges, film by Robert Pansard-Besson (Arkab Productions & EDP Sciences, Paris), 2009. Set of 4 DVDs + booklet of 274 pp. Price: €49 (ISBN 978-2-7598-0357-6), *Observatory* **129** (2009) 395-396

2010

561. Verre d'optique et lunettes astronomiques, par Philippe Véron, Éd. Fondazione Giorgio Ronchi, Florence, 2009, 456 pp., 16,5cm × 23,0cm (prix inconnu, broché, ISBN 978-88-88649-22-1), *Le Ciel* **72** (2010) 202

562. Verre d'optique et lunettes astronomiques, by Philippe Véron (Ed. Fondazione Giorgio Ronchi, Florence), 2009, Pp. 456, 23.0 × 16.5 cm. Price €67.50 (Europe, about £60) or €70 (North America) (paperback, ISBN 978-88-88649-22-1), *Observatory* **130** (2010) 177-178

2011

563. Taking Possession of Astronomy – Frontispieces and Illustrated Title Pages in 17th-Century Books on Astronomy, par Inga Elmqvist Söderlund (Éd. Center for History of Science, Royal Swedish Academy of Sciences, Stockholm), 2010, 400 pages, 17cm × 24cm, prix: SEK 150 (environ €16), broché, ISBN 978-91-7190-137-8, *Le Ciel* **73** (2011) 303

564. Taking Possession of Astronomy – Frontispieces and Illustrated Title Pages in 17th-Century Books on Astronomy, by Inga Elmqvist Söderlund (Ed. Center for History of Science, Royal Swedish Academy of Sciences, Stockholm), 2010. Pp. 400, 17cm × 24cm. Price: SEK 150 (about €16), Paperback (ISBN 978-91-7190-137-8). *Observatory* **131** (2011) 399

2014

565. Mission à Berlin, Lettres à Jean III Bernoulli et à Elert Bode – Lalandiana II, par Jerôme Lalande, Textes édités, annotés et commentés par Simone Dumont et Jean-Claude Pecker (Éd. Vrin, Paris), 2014. Pp 390, 13.5 × 20,5cm. Price €34 (Broché, ISBN 978 2 7116 2537 6), *Le Ciel* **76** (2014) 360

566. Mission à Berlin, Lettres à Jean III Bernoulli et à Elert Bode – Lalandiana II, by Jerôme Lalande, edited by Simone Dumont & Jean-Claude Pecker (Ed. Vrin, Paris), 2014. Pp 390, 13.5 × 20.5cm. Price €34 (about £28) (paperback; ISBN 978 2 7116 2537 6), *Observatory* **134** (2014) 288-289

Public Outreach Papers

Note: The following list gathers together papers directed at amateur astronomers and the public at large. See also the column *Les Potins d'Uranie* (p. 461) and the bibliographical reviews (p. 445).

1967

567. Requiescat in pace ... L'espace à trois dimensions (**A. Heck**), *Notre Trait d'Union* (juin 1967) 1-2
568. La kometoj, tiuj teruraj astroj (**A. Heck**), *Esperantista Amikeco* (oktobro 1967) 11-12
569. Les ragots de l'astronome (**A. Heck**), *Intégral* (décembre 1967) 4-5

1968

570. La bête noire des mathématiciens (**A. Heck**), *Notre Trait d'Union* (avril 1968) 12
571. Uranie et les hommes (**A. Heck**), *Notre Trait d'Union* (octobre 1968) 5

1969

572. Les géométries non-euclidiennes (**A. Heck**), *Notre Trait d'Union* (mars 1969) 7-9
573. Les éclipses de Soleil (**A. Heck**), *Notre Trait d'Union* (avril 1969) 3
574. Apsida moviĝo kaj stelstrukturo (**A. Heck**), *Scienca Revuo* **20** (1969) 115-124

1970

575. Kiel vivas stelo? (**A. Heck**), *La Migranto* **44** (1970) 18
576. La kometoj, tiuj teruraj astroj! (**A. Heck**), *La Migranto* **45** (1970) 16
577. La lakta vojo (**A. Heck**), *La Migranto* **46** (1970) 13

1971

578. Science et langages (**A. Heck**), *Intermédiaire* (mai 1971) 19
579. Kio estas la Saturna ringo? (**A. Heck**), *Svisa Espero* (septembro 1971) 10
580. La konstelacioj (**A. Heck**), *La Migranto* **49** (1971) 11
581. Hodiaùa universo (**A. Heck**), *Heroldo de Esperanto* **1513** (1971) *Sc. Suppl.* 2

1972

582. Kio pri la dilatiĝo de la universo? (**A. Heck**), *Svisa Espero* (januaro 1972) 10

583. Lunettes et télescopes (**A. Heck**), *Bull. Soc. Astron. Liège* (janvier 1972) 3 pp.
584. Section 'Observations' de la SAL – Bilan d'activités (**A. Heck**), *Bull. Soc. Astron. Liège* (février 1972) 2
585. Les types spectraux stellaires (**A. Heck**), *Bull. Sect. Obs. Soc. Astron. Liège* (février 1972) 1 p.
586. Le Grand Schmidt de l'Observatoire de Haute Provence (**A. Heck**), *Orion* **30** (1972) 138-141

1973

587. Observation de l'occultation des Pléiades par la Lune, le 19 mars 1972 (**A. Heck**), *Ciel et Terre* **89** (1973) 63
588. Erstaufnahme des Kometen Heck-Sause 1973a (**A. Heck**), *Orion* **31** (1973) 53
589. Le Grand Schmidt de l'Observatoire de Haute Provence (**A. Heck**), *l'Astronomie* **87** (1973) 241-250
590. L'éclipse totale de Soleil du 30 juin 1973 (**A. Heck**), *Bull. Soc. Astron. Liège* (décembre 1973) 1-2
591. Tracé d'un cadran solaire sur un mur vertical (**A. Heck**), *Ciel et Terre* **89** (1973) 483-493

1974

592. Prochain retour de la comète périodique Encke 1786I (**A. Heck**), *Orion* **32** (1974) 78-79
593. Comet Encke Makes Another Appearance (**A. Heck**), *Sky & Tel.* **47** (1974) 279
594. Prochain retour de la comète périodique Encke 1786I (**A. Heck**), *Ciel et Terre* **90** (1974) 143-147
595. Comet Bradfield (**A. Heck**), *Sky & Tel.* **47** (1974) 414
596. Un modèle simple d'atmosphère stellaire (**A. Heck**, J. Manfroid), *Orion* **32** (1974) 95-98
597. Les grands télescopes du Max-Planck-Institut für Astronomie (**A. Heck**, J. Manfroid), *Ciel et Terre* **90** (1974) 284-288
598. Observations photographiques de la comète Kohoutek (1973f) au grand télescope de Schmidt franco-liégeois (F. Dossin, **A. Heck**, M. Klutz, J. Manfroid, G. Sause, J.P. Swings, J.M. Vreux), *Ciel et Terre* **90** (1974) 384-387
599. La contribution des astronomes amateurs aux observations cométaires (**A. Heck**), *l'Astronomie* **88** (1974) 318-322

1975

600. L'éclipse de Lune du 29 novembre 1974 (**A. Heck**), *Bull. Soc. Astron. Liège* (janvier 1975) 2
601. La contribution des astronomes amateurs aux observations cométaires (**A. Heck**), *Bull. Soc. Astron. Liège* (janvier 1975) 3-5
602. A propos des comètes observables tout au long de leur orbite (**A. Heck**), *l'Astronomie* **89** (1975) 148
603. Denove pri konstelacioj (**A. Heck**), *Homo kaj Kosmo* **13** (1975) 13-16
604. Nomlisto de konstelacioj (**A. Heck**), *Scienca Revuo* **26** (1975) 3-6

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605. Les comètes et leur observation par les amateurs (**A. Heck**), *Proc. 2ème Séminaire Astron. Pratique Strasbourg* (mars 1974), Éd. Groupe Alsace SAF, Strasbourg (1976) 61-69
606. Astronomio kaj Esperanto (H.M. Maitzen, **A. Heck**), *Heroldo de Esperanto* **1595** (1976) 2
607. Observations stellaires et cométaires (C. Arpigny, F. Dossin, **A. Heck**, M. Klutz, J.P. Swings, J.M. Vreux), *Note Int. Inst. Astrophys. Liège* (avril 1976) 10 pp.
608. Une heureuse combinaison de filtre et d'émulsion astronomiques (**A. Heck**), *Orion* **34** (1976) 32-34
609. Fiche technique de l'observatoire d'Horion-Hozémont (**A. Heck**), *Bull. Soc. Astron. Liège* (juillet 1976) 6
610. Les comètes et leur observation par les amateurs (**A. Heck**), *Bull. Soc. Astron. Liège* (août 1976) 5-8
611. L'observatoire d'Horion-Hozémont (**A. Heck**, A. Lausberg), *Bull. Soc. Astron. Liège* (septembre-octobre 1976) 15-16

1978

612. Les moyens d'investigation de l'astronomie moderne (**A. Heck**), in *Développements Récents en Astronomie*, Éd. Planétarium, Bruxelles (1978) 64-71

1980

613. Possible Meteorite Crater (**A. Heck**), *Meteoros* **10** (1980) 15

1981

614. IUE: le précurseur des télescopes spatiaux (**A. Heck**), *Le Ciel* **43** (1981) 33

1982

615. Une nouvelle lumière sur V348 Sagittarii (**A. Heck**), *Bull. Ass. Française Obs. Étoiles Var.* **21** (1982) 106-108

1983

616. RR Tel: An Interesting Southern Variable (**A. Heck**, J. Manfroid), *IAPPP Comm.* **13** (1983) 9-11

1984

617. Léon Deru (1893-1983) (**A. Heck**), *Le Ciel* **46** (1984) 46
618. De Le Gentil au Concorde (**A. Heck**), *Ciel et Terre* **100** (1984) 46
619. Cyclic RR Telescopii (**A. Heck**, J. Manfroid), *Sky & Tel.* **68** (1984) 4
620. IRAS ou le ciel with des yeux infrarouges (**A. Heck**), *Ciel et Terre* **100** (1984) 163-167

1985

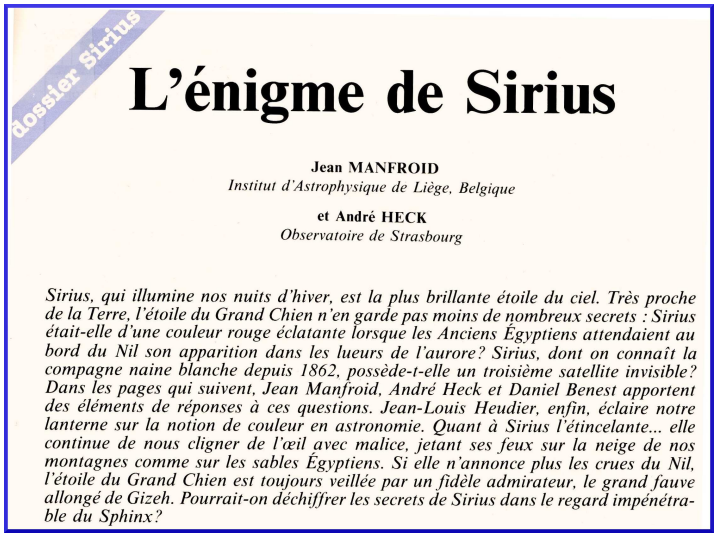
621. Catch the Minima: A Real Challenge on V348 Sgr (**A. Heck**, J. Manfroid), *IAPPP Comm.* **20** (1985) 31-36
622. Un véritable défi: les minimums de V348 Sgr (**A. Heck**, J. Manfroid), *Bull. Ass. Française Obs. Étoiles Var.* **33** (1985) 11-15
623. Germaine Wolff (1901-1985) (**A. Heck**), *Le Ciel* **47** (1985) 264
624. Astronomes amateurs et observations cométaires (**A. Heck**), *Ciel et Terre* **101** (1985) 115-120

1986

625. Le centre de données astronomiques de Strasbourg (**A. Heck**), *Ciel et Terre* **102** (1986) 81-82
626. Titres des périodiques astronomiques (**A. Heck**, J. Manfroid), *Ciel et Terre* **102** (1986) 121-122
627. L'énigme de Sirius (J. Manfroid, **A. Heck**), *Le Ciel* **48** (1986) 310-313
628. A propos de la couleur de Sirius (J. Manfroid, **A. Heck**), *Ciel et Terre* **102** (1986) 151-152

1987

629. L'énigme de Sirius (J. Manfroid, **A. Heck**), *Ciel et Espace* **215** (janvier-février 1987) 30-33
630. Dates de fondation des sociétés astronomiques (**A. Heck**, J. Manfroid), *Ciel et Terre* **103** (1987) 11-13
631. Menaces spatiales (**A. Heck**), *Ciel et Terre* **103** (1987) 79-80
632. Le centre de données astronomiques de Strasbourg (**A. Heck**), *Orion* **45** (1987) 113-115



dossier Sirius

L'énigme de Sirius

Jean MANFROID
Institut d'Astrophysique de Liège, Belgique
et André HECK
Observatoire de Strasbourg

Sirius, qui illumine nos nuits d'hiver, est la plus brillante étoile du ciel. Très proche de la Terre, l'étoile du Grand Chien n'en garde pas moins de nombreux secrets : Sirius était-elle d'une couleur rouge éclatante lorsque les Anciens Égyptiens attendaient au bord du Nil son apparition dans les lueurs de l'aurore? Sirius, dont on connaît la compagne naine blanche depuis 1862, possède-t-elle un troisième satellite invisible? Dans les pages qui suivent, Jean Manfroid, André Heck et Daniel Benest apportent des éléments de réponses à ces questions. Jean-Louis Heudier, enfin, éclaire notre lanterne sur la notion de couleur en astronomie. Quant à Sirius l'étincelante... elle continue de nous cligner de l'œil avec malice, jetant ses feux sur la neige de nos montagnes comme sur les sables Égyptiens. Si elle n'annonce plus les crues du Nil, l'étoile du Grand Chien est toujours veillée par un fidèle admirateur, le grand fauve allongé de Gizeh. Pourrait-on déchiffrer les secrets de Sirius dans le regard impénétrable du Sphinx?

Fig. 235: Publ. 627 in the Sep. 1986 issue of "Le Ciel" was reproduced by two magazines, the Belgian "Ciel et Terre" (Publ. 628) and the French "Ciel et Espace" (Publ. 629, header illustrated above). With reference, among other sources, to ancient Chinese reports, that paper stated the stability of the color of Sirius over the historical scale, contrary to what had been published here and there. Other authors, years later, claimed discovery of the same stability (see e.g. "Nature" 347, 1990, 625), ignoring Manfroid & Heck's papers! This can also be seen as a case of editors and referees not doing their job properly.

633. De constellacionibus (**A. Heck**), *Ciel et Terre* **103** (1987) 113-114

1988

634. Les répertoires astronomiques IDAAS et IDPAI (**A. Heck**), *Orion* **47** (1989) 192-194

635. La contribution des astronomes amateurs aux observations cométaires (**A. Heck**), in *La contribution des astronomes amateurs à l'astronomie*, Éd. M. Gerbaldi, Observations & Travaux Soc. Astron. France **2-3** (1988) 64-65

636. The Contribution of Amateur Astronomers to Cometary Observations (**A. Heck**), in *Stargazers*, Eds. S. Dunlop & M. Gerbaldi, Springer-Verlag, Heidelberg (1988) 152

1990

637. Applications de l'intelligence artificielle aux projets astronomiques et spatiaux (**A. Heck**), *Ciel et Terre* **106** (1990) 21-22

638. L'intelligence artificielle pour les projets astronomiques et spatiaux? (**A. Heck**), *Orion* **48** (1990) 58 + 67-68

1996

639. Facettes et challenges de l'évolution du traitement de l'information (**A. Heck**), *Ciel et Terre* **112** (1996) 103-113
640. Navigation cybercosmique (**A. Heck**), *Ciel et Terre* **112** (1996) 179-185

1997

641. An Alternative to Selling Stars (**A. Heck**), *Sky & Tel.* **93** (March 1997) 6
642. Sirius et les Dogons (**A. Heck**), *Orion* **55/3** (1997) 31-32
643. Roses et épines en navigation cybercosmique (**A. Heck**), *Orion* **55/5** (1997) 26-28

1998

644. Nul n'est prophète ... (**A. Heck**), *Ciel et Espace* **333** (Février 1998) 15
645. Aucun progrès en un siècle? (**A. Heck**), *Orion* **56/2** (1998) 23-24
646. Étoiles à adopter (**A. Heck**), *Ciel et Espace* (juin 1998) 15
647. Astronomy Around the World (**A. Heck**), *Astronomy Now* (August 1998) 52-53

2000

648. Where the Astronomers Are: A Stagnant Century (**A. Heck**), *Sky & Tel.* **99** (January 2000) 32-35
649. Des observatoires virtuels? (**A. Heck**), *Orion* **58/3** (2000) 19
650. Amateur and Professional Astronomers in Associations (**A. Heck**), *Orion* **58/4** (2000) 19

2001

651. Un bon rang pour l'Astronomie (**A. Heck**), *l'Astronomie* **115** (2001) 200

2002

652. Créativité en arts et sciences: Mêmes recettes? (**A. Heck**), *Orion* **60/1** (2002) 37-38
653. La pollution lumineuse – Un colloque très réussi (**A. Heck**), *Orion* **60/3** (2002) 29-32
654. La pollution lumineuse: un colloque historique (**A. Heck**), *Le Ciel* **64** (2002) 160-163

2003

655. Où les étoiles et les robinets d'eau ne sont pas d'accord [excerpt] (**A. Heck**), *Aquanews* **134** (2003) 16

656. L'Observatoire Astronomique de Strasbourg et son histoire multinationale – 1ère partie: Le contexte (**A. Heck**), *Orion* **61/6** (2003) 16-19

2004

657. L'Observatoire Astronomique de Strasbourg et son histoire multinationale – 2ème partie: Les directeurs (**A. Heck**), *Orion* **62/1** (2004) 11-15
658. L'Observatoire Astronomique de Strasbourg et son histoire multinationale – 3ème partie: Des instruments et des grands projets (**A. Heck**), *Orion* **62/2** (2004) 4-9
659. L'Observatoire Astronomique de Strasbourg et son histoire multinationale – 4ème partie: Encore quelques grands hommes (**A. Heck**), *Orion* **62/3** (2004) 21-26

2005

660. Strasbourg Observatory: A Multinational History (**A. Heck**), *Mercury* **34/4** (2005) 32-37

2006

661. Les globes de Vincenzo Coronelli (1650-1718): Génie ou mégalomanie? (**A. Heck**), *Orion* **64/2** (2006) 16-21

2007

662. Les grands globes de Coronelli restaurés (**A. Heck**), *Orion* **65/3** (2007) 21-22
663. Vincenzo Coronelli (1650-1718): Globes & Co. (**A. Heck**), *Le Ciel* **69** (2007) 176-185
664. L'observatoire astronomique de Strasbourg de 1977 à nos jours (**A. Heck**), *Ann. Soc. Amis Vieux Strasbourg* **XXXII** (2007) 137-154

2009

665. L'observatoire wilheminien de Strasbourg (**A. Heck**), *L'Astronomie* **19** (sept. 2009) 42-46
666. La villégiature pyrénéenne de la lunette méridienne de Liège (J.M. Rousseau, **A. Heck**), *Le Ciel* **71** (2009) 326-330

2011

667. Les premiers observatoires strasbourgeois (**A. Heck**), *l'Astronomie* **43** (octobre 2011) 34-40

2012

668. Eine Sternwarte als Spielball der Politik – Die deutsch-französische Vergangenheit des Straßburger Observatoriums (V. Witt, **A. Heck**), *Sterne u. Weltraum* **2** (2012) 82-88

2014

669. L'Observatoire de Strasbourg dans la première guerre mondiale (**A. Heck**), *l'Astronomie* **77** (novembre 2014) 40-45



Fig. 236: A number of papers published in the "Potins d'Uranie" column (p. 461) resulted from interviews of artists with astronomy-related works such as (from top to bottom): Stephanie Rayner (Publ. 822), Liz Bohlen (Publ. 846) and Ghislaine Guygot (Publ. 820). Some of Rayner's works included in the present volume were already illustrating the editorials of the OSA/OPSA series (Fig. 190 & 231): "Galileo's Eyelid" (Fig. 198) in OSA 4, "Labyrinth" (Fig. 188) in OSA 7, "Dialogue Concerning Two Chief World Systems" in OPSA 1 and "Solar Boat" (Fig. 191) in OPSA 2. Guygot's terracotta astronomers were pictured in OSA 4; Bohlen's "Celestial Embrace" (Fig. 192) in OSA 7; Gerling's "Constellation" (Fig. 223) in OSA 7 too while her "Emergence of Knowledge" was reproduced on the cover of the edited volume "Information Handling in Astronomy – Historical Vistas" (Fig. 163). Other artists were also given visibility in Heck's publications, such as Paul Delvaux (Publ. 767 & 910) with his "Astronomers" (Fig. 159) in OSA 6, his "Phases of the Moon II" (Fig. 196) in OSA 7, and his "Phases of the Moon III" (Fig. 197) in OSA 4. Anselm Kiefer's works were reproduced in OPSA 1 ("Heavenly Palaces 2 [Böotes]") and OPSA 2 ("Heavenly Palaces 1 [Hydra]"), while Ludek Pesek had a full chapter together with a CD-ROM in OSA 5 under the invited authorship of Noël Cramer.

Column "Les Potins d'Uranie"

Note: The following list gathers together the papers published within the column *Les Potins d'Uranie* in several magazines under the pen name *Al Nath*. When the same paper was printed in several journals, all the references appear under the first one (chronologically). Translations and compilations are listed at the end of this section. The full texts of the articles are available on the web[261].

1977

670. Ho et Hi(c), *Bull. Soc. Astron. Liège* (juin 1977) 13
671. Ah! ces comètes ..., *Bull. Soc. Astron. Liège* (septembre 1977) 28
672. L'astrologue de Louis XI, *Bull. Soc. Astron. Liège* (novembre 1977) 19

1978

673. Euler versus Diderot, *Bull. Soc. Astron. Liège* (janvier 1978) 22
674. Binamé Tchantchès, *Bull. Soc. Astron. Liège* **40** (1978) 46
675. Pastiche astronomique, *Bull. Soc. Astron. Liège* **40** (1978) 66
676. Rira bien qui ..., *Bull. Soc. Astron. Liège* **40** (1978) 118
677. Qui s'y frotte, s'y brûle, *Bull. Soc. Astron. Liège* **40** (1978) 169
678. Lick, *Bull. Soc. Astron. Liège* **40** (1978) 198
679. Filtre lux, *Bull. Soc. Astron. Liège* **40** (1978) 216

1979

680. Ee-Ee-Toy, *Bull. Soc. Astron. Liège* **41** (1979) 112
681. Al Nath, *Bull. Soc. Astron. Liège* **41** (1979) 222

1980

682. Newton, *Le Ciel* **42** (1980) 174

1981

683. L'Univers Illustré, *Le Ciel* **43** (1981) 46
684. Éclipses, *Le Ciel* **43** (1981) 82
685. De Le Gentil au Concorde, *Le Ciel* **43** (1981) 192

1982

686. Lune-tu-cru?, *Le Ciel* **44** (1982) 66-67

[261] http://www.potinsduranie.org/

687. Crédulationnisme, *Le Ciel* **44** (1982) 82-83
688. Le calendrier, *Le Ciel* **44** (1982) 111-112
689. L'âge de l'univers, *Le Ciel* **44** (1982) 135
690. Somnium, *Le Ciel* **44** (1982) 153-154
691. L'U.A.I., *Le Ciel* **44** (1982) 204-205
692. Le rapport Field, *Le Ciel* **44** (1982) 223-225
693. Les constellations, *Le Ciel* **44** (1982) 276-278

1983

694. L'E.S.O., *Le Ciel* **45** (1983) 5-7
695. Le minimum de Maunder, *Le Ciel* **45** (1983) 33-35
696. Sculpture spatiale, *Le Ciel* **45** (1983) 57-58
697. YoupiiIUE!, *Le Ciel* **45** (1983) 81-83
698. A. Koestler, *Le Ciel* **45** (1983) 111-112
699. Et platati, et platata ..., *Le Ciel* **45** (1983) 164-166
700. Astronart, *Le Ciel* **45** (1983) 173-174
701. Catalogues, *Le Ciel* **45** (1983) 196-198
702. Dinosaures première, *Le Ciel* **45** (1983) 226-228
703. Parasites terrestres, *Le Ciel* **45** (1983) 258-259

1984

704. Dinosaures deuxième, *Le Ciel* **46** (1984) 8-11
705. A propos du Télescope Spatial, *Ciel et Terre* **100** (1984) 47-48 + *Le Ciel* **46** (1984) 30-33
706. Geminga, *Le Ciel* **46** (1984) 58-61
707. IRAS ou le ciel avec des yeux infrarouges, *Le Ciel* **46** (1984) 91-97
708. Le SETI, *Le Ciel* **46** (1984) 122-124
709. Opération Sésame, *Le Ciel* **46** (1984) 151-152
710. L'amateur, *Le Ciel* **46** (1984) 196
711. Retraite spatiale, *Le Ciel* **46** (1984) 217-219
712. Le temps universel, *Le Ciel* **46** (1984) 243-247
713. NGC 4151 amaigri, *Le Ciel* **46** (1984) 270-272

1985

714. Opération Sésame radio, *Le Ciel* **47** (1985) 7-9
715. Les canaux de Mars, *Le Ciel* **47** (1985) 33 + 39-41
716. Tintin en Uranie, *Le Ciel* **47** (1985) 62
717. Credo, *Le Ciel* **47** (1985) 91-94
718. Their slip is showing, *Le Ciel* **47** (1985) 125-127
719. Télé-télescope, *Le Ciel* **47** (1985) 151-153
720. Giotto, *Le Ciel* **47** (1985) 189-196
721. Le méridien zéro, *Le Ciel* **47** (1985) 240-241
722. L'International Halley Watch, *Le Ciel* **47** (1985) 260-262
723. Une boucle de Halley, *Le Ciel* **47** (1985) 299-301
724. Découvertes cométaires, *Ciel et Terre* **101** (1985) 115-120 + *Le Ciel* **48** (1986) 204-210

1986

725. Le Château des Étoiles, *Le Ciel* **48** (1986) 1 + 4-6
726. Droit spatial, *Le Ciel* **48** (1986) 55-57
727. Météo-comique, *Le Ciel* **48** (1986) 99-100
728. Nouvelles DelhI-A-U, *Le Ciel* **48** (1986) 148-150
729. Noms de comètes, *Le Ciel* **48** (1986) 253-254
730. Le centre de données astronomiques de Strasbourg, *Le Ciel* **48** (1986) 300-302
731. Le Traité de la Lune, *Le Ciel* **48** (1986) 347-348
732. L'altitude des satellites artificiels, *Le Ciel* **48** (1986) 381-383
733. Condamine story, *Le Ciel* **48** (1986) 409-412

1987

734. Le bureau central des télégrammes astronomiques, *Le Ciel* **49** (1987) 6-8 (Dutch translation as Publ. 929)
735. Opération Sésame spatiale, *Le Ciel* **49** (1987) 42-43
736. Aliboronade, *Le Ciel* **49** (1987) 85-86
737. Star biz, *Le Ciel* **49** (1987) 123-125
738. Space biz, *Le Ciel* **49** (1987) 172-177 + *Orion* **45** (1987) 150-152
739. Astro biz, *Le Ciel* **49** (1987) 209-212

740. La place des amateurs, *Le Ciel* **49** (1987) 254-259 + *Orion* **45** (1987) 226-227
741. Juste ciel!, *Le Ciel* **49** (1987) 291-292
742. L'ICSU, *Le Ciel* **49** (1987) 319-321
743. Jules Verne, *Le Ciel* **49** (1987) 346-348

1988

744. Parano-mique, *Le Ciel* **50** (1988) 10
745. Le GEOS, *Le Ciel* **50** (1988) 52-54 + *Orion* **46** (1988) 74-75
746. Le COSPAR, *Le Ciel* **50** (1988) 79-81
747. Astro quiz, *Le Ciel* **50** (1988) 107
748. Réponses de l'Astro quiz, *Le Ciel* **50** (1988) 136

1989

749. Embrouillamétriques, *Orion* **47** (1989) 236-239

1990

750. Où les étoiles et les robinets d'eau ne sont pas d'accord, *Orion* **48** (1990) 204-206 + *Le Ciel* **63** (2001) 277-280 + *Aquanews* **134** (2003) [excerpt]

1991

751. Batman, Locke, Poe & Cie., *Orion* **49** (1991) 52-53

1992

752. La communication en astronomie, *Orion* **50** (1992) 66-70
753. L'observation astronomique au futur, *Orion* **50** (1992) 147-151

1993

754. Le rôle croissant des bibliothécaires dans la recherche de l'information en astronomie, *Orion* **51** (1993) 42-43
755. Trois légendes de 'Down Under', *Orion* **51** (1993) 218-220 (German translation as Publ. 932)

1994

756. Atacama fiction, *Orion* **52** (1994) 188-190
757. Maoris, Rona, Maaui & Te Raa, *Orion* **52** (1994) 245-246
758. Légendes des longues nuits arctiques, *Orion* **52** (1994) 275-276 (German translation as Publ. 933)

1995

759. Plus de grâce pour le ciel?, *Orion* **53** (1995) 268-269
760. La 'tapisserie' de Bayeux, *Orion* **53** (1995) 318

1996

761. Le chat à l'envers, *Orion* **54** (1996) 37
762. Cosmic BD, *Orion* **54** (1996) 163
763. Légendes de Patagonie, *Orion* **54** (1996) 288 (German translation as Publ. 930)

1997

764. Légendes de Californie, *Orion* **55/2** (1997) 17 (German translation as Publ. 931)
765. Rayons verts, *Orion* **55/3** (1997) 32-33
766. Haut les étoiles!, *Ciel et Terre* **113** (1997) 134-135
767. Delvaux en Uranie, *Orion* **55/5** (1997) 29-30
768. Roy Lichtenstein (1923-1997), *Orion* **55/6** (1997) 33

1998

769. Plic, ploc, pLick, *Orion* **56/1** (1998) 36
770. Indiens d'Amérique, *Orion* **56/2** (1998) 26-27
771. Mercure au télescope, *Orion* **56/2** (1998) 27-28
772. The Griffith Observatory, *Orion* **56/2** (1998) 29
773. Le septième ciel, *Orion* **56/2** (1998) 29-30
774. Cave media, *Orion* **56/3** (1998) 39-41
775. Le droit de rester 'internelligent', *Orion* **56/4** (1998) 39-40
776. L'univers d'Escher, *Orion* **56/6** (1998) 31-32

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777. Clips d'éclipses, *Orion* **57/1** (1999) 31
778. Les trois soleils de McCullogh, *Orion* **57/1** (1999) 32
779. L'étoile des Fagnes, *Orion* **57/2** (1999) 20-22
780. Va-t-on encore marcher sur la Lune?, *Orion* **57/2** (1999) 23
781. La nuit du coyote, *Orion* **57/3** (1999) 3.1
782. Le poète du Nord Gelé, *Orion* **57/3** (1999) 3.4
783. Le ciel sur la tête, *Orion* **57/4** (1999) 4.3-4
784. L'éclipse de Perry, *Orion* **57/5** (1999) 22
785. Polluciel, *Orion* **57/5** (1999) 5.3-4
786. Space biz bis, *Orion* **57/6** (1999) 30-31
787. Abelardo Morell et l'oeil de ses lentilles, *Orion* **57/6** (1999) 31-32

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788. Le vieil homme et Rigel, *Orion* **58/1** (2000) 30
789. Artisan du méridien, *Orion* **58/1** (2000) 1.6
790. La grenouille dans la Lune, *Orion* **58/2** (2000) 2.2-3
791. L'appel de la Baie, *Orion* **58/2** (2000) 2.3
792. La piste du maïs, *Orion* **58/3** (2000) 22
793. Les grands chambardements, *Orion* **58/4** (2000) 17-18
794. La tour de 300 mètres ... et la coupole du 200 francs, *Orion* **58/5** (2000) 38-39
795. L'Arlésienne, *Orion* **58/6** (2000) 29
796. Les masqués de la Pierre de Lune, *Orion* **58/6** (2000) 29-30
797. Rendez-vous à Sydney, *Orion* **58/6** (2000) 31

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798. Le prudent lever du Soleil, *Orion* **59/1** (2001) 32
799. Baiona et les indiens, *Orion* **59/2** (2001) 23-25
800. L'heure de Djakarta, *Orion* **59/2** (2001) 2.6-2.7
801. Ursa Major, *Orion* **59/3** (2001) 32-33
802. La peau du ciel, *Orion* **59/4** (2001) 34
803. Le Grand Feu, *Orion* **59/5** (2001) 24-26 (German translation as Publ. 934)
804. La tyrannie du communiqué, *Le Ciel* **63** (2001) 242-243
805. Well, Wells + Welles = Panic!, *Orion* **59/6** (2001) 35

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806. Zepp de ligne, *Orion* **60/1** (2002) 38-40
807. La qualité de la vie, *Orion* **60/1** (2002) 1.3-1.4
808. Le nouvel Eldorado, *Orion* **60/2** (2002) 2.7-2.8 (German translation as Publ. 935)
809. Bouquins célestes, *Le Ciel* **64** (2002) 83-85
810. À la Stöffler, *Orion* **60/3** (2002) 27-28
811. Tout faux, tout flammes, *Orion* **60/4** (2002) 32-33
812. L'exilé de Hauteville House, *Orion* **60/4** (2002) 35-36
813. Contrails, *Orion* **60/5** (2002) 34-35
814. La grande peur de Djusse, *Orion* **60/6** (2002) 23-26
815. Herschel en Ibérie, *Orion* **60/6** (2002) 26-27 + *Le Ciel* **66** (2004) 48-52

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816. Coulisses, *Orion* **61/1** (2003) 1.7-1.8
817. Le pavé de Saint-Jacques, *Orion* **61/1** (2003) 28 + *Le Ciel* **65** (2003) 124-127
818. Chambres obscures, *Le Ciel* **65** (2003) 21-24
819. Vespertilio homo, *Orion* **61/2** (2003) 43-44 (German translation as Publ. 937)
820. Les petits miraculés de l'univers, *Orion* **61/4** (2003) 35-37
821. Singlés!, *Orion* **61/4** (2003) 37-38 (German translation as Publ. 936)
822. L'univers de Stephanie Rayner, *Orion* **61/5** (2003) 39-41
823. Le carton rouge de Mars, *Orion* **61/6** (2003) 37 (German translation as Publ. 938)

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824. Scots Story, *Orion* **62/1** (2004) 1.3-1.4
825. Chariots célestes, *Orion* **62/2** (2004) 67 (German translation as Publ. 939)
826. Le merle et les crapauds, *Orion* **62/4** (2004) 31-32
827. Influences cosmiques?, *Orion* **62/4** (2004) 32-33
828. Les étoiles des sapins de Noël, *Orion* **62/6** (2004) 50 + *Le Ciel* **67** (2005) 128
829. Méphisto, *Orion* **62/6** (2004) 50-51
830. L'éclipse de Gabriel García Márquez, *Orion* **62/6** (2004) 6.4

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831. L'Einstein du Merlion, *Orion* **63/2** (2005) 38-39
832. La Lune rousse, *Orion* **63/2** (2005) 2.3-2.4
833. Le catalogue d'Hipparque retrouvé?, *Orion* **63/3** (2005) 35-36
834. La paupière du ciel, *Orion* **63/3** (2005) 37
835. L'Association Française des Observateurs d'Étoiles Variables (AFOEV), *Orion* **63/4** (2005) 28-29 + *Le Ciel* **67** (2005) 274-276
836. Les castors retors, *Orion* **63/4** (2005) 32-33
837. Le tir à la pastèque, *Orion* **63/5** (2005) 31-32
838. Lu mohèt, *Orion* **63/5** (2005) 5.7-5.8 + *Le Ciel* **67** (2005) 354-356
839. Berlin Story, *Orion* **63/6** (2005) 34
840. Le spirou grigou, *Orion* **63/6** (2005) 6.4 + *Le Ciel* **68** (2006) 127-128

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841. Les pavés de Paris, *Orion* **64/2** (2006) 24-26

842. La grue volage, *Orion* **64/2** (2006) 27
843. Brouillards planétaires, *Orion* **64/4** (2006) 27-29
844. Le "truc d'Ernest", *Orion* **64/5** (2006) 26-27
845. L'axe du monde, *Orion* **64/5** (2006) 28-29
846. Étreinte céleste, *Orion* **64/5** (2006) 30-31
847. Pas de pot pour Pluton (plus pleinement planète), *Orion* **64/6** (2006) 18-21
848. Wikikwa?, *Orion* **64/6** (2006) 21-22
849. L'oeil de Pékin, *Orion* **64/6** (2006) 23-26

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850. La Société des Connaissances Nébuleuses, *Orion* **65/1** (2007) 24
851. Ya-hoh!, *Orion* **65/1** (2007) 24-26
852. Le bouvier salvateur, *Orion* **65/1** (2007) 26-27 + *Le Ciel* **70** (2008) 126-129
853. Les mohètes, *Orion* **65/1** (2007) 28-29
854. Les pompiers de Seattle, *Le Ciel* **69** (2007) 102-105 + *Orion* **65/2** (2007) 29-31
855. Plutonisé!, *Orion* **65/3** (2007) 32
856. Encore des abus de langage ..., *Le Ciel* **69** (2007) 150-152 + *Orion* **65/3** (2007) 32-33
857. Communiquer l'astronomie au public, *Le Ciel* **69** (2007) 303-306
858. Pas mieux là-haut?, *Le Ciel* **69** (2007) 332-335

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859. Le chien qui fume, *Le Ciel* **70** (2008) 22-27
860. Le chat du Hanscroufe, *Le Ciel* **70** (2008) 46-49
861. Missing Cheetah, *Le Ciel* **70** (2008) 78-84
862. Les sourires du ciel, *Le Ciel* **70** (2008) 182-185
863. Le belvédère des étoiles, *Le Ciel* **70** (2008) 212-216
864. L'astronomie allemande à l'époque nazie, *Le Ciel* **70** (2008) 258-263
865. La chaise de Cassiopée, *Le Ciel* **70** (2008) 308-310
866. Le loup du houx, *Le Ciel* **70** (2008) 351-354
867. Stanley, *Le Ciel* **70** (2008) 392-398

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868. Les trains de traîneaux, *Le Ciel* **71** (2009) 12-17

869. Perdus?, *Le Ciel* **71** (2009) 58-62
870. Le coyote, les loups et les flèches, *Le Ciel* **71** (2009) 108-111
871. Faute de grives ..., *Le Ciel* **71** (2009) 126-129
872. Pipistrelles et tarentules, *Le Ciel* **71** (2009) 178-180
873. L'hercule-centaure, *Le Ciel* **71** (2009) 219-221
874. Les vieilles pies, *Le Ciel* **71** (2009) 266-269
875. L'étoile des Fagnes [rev.], *Le Ciel* **71** (2009) 388-391

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876. La petite lumière, *Le Ciel* **72** (2010) 16-17
877. Les masqués de la pierre de Lune [rev.], *Le Ciel* **72** (2010) 60-62
878. Le Grand Feu [rev.], *Le Ciel* **72** (2010) 113-115
879. Lu neûr djâle, *Le Ciel* **72** (2010) 160-165
880. Les castors retors [rev.], *Le Ciel* **72** (2010) 192-193
881. La ronde des macrales, *Le Ciel* **72** (2010) 228-235
882. Artistes bruts, *Le Ciel* **72** (2010) 274-276
883. La vieille poule grise, *Le Ciel* **72** (2010) 316
884. Le merle et les crapauds [rev.], *Le Ciel* **72** (2010) 355-357
885. Les cornues, *Le Ciel* **72** (2010) 407-413

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886. Singlés! [rev.], *Le Ciel* **73** (2010) 33-35
887. Reflets sépia, *Le Ciel* **73** (2010) 71-73
888. IUE: Tranquille faiseur d'histoire, *Le Ciel* **73** (2010) 91-95
889. La croix vagabonde, *Le Ciel* **73** (2010) 132-136
890. Grand Central Terminal, *Le Ciel* **73** (2010) 180-183
891. Sofia, *Le Ciel* **73** (2010) 216-219
892. Phénix impérial, *Le Ciel* **73** (2010) 256-258
893. Êtres d'eau, *Le Ciel* **73** (2010) 296-302
894. La grande peur de Djusse [rev.], *Le Ciel* **73** (2010) 346-351
895. La vue de Magellan, *Le Ciel* **73** (2011) 388-393

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896. Ces vieux astronomes ..., *Le Ciel* **74** (2012) 14-17

897. Chevelures, *Le Ciel* **74** (2012) 52-55
898. L'axe du monde, *Le Ciel* **74** (2012) 114-118
899. Dr. Faust, *Le Ciel* **74** (2012) 142-146
900. Noctua, *Le Ciel* **74** (2012) 174-177
901. Flèches célestes, *Le Ciel* **74** (2012) 224-227
902. L'AAS et ses soeurs, *Le Ciel* **74** (2012) 258-259
903. La grue volage [rem], *Le Ciel* **74** (2012) 295-298
904. Babayes, *Le Ciel* **74** (2012) 334-338
905. Le "truc d'Ernest" [rev.], *Le Ciel* **74** (2012) 373-375

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906. Les mohètes [rev.], *Le Ciel* **75** (2013) 15-17
907. Rangifer, *Le Ciel* **75** (2013) 64-65
908. Custos messium, *Le Ciel* **75** (2013) 100-102
909. Ya-hoh! [rev.], *Le Ciel* **75** (2013) 140-143
910. Paul Delvaux en Uranie, *Le Ciel* **75** (2013) 199-203
911. Timbrés!, *Le Ciel* **75** (2013) 273-278
912. Le chêne de Charles, *Le Ciel* **75** (2013) 293-298
913. Picètes, *Venngeist* (oct. 2013) 4 pp.
914. Walhalla, *Venngeist* (nov. 2013) 5 pp.
915. Le bric-à-brac céleste, *Venngeist* (déc. 2013) 6 pp.

2014

916. Hypathia, *Venngeist* (jan. 2014) 6 pp.
917. Astro-tourisme, *Venngeist* (fév. 2014) 6 pp.
918. Une constellation pour le Web?, *Venngeist* (mars 2014) 4 pp.
919. Lès steûles d'amon-nos-ôtes, *Venngeist* (avr 2014) 6 pp.
920. Les saintes constellations, *Venngeist* (mai 2014) 6 pp.
921. Herschel au ciel, *Venngeist* (juin 2014) 7 pp.
922. Une histoire de noeuds, *Venngeist* (juil.2014) 2 pp.
923. Ces chères disparues, *Venngeist* (août 2014) 10 pp.
924. L'astronomie de Saint-Saëns, *Venngeist* (sep. 2014) 6 pp.

Compilations

925. Potins d'Uranie, Soc. Astron. Liège (1985) ii + 132 pp. (Fig. 57)
926. Un tour d'Uranie en quelques potins (août 1992) vi + 201 pp.
927. Un tour d'Uranie en quelques potins (août 1998) viii + 266 pp.
928. Les Constellations des Potins d'Uranie (Al Nath), Venngeist, Duttlenheim (2014) 300 pp. (ISBN 978-2-9542677-2-2) (Fig. 57) [= Publ. 409 (monograph)]

Dutch Translation

929. Het centraal bureau voor astronomische telegrammen, *Heelal* **32** (1987) 91-92 [original paper in French as Publ. 734]

German Translations

930. Legenden aus Patagonien, *Orion* **55/2** (1997) 18 [original paper in French as Publ. 763]
931. Legenden aus Kalifornien, *Orion* **56/1** (1998) 37-38 [original paper in French as Publ. 764]
932. Drei Legenden von "Down Under", *Orion* **56/4** (1998) 40-42 [original paper in French as Publ. 755]
933. Legenden der langen arktischen Nächte, *Orion* **56/6** (1998) 32-33 [original paper in French as Publ. 758]
934. Das grosse Feuer, *Orion* **59/6** (2001) 36-37 [original paper in French as Publ. 803]
935. Das neue Eldorado, *Orion* **60/3** (2002) 39 [original paper in French as Publ. 808]
936. Singlés! oder Einzelgänger!, *Orion* **61/5** (2003) 38-39 [original paper in French as Publ. 821]
937. Vespertilio Homo, *Orion* **61/6** (2003) 38 [original paper in French as Publ. 819]
938. Die rote Karte für Mars, *Orion* **62/1** (2004) 1.5-1.6 [original paper in French as Publ. 823]
939. Himmliche Wagen, *Orion* **62/6** (2004) 52 [original paper in French as Publ. 825]



Fig. 237: Miguel Albrecht was the driving force behind the conversion of Heck's master files for his directories and dictionaries into databases, first at ESRIN as part of the ESIS project (database StarWays) and later at ESO (databases StarGates and StarWords). Read the story on pp. 210ff.



Fig. 238: Rudi Albrecht (unrelated to the above) appears in a number of collaborations with our biographee (cf. the Index of People). His long involvment in data processing for optical astronomy is the matter of a dedicated chapter in the volume "Information Handling in Astronomy – Historical Vistas" (cf. p. 505), complementing another contribution in the earlier sister volume "Information Handling in Astronomy" dealing with computer-assisted context analysis of databases (cf. p. 501). In the latest joint paper with Heck, he presented a concept for a peer-reviewed community-supported web site at the 2006 LISA V conference at Harvard University (Publ. 377). He is pictured here observing the partial solar eclipse on 03 October 2005 in El Escorial during the ADASS XV conference.

Databases

Note: The year mentioned between parentheses indicates when the database became operational at the corresponding institution. Note that StarHeads, while maintained by Heck till retirement from Strasbourg Observatory, was linked to the Astrophysics Data System (ADS) at Harvard's Center for Astrophysics. In other words, the results of every bibliographical query from the ADS resource were pointing to StarHeads, enabling the retrieval of personal homepages for the authors of the papers listed. See also the directories (p. 441), as well as the atlases & catalogues (p. 439). Go to p. 207 for a presentation of the StarPages, *i.e.* the three databases StarWorlds, StarHeads & StarBits.

- StarWays – On-line Database of Astronomy, Space Sciences and Related Organizations of the World, ESA/ESRIN/ESIS, Frascati (1992)
- StarGates – On-line Database of Astronomy, Space Sciences and Related Organizations of the World, ESO, Garching (1993)
- StarWords – On-line Database of Abbreviations, Acronyms and Symbols in Astronomy, Space Sciences and Related Fields, ESO, Garching (1993)
- MediaTheque – On-line Database of Modern Media Offering Material Related to Astronomy and Space Sciences, CDS, Strasbourg (1993)
- StarWorlds – On-line Database of Astronomy, Related Space Sciences and Other Related Organizations of the World, CDS, Strasbourg (1994)
- StarHeads – On-line Database of Individual Homepages of Astronomers and Related Space Scientists, CDS, Strasbourg (1994)
- StarBits – On-line Database of Abbreviations, Acronyms and Symbols in Astronomy, Related Space Sciences and Other Related Fields, CDS, Strasbourg (1994)



Fig. 239: A multiple contributor to the volumes produced by our biographee, Paul Murdin tackled matters such as the "Encyclopedia of Astronomy and Astrophysics" (EAA) he edited, British astronomy, astronomy communication, and various issues linked to the Royal Astronomical Society (RAS). See the tables of contents on pp. 497ff for the details. As EAA Editor, he invited Heck's contribution on information handling in astronomy (Publ. 113).



Fig. 240: Roger Ferlet (here in his office at Paris Institute of Astrophysics) has been a double contributor to the OSA volumes: in OSA 4 on the evolution and perspectives of the Société Astronomique de France (SAF) and, in OSA 6 with the collaboration of C.R. Pennypacker, on the Hands-On Universe project.

Summaries of a Few Publications

Note: This section gathers together, verbatim and roughly chronologically (including in each section), a few summaries of publications deemed to be significant. Of course only part of the results obtained for only a fraction of the research work carried out can be included here. Thus only a few of the distance scale studies (cf. pp. 65ff) are mentioned. The same applies to photometric investigations (cf. pp. 68ff) or spectroscopic studies with the IUE satellite (cf. pp. 91ff). In most of the latter ones, the rôle played by our biographee was – at various degrees in collaborative ventures – to carry out observations, to reduce these, to analyze the results and to shape the publications. Books are detailed in the next section.

Distance Scale Algorithmica (p. 64)

- *Some Methods of Determining the Stellar Absolute Magnitude* (invited lectures) (**A. Heck**, *Vistas in Astron.* **22**, 1978, 221-264):
  The basis of this paper is a series of lectures at the Stellar Data Center of Strasbourg Observatory during May 1876. We present here an English and updated version of the French notes published in 1976 by the Stellar Data Center (Heck 1976). The paper concentrates on the main methodological families, exposes underlying ideas and concepts, points out problems and shortcomings, and gives a basic bibliography for further reading.
- *Tests of Two Different Maximum-Likelihood Algorithms for Determining Statistical Parallaxes* (D.H.P. Jones, **A. Heck**, J. Dawe & S.V.M. Clube, *Astron. Astrophys.* **89**, 1980, 225-226):
  Synthetic data have been used to test two Maximum Likelihood algorithms for statistical parallax. Nothwithstanding their different formulations, both give the correct solutions.
- *About the Consistency of Absolute Luminosity Calibrations* (**A. Heck**, *Astron. Astrophys.* **82**, 1980, 370-372);
  The conclusions of a paper by Oblak (1978) about the consistency of absolute luminosity calibrations as deduced from a study of binaries should be carefully evaluated. Three points are more particularly considered here: the relevance of the method, the way various calibrations have been applied, and the lack of an error discussion.

- *About Statistical-Parallax Algorithms* (**A. Heck** & J. Fernley, *Astron. Astrophys.* **332**, 1998, 875-876):
  The results obtained by two algorithms of statistical parallaxes applied to a large sample of RR Lyrae stars are compared. They show no significant difference and confirm the validity of the earlier approach based on the principle of maximum likelihood.

RR Lyrae Stars (p. 66)

- *Relations Between Luminosity, Period and Metallicity in RR Lyrae Stars* (**A. Heck**, *Astron. Astrophys.* **42**, 1975, 131-133):
  We present here the results of the calibration of relations between the luminosity and the period on the one hand, and between the luminosity and the metallicity index ΔS (Preston 1959) on the other hand for two samples of RR Lyrae stars (a mixed sample and another one of Bailey types a and b only). All stars have a period larger than 0.2d. The calibration algorithm is based on the principle of maximum likelihood.
- *A Note on the Relation Between Metallicity and Luminosity in Field RRab Lyrae Stars* (**A. Heck** & J.M. Lakaye, *Monthly Not. Roy. Astron. Soc.* **184**, 1978, 17-24):
  With a new sample of RRab Lyrae stars, the relation between metallicity and luminosity is refined and found to be $M_v = 0.12(\pm 0.04)\Delta S - 0.33(\pm 0.20)$ with $\sigma_M = 0.51(\pm 0.18)$. We failed to find any relation between luminosity and period, confirming earlier results by Heck (1973). The differences between the results of Clube & Dawe (1978) on one hand and our results on the other hand are mainly due to data differences and to dissimilarities in the adopted laws for the interstellar reddening.
- *A Bibliographical Catalogue of RR Lyrae Stars* (**A. Heck**, *Astron. Astrophys. Suppl.* **75**, 1988, 237-238):
  A bibliographical catalogue of RR Lyrae stars has been prepared (6367 stars and 6340 quotations of 975 bibliographical references). It is made available as CDS Special Publication n° 11 as well as on magnetic tape and floppy disks through the Strasbourg astronomical Data Centre.
- See also the last publication (Heck & Fernley 1998) of the 'Algorithmica' section above.

Hertzsprung-Russell Diagram (p. 66)

- *Absolute Luminosity Calibration of Stroemgren's Intermediate Group* (**A. Heck**, *Astron. Astrophys.* **43**, 1975, 111-126):
  We present here a calibration of the relation $M_v^{(i)} = q_1 a^{(i)} + q_2 r^{(i)} + q_3$ for the

intermediate group (A0-A3 stars) as defined by Stroemgren (1966, 1967), by a method based on the princple of maximum likelihood (Heck 1975). The results confirm rather well the values given by Stroemgren for main-sequence stars. A calibration of the mentioned relation with an index $a_R^{(i)}$ corrected for reddening is also given. In each case, the dispersion in magnitude, the mean velocity components and the corresponding dispersions are also calculated, as well as the precision on each parameter. The paper of Eggen (1972) is criticized and, if kinematical groups are found for his sample, this does not occur for our larger sample. In both cases, rough comparisons to the trigonometric parallaxes are given, but the agreement is not fair.

- *A Study of Mira Variables – Implications for OH Stars and Galactic Evolution* (R. Foy, **A. Heck** & M.O. Mennessier, *Astron. Astrophys.* **43**, 1975, 175-188):
  In order to study the properties of Type I OH Mira variables and the kinematical evolution of our galaxy, we have analyzed a sample of Mira variables by means of a statistical method based on the principle of maximum likelihood (Heck 1975). This method takes into account the dispersion in magnitude and uses simultaneously proper motions and radial velocities. Internal bias of the method is negligible. Numerical experiments have been applied in order to determine the bias induced by the errors of the proper motions. Previous determinations of the relation between the absolute visual magnitude M_v and the period P never distinguished between OH and non-OH Mira stars. Since OH stars have been found to be as bright as non-OH stars in the visual spectral range, the relation M_v/P is not affected by it, as confirmed by our results. In contrast, in the near infrared ($1.04\mu m$), OH stars have been found to be brighter than non-OH stars, by one magnitude. Both results confirm the $V - I_{1.04}$ excess of Type I OH with respect to non-OH stars (Fillit *et al.* 1973). We propose to interpret this excess in terms of a hot circumstellar dust disk surrounding OH Mira variables; it appears that the only difference between Type I and Type II OH lies in the temperature of the dust grains, respectively T $\approx$ 1500° K and T $\approx$ 600° K. The structure of the disks would be similar. As far as possible, we have converted periods to ages, using a period versus mass relation, a mass loss rate and theoretical isochrones. This allows us to study the kinematical evolution of our galaxy, by way of σ_W, the standard deviation of the velocity component perpendicular to the galactic plane. The resulting σ_W versus age relation agrees with previous ones, from Age Zero up to nearly 10^{10} years. No large discontinuity has been found over, at least, the last 10^{10} years; this would support the idea of a gradual flattening of our Galaxy, as proposed by theories of a collisional collapse.

- *Absolute Luminosity Calibration of Stroemgren's Late Group* (**A. Heck**, *Astron. Astrophys.* **56**, 1977, 235-243):
  We deal here with luminosity calibrations of the late group as defined by Stroemgren (1966), by a statistical-parallax method based on the principle of maximum likelihood (Heck 1975). Relations are recommended to expressed the absolute lu-

minosity as functions of the photometric indices c_1 and β for stars of all luminosity classes and between the luminosity and the indices $b-y$ and c_1 for unreddened stars of the main sequence nearer than 150pc. They give a precision of the mean absolute magnitude better than 0.15^m. In addition to these relations, the dispersion in magnitude, the mean velocity components and the corresponding dispersions are also calculated, as well as the precision on each parameter. Comparisons with Crawford (1975) calibrations and with trigonometic parallaxes are also given.

- *Absolute Luminosity Calibration of F Stars* (**A. Heck**, *Astron. Astrophys.* **66**, 1978, 335-342): *Astron. Astrophys.* **66** (1978) 335-342
  We deal here with luminosity calibrations of F-type stars by a statistical-parallax method based on the principle of maximum likelihood. We recommended relations between the absolute magnitude and indices from the *uvby* photometry for a sample constituted by main-sequence F stars and for a sample consituted by F stars of all luminosity classes. In addition, the dispersion in magnitude, the mean velocity components and the corresponding dispersions are also calculated, as well as the precision on each parameter. For the samples above, the precision of the mean absolute magnitude is respectively 0.09^m and 0.04^m.

- *The Absolute Magnitude of the Hg-Mn Stars* (M. Jaschek, C. Jaschek, S. Grenier, A.E. Gomez & **A. Heck**, *Astron. Astrophys.* **81**, 1980, 142-144):
  The absolute magnitude of the Hg-Mn stars has been determined using statistical, photometric, spectroscopic, and cluster parallaxes. The results of all four procedures are in excellent agreement and give $\bar{M}_v = -0.6^m \pm 0.4^m$, which locates these objects above the main sequence, in agreement with spectroscopic results.

- *Absolute Magnitudes of F-, G-, K- and M-type Stars from Maximum-Likelihood Statistical Parallaxes* (T. Mikami & **A. Heck**, *Publ. Astron. Soc. Japan* **34**, 1982, 529-539):
  Absolute magnitudes and their corresponding dispersions are obtained for large samples of F- to M-type stars (giants and dwarfs) from the solar neighborhood based a statistical method based on the principle of maximum likelihood. The samples are characterized by homogeneous proper motions in the AGK3 system. Solar motions and corresponding velocity ellipsoids are also derived for each sample considered. Our results confirm that the absolute magnitude of late-type giants should be brighter by a few tenths of magnitude than the values usually adopted in the past. Smoothed values of visual absolute magnitude versus spectral types are proposed for G- to M-type giants and F- to K-type dwarfs.

- *The Absolute Magnitude of the Am Stars* (A.E. Gomez, S. Grenier, M. Jaschek, C. Jaschek & **A. Heck**, *Astron. Astrophys.* **93**, 1981, 155-159):
  The absolute magnitude of the Am stars has been determined by a statistical-parallax method based on the principle of maximum likelihood applied to a sample of 165 stars. The calibration of the absolute magnitude has been carried out in terms of different photometric indices from the UBV, $uvby$ and seven-

color (Geneva) systems. The results have been compared to the values obtained from Am stars in visual binary systems and in clusters. We showed that $\bar{M}_v = 1.2^m \pm 0.3^m$ and that consequently the Am stars lie one magnitude above the main sequence, the exact amount depending upon the definition of the main sequence used.

- *The Absolute Magnitudes of the Ap Stars* (S. Grenier, M. Jaschek, A.E. Gomez, C. Jaschek & **A. Heck**, *Astron. Astrophys.* **100**, 1981, 24-27):
  The mean absolute magnitude of the Ap stars (except those belonging to the Hg-Mn subgroup studied earlier) has been determined by statistical parallaxes. Our results, given as a function of UBV photometric indices, have been checked against the absolute magnitudes derived from Ap stars in clusters and in visual binaries. The agreement is good when the errors are taken into account. We essentially conclude that the Ap stars do have the same absolute magnitude as the main-sequence stars of the same color.

- *The Absolute Magnitudes of G5-M3 Stars Near the Giant Branch* (**A. Heck**, D. Egret & P.C. Keenan, *Astron. Astrophys.* **106**, 1982, 115-120):
  The absolute magnitudes of stars on the Red Giant Branch (G-K-M) have been determined using both trigonometric and statistical parallaxes, from a sample of 212 stars classified in the Revised MK System (Keenan & Pitts 1980). The results of both methods are in good agreement with a difference not greater than $\pm 0.002''$. The computed individual absolute magnitudes and space motions are provided as by-products.

- *SMR Stars, Strong CN Stars and R Stars* (P.C. Keenan & **A. Heck**, *Rev. Mexicana Astron. Astrof.* **29**, 1994, 103-110):
  The strong-CN stars (including the SMR stars) and the R-type Carbon stars are similar in that they occupy nearly the same part of the H-R diagram, in that their distribution in the medium-thick disk is similar, and in having about the same proportion of binary systems as are found in ordinary G and K giants. The spectra of both groups are alike in lacking enhancement of the s-process elements. The major difference between them is that at least most of the strong-CN stars are metal-rich, while the R stars have nearly solar abundances of the common metals. This suggests the possibility that a few of the strong-CN stars are not SMR stars, but maybe marginal R stars.

Photometric Data Reductions (p. 75)

- *A Generalized Algorithm for Efficient Photometric Reductions* (J. Manfroid & **A. Heck**, *Astron. Astrophys.* **120**, 1983, 302-306):
  We are presenting in this paper a generalized method applicable to the reduction of photometric observations in any well-defined system. The method is characterized by the use of practically every measurement of any non-variable star in the

reduction procedure. Its main advantages are a greater accuracy and a substantial saving of observing time on extinction and standard stars.

- *On the Accuracy of the Reduction of uvby Photometry* (J. Manfroid & **A. Heck**, *Astron. Astrophys.* **132**, 1984, 110-114):
  By simulating *uvby* observations under various conditions, we have analyzed the precision reachable by our photometric reduction algorithm (Manfroid & Heck 1983). The influence of variations in parameters such as the number of nights or the number of standard stars is discussed. It is shown how the grouping of nights in the reduction procedure allows the observer to spend less time on standard stars measurements, while improving the accuracy of the results. We stress the difficulty of giving a realistic value for the precision of the reductions in actual conditions. The inclusion of secondary stars is also recommended.

- *On Period Determination Methods* (**A. Heck**, J. Manfroid & G. Mersch, *Astron. Astrophys. Suppl.* **59**, 1985, 63-72):
  The two big families of period determination techniques are considered in this paper: those based on the Fourier transform, and the non-parametric algorithms derived from the θ-criterion by Lafler & Kinman (1965). We show that these groups of methods are not equivalent to each other under general conditions as asserted by some authors, but that at best all criteria can be expressed as the ratio of two quadratic forms. Since their statistical properties are difficult to establish theoretically, we undertook a comparative study of the performances of some of them by numerical simulations. The following algorithms were tested: Fourier's (Deeming 1975), autocorrelation (Burki *et al.* 1978), Lafler & Kinman's (1965), Renson's (1978) and Stellingwerf's (1978). Although the two last techniques tend to perform slightly better in general, the tests applied to single-periodic phenomena show that none of the methods is clearly superior to the others. The reader is invited to refer to the nuanced and detailed report of the performances given in the conclusions. Fourier's and the non-parametric methods have relatively different scopes and they are, to some extent, complementary.

Interface Photometric/Spectroscopic Data (p. 68)

- *An Application of Multivariate Analysis to a Photometric Catalogue* (**A. Heck**, *Astron. Astrophys.* **47**, 1976, 129-135):
  It is shown that the application of methods of statistical multivariate analysis to a photometric catalogue allows to obtain, with a strict minimum of physical considerations, valuable indications on the meaning of photometric indices. In the particular application considered here, one can obtain predictors of spectral type and, through them, of the effective temperature.

- *Detection of Errors in Spectral Classification by Cluster Analysis* (**A. Heck**, A. Albert, D. Defays & G. Mersch, *Astron. Astrophys.* **61**, 1977, 563-566):

Cluster analysis methods are applied to the photometric catalogue of *uvby*β measurements by Hauck & Lindemann (1973) and point out 249 stars the spectral type of which should be reconsidered or the photometric indices of which should be redetermined.

- *Prediction of Spectral Classification from Photometric Observations – Application to the uvby*β *Photometry and the MK Spectral Classification. I. Prediction Assuming a Luminosity Class* (**A. Heck** & G. Mersch, *Astron. Astrophys.* **83**, 1980, 287-296):
  An algorithm based on both multiple stepwise and isotonic regressions is developed to predict spectral classifications from photometric data. This first paper is concerned with a prediction assuming a luminosity class, from the $uvby\beta$ photometry and the MK spectral classification. The precision reached is about 90% and 80% chance of being within one spectral subtype respectively for Luminosity Groups I and V, and for Luminosity Groups III and IV. A list of stars for which discrepancies appear between photometry and spectral classification, is given.

- *Prediction of Spectral Classification from Photometric Observations – Application to the uvby*β *Photometry and the MK Spectral Classification. II. General Case* (G. Mersch & **A. Heck**, *Astron. Astrophys.* **85**, 1980, 93-100):
  The paper deals with the generalization of an algorithm to predict spectral classifications from photometric data, the particular case considered being that of the MK spectral classification and the $uvby\beta$ photometry. The precision reached is about 80% and 87% chance of being within one spectral subtype respectively for Luminosity Groups I, III, and IV, and for Luminosity Group V. The prediction of the luminosity group gives respectively 44%, 28 %, 45% and 56% of being in the correct group. This poor performance suggests that the $uvby\beta$ photometry is unable to distinguish luminosity classes clearly. A list of stars for which discrepancies appear between photometry and spectral classification is given.

- *Predictions: Also an Astronomical Tool* (invited paper) (**A. Heck**, in *Statistical Methods in Astronomy*, **ESA SP-201**, 1983, 135-143):
  The prediction process is defined from a statistical point of view as the construction of a model from a prior sample of observations and its application to an a posterior sample to predict the value of dependent variable(s) corresponding to a set of observed independent variables. Techniques for model elaboration are reviewed with special emphasis on the various types of regression. An extensive bibliography is provided for both theoretical works and coded algorithms. The case for predicting MK spectral classifications from *uvby*β photometric data is detailed as an example and compared to related studies, such as the photometric-box concept. Distinction is made between prediction, assimilation, and detection methods. Finally a few traps and pitfalls are pointed out and recommendations are made for successful predictions.

Space Operations (p. 106)

- *In-Flight Performance of the IUE* (A. Boggess, R.C. Bohlin, D.C. Evans, H.R. Freeman, T.R. Gull, S.R. Heap, D.A. Klinglesmith, G.R. Longanecker, W. Sparks, D.K. West, A.V. Holm, P.M. Perry, F.H. Schiffer III, B.E. Turnrose, C.C. Wu, A.L. Lane, J.L. Linsky, B.D. Savage, P. Benvenuti, A. Cassatella, J. Clavel, **A. Heck**, F. Macchetto, M.V. Penston, P.L. Selvelli, E. Dunford, P. Gondhalekar, M.B. Oliver, M.C.W. Sandford, D.J. Stickland, A. Boksenberg, C.I. Coleman, M.A.J. Snijders & R. Wilson, *Nature* **275**, 1978, 377-385):
  After the IUE's successful launch into an eccentric geosynchronous orbit, and following initial spacecraft checkout, observations were made of a set of high priority targets as an insurance against premature failure of the system. These were followed by systematic performance evaluation of the various spacecraft and scientific instrument sub-systems, some of which were optimised in orbit. The optical performance of the telescope and spectrograph and the photometric performance of the SEC cameras used as spectrum detectors all seem satisfactory, but the ground data processing system although operational needs further development.

Ultraviolet Spectral Classification (p. 152)

- *IUE Low-Dispersion Spectra Reference Atlas. Normal Stars* (**A. Heck**, D. Egret, M. Jaschek & C. Jaschek, *ESA SP-1052*, 1984, 476 pp. + 34 plates, ISSN 0379-6566):
  This atlas presents 229 graphic spectra together with the corresponding fluxes and an ultraviolet spectral type. The preparation of this publication has indeed confirmed that MK classifications cannot simply be transferred to the ultraviolet range. A set of transparencies are illustrating the reference sequences constructed from the ultraviolet data.

- *IUE Low-Dispersion Spectra Flux Catalogue. Normal Stars (magnetic Tape)* (**A. Heck**, D. Egret, M. Jaschek & C. Jaschek, *Astron. Astrophys. Suppl.* **57**, 1984, 213-216): *Inform. Bull. Strasbourg Stellar Data Center* **26** (1984) 127 (CDS-NASA ref. C3083)
  This catalogue on magnetic tape contains the fluxes (2 Å-step) of 229 selected IUE low-dispersion stellar spectra constituting spectral reference sequences.

- *Statistical Confirmation of the UV Spectral Classification System Based on IUE Low-Dispersion Stellar Spectra* (**A. Heck**, D. Egret, Ph. Nobelis & J.C. Turlot, *Astrophys. Sp. Sc.* **120**, 1986, 223-237):
  In the IUE Low-Dispersion Spectra Reference Atlas (Heck *et al.* 1984), a new spectral classification system specific to the UV had to be introduced because of the lack of one-to-one correspondence between the UV and visible ranges. It was elaborated from a classical morphological approach (Jaschek & Jaschek 1984). This paper presents an independent confirmation of the correctness of this system. A

statistical methodology working in a multidimensional parametric space has been applied to variables expressing, as objectively as possible, the information contained in the continuum and the spectral features of a set of stellar low-dispersion IUE spectra. This was done through, on the one hand, an asymmetry coefficient describing the continuum shape and empirically corrected for the interstellar reddening, and, on the other hand, the intensity of sixty objectively selected lines. These line intensities have been weighted in a way we called the *Variable Procrustean Bed Method* because, contrary to a standard weighting where a variable is weighted in the same way for all the individuals of a sample, the spectral variables were weighted here according to the asymmetry coefficient which varies with the star at hand. The statistical algorithm consisted of a Principal-Component Analysis followed by a Cluster Analysis. The choice of the lines used for the morphological approach in the atlas is shown to be correct. With respect to the UV classification system introduced in the atlas, the groups constructed by the cluster analysis display good homogeneity and discrimination for spectral types and luminosity classes, especially in the early spectral types which are well represented in the sample used for this study. The UV standard stars can be found in the neighborhood of the barycenters of the groups. Moreover, the methodology developed here could be used in a later stage to predict UV spectral classification.

- *UV Stellar Spectral Classification* (invited review) (**A. Heck**, in *Exploring the Universe with the IUE Satellite*, Eds. Y. Kondo, W. Wamsteker, A. Boggess, M. Grewing, C. de Jager, A.L. Lane, J.L. Linsky & R. Wilson, D. Reidel Publ. Co., Dordrecht, 1987, 121-137):
  Stellar observers in the ultraviolet tend to use the MK classification system as a spectral reference also in this spectral range, implying that it characterizes the whole spectrum, even if it is defined only from the visible range. However, an analysis of about two thousand spectra collected bt the S2/68 experiment on board the TD1 satellite showed that stars which are spectrally normal in the visible range do not always behave normally in the ultraviolet range. This has been confirmed by an extensive study of IUE low-dispersion spectra of normal stars. The present paper reviews the early works and details the IUE Classification System essentially for normal stars.

The Very Slow Nova RR Tel (p. 161)

- *IUE and Other New Observations of the Slow Nova RR Tel* (M.V. Penston, P. Benvenuti, A. Cassatella, **A. Heck**, P. Selvelli, F. Macchetto, D. Ponz, C. Jordan, N. Cramer, F. Rufener & J. Manfroid, *Monthly Not. Roy. Astron. Soc.* **202**, 1983, 833-857):
  Ultraviolet spectra of RR Tel taken with the *International Ultraviolet Explorer* satellite are reported. These cover the range 1150-3200Å at both high and low dispersion through both large and small apertures. A range of exposure times yields

a dynamic range of 1000 in line intensities. A line list of 431 lines is presented giving measured wavelength, intensity and full width at half maximum. Over three quarters of the lines are identified. There is a correlation of line width with ionization energy. Lines identified include common species from once to four times ionized. Lines seen are generally resonance, semi-forbidden and forbidden lines, but some recombination lines are also found for C, O and Ne. Many FeII lines are present – most are from odd levels near 5eV to even low-lying levels but decays from even 10eV levels are also seen. One third of the decays from the 5eV levels are part of a cascade from higher levels. Population of the 10eV levels may be due to L_α fluorescence. Diagnosis of densities and temperatures gives densities in the range $log\ n_e = 5.2$ to 6.7 and temperatures of T = 11,600 to 19,000° K. Forbidden line wavelengths are used to refine inter-system separations of energy levels in some species. Low-dispersion data yield a continuum energy distribution. The strength of the λ2175 feature and the HeII Paschen line intensities yield E(B-V) = 0.10 mag. The continuum energy distribution is not due to a simple combination of gaseous emission processes and a hot star or accretion disc but the very high ratio of the energy in the lines to that of the continuum of 2.4 argues that a high-temperature source must be present. New ground-based photometry finds variations of order 0.03 mag rms from night to night and within a night. If due to the lines this, in combination with the emission measure, would interestingly constrain the distance, but alternatively the variation may be seated in the continuum.

- *Variations in the Variability of RR Tel* (**A. Heck** & J. Manfroid, *Astron. Astrophys.* **142**, 1985, 341-345):
  uvby photometric data, IUE FES measurements and AAVSO visual estimates of the very slow nova RR Tel show that the object has gone through periodic variations in visible light since it started fading in 1949 after its ourburst in 1944. The period however is not constant and varies between 350 and 410 days, confirming an almost unnoticed mention by Mayall (1957) and in contradiction with the statements of some later investigators. Besides a general decrease in magnitude, the visible lightcurve is also marked by two events corresponding to sudden decreases of brightness in 1949 ($\approx 1^m$) and 1962/3 ($\approx 0.5^m$). There are also strong suspicions of occasional presence of fast variations of *y*. More observations are necessary in order, on the one hand, to establish clearly the contributions of lines and/or the continuum to the variations and, on the other hand, to specify the nature of the blue component and its relationship with the Mira.

The Irregular Variable Star V348 Sgr (p. 160)

- *Photometric Variations of the Irregular Variable V348 Sgr* (**A. Heck**, L. Houziaux, J. Manfroid, D.H.P. Jones & P.J. Andrews, *Astron. Astrophys. Suppl.* **61**, 1985, 375-385):
  We report visual estimates and photometric observations in various wavelength

ranges of the irregular variable V348 Sgr. They cover dramatic drops of brightness (from V $\approx$ 12.5 to $\approx$ 18) which accurred in 1972, 1973 and 1981 with a time scale much shorter than the characteristic time mentioned by previous observers. These deep minima are, to our knowledge, the best followed ones up to now. The maximum brightness of the object seems also to correspond to V $\approx$ 12 and not 10.5 as reported earlier. The minima reach V $\approx$ 18, but this might represent the nebular contribution while the star itself might even go fainter. The main conclusions of this compilation are probably that the characteristic times given by Herbig (1958) from appearances on Harvard plates are most likely incorrect and that it is impossible to give one at all. Deep minima such as that of August/September 1981 are believed to be not-so-rare events among longer, stabler phases either at maximum or at minimum. Additional observations are needed to better understand the behavior of the star and to have details on the fading and brightening phases.

- *Hot Carbon Stars: More About V348 Sgr* (L. Houziaux, P. Bouchet, **A. Heck** & J. Manfroid, *Quart. J. Roy. Astron. Soc.* **28**, 1987, 231-238):
  New observational techniques (sensitive receivers, access to ultraviolet and infrared spectroscopy), as well as recent theoretical investigations on advanced stages of stellar evolution focus attention again on hydrogen-poor and helium-rich objects known as 'carbon stars'. The case of the hot peculiar variable V348 Sgr is discussed. New visible and infrared observations are presented, but the exact nature of the star remains much of an enigma.

Cosmic Medley

- *The First New Comet of 1973* (F. Dossin & **A. Heck**, *Sky & Tel.* **45**, 1973, 291):
  The circumstances of the discovery and confirmation of Comet 1973a Heck-Sause are described, as well as the first spectroscopic investigations.
- *HD 72968 (3 Hya) – Another Low-Amplitude Photometric Double-Wave Ap Star* (H.M. Maitzen, R. Albrecht & **A. Heck**, *Astron. Astrophys.* **62**, 1978, 199-204):
  Extensive photoelectric intermediate-band photometry of the low-amplitude light variations of HD 72968 at ESO – La Silla yields evidence for a double-wave variation in all filters with only slightly different maxima. Thus the real period, or the rotational period in terms of the Oblique Rotator Theory, is twice as large as previously published (a situation that could be true for a number of other Ap stars) and fits the low-amplitude reversing magnetic-field curve far better than the old half period. The elements are: JD(Max(H_{eff})) = 2432897.68d + 11.305d E. The new elements correspond to an inclination between the line of sight and the rotational axis rendering a rather equator-on aspect. It is suggested that the controversial peculiarity degrees of this star derived from different peculiarity parameters can be understood in terms of an advanced main-sequence age.

- *On the Ultraviolet Spectrum of Nova Cygni 1978* (A. Cassatella, P. Benvenuti, J. Clavel, **A. Heck**, M.V. Penston, P.L. Selvelli & F. Macchetto, *Astron. Astrophys.* **74**, 1979, L18-L19):
  Ultraviolet high- and low-resolution spectra of Nova Cygni 1978 have been obtained with IUE at three dates during the first month after its outburst on Sept. 13). The high-resolution spectrum of Sept. 28 is dominated, in the range 2300-2800Å, by broad undisplaced emission lines of singly ionized metals like FeII, CrII, and MnII. The width of these lines indicate expansion velocities of about 310 km s^{-1}. Larger expansion velocities are observed in some OIII fluorescence lines. A P Cygni profile is observed in the MgII doublet lines. Most of the same spectral features are found in the earlier spectrum of Sept. 14-15. The low-resolution spectrum obtained on Oct. 10 indicates higher degrees of excitation and ionization than the earlier spectra.

- *On the High-Resolution Ultraviolet Spectrum of P Cygni* (A. Cassatella, F. Beeckmans, P. Benvenuti, J. Clavel, **A. Heck**, H.J.G.L.M. Lamers, F. Macchetto, M.V. Penston, P.L. Selvelli & D.J. Stickland, *Astron. Astrophys.* **79**, 1979, 223-229):
  IUE high-resolution spectra of P Cygni, obtained during 1978 at the Vilspa station are analyzed. The spectrum is dominated by blue-shifted absorption lines of singly and doubly ionized metals like Fe, Mn, Ni, Cr and Ti formed in the expanding envelope. The corresponding expansion velocities are about -220km/s for the singly ionized metals and considerably lower, about -80km/s, for the doubly ionized metals. A second absorption component, at about -177km/s is seen on the red edges of the singly ionized metal lines. At least for FeIII, the expansion velocity appears to be a monotonically decreasing function of the excitation energy. This behaviour has been interpreted as due to an outward decrease of the excitation and ionization. The observations suggest also the presence of plateaus in the velocity versus envelope radius relation connected with possible changes in the ionization conditions through the envelope. A curve of growth analysis has been carried out for the FeII lines. An excitation temperature of $12,000 \pm 900^{\circ}$K has been found for the shell in which these lines are formed. Only a few lines with P Cygni profiles are observed, in contrast to what is found in the optical spectrum. At least two pairs of broad photospheric lines – the CIV and SiIV doublets – are present. A rough estimate has been given for the energy blocked by the blue-shifted absorption lines. This energy could supply sufficient radiation pressure to explain the acceleration of the gas in the envelope. However, several reasons are given why the origin of the mass loss from P Cygni must be different from the radiation pressure mechanism which seems to be effective in other supergiants.

- *The UV Spectrum of the Narrow Emission-Line X-Ray Emitting Nucleus of the Galaxy NGC 7582* (J. Clavel, P. Benvenuti, A. Cassatella, **A. Heck**, M.V. Penston, P.L. Selvelli, F. Beeckmans & F. Macchetto, *Monthly Not. Roy. Astron. Soc.* **192**, 1980, 769-777):
  UV spectra of the narrow emission line, X-ray emitting nucleus of the galaxy

NGC 7582 obtained with the IUE instrument show a steep featureless continuum, obeying a power law of spectral index $\alpha = 3.4 \pm 0.4$, close to the value of Ward *et al.* (1978) for the visible spectrum ($\alpha = 3$). The visual extinction on the line of sight of the source of continuum was derived from the strength of the 2200Å feature, and is found to be much smaller than the one deduced for the emission line region by Ward *et al.* (1980). The total energy distribution cannot be accounted for in terms of a hot star model, but is rather well represented by a power law spectrum of spectral index $\alpha = 2.1$ suffering a total absorption corresponding to $E_{B-V} = 0.45$. From the presence of a jump in the continuum near 3600Å, we estimate that hot stars must contribute approximately 30% of the flux at visible wavelengths. The column density of gas in front of the source of continuum is $N_H = 2.5 \pm 1.7 \times 10^{21}$ atom cm^{-2}, so that a low-energy cutt-off in the X-ray spectrum should be observed around 0.75keV. The absence of emission lines in the UV range is consistent with the high value of the extinction for the line-emitting region found by Ward *et al.* (1980).

- *Coordinated Optical, Ultraviolet, Radio and X-Ray Observations of Supernova 1979c in M100* (N. Panagia, G. Vettolani, A. Boksenberg, F. Ciatti, S. Ortolani, P. Rafanelli, L. Rosino, C. Gordon, D. Reimers, K. Hempe, P. Benvenuti, J. Clavel, **A. Heck**, M.V. Penston, F. Macchetto, D.J. Stickland, J. Bergeron, M. Tarenghi, B. Marano, G.G.C. Palumbo, A.N. Parmar, G.S.W. Pollard, P.W. Sandford, W.L.W. Sargent, R.A. Sramek, K.W. Weiler & P. Matzik, *Monthly Not. Roy. Astron. Soc.* **192**, 1980, 861-879):
  We present and discuss optical, ultraviolet, radio and X-ray observations of Supernova 1979c in M100 made in the first six weeks after discovery (1979 April 20 – June 5). On the basis of the optical data, the SN is classified as peculiar type II. It attained a magnitude at maximum of M_B = -19.4$\pm$0.8 mag and has decayed linearly at a rate of 0.046 mag d^{-1}. Correspondingly, the colour temperature decreased from 1.1×10^4 K on April 22 to $\sim 7 \times 10^3$ K in late May. The total radiative energy is estimated to be $E_{rad} = 7 \times 10^{49}$ erg. The optical lines, as well as the MgII 2800Å doublet, originate in the upper layers of the main SN envelope, which is moderately ionized and expands at about 10^4 km s^{-1}. The main results from the ultraviolet line spectrum are that: (i) Most absorption features are produced either in the disc or the halo of our Galaxy and M100; (ii) The emission lines indicate the presence of a shell where the gas is highly ionized, the expansion velocity is around 4×10^3 km s^{-1} and the radius is greater than twice the photospheric radius. The shell is likely to consist of compressed gas of pre-existing circumstellar material. Radio and X-ray observations have provided only upper limits to the SN emission. The inferences from these limits confirm the ultraviolet results.

- *Simultaneous Spectroscopic (UV MgII and AlII lines) and Photometric Variations of ζ^1 Sco (HD 152236)* (**A. Heck**, G. Burki, L. Bianchi, A. Cassatella & J. Clavel), *Monthly Not. Roy. Astron. Soc.* **192**, 1980, 59P-65P):
  Repeated IUE observations of ζ^1 Sco show variations in the line profiles of the

two MgII doublets at about 2800Å and of the AlII λ1670 line. A series of puffs in the expanding envelope have been identified, implying a non-stationary mass loss process. A phase of particularly discontinuous loss of matter has been correlated with a sharp decrease of the V magnitude.

- *Evolution of the Periodicity of the W UMa System ϵ CrA* (J. Manfroid, **A. Heck**, J. Bergeat & M. Lunel, *Astron. Astrophys.* **176**, 1987, 180-182):
  The analysis of photometric observations spanning 25 years reveals fluctuations in the period of the W UMa system ϵ CrA, with a relative increase of about 10^{-5} between HJD 2,440,000 and 2,443,000. It is not possible to say how progressive this change was. It could have been quite abrupt around HJD 2,440,000 or it could have lasted five to ten years. The recent observations suggest that the period is again stabilized. Additional observations and a close survey are necessary for a better understanding of the evolution and to get an idea of the time lapse between successive period changes.

Electronic Information Handling (p. 242)

- *Electronic Publishing and 'Intelligent' Information Retrieval in Astronomy and Space Sciences* (invited review) (**A. Heck**, *Vistas in Astron.* **35**, 1992, 215-237):
  The paper reviews the then state of the art in terms of desktop and electronic publishing for astronomy and related space sciences, especially in light of the colloquium held in October 1991 at Strasbourg Observatory (Heck 1992). The survey carried out prior to that conference is commented. The links between electronic publishing, intelligent information retrieval and knowledge bases are discussed and the future is cautiously investigated.

- *Facets and Challenges of the Information Technology Evolution* (invited review) (**A. Heck**, in *Information & On-Line Data in Astronomy*, Eds. D. Egret & M.A. Albrecht, Kluwer Acad. Publ., Dordrecht, 1995, 1-14):
  The recent dramatic information technology evolution has brought major modifications in the way information is handled with new techniques and new tools. This paper will question a few clichés and deal with a number of newly resulting problems and challenges, especially ethical, legal and educational ones.

- *Electronic Publishing in its Context* (invited review) (**A. Heck**, *Astrophys. Sp. Sc.* **247**, 1997, 1-10):
  Contextual aspects of electronic publishing (and more generally of diversified publishing) are discussed. Definitions and concepts are introduced. Pending issues are identified. The accent is put on the need for providing authenticated and validated information. The electronic medium is a new medium *per se* that will exist together with other ones, such as paper, but it will call for specific procedures, strategies and policies. A lot has still to be done on the human level.

- *Electronic Astronomical Information Handling and Flexible Publishing* (invited lecture) (**A. Heck**, in *Proceedings of the Fifth Workshop on Data Analysis in Astronomy*, Eds. V. Di Gesù, M.J.B. Duff, A. Heck, M.C. Maccarone, L. Scarsi & H.U. Zimmermann, World Scientific, Singapore, 1997, 365-376):
  The current dramatic evolution in information technology is bringing major modifications in the way scientists work and communicate. The concept of electronic information handling encompasses the diverse types of information, the different media, as well as the various communication methodologies and technologies. It ranges from the very collection of data until the final publication of results and sharing of knowledge. Fluid information is becoming a common concept. New problems and challenges result also from the new information culture, especially on legal, ethical, and educational grounds. Electronic publishing will have to diverge from an electronic version of contributions on paper and will be part of a more general flexible-publishing policy. The benefits of private publishing are questioned. The procedures for validating published material and for evaluating scientific activities will have to be adjusted too. Provision of electronic refereed information independently from commercial publishers is now feasible. Authors have to read carefully the restrictions on the copyright forms. Scientists and scientific institutions have now the possibility to run an efficient information server with validated (refereed) material without the help of a commercial publisher.
- *Electronic Publishing in its Context and in a Professional Perspective* (invited lecture) (**A. Heck**, *Rev. Modern Astron.* **11**, 1998, 337-347):
  Contextual aspects of electronic publishing (and more generally of diversified publishing) are discussed beyond what is called today electronic publishing, but is merely computer-assisted traditional publishing. Definitions and concepts are introduced. Pending issues and challenges are identified. The need for providing authenticated and validated information is stressed, as well as the necessity of providing an information that is correct, relevant and on target. Ad hoc reward schemes will have to be designed. The electronic medium is a new medium *per se* that will exist together with other ones, such as paper, but it will call for specific procedures, strategies and policies. Human aspects should not be underestimated.

The Star*s Family (p. 207)

- *StarWays – A Database of Astronomy, Space Sciences and Related Organizations of the World (announcement of a database)* (**A. Heck**, A. Ciarlo & H. Stokke, *Astron. Astrophys. Suppl.* **92**, 1992, 565-566):
  A database of astronomy, space sciences and related organizations of the world has been made available through the ESIS public account at ESRIN.
- *StarGuides – A Directory of Astronomy, Space Sciences and Related Organizations of the World (announcement of a catalogue)* (**A. Heck**, *Astron. Astrophys. Suppl.*

102, 1993, 85-86):
A directory of astronomy, space sciences and related organizations of the world has been compiled. It is made available as a CDS Special Publication through the Strasbourg astronomical Data Centre.

- *StarBriefs – A Dictionary of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences, and Related Fields (announcement of a catalogue)* (**A. Heck**, *Astron. Astrophys. Suppl.* **102**, 1993, 87):
A dictionary of abbreviations, acronyms, and symbols in astronomy, space sciences and related fields has been compiled. It is made available as CDS a Special Publication through the Strasbourg astronomical Data Centre.
- *StarWords – A Database of Abbreviations, Acronyms, and Symbols in Astronomy, Space Sciences, and Related Fields (announcement of a database)* (**A. Heck** & M.A. Albrecht, *Astron. Astrophys. Suppl.* **103**, 1994, 471):
A database of abbreviations, acronyms, and symbols in astronomy, space sciences and related fields has been made available at ESO under the STARCAT system.
- *StarGates – A Database of Astronomy, Space Sciences and Related Organizations of the World (announcement of a database)* (**A. Heck** & M.A. Albrecht, *Astron. Astrophys. Suppl.* **103**, 1994, 473-474):
A database of astronomy, space sciences and related organizations of the world has been made available at ESO under the STARCAT system.
- *StarWorlds – StarBits (announcement of two databases)* (**A. Heck**, D. Egret & F. Ochsenbein, *Astron. Astrophys. Suppl.* **108**, 1994, 447-448):
Two databases have been made available through the CDS WWW server: StarWorlds, a database of astronomy, space sciences and related organizations of the world, and StarBits, a database of abbreviations, acronyms, contractions and symbols in the same fields.
- *StarHeads (announcement of a database)* (**A. Heck**, *Astron. Astrophys. Suppl.* **109**, 1995 265):
Another database has been made available on-line through the CDS WWW server. StarHeads is a resource providing links to individual web pages of astronomers and related scientists.
- *Electronic Yellow-Page Services: The Star*s Family as an Example of Diversified Publishing* (invited review) (**A. Heck**, *Astrophys. Sp. Sc.* **247**, 1997, 211-220):
The broad currently accepted definition of electronic publishing encompasses also yellow-page services on the web. Together with their equivalent on paper, they are an example of diversified publishing. Some of these include validation and authentication steps which are *sine qua non* requirements for a service worthy of its name. We briefly describe here such a service with its outstanding features and procedures. We also discuss the maintenance processes and illustrate how constraints at the distribution level can downgrade an otherwise rich compilation of information.

Socio-strategical and Organizational Studies (p. 227)

- *Geographical Distribution of Observational Activities in Astronomy* (**A. Heck**, *Astron. Astrophys. Suppl.* **130**, 1998, 403-406):
  The geographical distribution of astronomy-related observational activities is illustrated from comprehensive and up-to-date samples of professional institutions, of public observatories and planetariums, and of associations. Results are commented and, in particular, the lack of evolution over the past century in the overall distribution is pointed at as an alarming indicator.

- *Astronomy-Related Organizations Over the World* (**A. Heck**, *Astron. Astrophys. Suppl.* **132**, 1998, 65-81):
  The geographical distribution of astronomy-related organizations is illustrated from comprehensive and up-to-date samples. Results for professional institutions, for public observatories, for planetariums, and for associations are commented and compared to an earlier study involving only observational locations (observing and receiving stations). Specific distributions of astronomy-related publishers and software producers are also illustrated. There is a reinforcement of the tendencies pointed out in the previous study with very high densities in Europe and Northeastern USA. Comments are offered on specific concentrations and national differences. It is also clear that numerous institutions and associations are not involved in direct observing. The astronomy-related publishers and software producers are interestingly concentrated in only a few places.

- *The Age of Astronomy-Related Organizations* (**A. Heck**, *Astron. Astrophys. Suppl.* **135**, 1999, 467-475 + 136, 1999, 615):
  The age of currently active astronomy-related organizations is investigated from comprehensive and up-to-date samples. Results for professional institutions, associations, planetariums, and public observatories are commented, as well as specific distributions for astronomy-related publishers and software producers. Some events had a clear impact on the rate of foundation of astronomy-related organizations, such as World War I and II, the beginning of space exploration and the landing of man on the Moon, but not all of them affected in the same way Western Europe and North America. It is still premature to assess the impact of the end of the Cold War. A category such as the software producers would of course not exist nor prosper without the advent of the computer age and the subsequent electronic networking of the planet. Other aspects are discussed in the paper.

- *From Data Files to Information Hubs: Beyond Technologies and Methodologies* (**A. Heck**, in *Information Handling in Astronomy*, Kluwer Acad. Publ., Dordrecht, 2000, 223-242):
  A few comments are humbly offered in the light of about 30 years of activities linked to the information flow: concepts and buzzwords, virtual observatories, success stories, methodological lessons learned, real slot of electronic publishing, quality and automation, need of forecasting, education and communication, etc.

- *Characteristics of Astronomy-Related Organizations* (**A. Heck**, *Astrophys. Sp. Sc.* **274**, 2000, 733-783):
  Geographical distributions, ages and sizes of astronomy-related organizations have been investigated from comprehensive and up-to-date samples extracted from the master files for *StarGuides/StarWorlds*. Results for professional institutions, associations, planetariums, and public observatories are commented, as well as specific distributions for astronomy-related publishers and commercial-software producers. The highly uneven general pattern displayed by geographical distributions is still very much the same as it was at the beginning of the $20^{\rm th}$ century, even if the densities are higher – another illustration of the well-known socio-economic effect of self-reinforcement. Other geographical peculiarities (local concentrations, national cultures and policies, electronic astronomy, ...) are discussed in the paper, as well as the uneasy separation between amateur and professional astronomers in associations. Some events had a clear impact on the rate of foundation of astronomy-related organizations, such as World Wars I and II, the beginning of space exploration, the landing of man on the Moon, the end of the Cold War, spectacular comets, and so on. However, as detailed in the paper, not all of them affected in the same way Western Europe and North America, nor the various types of organizations. The size of the vast majority of astronomy-related organizations is relatively small, with again some differences between Western Europe and North America.

- *Communicating in Astronomy* (**A. Heck**, in *Organizations and Strategies in Astronomy 1 (OSA 1)*, Kluwer Acad. Publ., Dordrecht, 2000, 165-184):
  This chapter is an essay introducing the general communication process related to astronomy and structured essentially in two parts: on one hand, the intra-professional communication, typically but not exclusively, of scientific information and, on the other hand, the communication towards the outside world (other scientific communities, decision makers and takers, news media, public and society at large, including amateur astronomers). Some issues are more specifically touched, such as the language usage and the image of the scientific community. The need for training astronomers to adequately prepare professional communications (talks, 'papers', graphism, ...) and to handle news media is emphasized.

- *Creativity in arts and sciences: A survey* (**A. Heck**, in *Organizations and Strategies in Astronomy 2 (OSA 2)*, Ed. A. Heck, Kluwer Acad. Publ., Dordrecht, 2001, 257-268):
  The motivation for this chapter lies in a survey on creativity among a significant number of artists and scientists (largely but not only astronomers) worldwide. It mainly illustrates there is no unique creativity process, although similarities abound between artistic and scientific creativity. No major difference appears between the groups of artists, nor between the subsamples of male and female surveyees. Comparisons are offered on the basis of well-documented creativity processes as well as a few additional comments.

- *The Impact of New Media on 20th-Century Astronomy*, (**A. Heck**, *Astron. Nachr.* **323**, 2002, 542-547):
  This paper offers a few comments on the impact and changing sociology of astronomy information handling over the past century (especially its last third), drifting from individual measurements or records to catalogs and data centres, and moving recently from information hubs to those distributed digital research facilities including the current projects of so-called 'virtual observatories'. After an introductory part and some notes on personal experience, the paper discusses data centres, methodologies, electronic publishing, as well problems and challenges inherited from the new media: fragility, security and ethics, not to forget the most important one, quality.
- *Advertising from Space: A Real Danger?* (**A. Heck**, in *Light Pollution: The Global View*, Ed. H.E. Schwarz, Kluwer Acad. Publ., Dordrecht, 2003, 269-276):
  This paper recommends we keep a close eye on what is going on around our planet as all improvements brought on ground in terms of light pollution could be quickly ruined by undesirable luminous objects put in Earth orbit. A 'pessimistic' approach would have it that, in the current global market context, if a company realizes that the technology is at hand and that the corresponding RoI is appealing, we could have advertising from space in a couple of years. The 'optimistic view' would moderate this by saying that things are not so simple even if it would be difficult to counter some preliminaries such as luminaries put in Earth orbit for humanitarian purposes (reflecting sunlight on locations with emergency situations and/or natural disasters). Beyond developing ties with other scientific disciplines concerned with environmental impact and disruption of circadian cycles in living beings including humans, appropriate strategies would be to secure public support by ad hoc information and education. Astronomy is in need of a *'cosmic Cousteau'*.

- *Future Professional Communication in Astronomy: Questions and Challenges* (**A. Heck**, in *Future Professional Communication in Astronomy*, Eds. A. Heck & L. Houziaux, Mém. Acad. Royale Belgique in 8° **XXVII**, 2007, 19-36):
  This introductory talk aims at setting pieces of context for the FPCA meeting and at reminding bits of history, for both electronic publishing and astronomy communication in a broader sense. While emphasizing the necessary complementarity of media, it reflects on possible sociological limitations (among others at the level of evaluation committees) responsible for the fact that we still mainly produce electronic versions of documents printable or otherwise available on paper instead of practising full electronic publishing for our verified knowledge. After introducing new publishing models and sketching possibly interfering new technologies, criticisms and questions from the community are echoed in a *Complaint of the Publishing Astronomer*. A few comments are also made on evaluation criteria.
- *Future Professional Communication in Astronomy II Opening Comments* (**A. Heck**, in *Future Professional Communication in Astronomy II*, Ed. A. Accomazzi, Springer,

New York, 2011, 1-10):
This introductory talk reflects on history, sets up pieces of context, and puts forward a few issues to be hopefully addressed during the meeting. The needs for another FPCA meeting are detailed, alternate publishing solutions are mentioned, the status of ERA archives (exchanges between Editors-Referees-Authors) is reviewed for the main journals, etc.

- *A Matter of Continuity, of People, of Ethics, of Vision*, (**A. Heck**, in *Organizations, People and Strategies in Astronomy – Vol. 1*, Venngeist, Duttlenheim, 2012, 1-13):
This introductory chapter emphasizes the people behind the various facets of astronomy activities as well as the frequent lack of training of the managers of astronomical institutions for handling the human material they are in charge of. The need for ethical education of young scientists is also stressed, directed at the proper way of doing research or more generally pursuing the professional activities in the respect of others and of the true and clean aspiration of science. Vision and deontology are complementary concepts for an efficient progress of knowledge.
- A Matter of Quality of Life, of DOBEs and MEEPs, of Appropriate Recognition, and of Targeted Information (**A. Heck**, in *Organizations, People and Strategies in Astronomy – Vol. 2*, Venngeist, Duttlenheim, 2013, 1-14):
This introductory chapter exposes the unfortunate consequences, for an organization, of the mismanagement of human resources, leading to demotivation, desertion and/or antagonistic reactions of personnel. It confronts DOBE-type managers (Demotivating-Ostracizing-Blaming-Expelling ones) with MEEP-type ones (Motivating-Entertaining-Encouraging-Promoting ones). Securing appropriate recognition and providing targeted information are complimentary facets to retain focussed in a rapidly changing context of scientific communication.

Historical Investigations (p. 260)

- *Half A Century of Intense Maturation* (**A. Heck**, in *Information Handling in Astronomy – Historical Vistas*, Kluwer Acad. Publ., Dordrecht, 2003, 1-13):
The $20^{\rm th}$ century, and especially its second half, has seen a dramatic change in the way data were collected, recorded and handled, as well as how the ultimate product was distributed either to scientists, to students or to the public at large. Beyond a compact historical review, this paper offers also a few considerations touching issues such as the available manpower and the place of astronomy in our society.
- *Strasbourg Astronomical Observatory and its Multinational History*, (**A. Heck**, in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht, 2005, 1-61):
Strasbourg Astronomical Observatory changed nationality several times since its foundation in the $19^{\rm th}$ century. This chapter outlines the observatory history over

roughly a century and introduces the directors together with a few high-profile scientists having been based there or associated with the institution during that time. The major instruments are presented as well as several big projects born (Hipparcos) or installed (CDS) in the observatory. Pointers are provided towards other chapters of the book.

- *Vistas into the CDS Genesis*, (**A. Heck**, in *The Multinational History of Strasbourg Astronomical Observatory*, Springer, Dordrecht, 2005, 191-209):
  This chapter gathers together a few milestones of the pre-CDS years marking the advent of astronomical data centers. Two chronologies are reviewed: one essentially at the level of the International Astronomical Union (IAU), and the other one centered on the preparatory steps to the official creation, in 1972, of the *Centre de Données Stellaires (CDS)* in Strasbourg.
  Some tentative explanations to CDS' long-term success are put forward.
- *The Progressive World Penetration of the Strasbourg Astronomical Data Center (1970-1990)*, (**A. Heck**, in *Organizations and Strategies in Astronomy 7 (OSA 7)*, Springer, Dordrecht, 2006, 315-354):
  Over roughly two decades, Strasbourg astronomical Data Center (CDS) managed to be recognized as an excellence center for stellar and non-stellar data (solar-system excluded) on a world-wide scale. After briefly recalling the CDS genesis, this chapter details the progressive international penetration of that small structure, ahead of the networking of the planet. Among the aspects reviewed are: the international membership of CDS Council, the participating observatories, the CDS international agreements, the geographical coverage of users, the international meetings, the publications, the staff, and, last but not least, the critical ventures with the space agencies without which CDS would not have remained on the international scene. Some tentative explanations of CDS' international acceptance are put forward, such as its genial basic idea (table of correspondence between catalog identifications) and more generally its excellent home-made products; right decisions taken at the right time by the initial managers; perceptiveness in terms of future needs; adequate response to the expectations of space agencies; and so on.
- *Historical Examples of Lobbying: The Case of Strasbourg Astronomical Observatories*, (**A. Heck**, in *Organizations, People and Strategies in Astronomy 1 (OPSA 1)*, Venngeist, Duttlenheim, 2012, 295-318):
  Several astronomical observatories have been established in Strasbourg in very differing contexts. In the late $17^{\rm th}$ century, an observing post (scientifically sterile) was put on top of a tower, the Hospital Gate, essentially for the prestige of the city and the notoriety of the university. In the $19^{\rm th}$ century, the observatory built on the *Académie* hosting the French university was the first attempt to set up in the city a real observatory equipped with genuine instrumentation with the purpose of carrying out serious research, but the succession of political regimes in France and the continual bidding for moving the university to other locations, together

with the faltering of later scholars, torpedoed any significant scientific usage of the place. After the 1870-1871 Franco-Prussian war, the German authorities set up a prestigious university campus with a whole range of institutes together with a modern observatory consisting of several buildings and hosting a flotilla of excellent instruments, including the then largest refractor of the country. This paper illustrates various types of lobbying used in the steps above while detailing, from archive documents largely unexploited so far, original research on the two first observatories.

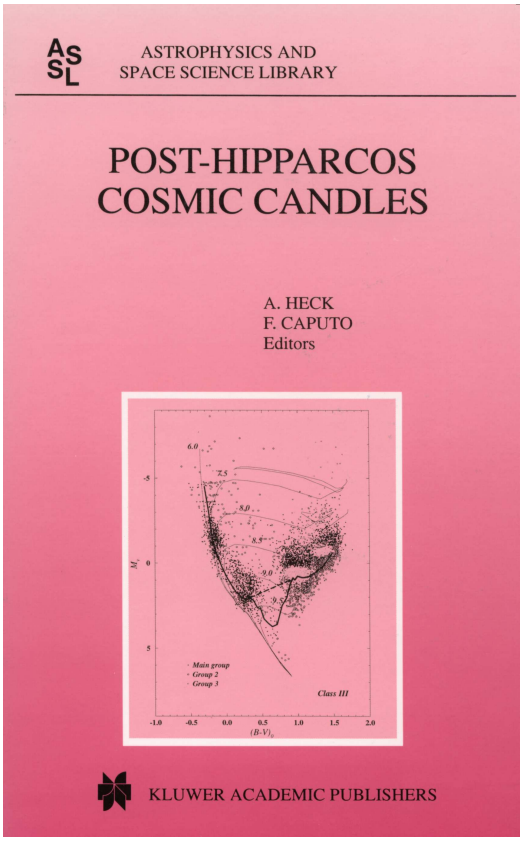


Fig. 241: The volume "Post-Hipparcos Cosmic Candles" edited with F. Caputo (Kluwer, 1999, ISBN 0-7293-5348-X) has its table of contents detailed on p. 500.

Tables of Contents of Books Produced

Note: This section details the tables of contents of the books shaped and produced by our biographee as editor or co-editor (see pp. 435ff), to the exclusion of edited proceedings of scientific meetings (pp. 443ff). A global alphabetical list of authors-contributors to the volumes produced is downloadable from the web[262].

Knowledge-Based Systems in Astronomy

(Eds. **A. Heck** & F. Murtagh, Springer-Verlag, 1989)

- Foreword
  (Editors)
- Artificial Intelligence Applications for Hubble Space Telescope Operations
  (G. Miller/STScI)
  (M.D. Johnston/STScI)
- Survey Work with Automated Data Analysis
  (D. Teuber, P. Schuecker & H. Horstmann/Münster Astron. Inst.)
- Distributed Point-Pattern Matching
  (G.R. Cross & R. Gupta/Washington & Louisiana State Univ.)
- Decision Problems in the Search for Periodicities in Gamma-Ray Astronomy: How Can AI Help?
  (M.C. Maccarone & R. Buccheri/IFCAI)
- Classification and Knowledge
  (M.J. Kurtz/CfA)
- WOLF:
  A Computer Expert System for Sunspot Classification and Solar Flare Prediction
  (R.W. Miller/Cedar Valley Solar Obs.)
- Knowledge-Based Classification of Galaxies
  (M. Thonnat & A. Bijaoui/INRIA & Obs. Nice)
- Classification of IUE Spectra: A Rule-Based Approach
  (F. Murtagh/ST-ECF, **A. Heck**/Obs. Strasbourg & R. Rampazzo/Oss. Brera)

[262] http://www.aheck.org/authbks.pdf

- Representation of Knowledge Using Fuzzy Set Theory
  (V. Di Gesù/IFCAI)
- An Approach to Heuristic Exploitation of Astronomers' Knowledge in Automatic Interpretation of Optical Pictures
  (A. Accomazzi, G. Bordogna, P. Mussio & A. Rampini/Univ. Milano & IFCTR)
- Connectionism and Neural Networks
  (H.M. Adorf/ST-ECF)
- Applications of AI in Astronomy: A View Towards the Future
  (R. Albrecht/ST-ECF)

Applying Fractals in Astronomy

(Eds. **A. Heck** & J.M. Perdang, Springer-Verlag, 1991)

- Foreword
  (Editors)
- Geometry and Dynamics of Fractal Sets
  (J.M. Perdang/IALg)
- Pulsating Stars and Fractals
  (M.J. Goupil, M. Auvergne & Th. Serre/Obs. Paris)
- Turbulence, Fractals, and the Solar Granulation
  (P.N. Brandt & W. Mattig/Kiepenheuer-Inst. f. Sonnenphysik,
  R. Greimel/Inst. Astron. Graz & E. Guenther/MPIA)
- Fractals and the Large-Scale Galaxy Distribution
  (A. Provenzale/CNR Ist. Cosmogeofisica)
- Is the Spatial Distribution of Galaxies a Bounded Self-Similar Structure: Observational Evidences
  (D. Calzetti & M. Giavalisco/ICRA)
- Fractal Aspects of Galaxy Clsutering
  (V. Martínez/Univ. Valencia)
- Fractal Properties in the Simulations
  of a One-Dimensional Spherically Expanding Universe
  (J.L. Rouet, E. Jamin & M.R. Feix/CNRS PMMS)
- The Fractal Structure of the Quantum Space-Time
  (L. Nottale/Obs. Meudon)
- The Real Stuff
  (**A. Heck**/Obs. Strasbourg)

Intelligent Information Retrieval – The Case of Astronomy and Related Space Sciences

(Eds. **A. Heck** & F. Murtagh, Kluwer Acad. Publ., 1993)

- Preface
  (B. Hauck/Inst. Astron. Lausanne)

- Introduction
  (Editors)
- Understanding and Supporting Human Information Seeking
  (N. Belkin/Rutgers Univ.)
- Advice from the Oracle: Really Intelligent Information Retrieval
  (M.J. Kurtz/CfA)
- Search Algorithms for Numeric and Quantitative Data
  (F. Murtagh/ST-ECF)
- Information-Sifting Front Ends to Databases
  (H.M. Adorf/ST-ECF)
- What Hypertext can do for Information Retrieval
  (R. Bogaschewsky & U. Hoppe/Univ. Göttingen)
- Archie
  (A. Emtage/Bunyip Inf. Syst.)
- WAIS
  (J. Fullton/CNIDR)
- The Internet Gopher
  (F. Anklesaria & M. McCahill/Univ. Minnesota)
- WorldWideWeb
  (B. White/SLAC)
- Information in Astronomy: Tackling the Heterogeneity Factor
  (M.A. Albrecht/ESO & D. Egret/Obs. Strasbourg)
- Multistep Queries: The Need for a Correlation Environment
  (M.A. Hapgood/RAL)
- Intelligent Information Retrieval in High-Energy Physics
  (E. van Herwijnen/CERN)
- Astronomical Data Centres from an IIR Perspective
  (M. Crézé/Obs. Strasbourg)
- Epilogue
  (Editors)

Electronic Publishing for Physics and Astronomy

(Ed. **A. Heck**, Kluwer Acad. Publ., 1997)

- Introduction – Electronic Publishing in its Context
  (Editor)
- The Impact of Information Technology and Networks:
  New Perspectives for Scientific, Technical and Medical (STM) Publishing
  (A. de Kemp/Springer-Verlag)
- Advanced Multimedia Publishing: Where Does Europe Stand in the Wired World?
  (F. Mastroddi/EU DG XIII)
- The Technologies which Underpin Electronic Publishing
  (F. Murtagh/Univ. Ulster)

- Electronic Publishing: The Rôle of a Large Scientific Society
  (B. Bederson & H. Lustig/American Physical Soc.)
- The AAS Program of Electronic Publication
  (P. Boyce/AAS)
- The Project of Electronic Publication of *Astronomy and Astrophysics*
  (H.J. Habing & J. Lequeux/Astron. Astrophys.)
- The ACM Electronic Publishing Plan
  (P.J. Denning & B. Rous/ACM)
- The ACM Interim Copyright Policy
  (P.J. Denning & B. Rous/ACM)
- The ICSU Press Programme on Electronic Publishing in Science
  (D.F. Shaw/ICSU Press)
- Electronic Publishing: Economic Issues in a Time of Transition
  (H. Lustig/American Physical Soc.)
- Rights Management in Electronic Environments
  (D. Armati/Jackson Brevis Ltd.)
- Protecting Published Science
  (E. Barrow/UK Copyright Licensing Agency)
- Bits and Bytes and Still a Lot of Paper:
  Astronomy Libraries and Librarians in the Age of Electronic Publishing
  (U. Grothkopf/ESO)
- The Digital Library of the Astrophysics Data System
  (G. Eichhorn/CfA)
- Electronic Yellow-Page Services:
  The Star*s Family as an Example of Diversified Publishing
  (**A. Heck**/Obs. Strasbourg)
- Electronic Publishing at Institute of Physics
  (A. Dixon/IoP Publishing)
- IDEAL and APPEAL:
  A Model for Consortium Licensing of Electronic Journal Collections
  (J. Menzel, K. Metzner & E. Pope/Academic Press)

Post-Hipparcos Cosmic Candles

(Eds. **A. Heck** & F. Caputo, Kluwer Acad. Publ., 1999)

- Foreword
  (Editors)
- Hipparcos: A New Basis for Calibrating Distance Indicators
  (C. Turon/Obs. Paris)
- Distance Determination with Cepheid Variables
  (N.R. Tanvir/Univ. Cambridge)
- Absolute Magnitudes Derived Using the Statistical Parallax Method
  (A.C. Layden/Univ. Michigan)

- The RR Lyrae Distance Scale
  (P. Popowski & A. Gould/Ohio State Univ.)
- Mira Distances and their Use
  (M. Feast/Univ. Cape Town & P. Whitelock/SAAO)
- Distances and Ages of Globular Clusters
  Using Hipparcos Parallaxes of Local Subdwarfs
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- Globular Cluster Distance Determinations
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- The Distances of the Magellanic Clouds
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- Distances from the Correlation between Galaxy Luminosities and Rotation Rates
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- The Contribution of Microlensing Surveys to the Distance Scale
  (J.Ph. Beaulieu/Kapteyn Sterrenkundig Inst. & W.J. de Wit/Univ. Utrecht)
- Stellar Evolution and Standard Candles
  (V. Castellani/Univ. Pisa)

Information Handling in Astronomy

(Ed. **A. Heck**, Kluwer Acad. Publ., 2000)

- Foreword – The Information Flow in Astronomy
  (Editor)
- Information in Astronomy: The Role of the IAU
  (J. Andersen/IAU)
- Astronomy and the News Media
  (S.P. Maran/NASA GSFC, L.R. Cominsky/Sonoma State Univ.
  & L.A. Marshall/Gettysburg Coll.)
- Public Outreach in Astronomy: The ESO Experience
  (C. Madsen & R.M. West/ESO)
- New Frontiers in NASA Data Management
  (C. Cheung & D. Leisawitz/NASA GSFC)
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- The Use of the IRAF System at NOAO
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- To be Editor-in-Chief of a Primary Scientific Journal:
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- Astronomy Libraries 2000: Context, Coordination, Cooperation
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- Astronomy Teaching at the Open University
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- The Role of the Planetarium
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- Data Handling in the AAVSO:
  An example from a large organization of amateur astronomers
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- From Data Files to Information Hubs: Beyond Technologies and Methodologies
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Organizations and Strategies in Astronomy – Vol. 1

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- NASA Program Solicitations, Proposal Evaluations, and Selection of Science Investigations (J.D. Bohlin/NASA)
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- Bibliography of Socio-Astronomy

Organizations and Strategies in Astronomy – Vol. 2

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- Foreword (A. Blaauw/Kapteyn Astron. Inst.)
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- Strategies for Bringing a $19^{\rm th}$-Century Observatory up to the Standards of $21^{\rm st}$-Century Astronomy (M. Golay/Obs. Genève)
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- Background and Achievements of UN/ESA Workshops on Basic Space Science 1991-2001 (H.J. Haubold/UN Office for Outer Space Affairs)
- Organising and Funding Research at a European Level (A.E.S. Mayer/ESF)
- OPTICON: EC Optical Infrared Coordination Network for Astronomy (G. Gilmore/Cambridge Inst. Astron.)
- Coordinating Multiple Observatory Campaigns (K.A. Peterson/STScI, B. Perriello/STScI, P. Stanley/STScI, J. Bonnell/NASA GSFC, E. Smith/NASA GSFC, N.R. Evans/SAO, P. Hilton/ISAS & B. Roberts/Johns Hopkins Univ.)
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- Large Surveys in Cosmology: The Changing Sociology (O. Lahav/Cambridge Inst. Astron.)

- The ESO Observing Programmes Committee
  (J. Breysacher/ESO & Chr. Waelkens/Katholieke Univ. Leuven)
- Astronomical Software Strategies
  (K. Shortridge/AAO)
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  (A. Schubert/Hungarian Acad. Sciences)
- Comments on Refereeing
  (H.A. Abt/KPNO)
- Communicating and Networking in Astronomy Libraries
  (U. Grothkopf/ESO & M. Cummins/Univ. Toronto)
- Editing the *Encyclopedia of Astronomy and Astrophysics*
  (P. Murdin/PPARC & British National Space Ctre)
- Editing a Multilingual Astronomy Magazine
  (N. Cramer/Obs. Genève)
- Working with the Media: The Royal Astronomical Society Experience
  (J. Mitton/RAS)
- Creativity in Arts and Sciences: A Survey
  (**A. Heck**/Obs. Strasbourg)
- Updated Bibliography of Socio-Astronomy

Organizations and Strategies in Astronomy – Vol. 3

(Ed. **A. Heck**, Kluwer Acad. Publ., 2002)

- Foreword
  (R. Cayrel/Obs. Paris-Meudon)
- Editorial
- Close Encounters of the Third Kind with the Hubble Space Telescope
  (Cl. Nicollier/ESA EAC)
- Public Relations for a National Observatory
  (D.G. Finley/NRAO)
- Popularizing Astronomy: Four Decades as a Galley Slave
  (L.J. Robinson/Sky & Telescope)
- The International Max Planck Research School (IMPRS)
  for Astrophysics at Garching-Munich
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- Scientific Impact of Large Telescopes
  (C.R. Benn/ING)
- The Rôle of Ground Stations in Space Observatories
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- Optical Astronomy and South Africa. Part I: To 1994
(M. Feast/Univ. Cape Town)
- Astronomy and Astrophysics in the Czech Republic
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Abbreviations

3D = Three-dimensional/Three Dimensions
4S = Science and Social Studies of Science

A&A = Astronomy & Astrophysics (journal)
AAO = Anglo-Australian Observatory (Australia)
AAPPS = Association of Asian and Pacific Physical Societies
A&AS = Astronomy & Astrophysics Supplements (journal)
AAS = American Astronomical Society (USA)
AAVSO = American Association of Variable Stars Observers (USA)
Acad. = Academy/Académie/Academia/Academic/Academique/Académico
ACM = Association for Computational Machinery (USA)
ADA = Astronomy in Daily Art (project)
ADASS = Astronomical Data Analysis Software and Systems (conferences)
ADC = Astronomy Data Center (NASA)
ADF = Astrophysics Data Facility (USA)
ADS = Astrophysics Data System (USA)
AE = Academia Europaea
AFB = Air Force Base (USA)
AFOEV = Association Française d'Observateurs d'Étoiles Variables (France)
AG = Assemblée Générale
AG = Astronomische Gesellschaft (Germany)
AIPS = Astronomical Image Processing System
AITA = Artificial Intelligence Techniques for Astronomy (workshop)
Akad. = Akademie
AL = Astronomical League (USA)
ALD = Astronomy from Large Databases (conferences)
AMA = American Management Association (USA)
Amer. = American
AMOS = Advanced Mechanical and Optical Systems (Belgium)
ARI = Astronomisches Rechen-Institut (Germany)
ARL = Athénée Royal de Liège (Belgium)
ARPA = Advanced Research Projects Agency (USA)
ARPANET = Advanced Research Projects Agency Network

ARV = Athénée Royal de Verviers (Belgium)
ASE = Agence Spatiale Européenne
ASP = Astronomical Society of the Pacific (USA)
ASpScROW = Astronomy, Space Sciences and Related Organizations of the World (directory)
ASSL = Astrophysics and Space Science Library (Kluwer/Springer)
Astrof.= Astrofísica
Astron. = Astronomy/Astronomie/Astronomía Astronomical/Astronomique/Astronómico/Astronomiche Astronomische/Astronomiche
Astrophys. = Astrophysics/Astrophysique/Astrophysical/Astrophysik
ATC = Astronomy Technology Centre (UK)
ATP = Action Thématique Programmée
AU = Astronomical Unit
AURA = Association of Universities for Research in Astronomy (USA)
AVCUS = Archives de la Ville et de la Communauté Urbaine de Strasbourg
AZ = Arizona (USA)

BA = British Airways
BDL = Bureau des Longitudes
Beitr. = Beiträge
BNF = Bibliothèque Nationale de France
Biogr. = Biography/Biographie/Biographic/Biographique
BNU = Bibliothèque Nationale et Universitaire (Strasbourg)
BOE = Boletín Oficial del Estado (Spain)
BSI = Bibliographical Star Index (CDS)
Bull. = Bulletin

CA = California (USA)
CAAAH = Cahiers Alsaciens d'Archéologie, d'Art et d'Histoire (periodical)
CAD = Club d'Astronomie de Duttlenheim (France)
CalTech = California Institute of Technology (USA)
CAP = Communicating Astronomy with the Public
CAPj = Communicating Astronomy with the Public Journal
CARSO = Carnegie Southern Observatory (now Las Campanas Observatory) (Chile)
CBAT = Central Bureau of Astronomical Telegrams (IAU)
CCLRC = Council for the Central Laboratory of the Research Councils (UK) (formerly PPARC)
CCMA = Converging Computing Methodologies in Astronomy (ESF network)
CCSC = Centre de Calcul de Strasbourg-Cronenbourg (CNRS)
CDCA = Centre de Dépouillement des Clichés Astronomiques (France)
CDS = Centre de Données astronomiques de Strasbourg (France) (formerly Centre de Données Stellaires)

C&E = Ciel & Espace (periodical)
CEA = Commissariat à l'Énergie Atomique (France)
CEE = Communauté Économique Européenne (Europe)
CERGA = Centre d'Études et de Recherches en Géodynamique et Astrométrie (France)
CERN = Centre Européen pour la Recherche Nucléaire
CESR = Centre d'Étude Spatiale des Rayonnements (France)
CfA = Center for Astrophysics (USA)
CFHT = Canada-France-Hawaii Telescope
CIME = Comité Interministériel pour les Migrations Européennes
Circ. = Circular
CNAP = Conseil National des Astronomes et Physiciens (France)
CNBCGI = Comité National Belge pour la Coopération Géophysique Internationale (Belgium)
CNED = Centre National d'Éducation à Distance (France)
CNES = Centre National d'Études Spatiales (France)
CNIDR = Clearinghouse for Networked Information Discovery and Retrieval (USA)
CNR = Consiglio Nazionale delle Ricerche (Italy)
CNRS = Centre National de la Recherche Scientifique (France)
Co. = Company
CO = Colorado (USA)
CO = Comité d'Organisation
CODATA = Committee on Data for Science and Technology (ICSU)
Coll. = Colloquium/Colloque
Comm. = Commission
Conf. = Conference/Conférence
Coord. = Coordinating
COSPAR = Committee on Space Research
COTOREP = Commission Technique d'Orientation et de Reclassement Professionnel (France) (now MDPH)
CP = Conference Proceedings (NASA)
CPD = Cape Photographic Durchmusterung (catalog)
CR = Comptes-Rendus
CSI = Catalogue of Stellar Identifications (CDS)
CSICOP = Committee for the Scientific Investigations of Claims of the Paranormal (USA)
CSWA = Committee on the Status of Women in Astronomy (AAS)
CTIO = Cerro Tololo Inter-American Observatory (Chile)
CUP = Cambridge University Press
CVA = Cerebrovascular Ailment

DAA = Data Analysis in Astronomy (workshops)
DC = District of Columbia (USA)

DDO = David Dunlap Observatory (Canada)
DEA = Diplôme d'Études Approfondies (France)
DG = Direction Générale/Directorate General
Dict. = Dictionary/Dictionnaire
DNA = Dernières Nouvelles d'Alsace (newspaper)
DOBE = Demotivate-Ostracize-Blame-Expell (management style)
DTP = DeskTop Publishing
DVD = Digital Versatile Disc
Digital Video Disc

EAA = East African Airways
EAAE = European Association for Astronomy Education
EAC = European Astronauts Centre (ESA)
EAGB = Expédition Astrophysique et Géophysique Belge (Belgium)
EARN = European Academic Research Network
EAS = European Astronomical Society
EASST = European Association for the Study of Science and Technology
EBUA = Errors, Bias and Uncertainties in Astronomy (conference)
ECHT = European Conference on Hypertext
Ed. = Editor
Éd. = Éditeur
Eds = Editors
EDS = Experimental Display System (IUE)
Éds = Éditeurs
EGO = European Gravitational Observatory
ELDO = European Launcher Development Organisation
EMS = Emergency Medical Service
ENIAC = Electronic Numerical Integrator And Computer
ENSSIB = École Nationale Supérieure des Sciences de l'Information et des Bibliothèques (France)
EP = Electronic Publishing
EPFL = École Polytechnique Fédérale de Lausanne (Switzerland)
ERA = Editors-Referees-Authors
ESA = European Space Agency
ESF = European Science Foundation
ESIS = European Space Information System
ESLAB = European Space Laboratory
ESO = European Southern Observatory
ESOC = ESA Space Operations Centre (Germany)
ESRIN = ESA Space Research Institute (Italy)
ESRO = European Space Research Organization
ESTEC = ESA Science and Technology Centre (Netherlands)
ETHZ = Eidgenössische Technische Hochschule Zürich (Switzerland)

EU = European Union
EWASS = European Week of Astronomy and Space Science

f. = für
Fac. = Facultad/Faculté/Faculty
FAGS = Federation of Astronomical and Geophysical Services
FAQ = Frequently Asked Question(s)
ff = and following pages
FES = Fine Error Sensor
FiA = Fractals in Astronomy (workshop)
Fig. = Figure
FNOES = Fondation Nationale pour l'Organisation d'Expéditions Scientifiques (Belgium)
FNRS = Fonds National de la Recherche Scientifique (Belgium)

FPCA = Future Professional Communication in Astronomy (workshops)
FTS = Federal Telecommunications Service (USA)

GA = General Assembly
GA = Georgia (USA)
GEOS = Groupement Européen d'Observation Stellaire
GSFC = Goddard Space Flight Center (NASA)

HAD = Historical Astronomy Division (AAS)
HD = Henry Draper (catalog)
HDR = Habilitation à Diriger des Recherches (degree)
HEIC = Hubble ESA Information Centre
HEP = High-Energy Physics
H/O = Handover
HQ = Headquarters
HR = Harvard Revised (catalog)
HST = Hubble Space Telescope

IAC = Instituto de Astrofísica de Canarias (Spain)
IALg = Institut d'Astrophysique de l'Université de Liège (Belgium)
IAP = Institut d'Astrophysique de Paris (France)
IAPR = International Association on Pattern Recognition
IATE = Instituto de Astronomía Teórica y Experimental (Argentina)
IAU = International Astronomical Union
IAUC = International Astronomical Union Circular
ICHA = Inter-Union Commission for History of Astronomy
ICHS = International Congress of History of Science
ICRA = International Center for Relativistic Astrophysics (Italy)

ICSTI = International Council for Scientific and Technical Information
ICSU = International Council of Scientific Unions
ID = Identification/Identifier
IDAAS = International Directory of Amateur Astronomical Societies (first)
International Directory of Astronomical Associations and Societies (later)
IDPAI = International Directory of Professional Astronomical Institutions
IERS = International Earth Rotation and Reference Systems Service
IFCAI = Istituto di Fisica Cosmica ed Applicazioni dell'Informatica (Italy)
IFCTR = Istituto di Fisica Cosmica e Tecnologie Relative (Italy)
IHW = International Halley Watch
IIR = Intelligent Information Retrieval
IL = Illinois (USA)
IMCCE = Institut de Mécanique Céleste et de Calcul des Éphémérides (France)
IMPRS = International Max Planck Research School (Germany)
INAG = Institut National d'Astronomie et de Géophysique (later INSU) (France)
Inf. = Information
Inform. = Information
ING = Isaac Newton Group (Canary Islands)
INRA = Institut National de la Recherche Agronomique (France)
INRIA = Institut National de Recherche en Informatique et en Automatique (France)
INSAP = Inspiration from the Astronomical Phenomena (conference)
Inst. = Institute/Institut/Instituto
INSU = Institut National des Sciences de l'Univers (France)
(formerly INAG)
Int. = Internal/Interne
INTA = Instituto Nacional de Técnica Aeroespacial (Spain)
Internat. = International(e)
IoP = Institute of Physics (UK)
I/P = Image Processing
IPAC = Infrared Processing and Analysis Center (USA)
IPS = Image Processing Software
IR = Infrared
IRAM = Institut de Radioastronomie Millimétrique
IRAS = Infrared Astronomical Satellite
IRS = Information Retrieval System (ESA/ESRIN)
ISAS = Institute for Space and Astronautical Science (Japan)
ISBN = International Standard Book Number
ISO = International Standardization Organization
ISSI = International Space Science Institute (Switzerland)
ISSN = International Standard Serial Number
Ist. = Istituto
ISU = International Space University (France)
Ital. = Italiana

ITSRE = Istituto di Tecnologie e Studio delle Radiazioni Extraterrestri (Italy)
IUCAA = Inter-University Centre for Astronomy and Astrophysics (India)
IUE = International Ultraviolet Explorer (spacecraft)
IYA = International Year of Astronomy

J. = Journal
JBO = Jodrell Bank Observatory (UK)
JENAM = Joint European and National Astronomy Meeting
JILA = Joint Institute for Laboratory Astrophysics (USA)
JOSO = Joint Organization for Solar Observations
JPL = Jet Propulsion Laboratory (USA)

KBS = Knowledge-Based System
KGB = Komitet Gosudarstvennoy Bezopasnosti (USSR)
KNAW = Koninklijke Nederlandse Akademie van Wetenschappen (Netherlands)
Kon. = Koninklijke
KPNO = Kitt Peak National Observatory (USA)
KSB = Koninklijke Sterrenwacht van België (Belgium)

Lab. = Laboratory/Laboratories/Laboratoire(s)
LBTO = Large Binocular Telescope Observatory (USA)
LCER = Lewis Center for Educational Research (USA)
LISA = Library and Information Systems in Astronomy (conference)
LSU = Louisiana State University (USA)
LTEP = Long-Term Electronic Publishing (workshop)
LW = Long Wavelength
LWP = Long Wavelength Prime (camera, on IUE)
LWR = Long Wavelength Redundant (camera, on IUE)

M = Messier (catalog)
MA = Massachusetts (USA)
MAM = Modern Astronomical Methodology (WG)
MAMA = Machine À Mesurer Automatique (project)
MAO = Main Astronomical Observatory (Ukraine)
MAST = Barbara A. Mikulski Archive for Space Telescopes (STScI)
MCE = Management Center Europe
MD = Maryland (USA)
MDA = Multivariate Data Analysis
MDPH = Maison Départementale des Personnes Handicapées (France)
(formerly COTOREP)
MEEP = Motivate-Entertain-Encourage-Promote (management style)
Mém. = Mémoires
Memo = Memorandum

MEN = Ministère de l'Éducation Nationale
Min. = Ministère
MIT = Massachusetts Institute of Technology (USA)
Mitt. = Mitteilungen
MK = Morgan-Keenan (spectral classification)
MNHSO = The Multinational History of Strasbourg Observatory (book)
MO = Missouri (USA)
MPE = Max-Planck-Institut für extraterrestrische Physik (Germany)
MPI = Max-Planck-Institut (Germany)
MPIA = Max-Planck-Institut für Astronomie (Germany)
MPIfR = Max-Planck-Institut für Radioastronomie (Germany)

NAOJ = National Astronomical Observatory of Japan
Nachr. = Nachrichten
NAM = National Astronomy Meeting
NASA = National Aeronautics and Space Administration (USA)
NATO = North Atlantic Treaty Organization
NC = North Carolina (USA)
NCSA = National Center for Supercomputing Applications (USA)

NDBA = Nouveau Dictionnaire de la Biographie Alsacienne
NED = NASA Extragalactic Database Newsl. = Newsletter
NGC = New General Catalog
NIOZ = Nederlands Instituut voor Onderzoek der Zee (Netherlands)
NM = New Mexico (USA)
NOAO = National Optical Astronomy Observatories (USA)
NOT = Nordic Optical Telescope
Nouv. = Nouveau/Nouvel/Nouvelle
NOVA = Nederlandse Onderzoekschool Voor Astronomie (Netherlands)
NRAO = National Radio Astronomy Observatory (USA)
NRCC = National Research Council of Canada
NSF = National Science Foundation (USA)
NSO = National Solar Observatory (USA)
NY = New York (USA)
NYAS = New York Academy of Sciences (USA)
NYC = New York City (USA)

OAC = Osservatorio Astronomico di Capodimonte (Italy)
OAT = Osservatorio Astronomico di Trieste (Italy)
Obs. = Observateurs/Observatoire/Observatorio/Observatory
OC = Organizing Committee
OH = Ohio (USA)
OHP = Observatoire de Haute Provence (France)

OMSI = Oregon Museum of Science and Industry (USA)
OPC = Observing Programmes Committee (ESO)
OPMT = Observatoire du Pic du Midi et de Toulouse (France)
Ops = Operations
OPSA = Organizations, People and Strategies in Astronomy (volumes)
OR = Oregon (USA)
ORB = Observatoire Royal de Belgique (Belgium)
OSA = Organizations and Strategies in Astronomy (volumes)
Oss. = Osservatorio
OST = Observatoire des Sciences et Techniques (France)
OTAN = Organisation du Traité de l'Atlantique Nord
OUP = Oxford University Press

p. = page
PA = Pennsylvania (USA)
Par. = Paragraph
PI = Principal Investigator
Plan. = Planetarium/Planétarium/Planetario
pp. = pages
PPARC = Particle Physics and Astronomy Research Council (UK)
(formerly SERC, later CCLRC)
PR = Pattern Recognition
PRC = People's Republic of China
Proc. = Proceedings
Prod. = Productions
PSS = Palomar Sky Survey
Publ. = Publication(s)/Publisher(s)/Publishing

Quart. = Quarterly

R/A = Resident Astronomer
RAL = Rutherford Appleton Laboratory (UK)
RAS = Royal Astronomical Society (UK)
Rev. = Review/Revue/Revista
RGO = Royal Greenwich Observatory (UK)
Ric. = Ricerche
ROE = Royal Observatory, Edinburgh (Scotland)
R/T = Real Time

SAAO = South African Astronomical Observatory
SAF = Société Astronomique de France
SAFGA = Groupe d'Alsace de la Société Astronomique de France
SAL = Société Astronomique de Liège (Belgium)

SALT = South African Large Telescope
SAO = Smithsonian Astrophysical Observatory (USA)
Sc. = Science(s)/Scientific/Scientifique
S/C = Spacecraft
SDI = Selective Dissemination of Information
SEAN = Scientific Event Alert Network (Smithsonian Institution)
Ser. = Series
SERC = Scientific and Engineering Research Council (later PPARC) (UK)
SETI = Search for Extraterrestrial Intelligence (project)
SFSA = Société Française des Spécialistes d'Astronomie (France)
(later SF2A)
SF2A = Société Française d'Astronomie et d'Astrophysique (France)
(formerly SFSA)
SIAM = Society for Industrial and Applied Mathematics (USA)
SIGIR = Special Interest Group on Information Retrieval (ACM)
SIM = Société Industrielle de Mulhouse (France)
SIMBAD = Set of Identifications, Measurements and Bibliography for Astronomical Data (database)
SLAC = Stanford Linear Accelerator Center (USA)
SMA = Statistical Methods in Astronomy (conference)
Soc. = Sociedad/Società/Société/Society
SOFIA = Stratospheric Observatory for Infrared Astronomy
Sp. = Space
SP = Special Publication (ESA)
Spéc. = Spécial(e)
SPAN = Space Physics Analysis Network
SPIE = Society of Photo-optical Instrumentation Engineers
SRBA = Société Royale Belge d'Astronomie, de Météorologie et de Physique du Globe (Belgium)
SRC = Scientific Research Council (UK)
SSD = Space Science Department (ESA)
S&T = Sky & Telescope (periodical)
ST = Space Telescope
ST-ECF = Space Telescope European Coordinating Facility (Germany)
Sternw. = Sternwarte
STIA = Strategies and Techniques of Information for Astronomy (workshop)
STM = Scientific-Technical-Medical
STScI = Space Telescope Science Institute (USA)
Suppl. = Supplements
S/W = Software
SW = Short Wavelength
SWP = Short Wavelength Prime (camera, on IUE)
SWR = Short Wavelength Redundant (camera, on IUE)

Symp. = Symposium

TC = Technical Committee
TCP/IP = Transmission Control Protocol/Internet Protocol
TEE = Trans-Europ-Express (train)
Tel. = Telescope
TG = Task Group
T/O = Telescope Operator (IUE)
ToO = Target of Opportunity (IUE)
TU = Technical University/Technische Universität/Technische Universiteit
TÜBITAK = Türkiye Bilimsel ve Teknolojik Arastirma Kurumu (Turkey)
TUG = TÜBITAK Ulusal Gozlemevi (Turkey)
TX = Texas (USA)

u3a = Université du Troisième Âge
UA = Unité Astronomique
UAI = Union Astronomique Internationale
UCB = University of California at Berkeley (USA)
UCD = University of California at Davis (USA)
UCL = University College London (UK)
UCLA = University of California at Los Angeles (USA)
UE = Union Européenne
UFO = Unidentified Flying Object
UK = United Kingdom
ULDA = Uniform Low-Dispersion Archive (IUE)
UN = United Nations
UNAM = Universidad Nacional Autónoma de México (Mexico)
UNESCO = United Nations Educational, Scientific and Cultural Organization
Univ. = Universidad/Università/Université/University
URA = Unité de Recherche Associée (CNRS)
URL = Uniform Resource Locator
US = United States
USA = United States of America
USAF = United States Air Force (USA)
USNO = United States Naval Observatory (USA)
USSP = ULDA Software Support Package (IUE)
USSR = Union of Soviet Socialist Republics
UTL = Université du Temps Libre
UU = University of Ulster (Northern Ireland)
UV = Ultraviolet
UVSC = Ultraviolet Stellar Classification (workshop)

V/A = Visiting Astronomer (IUE)

VA = Virginia (USA)
Var. = Variable
VHF = Very High Frequency
Vilspa = Villafranca del Castillo Satellite Tracking Station (Spain)
VLA = Very Large Array
VLBA = Very Long Baseline Array
VLT = Very Large Telescope
VO = Virtual Observatory
Vol. = Volume
VPB = Variable Procrustean Bed (method)
VUB = Vrije Universiteit Brussel (Belgium)

WA = Washington (USA)
WAN = Wide-Area Network
WAW = Weaving the Astronomy Web (workshop)
Wetensch. = Wetenschappen
WG = Working Group
WGMAM = Working Group on Modern Astronomical Methodology
WI = Wisconsin (USA)
WMO = World Meteorological Organization
WWI = World War I
WWII = World War II
WWW = World-Wide Web

YCDA = You Can Do Astronomy (project)

Indices

The following section offers breakdowns by the dates[263], people and places mentioned in the book, as well as a general index itself structured with thematic sub-indices (such as astronomical objects, observatories, periodicals, etc.). Cross-references ("see") are pointing towards one or several main entries (separated by •), or hierarchies (with steps to lower levels marked by ▷).

[263]The double ∗∗ for the day means an indefinite date or period within the month, up to the whole month.

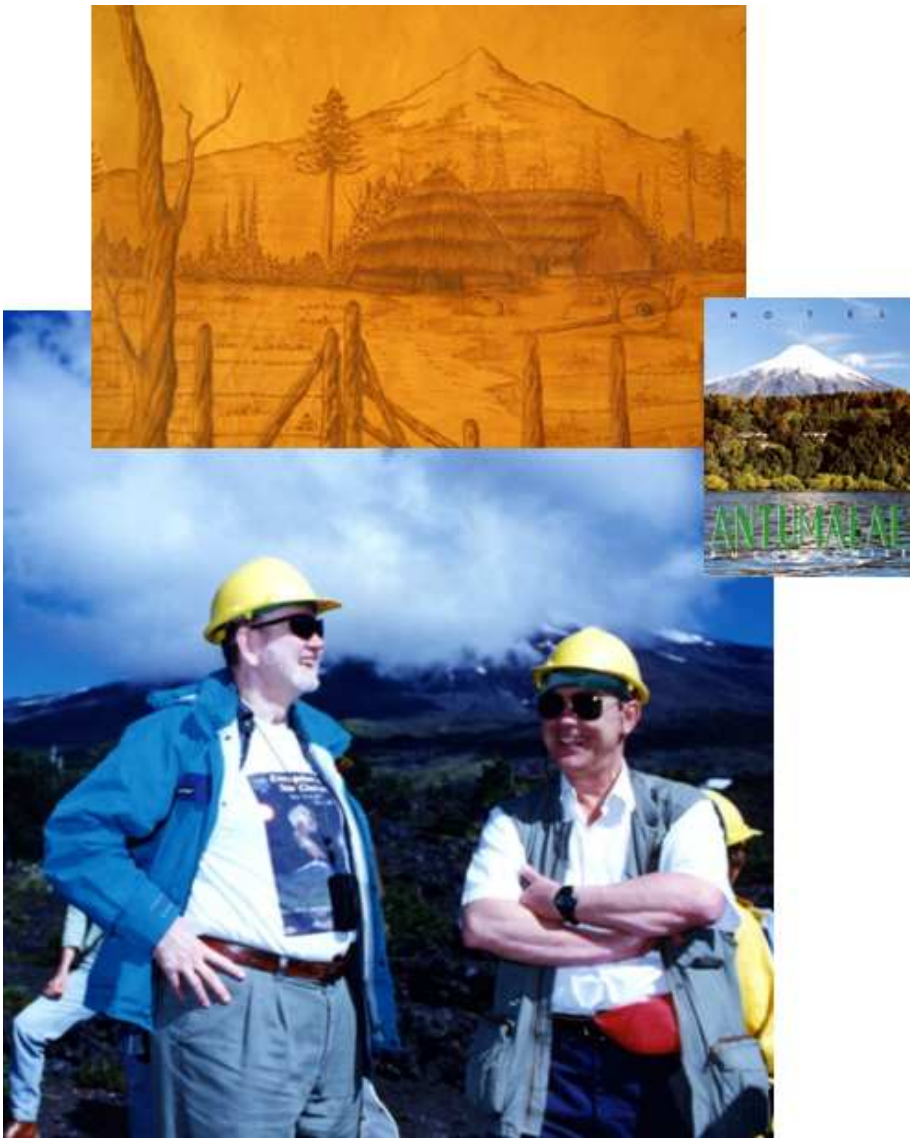


Fig. 242: Villarrica 1971-2001: our biographee is standing here with James (Jim) E. Hesser (left) at the foot of Volcano Villarrica on 14 March 2001 while attending IAU Symposium 207 on "Extragalactic Star Clusters" in Pucón. They had been visiting volcanic caves, hence the hard hats. Taking advantage of a rental car and following an advice from his pal Manfroid who had lived in the country, instead of staying downtown with the symposium crowd, our biographee had preferred Hotel Antumalal (middle inset) that used to host royalties enjoying the magnificent site and views over Lake Villarrica. The top picture shows the volcano sketched with a hot iron on a goat skin that our biographee had acquired on 14 November 1971 at Temuco Indian market during his first trip to Chile (cf. p. 48). It has been adorning Heck's living rooms since.

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Fig. 243: This excerpt comes from a map of the Prince-Bishopric of Liège ("Diocesis Leodiensis" delimited in light pink) sketched by Henricus Hondius the Younger (1597-1651) in Amsterdam. It is today adorning Heck's living room. His native village (spelled Ialhoy) is located in the lower right corner next to the green area (Bois de Fagne). Other places mentioned in this book (e.g. p. 262) are also visible, such as Franchimont, Limbourg (Limborg), Spa (Spaa) and Verviers. The main city is flagged in three languages: Latin (Leodium), Belgian i.e. today's Dutch (Luyck) and Gallic i.e. today's French (Liege). The Northern tip of the Duchy of Luxembourg (Lutzenburgensis Pars.) protruding from the lower edge.

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This volume is devoted to the itinerary and professional activities of Astronomer André Heck whose international career spanned the period 1969-2014.

This is the story of a Belgian scientist of humble origins whose name was assigned to a comet he discovered at the age of 26 at Haute Provence Observatory, who was in charge at 31 of the science operations on the then most advanced astronomy satellite from a European Space Agency station in Spain, and who later ended up at the top level for astronomers in France after pushing forward new fields and acting as a catalyst for novel approaches.

His activities touched quite a variety of observational and theoretical matters. These ranged from meridian astronomy to space spectroscopy via ground-based photographic, photometric and spectroscopic collection of data, and from studies in stellar evolution to pioneering facets of astronomical information handling and applications of advanced statistical analysis. Time-consuming routine service for the benefit of his professional community should not be forgotten, be it at manning observing instruments or at shaping databases of world-wide usage.

Along the way, he became a prolific author of papers and reference books, both for a specialized audience and for the public at large. He also produced quite a number of edited volumes, including the prize-winning series *Organizations and Strategies in Astronomy* tackling many facets of the way astronomy-related activities are conducted round the world, the "sociology of astronomy". Towards the end of his professional life, Heck set up his own non-commercial publishing venture *Venngeist*.

Specialists in bibliography consider Heck as one of the most published authors in the history of astronomy.

He also devoted a good chunk of his time to historical research and to public outreach, some of it under a pen name. He used to say that these two components of his activities – digging into the past and retaining close contacts with the society at large – were complementary of the exploratory ones, be it at the level of the sociology of astronomy or of the evolution of astronomy communication.

This book remains as factual as possible. It has been intended essentially for historians of astronomy, but will also be usefully read by researchers, teachers, sociologists of science, research planners and strategists, as well as by students aiming at a career in astronomy or related space science.