

INTERNATIONAL ASTRONOMICAL UNION

UNION ASTRONOMIQUE INTERNATIONALE

INFORMATION BULLETIN JUNE 2009



Évidemment, ce n'est pas celui de Tombouctou!

Attendez! Le chevalier de Hadoque, lui, a certainement compté en prenant comme méridien d'origine le méridien de Paris, qui est situé à plus de deux degrés à l'est du méridien de Greenwich!...



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Preface

Just two months before the IAU XXVII General Assembly in Rio de Janeiro, the IAU Secretariat is working full steam in close cooperation with our Brazilian NOC colleagues to complete all preparations for a very interesting GA. The preliminary program was published in IB 103 and on the GA web site, and the final program is now on the GA web site and in the Program Book, available for participants on the spot in Rio de Janeiro. The program comprises six Symposia, 16 Joint Discussions and 10 Special Sessions in 17 parallel sessions, together with the regular business meetings of the IAU Divisions, Commissions and Working Groups, six working luncheons, four Invited Discourses, a lot of attention to the IAU Strategic Plan (see § 5.1.3) and of course the GA proper with its Inaugural Ceremony, Sessions 1 and 2, and Closing Ceremony (see § 5).

As always just before the GA, this *Information Bulletin* also presents a proposal for updates of the IAU Statutes and Bye-Laws (see § 5.1.2), and Resolutions to be discussed and voted on during the GA (see § 5.1.3).

Just before the GA, the IAU will have its 90th birthday on 28 July 2009. To commemorate this respectable age, IAU past-Presidents have written their presidential reminiscences in this *Bulletin* (see § 2), parallel to the GS reminiscences published in IB 100.

In the meantime, astronomers world-wide are actively involved in numerous outreach activities under the umbrella the *International Year of Astronomy*, the largest astronomical popularizing activity in history (see § 4).

The IAU Secretariat always appreciates whole-heartedly the hospitality extended by the Institut d'Astrophysique de Paris and its proximity to the Observatoire de Paris. In the Salle Cassini of the latter, the IAU offers its annual reception to its hosts and local professional associates. In gratitude, the IAU reception held this year started with presentations of three recent books on one of the most famous directors of the Observatoire de Paris, François Arago (see § 14).

Three years look like a long period in the beginning but like a short period at the end, as I noted as IAU General Secretary. The period August 2006 till today was continuously dominated by expected and unexpected important activities and events. There is much to be grateful for, and there are many to be grateful to. My sincere thanks to the staff at the IAU Secretariat, notably Vivien A. Reuter, to our hosts of the IAP, my home institute for giving me leave of absence, my fellow IAU Officers Catherine Cesarsky, Bob Williams and Ian Corbett, all other EC members, all preceding General Secretaries who were always there to give advice, and the IAU membership at large. Preparing for a GA requires frequent communication with all Division and Commission presidents, WG and PG chairs, and in particular with our very motivated National Organizing Committee for the IAU XXVII GA. Your support is much appreciated.

I look forward to seeing you all in Rio de Janeiro.

Karel A. van der Hucht, IAU General Secretary, 2 June 2009

1. EVENTS AND DEADLINES

Proposals for IAU Symposia in 2011
should reach the Assistant General Secretary
via the IAU Proposal Web Server
<<http://www.iau.org/science/meetings/proposals/lop/>>
before 1 December 2009

Letters-of-Intent should be submitted to the IAU web page
<www.iau.org/science/meetings/proposals/loi>
before 15 September 2009

See: <www.iau.org/science/meetings>

2009

- June 15 Due date for agenda items and documents for the 87th IAU
EC Meeting, August 14, 2009 in Rio de Janeiro
- July 25-29 ***Dynamic solar corona and its impact on space weather,***
International Conference in *Suzhou, Jiangsu province, China*
- July 29- Aug 3 ***Astronomical Instruments from the Antikythera***
Mechanism to the de Dondi's Astrarium, Budapest,
Hungary
- Aug 3-14 **IAU XXVII General Assembly, Rio de Janeiro, Brazil,** with
associated Invited Discourses, Symposia, Joint Discussions,
Special Sessions, Division/Commission/WG Business
Meetings, Executive Committee meetings EC86 and EC87
- Sep 15 Due date for Letters-of-Intent proposing IAU Symposia in 2011
- Sep 28-Oct 3 ***Astronomy and its Instruments Before and After Galileo,***
Venice, San Servolo Isle, Italia
- Nov 1 Due date for contributions to IAU IB 105
- Nov 1 Due date for agenda items and documents for Officers' Meeting,
January 2010
- Nov 9-13 **IAU S268, *Light elements in the Universe, Geneva, Switzerland***
- Nov 23-27 ***Mathematics and Astronomy, a Joint Long Story, Madrid***
Spain
- Nov 30-Dec 18 ***International School for Young Astronomers 2009,***
St Augustine, Trinidad & Tobago, West Indies
- Dec 1 Due date for proposals for IAU Symposia in 2011
- Dec 15 Deadline for nominations for the Peter and Patricia Gruber
Foundation Cosmology Prize 2010

2010

- 6-9 Jan **IAU S269, *Galileo's Medicean Moons – their impact on 400 years of Discovery*, Padova, Italy**
- Feb 1 Due date for agenda items and documents for Officers' Meeting and 88th EC Meeting, 10-12 May 2010
- Mar 1 Deadline for applications for the Peter and Patricia Gruber Foundation Fellowship 2010
- May 1 Due date for contributions to IAU IB 106
- 3-7 May **IAU S270, *Computational star formation – playing by the numbers?* Barcelona, Spain**
- 21-25 June **IAUS 271, *Astrophysical dynamics – from stars to galaxies*, Nice, France**
- 19-23 July **IAU S272, *Active OB stars – structure, evolution, mass loss, and critical limits*, Paris, France**
- 23-26 Aug **IAU S273, *Physics of Sun and star spots*, Los Angeles, USA**
- 6-10 Sep **IAU S274, *Advances in plasma astrophysics*, Catania, Italy**
- 13-17 Sep **IAU S275, *Jets at all scales*, Buenos Aires, Argentina**
- Sep 15 Due date for Letters-of-Intent proposing IAU Symposia in 2012
- 20-24 Sep **IAU S276, *The Astrophysics of planetary systems – formation, structure, and dynamical evolution*, Torino, Italy**
- Oct 18-22 **XIII Latin American Regional IAU Meeting (LARIM 2010), Morelia, Mexico**
- Nov 1 Due date for contributions to IAU IB 107
- Nov 1 Due date for agenda items and documents for Officers' Meeting, January 2011
- Dec 1 Due date for proposals for IAU Symposia in 2012
- 13-17 Dec **IAU S277, *Tracing the ancestry of galaxies (on the land of our ancestors)*, Ouagadougou, Burkina Faso**
- Dec 15 Deadline for nominations for the Peter and Patricia Gruber Foundation Cosmology Prize 2011

2011

- 26-29 July **XI Asian-Pacific Regional IAU Meeting (APRIM 2011), Chiang Mai, Thailand**

2012

- Aug 20-31 **IAU XXVIII General Assembly, Beijing, China**

2. REMINISCENCES OF PAST IAU PRESIDENTS

Introduction

The year 2009 will for ever be remembered as the *International Year of Astronomy*, at least by us astronomers and by the millions who made acquaintance with astronomy this year. But there is more: in 2009 we celebrate also the 90th anniversary of the IAU. IAU past-president Adriaan Blaauw writes in his book *History of the IAU. Birth and First Half-Century of the International Astronomical Union* (Kluwer, 1994): (p. 1) "... *The IAU was born during the Constitutive Assembly of the International Research Council (IRC) from July 18 to 28, 1919 in the Palais des Académies at Brussels. ...*"; and (p. 2) "... *As the Statutes of the IRC itself were formally adopted only on the closing day of the Assembly, we consider this as the date of the creation of the IAU: July 28, 1919. ...*". Therefore, on 28 July we celebrate the 90th birthday of the Union.

In IAU *Information Bulletin* No. 100, IAU past-General Secretaries wrote their personal recollections. As promised there, IAU past-Presidents would be invited to write their presidential recollections for publication in *Information Bulletin* No. 104, to be issued in June 2009. It is my pleasure to present the received presidential reminiscences here.

Karel A. van der Hucht
IAU General Secretary

2.1. Adriaan Blaauw, 18th IAU President, 1976 - 1979

RECOLLECTIONS OF MY PRESIDENCY

I was elected President at the closing session of the General Assembly of 1976, in Grenoble, France. At the closing dinner, Alla Masevitch, a delegate from the Soviet Union and, I believe, a retiring member of the Executive Committee, presented me with a beautiful bowl and spoon, craftsmanship from her home-country, with the words: "*to cook the policy of the IAU*". Bowl and spoon still decorate my home

I had been interested in the work of the IAU since my early days when, as a student, I was allowed to attend the IAU General Assembly of Stockholm in the year 1938, to be followed by attending many assemblies in subsequent years. I guess my experience as a Director General of ESO in the years 1970-74, with its involvement with astronomers and astronomical projects on an international scale, had contributed to making me a candidate for the IAU presidency – a combination of offices that in preceding years had been held by Otto Heckmann and in later years would be held also by Lodewijk Woltjer and Catherine Cesarsky. And I realized that two of my highly esteemed teachers of

astronomy, who had been at the base of my career, had also been a President of the IAU: Willem de Sitter in the years 1925-1928 and Jan H. Oort in the years 1958-1961.

Normally, the affairs of the IAU, including the extensive work of preparing and running the General Assembly, are taken care of by the General Secretary and the Assistant General Secretary in collaboration with the Union's secretarial office and the local host and organizing committee. I remember with gratitude and deep admiration the way General Secretary Edith Müller and Assistant General Secretary Patrick Wayman took care of these tasks during the years of my presidency. Both sadly passed away not long after they had served the Union. They would have had a lot of interesting things to tell us now that the Union is to celebrate its 90th birthday.

It is the president's task to supervise the running of the Union at large, to chair the meetings of the Executive Committee, and to perform an occasional representative duty. However, this time there was an item that would call for special attention and effort on the part of the president, an item that already had caused considerable concern to my predecessor in the presidency, Leo Goldberg, but that during his term of office could not have been brought to a satisfactory solution. It was what I shall call the China conflict, a political, non-scientific, issue that, however, was felt to have serious implications for the Union. Reminiscing on my years as president, I realize that this problem strongly dominated my attention and efforts for the Union during, say, the last half year of my presidency. Let me, therefore, tell a little more about this subject.

To understand the cause of the conflict, we must go back in time to the General Assembly of 1961 held in Berkeley, California. China had been a member since its adherence in 1935 (with the National Committee of Astronomy at Nanjing as adhering organization), but prior to the Berkeley Assembly the People's Republic of China withdrew from the IAU. It did so, because the Executive Committee had accepted an application of Taiwan for membership of the Union (through its Astronomical Society in Taipei) – an application that led to Taiwan indeed becoming a member at the Berkeley Assembly. These events must be seen against the background of the worldwide political polarization fifty years ago, with the communist-oriented powers of the People's Republic of China and the Soviet Union on the one hand, and the western powers, in particular the United States, on the other hand. A situation in which the nationalistic government of Taiwan enjoyed strong political protection by the United States.

In the years following the Berkeley Assembly, this situation caused growing dissatisfaction among astronomers all over the world. Even rescission of the 1961 decision was advocated by certain parties, and in fact, certain international scientific unions that faced similar problems had taken recourse to discontinuing the Taiwan membership – a measure we did not want to consider. It was

deemed unacceptable that mainland China, with its impressive history of astronomical observations – with records dating back to centuries when, for instance, European astronomy was virtually non-existent – was not represented among the worldwide astronomical community. Hence Leo Goldberg's efforts toward reconciliation in the years preceding my presidency. However, in those years, China still underwent the Cultural Revolution, a series of measures by the Chinese government that made discourse on scientific matters virtually impossible.

In the late 1970's, however, the Cultural Revolution toned down, and the time seemed ripe for negotiations. Spade work was done by the General Secretary and the Assistant General Secretary, especially by the latter at the occasion of a visit to the People's Republic early in 1979. It led to the People's Republic's sending a delegation of scientists to Montreal, Canada, for negotiations with the IAU Executive Committee before and during the 1979 Montreal General Assembly.

I well remember the high intensity of these negotiations (sometimes pretty vehement!) in which it was especially the leader of the Chinese delegation, astronomer Chang Yu-Che from Purple Mountain Observatory, Nanjing, who frequently met with myself, sometimes several times a day. A fortunate circumstance was the fact that in the late 1940's Chang and I had simultaneously spent several months at Yerkes Observatory of the University of Chicago. It was, therefore, in a way, also a meeting of old acquaintances. Also consulted in the negotiations was, of course, the delegate from Taiwan, C.S. Shen.

In my book *History of the IAU*, published at the occasion of the 75th birthday of the IAU (Kluwer Publishers, 1994), I have described these events and the preceding developments in much more detail. Other accounts may be found in the reports presented by the Executive Committee and by the Taiwan delegate at the closing session of the General Assembly in Montreal. In the present context it suffices to mention that our negotiations resulted in a solution that allowed the People's Republic to resume its membership of the IAU, and that was acceptable also for the delegation from Taiwan. Needless to say that this outcome of the joint effort of the two astronomical communities and the IAU Executive Committee has given me great satisfaction. As we all know, Chinese astronomy has flourished immensely during the past decades. It is gratifying that it has been closely in touch again with astronomical developments elsewhere in the world.

For me personally, the matter did not end at the Montreal Assembly. In 1986, a Symposium on neutron stars was held at Nanjing; I believe it was the first large international gathering of astronomers in the People's Republic after the events described above. Since it was a subject I had studied in detail myself, I decided to participate, and I informed my friend and opponent Chang Yu-Che about my coming to Nanjing. Clearly, Chang had not forgotten our early friendship and our struggles at Montreal, for to my great and pleasant surprise, I received

shortly afterwards an invitation on behalf of the joint astronomical institutes in the People's Republic to be their guest after the Nanjing symposium. And so, I enjoyed an unforgettable tour of about three weeks. From Nanjing I was handed over to the astronomy department in Shanghai, where its director Mrs Ye Shu-hua – who also had been one of the Chinese delegates at Montreal – showed me around, including a trip to their field station, a former Jesuit observatory. From there I flew to the astronomy department and the observatory of the University of Kunmin in south-central China, where my hosts also guided me through the beautiful and impressive landscape. Next I flew to the astronomy department of Xi-an. Here, I was invited to spend an afternoon at the incredibly impressive, partly excavated, underground terracotta army of emperor Qin Shi Huang in the observatory's neighbourhood. My trip concluded with a 24-hour train ride to Beijing and its astronomy department – and a visit to the Great Wall. The Chinese astronomical community's hospitality has been an unforgettable experience.

Adriaan Blaauw
Groningen, the Netherlands, 1 February 2009

2.2. Jorge Sahade, 21st IAU President, 1985 – 1988

I was elected as IAU President at the 1985 General Assembly held in India, at New Delhi, and I ended my term about three years later at the General Assembly held in the city of Baltimore, in the eastern United States. I always had the impression that my candidacy for the IAU Presidency was actually suggested by Jean Pierre Swings, then IAU Assistant General Secretary, perhaps with the support of Richard M. West, then IAU General Secretary. My impression is based on the fact that Swings, in his then official capacity had attended the third IAU Latin American Regional Meeting, held in Buenos Aires in 1983, and may have become perhaps somewhat impressed by the way I organized the regular discussion session on special local specific astronomical matters. Swings' proposal could have been perhaps strongly supported by Richard West, the IAU General Secretary, with whom I had dealt with extensively in relation with the IAU Visiting Professor's Lecture Program carried out in Peru. Richard West actually came to La Plata to ask me, on behalf of the IAU Executive Board, to accept the candidacy to become President, which I did with much hesitation but, of course, terribly honoured.

During my tenure as IAU President, my main and perhaps actually my only important contribution to the organization of the IAU was achieved at the very first meeting I conducted, which was held, of course, in India at the very end of the Delhi General Assembly. There, I proposed that at each IAU General Assembly, a "President-Elect," who would become President three years later, be elected as an additional member of the Board, mainly in order that he could take active part in the elaboration of the budget for his term. As it was natural,

the proposal was readily and unanimously adopted. I do not remember if I made any other important proposal during my tenure, but I do remember that I did try, perhaps in an erroneous way, to suggest efforts addressed to help Latin-American astronomy to grow healthier, and received a negative response of the then only other Latin-American member of the Board and also from the then past IAU President. I am sure that a more thorough discussion of the subject could have helped to reach a reasonable, fair and also constructive decision.

During my tenure, I received kind invitations to visit the astronomy institutions in several countries, notably: China, Cuba, Poland, Morocco, the Canary Islands, Colombia (on the occasion of a Third World Academy of Sciences meeting in Bogotá), and the Soviet Union. Among the latter, notably one for a two months' stay in Armenia at Professor Ambartsumian's Observatory, that I could accept for only half that time. I was also honoured with an invitation, which I suppose was arranged by Derek McNally, to speak at a regular meeting of the British Royal Astronomical Society in London, which I used only to sketch briefly plans I had in mind for future action. The Society offered me, at the end, a most delightful and friendly dinner with appropriate words by its President, to which I replied with a supposedly humorous speech, as I understood was customary in British gatherings of the sort.

On account of local invitations or other reasons, including IAU board meetings and kind invitations to offer astronomy lectures, I had to travel, in some cases, more than once, to Belgium, Brazil, Colombia (this on the occasion of a Third World Academy of Science meeting over in Bogotá), India, México, the Netherlands, the Peruvian Republic, the United States, and Uruguay.

During my tenure, I was surprised that the General Secretary would attend a COSPAR meeting in representation of the IAU and take a position without a previous exchange of ideas with the President, and I reacted accordingly. Later I found out that Pierre had been just following the procedure that had always been followed in the IAU. Fortunately, my reaction was understood by Pierre, and our relation was most friendly and normal until the end. It would, however, be good if a previous exchange of ideas between the General Secretary and the President on these and similar matters would become a customary procedure.

I feel most grateful to the IAU Secretariat for all their help during my tenure as Board President and Past President.

Jorge Sabade
La Plata, Argentina, 9 February 2009

2.3. Yoshihide Kozai, 22nd IAU President, 1988 – 1991

I was nominated as the President of the Union at its 20th General Assembly in Baltimore, USA in August, 1988, when the construction of 8m class telescopes, VLT of ESO, GEMINI of USA and SUBARU of National Observatory, Japan, of which I was the director, was ready to start and *Hipparcos* satellite was expected to be launched by ESA soon. Also in February, 1987 a neutrino burst from the supernova, 1987A, in the Small Magellanic Cloud, was detected by Kamiokande, Japan.

When the second plenary meeting of the General Assembly was closed, Dr. Peter Millman, a Canadian astronomer, who spent his teen-age years in Japan in the early 1920s, came to congratulate me on my presidency. I think that he had a special feeling for a Japanese to be elected as the president. In fact, one of my dreams when I was a young astronomer was to go abroad to attend the General Assembly of the Union once in my life.

Before the first plenary session of the General Assembly, the Extraordinary Assembly modified the Statutes of the Union to permit the appointment of a President-Elect. Therefore, I was the last President of the Union who did not serve as the President-Elect. Moreover, I had not held any position in the Executive Committee before. Still, I could manage to do my job with strong support by excellent colleagues, Dr. Derek McNally, the General Secretary, and other members of the Executive Committee as well as Mrs. Monique, executive assistant, and her staff.

There were, of course, several important issues to be solved by the Executive Committee, and one of them was the shortage of funds to support several activities of the Union. Therefore, the Executive Committee investigated the possibility of introducing an annual fee for individual members, although we were told that for several countries, it was hard for people to send hard currency to abroad. We also asked adhering bodies to increase their contributions with a little success. Still, I was surprised to learn, when I visited one of the socialistic countries, that their national committee tried to decrease the number of individual members in their country in order to avoid any increase of annual fee.

There was another serious problem was the number of participants of the General Assembly. In those days, the number of individual members of the Union was increasing rapidly, and several symposia and colloquia, which were sponsored by the Union, attracted many astronomers. Still, not many members attended the General Assembly, as they said that for young astronomers, the Assembly looked like meetings for the business of commissions and working groups, but not for scientific discussion.

Therefore, the Executive Committee spent many hours discussing this issue to try to find a new, attractive format for the General Assembly. However, we had to adopt the traditional format for the 21st General Assembly in Buenos Aires,

1991. Namely, the duration of the Assembly was 10 days and several Symposia and Colloquia were held in Argentine and Brazil before and after the General Assembly. We also discussed possible improvement of the structure of the Union and the commission system.

The 21st General Assembly was well organized, thanks to the efforts of the Local Organizing Committee, and participants enjoyed Asada, a traditional barbecue party, on Sunday. Then an accident took place on the final day of the scientific program. In the early morning of July 31, a fire broke out in the underground car park and smoke flowed into several rooms of the San Martin Cultural Center, where the General Assembly was being held. In spite of this accident, one third of the scheduled scientific sessions including the Joint Discussion on the Hubble Space Telescope could be held with some time delay due to hard work of Local Organizing Committee and others.

The second (final) session of the General Assembly could be held on August 1 in a theatre of the San Martin Cultural Center. And there it was decided that the next General Assembly would take place in The Hague.

Then, following the suggestion by Dutch National Committee of Astronomy, the Executive Committee adopted a new format for the 22nd General Assembly. The General Assembly would take place for two weeks instead of 10 days, and within this period four to six Symposia and Colloquia would be held at the same place at the beginning and towards the end of the General Assembly. I understand that this format has been adopted for the General Assemblies.

A new structure of the Union was discussed in the Executive Committee during the 22nd General Assembly, and the structure of the division system was later introduced.

Finally, I would like to note that during the Baltimore General Assembly, the Working Group of Worldwide Development of Astronomy was set up and started to work immediately. Now I find that high-level astronomical research has started in developing countries and, for example, South-East Asian Net was initiated with members of Cambodia Indonesia, Malaysia and, the Philippines, Thailand, Vietnam and others. I expect that astronomical research will be more active in near future. Therefore, I hope that more countries will join the Union in the near future.

Yoshibide Kozai
Suginami, Tokyo 168-0071, Japan, 14 December 2008

2.4. Lodewijk Woltjer, 24th President, 1994 – 1997

In 1988, on the proposal of Jorge Sahade, the IAU made an important improvement to the functioning of the Executive Committee by the creation of the position of President-Elect, who would serve for three years prior to assuming the presidency. Until that time the President assumed his function at the end of the General Assembly, and by the time he had discovered what was going on, it was almost the moment to hand over his task to his successor. The President-Elect does not have much of a specific function, which gives him the opportunity to try out ideas and to gauge the reaction of the community before changes get much more set in stone by resolutions of the Executive Committee.

This was particularly important during my time. The then General Secretary Jacqueline Bergeron and I both had ideas how to reform the overall structure of the Union, in part to give the newer branches of Astronomy their rightful place. Following various consultations and iterations, this resulted in the new divisional structure. Not surprisingly, there was some opposition here and there, but change was needed to avoid that the younger members would disconnect from the IAU altogether. This was further fostered by integrating six symposia into the General Assemblies, which gave these a much more scientific look and which contributed towards integrating those who came only for the symposia a bit more into the Union in general.

I had assumed that many of the commissions would gradually wither away, but this has been a slow process. And, of course, some of the commissions and working groups had very specific functions and so had every justification to continue to exist. Another development that I foresaw, but which has not yet come about, was to replace the six vice-presidents and the two advisors (past President and General Secretary) on the Executive Committee by the 12 divisional presidents. This would only marginally increase the travel expenses for the EC by eight trips for the two EC meetings between the General Assemblies.

Some ninety percent of the work of the IAU, including the preparation of the next GA, is done by the General Secretary. I was very lucky to have Immo Appenzeller in that role, who with calm and imperturbable competence solved all problems as they occurred. The great success of the GA in Kyoto was due to his careful preparation of the event. Of course, the Local Organizing Committee also had a major positive role.

The presence of the Emperor and Empress of Japan gave a particular cachet to the introductory GA. The Emperor proved to be a person of broad culture and the Empress, someone of great charm putting everyone at ease. The Emperor told me much I did not know about the early dealings of the Dutch in Japan. He also talked with enthusiasm of his studies of a fish with great tolerance for variations in salinity. The beautiful conference center in Kyoto, which would soon receive the delegates aiming at concluding a treaty to limit CO₂ production, contributed much to the interaction and communication during the

GA. Fittingly the IAU adopted there a resolution which declared the night sky to be the heritage of all humanity.

Of course, there is much more to the IAU than the General Assemblies, and a large number of persons devote much time unselfishly to necessary but not so glamorous activities. These range from frequency allocations in the electromagnetic spectrum, where astronomy and economics are at cross purposes, to questions of efficient lighting, where the interests are more parallel. Nomenclature is another issue of importance, though the silly passions provoked by the status of Pluto are hopefully behind us. Protection of the space environment from military activities and from space debris is gaining in importance. And finally, the larger part of humanity has no idea in what kind of universe they live, and education also in things astronomical is more necessary than ever. The conclusion is clear: if there were no IAU, something very much like it would have to be invented. The first General Assembly I attended was in 1955 in Dublin. I am looking forward with much anticipation to the coming one in Rio de Janeiro, more than half a century later.

Lodewijk Woltjer
Grand-Saconnex, Suisse, 5 December 2008

2.5. Robert P. Kraft, 25th IAU President, 1997 – 2000

SOME COMMENTS ON MY TIME AS IAU PRESIDENT

Sometime, I think in 1993, I was surprised to receive a telephone call from an old friend and colleague, Helmut Abt, then a member of the IAU nominating committee, asking if I would consider being nominated for the Presidency of the IAU. There had not been an American President since Leo Goldberg held the position ending at the meeting in Patras in 1982. Never having been an officer of an IAU commission, I was not particularly well prepared, although I had served as a Vice-President from 1982 to 1985, and remembered that we had hosted a meeting of the Executive Committee here in Santa Cruz in that period.

After much thought, I said "yes", partly because one of my heroes, Otto Struve, had been a President many years before, partly out of curiosity over the broader world's perspective on astronomy, and partly out of a feeling that some changes in the conduct of EC affairs perhaps were needed. I became President-Elect following the 1994 GA in The Hague, President after Kyoto, and Past-President after Manchester in 2000. I had the enormous good fortune to be President when Johannes Anderson (Denmark) was General Secretary, a man whose scientific accomplishments and administrative knowledge are second to none.

Anderson and I did succeed in making a few changes of emphasis in the workings of the EC, which I hope were improvements. First, the focus of the meetings was altered so that the administrative affairs were put later, following

the evaluation of proposals for Symposia and Colloquia. Second, we insisted on the appointment of Vice-Presidents who were to represent as widely as possible the various disciplines of contemporary astronomy, as well as diversity of national origin. Both of these steps were designed to place support for the best science highest among IAU priorities. In these efforts we were greatly assisted by the hard work of assistant General Secretary Hans Rickman (Sweden), one of whose tasks consisted of reviewing the proposals for Symposia and Colloquia for the benefit of the EC. Anderson made progress in the effort to bring our concerns about night-sky and radio-frequency contamination before appropriate bodies of the UN, but I do not now have knowledge of subsequent progress in these areas.

Unfortunately, my participation in IAU affairs had to be curtailed during my term as Past President, as I experienced the medical problem of retinal detachments. These have finally eased with only modest loss of vision. But I cannot leave this subject without mentioning a couple of personal pleasures. Like most Americans, I was delighted to spend some days in Paris, absorbing its cultural treasures, the most impressive of which for me was the Musée d'Orsay, especially the floor devoted to the 'impressionists'. I attended performances of Opera Bastille, the Theatre de Champs-Elysees, where Stravinsky's *Le Sacre* had first been performed (1913), and l'Opera Comique. Thus my time with the IAU broadened not only my astronomical horizons, but cultural ones as well.

Robert P. Kraft

UCO/Lick Observatory, Santa Cruz, CA, USA, 9 February 2008

2.6. Franco Pacini, 26th President, 2000 – 2003

*“If the stars were visible from just one place on Earth,
people would never stop travelling to that place in order to see them”
(Lucio Anneo Seneca: *Naturales Questiones*, 4 B.C. - 65 A.D.)*

About 30 years ago, shortly after joining the Arcetri Astrophysical Observatory, I came across a very old picture showing a group of gentlemen on the terrace of our Institute. Giorgio Abetti, who was then almost 100 years old, explained to me that the people in the picture were the members of the International Astronomical Union, visiting Arcetri and the historical sites of Galileo after having held the first General Assembly in Rome (1922). The group was fairly small, perhaps, at most, a few tens of people.

An important purpose of the newly formed IAU was to overcome the political difficulties hampering scientific exchanges after the First World War. This same role has characterized the activity of the IAU in other circumstances, for instance during the political and ideological tensions which followed the Second World War. In fact over the years, despite various ups and downs, IAU has often waved the flag of peace in various parts of the world.

Scientifically, the 20's, when the IAU was formed, was a period when many important scientific developments took place, in a close collaboration between astronomy and other sciences, especially physics. About a hundred years ago, a new telescope was installed on Mount Wilson with a diameter of 2.5 meters. This led to the discovery of the first external galaxy, the one in Andromeda, and of the expansion of the Universe. Since then the size of the Universe explored by astronomers has increased in volume by a factor close to 10^{15} .

Several years ago the American National Academy of Science stated that, during our lifetime, the importance and number of astronomical discoveries is comparable to that of Galileo's times. As a result, the fascination of astronomy for the general public has also increased enormously, especially among young people. This wide appeal has been the basis for the Project "*2009: the Year of Astronomy*" which I have had the honour to propose when I was President of the International Astronomical Union. A few years earlier (2005), a similar event celebrated the great discoveries in physics, in particular the theory of relativity of Albert Einstein. In the case of astronomy, a fortunate coincidence has been the 400th anniversary of the astronomical discoveries of Galileo Galilei. These were made in the period 1609-1610, when Galileo used for the first time an improved version of the telescope which, a few years earlier, had been invented by Dutch and English scientists. By using this instrument, Galileo discovered that the Moon has mountains, craters, deserts. The Earth is not alone in the Universe. It is hard to think of another discovery of the same importance in the history of mankind.

The *International Year of Astronomy* has just been successfully inaugurated in Paris, thanks to the efforts of many people. I feel that having contributed to its realization was, for me, the most important event during my term as President of IAU.

Franco Pacini
Arcetri Astrophysical Observatory, Arcetri, Florence, 10 February 2009

3. IAU EXECUTIVE COMMITTEE

3.1. IAU Officers' Meeting 2009-1. *Brief report*

The 2009 IAU Officers' meeting – Part 1 – took place on 12 January 2009 at the IAU Secretariat, Paris, France. Present were President Catherine J. Cesarsky, President-Elect Robert Williams, General Secretary Karel A. van der Hucht, Assistant General Secretary, Ian F. Corbett and IAU Executive Assistant Vivien A. Reuter.

The Officers expressed their appreciation for the progress made by the IAU Secretariat in renewing its procedures and activities in 2008. The current staff consisted of Mme Vivien A. Reuter, Executive Assistant, Mme Maiténa Mitschler, data base assistant, and Mme Ginette Rude, part-time archive assistant. The Officers expressed their appreciation for the present state of the IAU data base and web site, of which the maintenance and refurbishment is out-sourced to ESO.

The Officers discussed the draft budget for the upcoming triennium 2010-2012, to be forwarded with their recommendations to the EC and the National Members, together with proposed revisions and modifications of the Statutes, Bye-Laws and Working Rules.

As for the IAU XXVII General Assembly preparations, the Officers took note of the latest report of the chair of the IAU XXVII GA NOC, Prof. Daniela Lazzaro and the progress reported therein.

The Officers expressed their satisfaction with the signing of the Memorandum of Understanding between the IAU and the UNESCO World Heritage Center and the creation of an IAU Commission 41 Working Group on *Astronomy and World Heritage* by Commission 41 vice-president Prof. Clive L.N. Ruggles.

The President, in her capacity as chair the EC Working Group on the *International Year of Astronomy 2009*, informed the Officers of the progress of the IYA2009 preparations, notably those for the Opening Ceremony of the IYA2009, 15-16 January in Paris at the UNESCO Headquarters, and the plethora of national IYA activities in over 135 participating countries.

3.2. IAU Officers' Meeting 2009-2 and IAU EC85 Meeting. *Brief report*

In order to diminish the burden of too many business meetings of the Executive Committee during the up-coming IAU XXVII GA in Rio de Janeiro, the EC had its 85th meeting on 7-8 April 2008, preceded by a one-day Officers' Meeting on 6 April, both at the IAU Secretariat in Paris, France, using the excellent meeting room facilities of the Institute d'Astrophysique in Paris. All EC members attended, as well as invited guests Paul G. Murdin, chair of the

Finance Sub-Committee, Daniela Lazzaro, co-chair of the Brazilian National Organizing Committee of the IAU XXVII General Assembly, and IAU Executive Assistant Vivien A. Reuter.

The EC evaluated the old IAU Secretariat of the past 20 years and discussed the developments in the new IAU Secretariat during the past 14 months and plans for the near future. The EC discussed in detail the IAU triennial financial report 2006 - 2009 and the budget for the upcoming triennium 2010 – 2012. The EC discussed proposed changes in the IAU Statutes and Working Rules. The EC discussed the request for National Membership submitted by a number of countries.

The EC expressed its deep satisfaction with the *IAU Strategic Plan 2010 – 2020. Astronomy for the Developing World*, a decadal plan developed by and under supervision of IAU vice-president George K. Miley, with input from IAU Commission 46 Program Group chairs and EC members. This Plan will be submitted to and discussed by the IAU XXVII General Assembly in Rio de Janeiro.

Daniela Lazzaro, co-chair of the Brazilian National Organizing Committee of the IAU XXVII General Assembly, presented the latest news on the activities of her NOC. The EC was very pleased to see that the organization is in good hands and progressing satisfactorily. The EC also noted with satisfaction the sponsoring by the Norwegian Academy of Science and Letters of a GA educational event. In preparation for the IAU XXVIII General Assembly in Beijing, 2012, vice-president Fang Cheng reported that the most modern convention center in town has been contracted.

IAU President Catherine Cesarsky reported on recent activities happening during the *International Year of Astronomy*.

The EC discussed the publication of the 'GS trilogy': the IAU *Reports on Astronomy* (Transactions-A), *Proceedings of the General Assemblies* (Transactions-B) and *Highlights of Astronomy*, and considered options for the future.

4. THE EC WORKING GROUP ON THE INTERNATIONAL YEAR OF ASTRONOMY 2009 – status report

The year 2009 will be remembered for many reasons, but the IYA2009 will hopefully be memorable for all astronomers – hobbyists as well as professionals. The IYA2009 fosters a global appreciation of the role and value of science, technology and astronomy as a unifying activity for humanity. The IYA2009 is a global endeavour, promoting astronomy and its contribution to society and culture. There is a strong emphasis on education and public engagement. The response from all the corners of the world has been extremely positive and encouraging, making the Year a great success already. This report outlines the status of its main projects and activities.

Participating Nations and Organizations. As of 27 May 2009, 141 National Nodes have signed up to participate in the IYA2009. Innumerable professional and amateur astronomers, educators, communicators and enthusiasts have invested time, resources and passion into organizing local, regional, national and global activities. The full list can be consulted at www.astronomy2009.org/organisation/nodes/national/. The most recent National Nodes are Azerbaijan, Myanmar, the Maldives, Zambia, the Fiji Islands, Grenada and Palestine.

The IAU is still welcoming suggestions for IYA2009 Single Points of Contact from countries or organisations that are not yet involved. Based on the report on the state of astronomy development by country, compiled by John Hearnshaw (IAU Commission 46, PG World-wide Development of Astronomy iau46.obspm.fr/spip.php?article53&lang=enspip.php?article53&artsuite=0#sommaire_1), the IYA2009 Secretariat is particularly keen to establish contact with the following countries: Brunei, Barbados, Liechtenstein, Mauritius, Monaco and San Marino.

Astronomy, education and science outreach related organisations and institutions are also participating in the IYA2009. So far, 31 such organisations have signed up. The complete list is posted on the IYA2009 website at: www.astronomy2009.org/organisation/nodes/organisational/. The most recently affiliated Organisational Nodes are ESCONET, Yuri's Night, ISU, CERN, ALPO, RadioNet and SiW.

Organizational Associates. The IYA2009 Organizational Associates are organizations, institutions and agencies related to astronomy, space science and natural science that provide financial support for the global coordination of IYA2009 www.astronomy2009.org/organisation/structure/partners/organisationalassociates/. The most recently affiliated Organisational Associates are EAS, NRAO, CEA and KASI. The IAU still welcomes organisations, institutions and agencies that wish to join the IYA2009 Organisational Associates. For more information, please contact the IYA2009 Secretariat: iya2009@eso.org.

Media Partners. The IYA2009 Secretariat has established a network of media partners [<www.astronomy2009.org/organisation/structure/partners/media/>](http://www.astronomy2009.org/organisation/structure/partners/media/) that supports and promotes the IYA2009 programme by providing coverage and publicity for the global and international programmes. The most recently joined Media Partners are: Wiley-VCH, Springer, Cambridge University Press, Athenaweb, Science Newspaper, A&A, Popular Mechanics, Astrocast.tv and Medea Awards.

Resources. The IYA2009 Secretariat has produced a wide array of resources that can be used by laypeople and participants in the IYA2009. These include trailers, brochures and presentations are easily accessible at: [<www.astronomy2009.org/resources/>](http://www.astronomy2009.org/resources/). The public is free to use them in activities and events during 2009.

IYA2009 Cornerstone Projects. In addition to the numerous local and regional projects, the IYA2009 is supported by twelve Cornerstone projects. Based on specific themes, these global programmes collectively represent the means to achieve the IYA2009's primary goals. The steady progress of these projects can be followed on their dedicated websites:

- 100 Hours of Astronomy [<www.100hoursofastronomy.org>](http://www.100hoursofastronomy.org)
- The Galileoscope [<www.galileoscope.org>](http://www.galileoscope.org)
- Cosmic Diary [<www.cosmicdiary.org>](http://www.cosmicdiary.org)
- Portal to the Universe [<www.portaltotheuniverse.org>](http://www.portaltotheuniverse.org)
- She is an Astronomer [<www.sheisanastronomer.org>](http://www.sheisanastronomer.org)
- Dark Skies Awareness [<www.darkskiesawareness.org>](http://www.darkskiesawareness.org)
- Astronomy and World Heritage [<whc.unesco.org/pg.cfm?cid=281&id_group=21&cs=home>](http://whc.unesco.org/pg.cfm?cid=281&id_group=21&cs=home)
- Galileo Teacher Training Program [<www.galileoteachers.org>](http://www.galileoteachers.org)
- Universe Awareness [<www.unawe.org>](http://www.unawe.org)
- From Earth to the Universe [<www.fromearthtotheuniverse.org>](http://www.fromearthtotheuniverse.org)
- Developing Astronomy Globally [<www.developingastronomy.org>](http://www.developingastronomy.org)
- Galilean Nights [<www.galileannights.org>](http://www.galileannights.org)

We would just like to highlight some of the achievements so far: 100 Hours of Astronomy was a major success, with more than 1 million people participating in events such as a global star party, the live 24-hour webcast "Around the World in 80 Telescopes," a Science Centre webcast, and Sun Day. As of May 2009, 60 000 Galileoscopes have been produced, 4000 of which will be donated to organisations and schools in developing countries, in collaboration with the Developing Astronomy Globally Cornerstone project. The Cosmic Diary has more than 60 professional scientists blogging from 28+ countries. To date there are over 1000 individual blog posts, which have attracted more than 55 000 unique visitors. In its first month of operation, the Portal to the Universe had more than 12 000 news and blog posts indexed, which were read by more than 40 000 unique visitors. She is an Astronomer launched its own dedicated website on 21 April 2009. During IYA2009, GLOBE at Night, a programme in the Dark Skies Awareness Cornerstone, set a new record, with 80% more observations of the world's dark skies than the programme's previous best. The

worldwide response to the FETTU project continues to be astounding. As of May 2009, over 55 countries around the world have signed up to host FETTU exhibits in more than 200 separate locations ranging from Brazil to Bulgaria and from Uruguay to the United States.

Following the unprecedented success of the IYA2009's 100 Hours of Astronomy, another weekend of astronomy events has been lined up for 23–24 October 2009. This new IYA2009 Cornerstone project is called Galilean Nights and will see amateur and professional astronomers around the globe taking to the streets, pointing their telescopes at the wonders that Galileo observed 400 years ago. The project's focus is sidewalk observations of the gas giant Jupiter and its moons, and members of the public will also be able to observe the Sun, our own Moon and many more celestial marvels with their own eyes, much as Galileo did 400 years ago.

IYA2009 Special Projects. While the focus of the global activities will rest on the Cornerstones, special projects will also contribute towards the vision and goals of IYA2009. The complete list of IYA2009 Special Projects is available on: <www.astronomy2009.org/global_projects/specialprojects/>. The most recent Special Projects are:

* *BLAST!* is astrophysics Indiana Jones-style! The movie takes the viewer on a journey around the world and across the Universe to launch a new telescope on a high-altitude balloon. See <www.blastthemovie.com> .

* *StarPeace* connects people living on two sides of a national border by conducting joint star parties to show that the sky can act as a bridge to join the people of the world regardless of race, culture or nationality. See <www.starpeace.org> .

* *GalileoMobile* is an itinerant science education project bringing IYA2009 to young underprivileged people across South America to foster their will to learn by exciting their wonder about our Universe, while supplying local teachers with educational resources to sustain our activities. See <www.galileo-mobile.org> .

IYA2009 Special Task Groups. Several groups have been set up to organise very specific events or actions throughout the Year which will complement other global projects. See <www.astronomy2009.org/organisation/structure/taskgroups/>.

Among the highlights is a beautiful collection of IYA2009 related stamps that is available on the IYA2009 Philatelic Release Calendar <www.astronomy2009.org/organisation/structure/taskgroups/philately/calendar/> .

IYA2009 Press Releases, Updates and Features. The IYA2009 Secretariat publishes stories and news daily on the global IYA2009 website: <www.astronomy2009.org>. An extensive, but not comprehensive list of international press clippings can be found at: <www.astronomy2009.org/news/presscoverage/>.

Conclusions. Although 1 January 2009 marked the official beginning of the IYA2009, this immense worldwide science outreach and education programme began more than six years earlier with the IAU's initiative during the IAU XXVI

General Assembly in 2003. The IYA2009 aims to unite nations under the umbrella of astronomy and science, while at the same time acknowledging cultural, national and regional diversity. Never before has such a network of scientists, amateur astronomers, educators, journalists and scientific institutions come together. IYA2009 is, thanks to many of you, truly the largest network in astronomy.

As the IYA2009 comes to an end, we will join in a celebration of astronomy and astronomical experiences. The Closing Ceremony is in preparation and will take place on 9–10 January 2010 in Padua, Italy. We believe that the momentum generated by the end of IYA2009 will leave a lasting legacy for global astronomy and the IAU.

Pedro Russo, LAU IYA2009 Coordinator

*Lars Lindberg Christensen, LAU IYA2009 Secretariat Manager/LAU IYA2009 EC WG Secretary,
Garching bei München, 29 May 2009*

5. IAU GENERAL ASSEMBLIES

5.1. IAU XXVII General Assembly, Rio de Janeiro, Brazil, 3 - 14 August 2009

For recent information and details on registration, visit the IAU XXVII GA web site: <www.astronomy2009.com.br/index.html>.

5.1.1. Inaugural Ceremony, First Session, Second Session and Closing Ceremony

INAUGURAL CEREMONY *Tuesday 4 August 2009, 14:00 - 16:00 hr*

1.	Introduction by the Master of Ceremonies on behalf of the National Organizing Committee	14:00
2.	Opening address by <i>Dr. Catherine J. Cesarsky</i> , President of the International Astronomical Union	14:03
3.	<i>Brazilian National Anthem</i>	14:24
4.	Addresses by national dignitaries	14:28
4.a.	Address by <i>Pr. Dr. Jacob Palis</i> , President of the Academy of Sciences of Brazil	
4.b.	Address by <i>Mr. Eduardo da Costa Paes</i> , Mayor of the city of Rio de Janeiro	
4.c.	Address by <i>Mr. Sérgio de Oliveira Cabral Santos Filho</i> , Governor of the state of Rio de Janeiro	
4.d.	Address by <i>Mr. Sérgio Rezende</i> , Minister of Science & Technology of the Republic of Brazil	
4.e.	Address by <i>Mr. Luis Inácio Lula da Silva</i> , President of the Republic of Brazil (tbc)	
5.	Presentation list of sponsors of the IAU XXVII GA	14:49
6.	<i>Cultural performance</i>	14:52
7.	Gruber Foundation Cosmology Prize 2009 Award and Peter and Patricia Gruber Foundation Fellowship 2009	15:13
8.	Presentation by <i>Prof. Dr. Clive L.N. Ruggles</i> , chair IAU-C41 /UNESCO-WHC Working Group on <i>Astronomy and World Heritage</i>	15:39
9.	<i>Presentation on Astronomy in Brazil</i> by <i>Prof. Dr. Kepler de Oliveira</i>	15:50
	<i>Break</i>	16:00

FIRST SESSION *Tuesday 4 August 2009, 16:15 - 17:15 hr*

Dr. Catherine J. Cesarsky, President, in the chair

1.	Opening of the General Assembly Session I. Welcome	16:15
2.	Listing the Representatives of IAU National Members, the members of the Nominating Committee, and the members of the Finance Committee	16:17
3.	Appointment of official Tellers	16:19
4.	Admission of new National Members to the Union	
4.a.	Introduction	16:21
4.b.	Vote on admission of new National Members	16:25
5.	Revisions of Statutes and Bye-Laws	
5.a.	Introduction by Dr. Ian F. Corbett	16:28
5.b.	Comments from the Members	16:35
5.c.	Vote on proposed revisions of Statutes and Bye-Laws	16:40
6.	Appointment of the Finance Committee	16:51
7.	Appointment of the Nominating Committee	16:54
8.	Report of the Executive Committee 2006 – 2009	16:57
9.	Report of the Special Nominating Committee	17:03
10.	Proposals to host the IAU XXIX GA in 2015	17:06

Welcoming cocktails in the garden of the Conference Center 17:30 – 19:00

SECOND SESSION

Thursday, 13 August 2009, 14:00 - 15:30 hr

Dr. Catherine J. Cesarsky, President, in the chair

11.	Opening of the General Assembly Session II. Welcome	14:00
12.	Individual Membership	14:02
13.	Appointment of official Tellers	14:13
14.	Resolutions	
14.a.	Report of the Resolutions Committee by chairperson <i>Jocelyn S. Bell Burnell</i>	14:15
14.b.	Presentation of Resolutions of type B by proposers, And vote on Resolutions	14:26
15.	Appointment of Resolutions Committee 2009 – 2012	14:39
16.	Place and date of IAU XXIX GA in 2015	14:41
17.	Division and Commission matters, adjustments to the Divisional structure	14:44
18.	Deceased members listed on screen, 1 minute silence	14:55
19.	Financial matters	
19.a.	Introduction	14:58
19.b.	Report of the Finance Committee on IAU 2006 – 2009 accounts and 2010 - 2012 budget; vote on budget	15:09
20.	Appointment of the Finance Sub-Committee 2009 – 2012	15:20
21.	Appointment of the Special Nominating Committee 2009-2012	15:23

22. Election of the Executive Committee 2009-2012 15:28

Break for coffee & tea 15:30 – 15:45

CLOSING CEREMONY
Thursday, 13 August 2009, 15:45 - 17:00 hr

Dr. Catherine J. Cesarsky, President, in the chair

- | | | |
|----|---|-------|
| 1. | IAU Strategic Plan. Address by IAU Vice President
<i>Prof. George K. Miley</i> | 15:45 |
| 2. | Invitation to the IAU XXVIII General Assembly
in Beijing, China. Address by <i>Prof. Gang Zhao</i> | 5:56 |
| 3. | Address by the retiring General Secretary
<i>Dr. Karel A. van der Hucht</i> | 16:07 |
| 4. | Address by the incoming General Secretary
<i>Dr. Ian F. Corbett</i> | 16:13 |
| 5. | Address by the retiring President
<i>Dr. Catherine J. Cesarsky</i> | 16:19 |
| 6. | Address by the incoming President
<i>Prof. Robert Williams</i> | 16:25 |
| 7. | Closure of the IAU XXVII General Assembly | 16:31 |
| 8. | <i>Cultural performance</i> | 16:37 |

5.1.2. Proposal for modification of Statutes and Bye-laws

The Executive Committee will submit a revision of the IAU Statutes and Bye-Laws to the vote of the Representatives of the National Members of the IAU in the First Session of the IAU XXVII General Assembly, in Rio de Janeiro, Brazil, 4 August 2009. The revisions as compared to the current Statutes and Bye-Laws (approved by the IAU XXVI GA in Prague, 2006) are either in bold-underlined (for additions) or barred (for deletions).

*Karel A. van der Hucht, General Secretary
International Astronomical Union – Union Astronomique Internationale
98bis bd Arago, F-75014 Paris, France*

5.1.2.1. Proposal for modification of Statutes

IAU STATUTES

~~Prague, Czech Republic, 15 August 2006~~

Rio de Janeiro, Brazil, 4 August 2009

I. OBJECTIVE

1. The International Astronomical Union (**hereinafter** referred to as the Union) is an international non-governmental organization. Its objective is to promote the science of astronomy in all its aspects.

II. DOMICILE AND INTERNATIONAL RELATIONS

2. The legal domicile of the Union is Paris, **Republic of France.**

3. The Union adheres to, and co-operates with the body of international scientific organizations through ~~ICSU~~: **the International Council for Science (ICSU).** It supports and applies the policies on the Freedom, Responsibility, and Ethics in the Conduct of Science defined by ICSU.

III. COMPOSITION OF THE UNION

4. The Union is composed of:

- 4.a. National Members (adhering organizations)
- 4.b. Individual Members (adhering persons)

IV. NATIONAL MEMBERS

5. An organization representing a national professional astronomical community, desiring to promote its participation in international astronomy and supporting the objective of the Union, may adhere to the Union as a National Member. ~~Exceptionally, a National Member may represent the community in the territory of more than one nation, provided that no part of that community is represented by another National Member.~~

6. An organization desiring to join the Union as a National Member while developing professional astronomy in the community it represents may do so:

~~6a.~~ on an interim basis, on the same conditions as above, for a period of up to nine years. After that time, it ~~will either~~ **must apply to** become a National Member on a permanent basis or its membership in the Union will terminate;

~~6b.~~ **on a prospective basis for a period of up to six years if its community has less than six Individual Members. After that time it must apply to become a National Member on either an interim or permanent basis or its membership in the Union will terminate.**

7. A National Member is admitted to the Union on a permanent, ~~or~~ interim, **or prospective** basis by the General Assembly. It may resign from the Union by so informing the General Secretary in writing.

8. A National Member may be either:

8.a. the organization by which scientists of the corresponding nation or territory adhere to ICSU or:

8.b. an appropriate National Society or Committee for Astronomy, or:

8.c. an appropriate institution of higher learning.

9. The adherence of a National Member is **automatically** suspended if its ~~due~~ **annual contributions, as defined in Articles 23c and 23e below** have not been paid for five years; it resumes, upon the approval of the Executive Committee, when the arrears **in contributions** have been paid **in full**. After five years of suspension of a National Member, the Executive Committee may recommend to the General Assembly to terminate the ~~its~~ **Membership**.

10. A National Member is admitted to the Union in one of the categories specified in the Bye-Laws.

V. INDIVIDUAL MEMBERS

11. A professional scientist who is active in some branch of astronomy may be admitted to the Union by the Executive Committee as an Individual Member. An Individual Member may resign from the Union by so informing the General Secretary in writing.

VI. GOVERNANCE

12. The governing bodies of the Union are:

- 12.a. The General Assembly;
- 12.b. The Executive Committee; and
- 12.c. The Officers.

VII. GENERAL ASSEMBLY

13. The General Assembly consists of the National Members and of Individual Members. The General Assembly determines the overall policy of the Union.

13.a. The General Assembly approves the Statutes of the Union, including any changes therein.

13.b. The General Assembly approves Bye-Laws specifying the Rules of Procedure to be used in applying the Statutes.

13.c. The General Assembly elects an Executive Committee to implement its decisions and to direct the affairs of the Union between successive ordinary meetings of the General Assembly. The Executive Committee reports to the General Assembly.

13.d. The General Assembly appoints a Finance Committee, consisting of one representative of each National Member having the right to vote on budgetary matters according to §14.a., to advise it on the approval of the budget and accounts of the Union. The General Assembly also appoints a Finance Subcommittee to advise the Executive Committee on its behalf on budgetary matters between General Assemblies.

13.e. The General Assembly appoints a Special Nominating Committee to prepare a suitable slate of candidates for election to the incoming Executive Committee.

13.f. The General Assembly appoints a Nominating Committee to advise the Executive Committee on the admission of Individual Members.

14. Voting at the General Assembly on issues of a primarily scientific nature, as determined by the Executive Committee, is by Individual Members. Voting on all other matters is by National Member. Each National Member authorises a representative to vote on its behalf.

14.a. On questions involving the budget of the Union, the number of votes for each National Member is one greater than the number of its category, referred to in article 10. National Members with interim status, or which have not paid their dues for years preceding that of the General Assembly, may not participate in the voting.

14.b. On questions concerning the administration of the Union, but not involving its budget, each National Member has one vote, under the same condition of payment of dues as in §14.a.

14.c. National Members may vote by correspondence on questions concerning the agenda for the General Assembly.

14.d. A vote is valid only if at least two thirds of the National Members having the right to vote by virtue of article §14.a. participate in it by either casting a vote or signalling an abstention. An abstention is not considered a vote cast.

15. The decisions of the General Assembly are taken by an absolute majority of the votes cast. However, a decision to change the Statutes ~~can only be taken with~~ requires the approval of at least two thirds ~~of the votes~~ of all National Members having the right to vote by virtue of article §14.a. Where there is an equal division of votes, the President determines the issue.

16. Changes in the Statutes or Bye-Laws can only be considered by the General Assembly if a specific proposal has been duly submitted to the National Members and placed on the Agenda of the General Assembly by the procedure and deadlines specified in the Bye-Laws.

VIII. EXECUTIVE COMMITTEE

17. The Executive Committee consists of the President of the Union, the President-Elect, six Vice-Presidents, the General Secretary, and the Assistant General Secretary, elected by the General Assembly on the proposal of the Special Nominating Committee.

IX. OFFICERS

18. The Officers of the Union are the President, the General Secretary, the President-Elect, and the Assistant General Secretary. The Officers decide short-term policy issues within the general policies of the Union as decided by the General Assembly and interpreted by the Executive Committee.

X. SCIENTIFIC DIVISIONS

19. As an effective means to promote progress in the main areas of astronomy, the scientific work of the Union is structured through its Scientific Divisions. Each Division covers a broad, well-defined area of astronomical science, or deals with international matters of an interdisciplinary nature. As far as practicable, Divisions should include comparable fractions of the Individual Members of the Union.

20. Divisions are created or terminated by the General Assembly on the recommendation of the Executive Committee. The activities of a Division are organized by an Organizing Committee chaired by a Division President. The Division President and a Vice-President are elected by the General Assembly on the proposal of the Executive Committee, and are ex officio members of the Organizing Committee.

XI. SCIENTIFIC COMMISSIONS

21. Within Divisions, the scientific activities in well-defined disciplines within the subject matter of the Division may be organized through scientific Commissions. In special cases, a Commission may cover a subject common to two or more Divisions and then becomes a Commission of all these Divisions.

22. Commissions are created or terminated by the Executive Committee upon the recommendation of the Organizing Committee(s) of the Division(s) desiring to create or terminate them. The activities of a Commission are organized by an Organizing Committee chaired by a Commission President. The Commission President and a Vice-President are appointed by the Organizing Committee(s) of the corresponding Division(s) upon the proposal of the Organizing Committee of the Commission.

XII. BUDGET AND DUES

23. For each ordinary General Assembly the Executive Committee prepares a budget proposal covering the period to the next ordinary General Assembly, together with the accounts of the Union for the preceding period. It submits these, with the advice of the Finance Sub-Committee, to the Finance Committee for consideration before their submission to the vote of the General Assembly.

23.a. The Finance Committee examines the accounts of the Union from the point of view of responsible expenditure within the intent of the previous General Assembly, as interpreted by the Executive Committee. It also considers whether the proposed budget is adequate to implement the policy of the General Assembly. It submits reports on these matters to the General Assembly before its decisions concerning the approval of the accounts and of the budget.

23.b. The amount of the unit of contribution is decided by the General Assembly as part of the budget approval process.

23.c. Each National Member pays annually a number of units of contribution corresponding to its category. The number of units of contribution for each category shall be specified in the Bye-Laws.

23.d. A vote **on matters under article 23** is valid only if at least two thirds of the National Members having the right to vote by virtue of article §14.a. ~~participate in it~~ **cast a vote. In all cases an abstention is not a vote, but a declaration that the Member declines to vote.**

23.e. National Members having interim status pay annually one half unit of contribution.

23.f. National Members having prospective status pay no contribution.

23.g. The payment of contributions is the responsibility of the National Members. The liability of each National Members in respect of the Union is limited to the amount of contributions due through the current year.

XIII. EMERGENCY POWERS

24. If, through events outside the control of the Union, circumstances arise in which it is impracticable to comply fully with the provisions of the Statutes and Bye-Laws of the Union, the Executive Committee and Officers, in the order specified below, shall take such actions as they deem necessary for the continued operation of the Union. Such action shall be reported to all National Members as soon as this becomes practicable, until an ordinary or extraordinary General Assembly can be convened.

The following is the order of authority: The Executive Committee in meeting or by correspondence; the President of the Union; the General Secretary; or failing the practicability or availability of any of the above, one of the Vice-Presidents.

XIV. DISSOLUTION OF THE UNION

25. A decision to dissolve the Union is only valid if taken by the General Assembly with the approval of three quarters of the National Members having the right to vote by virtue of article §14.a. Such a decision shall specify a procedure for settling any debts and disposing of any assets of the Union.

XV. FINAL CLAUSES

26. These Statutes enter into force on ~~15 August 2006~~ **4 August 2009**.

27. The present Statutes are published in French and English versions. ~~In case of doubt~~ **For legal purposes**, the French version is ~~the only authority~~ **authoritative**.

5.1.2.2. Proposal for modification of Bye-Laws

IAU BYE-LAWS

Prague, Czech Republic, 15 August 2006

Rio de Janeiro, Brazil, 4 August 2009

I. MEMBERSHIP

1. An application for admission to the Union as a National Member shall be submitted to the General Secretary by the proposing organization at least eight months before the next ordinary General Assembly.

2. The Executive Committee shall examine the application and resolve any outstanding issues concerning the nature of the proposed National Member and the category of membership (**§ VII.25**). Subsequently, the Executive Committee shall forward the application to the General Assembly for decision, with its recommendation as to its approval or rejection.

3. The Executive Committee shall examine any proposal by a National Member to change its category of adherence to a more appropriate level. If the Executive Committee is unable to approve the request, either party may refer the matter to the next General Assembly.

4. Individual Members are admitted by the Executive Committee upon the nomination of a National Member or the President of a Division. The Executive Committee shall publish the criteria and procedures for membership, and shall consult the Nominating Committee before approving applications for admissions as Individual Members.

II. GENERAL ASSEMBLY

5. The ordinary General Assembly meets, as a rule, once every three years. Unless determined by the previous General Assembly, the place and date of the ordinary General Assembly shall be fixed by the Executive Committee and be communicated to the National Members at least one year in advance.

6. The President may summon an extraordinary General Assembly with the consent of the Executive Committee, and must do so at the request of at least one third of the National Members. The date, place, and agenda of business of an extraordinary General Assembly must be communicated to all National Members at least two months before the first day of the Assembly.

7. Matters to be decided upon by the General Assembly shall be submitted for consideration by those concerned as follows, counting from the first day of the General Assembly:

7.a. A motion to amend the Statutes or Bye-Laws may be submitted by a National Member or by the Executive Committee. Any such motion shall be submitted to the General Secretary at least nine months in advance and be forwarded, with the recommendation of the Executive Committee as to its adoption or rejection, to the National Members at least six months in advance.

7.b. The General Secretary shall distribute the budget prepared by the Executive Committee to the National Members at least eight months in advance. Any motion to modify this budget, or any other matters pertaining to it, shall be submitted to the General Secretary at least six months in advance. Any such motion shall be submitted, with the advice of the Executive Committee as to its adoption or rejection, to the National Members at least four months in advance.

7.c. Any motion or proposal concerning the administration of the Union, and not affecting the budget, by a National Member, or by the Organizing Committee of a Scientific Division of the Union, shall be placed on the Agenda of the General Assembly, provided it is submitted to the General Secretary, in specific terms, at least six months in advance.

7.d. Any motion of a scientific character submitted by a National Member, a Scientific Division of the Union, or by an ICSU Scientific Committee or

Program on which the Union is formally represented, shall be placed on the Agenda of the General Assembly, provided it is submitted to the General Secretary, in specific terms, at least six months in advance.

7.e. The complete agenda, including all such motions or proposals, shall be prepared by the Executive Committee and submitted to the National Members at least four months in advance.

8. The President may invite representatives of other organizations, scientists in related fields, and young astronomers to participate in the General Assembly. Subject to the agreement of the Executive Committee, the President may authorise the General Secretary to invite representatives of other organizations, and the National Members or other appropriate IAU bodies to invite scientists in related fields and young astronomers.

III. SPECIAL NOMINATING COMMITTEE

9. The Special Nominating Committee consists of the President and past President of the Union, a member proposed by the retiring Executive Committee, and four members selected by the Nominating Committee from among twelve ~~Members~~ **candidates** proposed by Presidents of Divisions, with due regard to an appropriate distribution over the major branches of astronomy.

9.a. Except for the President and immediate past President, present and former members of the Executive Committee shall not serve on the Special Nominating Committee. No two members of the Special Nominating Committee shall belong to the same nation or National Member.

9.b. The General Secretary, ~~and~~ the Assistant General Secretary **and the President-Elect** participate in the work of the Special Nominating Committee in an advisory capacity.

10. The Special Nominating Committee is appointed by the General Assembly, to which it reports directly. It assumes its duties immediately after the end of the General Assembly and remains in office until the end of the ordinary General Assembly next following that of its appointment, and it may fill any vacancy occurring among its members.

IV. OFFICERS AND EXECUTIVE COMMITTEE

11.

11.a. The President of the Union remains in office until the end of the ordinary General Assembly next following that of election. The President-Elect succeeds the President at that moment.

11.b. The General Secretary and the Assistant General Secretary remain in office until the end of the ordinary General Assembly next following that of their election. Normally the Assistant General Secretary succeeds the General Secretary, but both officers may be re-elected for another term.

11.c. The Vice-Presidents remain in office until the end of the ordinary General Assembly following that of their election. They may be immediately re-elected once to the same office.

11.d. The elections take place at the last session of the General Assembly, the names of the candidates proposed having been announced at a previous session.

12. The Executive Committee may fill any vacancy occurring among its members. Any person so appointed remains in office until the end of the next ordinary General Assembly.

13. The past President and General Secretary become advisers to the Executive Committee until the end of the next ordinary General Assembly. They participate in the work of the Executive Committee and attend its meetings without voting rights.

14. The Executive Committee shall formulate Working Rules to clarify the application of the Statutes and Bye-Laws. Such Working Rules shall include the criteria and procedures by which the Executive Committee will review applications for Individual Membership; standard Terms of Reference for the Scientific Commissions of the Union; rules for the administration of the Union's financial affairs by the General Secretary; and procedures by which the Executive Committee may conduct business by electronic or other means of correspondence. The Working Rules shall be published electronically and in the Transactions of the Union.

15. The Executive Committee appoints the Union's official representatives to other scientific organizations.

16. The Officers and members of the Executive Committee cannot be held individually or personally liable for any legal claims or charges that might be brought against the Union.

V. SCIENTIFIC DIVISIONS

17. The Divisions of the Union shall pursue the scientific objects of the Union within their respective fields of astronomy. Activities by which they do so include the encouragement and organization of collective investigations, and the discussion of questions relating to international agreements, cooperation, or standardization.

They shall report to each General Assembly on the work they have accomplished and such new initiatives as they are undertaking.

18. Each Scientific Division shall consist of:

18.a. An Organizing Committee, normally of 6-12 persons, including the Division President and Vice-President, and a Division Secretary appointed by the Organizing Committee from among its members.

18.b. Members of the Union appointed by the Organizing Committee in recognition of their special experience and interests. The Committee is responsible for conducting the business of the Division.

19. Normally, the Division President is succeeded by the Vice-President at the end of the General Assembly following their election, but both may be re-elected for a second term. Before each General Assembly, the Organizing Committee shall organize an election from among the membership, by electronic or other means suited to ~~the Commission~~ **its scientific** ~~structure of the Division~~, of a new Organizing Committee to take office for the following term. Election procedures should, as far as possible, be similar among the Divisions and require the approval of the Executive Committee.

20. Each Scientific Division may structure its scientific activities by creating a number of Commissions. In order to monitor and further the progress of its field of astronomy, the Division shall consider, before each General Assembly, whether its Commission structure serves its purpose in an optimum manner. It shall subsequently present its proposals for the creation, continuation or discontinuation of Commissions to the Executive Committee for approval.

21. With the approval of the Executive Committee, a Division may appoint Working Groups to study well-defined scientific issues and report to the Division. Unless specifically re-appointed by the same procedure, such Working Groups cease to exist at the next following General Assembly.

VI. SCIENTIFIC COMMISSIONS

22. A Scientific Commission shall consist of:

22.a. A President and an Organizing Committee consisting of 4-8 persons elected by the Commission membership, subject to the approval of the Organizing Committee of the Division;

22.b. Members of the Union, appointed by the Organizing Committee, in recognition of their special experience and interests, subject to confirmation by the Organizing Committee of the Division.

23. A Commission is initially created for a period of six years. The parent Division may recommend its continuation for additional periods of three years at a time, if sufficient justification for its continued activity is presented to the Division and the Executive Committee. The activities of a Commission is governed by Terms of Reference, which are based on a standard model published by the Executive Committee and are approved by the Division.

24. With the approval of the Division, a Commission may appoint Working Groups to study well-defined scientific issues and report to the Commission. Unless specifically re-appointed by the same procedure, such Working Groups cease to exist at the next following General Assembly.

VII. ADMINISTRATION AND FINANCES

25. Each National Member pays annually to the Union a number of units of contribution corresponding to its category as specified below. National

Members with interim status pay annually one half unit of contribution, **and those with prospective status pay no dues.**

Categories as defined in article 10 of the Statutes

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1	2	4	6	10	14	20	27	35	45	60	80

number of units of contribution

26. The income of the Union is to be devoted to its objects, including:

26.a. the promotion of scientific initiatives requiring international co-operation;

26.b. the promotion of the education and development of astronomy world-wide;

26.c. the costs of the publications and administration of the Union.

27. Funds derived from donations are reserved for use in accordance with the instructions of the donor(s). Such donations and associated conditions require the approval of the Executive Committee.

28. The General Secretary is the legal representative of the Union. The General Secretary is responsible to the Executive Committee for not incurring expenditure in excess of the amount specified in the budget as approved by the General Assembly.

29. The General Secretary shall consult with the Finance Sub-Committee (cf. Statutes § 13.d.) in preparing the accounts and budget proposals of the Union, and on any other matters of major importance for the financial health of the Union. The comments and advice of the Finance Sub-Committee shall be made available to the Officers and Executive Committee as specified in the Working Rules.

30. An Administrative office, under the direction of the General Secretary, conducts the correspondence, administers the funds, and preserves the archives of the Union.

31. The Union has copyright to all materials printed in its publications, unless otherwise arranged.

VIII. FINAL CLAUSES

32. These Bye-Laws enter into force on ~~15 August 2006~~ **4 August 2009**.

33. The present Bye-Laws are published in French and English versions. ~~In case of doubt~~ **For legal purposes**, the French version is ~~the only authority~~ **authoritative**.

5.1.3. IAU Strategic Plan 2010 – 2020 *Astronomy for the Developing World*

5.1.3.1. Foreword

The IAU Executive Committee regards stimulating astronomy education and development throughout the world as one of the most important tasks of the Union. Over many years, the accomplishments of IAU Commission 46 and its various Program Groups in this area have been impressive. Much has been achieved with few resources. With the current *International Year of Astronomy*, the EC regards this as an opportune time to review the long-term strategy of the IAU in development and education. At its EC83 meeting in 2007, the Executive Committee asked me to take on the EC portfolio related to Commission 46 activities and to produce a strategic plan for IAU involvement in development and education during the next decade.

There are several reasons why such a decadal plan is needed. First, technology is changing. The widespread access to the internet and the future availability of remotely operated telescopes for education are important opportunities that should be exploited. Secondly, several new programs outside the IAU are contributing substantially to astronomy education, particularly at the secondary and primary levels. Given the limited available resources, coordination and focusing of the various IAU and non-IAU programs can produce a program that as a whole is greater than the sum of its parts. Thirdly, to augment efforts in this area, additional funding is needed. An ambitious and well-founded strategic plan is a prerequisite for any attempt to solicit additional external funding.

We therefore embarked on an exercise designed to produce a plan for ratification at the IAU XXVII General Assembly at Rio de Janeiro in August 2009. This plan addresses the rationale for astronomy development, education at the primary, secondary and tertiary levels, public outreach and the development of an infrastructure for research.

An informal 'brainstorming' meeting was held at the Institut d'Astrophysique de Paris from 28 - 30 January 2008, on the initiative of the IAU Executive Committee. Present were the President and Vice President of Commission 46, Magda Stavinschi and Rosa Ros, the chairs of some relevant program groups, John Hearnshaw (PH-WWDA), Ed Guinan and Larry Marschall (PG-TAD), Jean-Pierre De Greve and Michele Gerbaldi (PG-ISYA), the IAU Officers (Catherine Cesarsky, Bob Williams, Karel van der Hucht and Ian Corbett) and the responsible IAU Vice-President (George Miley). In addition there were representatives from the following related programs: the Japanese Tripod, ODA program (Kaz Sekiguchi), IYA Cornerstone 11/ Africa Plan (Kevin Govender), Las Cumbres Observatory/ Faulkes Telescopes (Paul Roche), Hands on Universe (Roger Ferlet), and Universe Awareness (Carolina Ödman). The meeting was lively and resulted in several interesting ideas, most of which are included in the draft plan presented here.

Funding the plan will be a huge challenge. However, without a well-developed plan that can appeal to potential fund-givers, there is little chance of increasing funds for astronomy development. I believe that the astronomy development activities are sufficiently important to be attractive to potential fund givers and that the plan is modest in scope compared to the annual global cost of ground-based and space research in astronomy.

The first draft of this plan was discussed by the Executive Committee of the IAU at their EC84 meeting on 28 - 30 May 2008. There was general agreement that the vision and goals of the plan are laudable, that the introduction of the suggested new programs should be supported. Ways for funding the plan should be investigated.

After consultation with the various stakeholders and outside bodies such as UNOOSA, COSPAR and URSI, a revised version of this plan was approved by the Executive Committee at their EC85 meeting on 7 April 2009. We shall have a discussion of the plan at the General Assembly at Rio de Janeiro in August 2009 and hope to produce a final version shortly thereafter.

The full document is available at http://www.iau.org/education/strategic_plan/ .

Please send comments and/or suggestions on the plan to me. Many thanks.

*George K. Miley, IAU Vice-President
Leiden, 4 June 2009, <miley@strw.leidenuniv.nl>*

5.1.3.2. Executive summary

Astronomy embodies a combination of science, technology and culture, all important elements of international development.

- A challenging science in itself, astronomy is also an exciting gateway to physics, chemistry, biology and mathematics.
- The need to study the faintest celestial object has driven advanced developments in electronics, optics and information technology.
- The quest to explore the Universe satisfies the deepest cultural and philosophical yearnings of our species and can stimulate a sense of global citizenship.

Astronomy inspires teenagers to choose a career in science and technology and is a staple of adult education. Many large international telescope facilities are accessible to all astronomers throughout the world, providing an inexpensive entry to cutting-edge international research for developing countries.

The International Astronomical Union regards access to knowledge about the Universe as a birthright of all people and furthering the exploitation of astronomy for sustainable global development as an important part of its

mission. We here present an ambitious decadal strategic plan for stimulating astronomy in the developing world. The plan shows that astronomy can make an important contribution to global development and outlines a strategy for furthering this process.

The Union presently conducts a range of activities directed towards education and development, with emphasis on universities and research. Several complementary programs have recently been initiated by IAU members for exploiting astronomy in primary and secondary education. During the next decade, the IAU intends to expand its role in furthering the use of astronomy at all levels in developing countries, working closely with relevant external organizations and using the *International Year of Astronomy 2009* as a springboard. The vast reservoir of talent presently active in astronomy throughout the world will be exploited and mobilized to further sustainable global development.

The long-term vision of the IAU is that:

- All countries will participate at some level in international astronomical research;
- All children throughout the world will be exposed to knowledge about astronomy and the Universe.

Goals for the next decade are:

- Raising the level of astronomy development in as many countries as possible, so as to maximize the size of population reached.
- Working to include aspects of astronomy as aids to the primary and secondary education of as many children as possible.

To achieve these goals, existing efforts will be intensified, new programs will be initiated and the IAU development activities will be incorporated into a more professional organizational structure.

Ingredients of the strategy include the following:

- An integrated strategic approach involving primary, secondary, tertiary and research education and public outreach. The strategy will be based on the future potential for astronomy research and education in each country, using objective data, augmented by advice from experts in the region. Because of its relative underdevelopment, Sub-Saharan Africa is a region that will receive special attention.
- Enlarging the number of active volunteers. Present activities depend entirely on volunteers, both for their coordination and implementation. The IAU aims to enlarge the number of volunteer-experts by recruiting more members and augmenting the pool of volunteers with doctoral and postdoctoral trainees and talented non-member experts on pre-tertiary education and outreach.
- Initiation of new programs. The IAU will begin several new programs to stimulate astronomy development.
 - An endowed lectureship program will provide semi-popular lectures on inspirational topics in modern astrophysics for

high-school students and the general public in developing countries.

- An institute twinning scheme will encourage developed astronomy institutes to provide long-term guidance and advice to university departments in developing countries interested in building up an astronomy research capability.
- Creation of a Global Development Office. Mobilizing a larger number of volunteers and implementing new programs cannot be achieved without some professional coordination. A crucial step is the creation of a small IAU Global Development Office, led by an IAU Director of Development and Education.
- Increasing regional involvement. An important component of the plan is the adoption of a 'bottom-up' approach for astronomy development, with a substantial degree of decentralization. This will involve the appointment of regional development coordinators and the designation of regional 'institute nodes'. The regional coordinators will coordinate development efforts throughout their geographical region.
- Global task forces. After the pool of volunteers has been increased, the global activities will be consolidated into three task forces to cover the various sectors of astronomy development.

Evaluation and assessment will be an essential part of every component of the plan. The strategy will be implemented flexibly, taking account of available funding. The total annual direct cost of the plan is about € 1 million, an order of magnitude larger than the present cost of the IAU astronomical development program, but very small compared with the annual global expenditure on astronomical research.

Funding the plan will need an innovative approach and action on several fronts. First, an 'astronomy development levy' on the IAU dues of wealthy countries will be considered as a way of funding the IAU Global Development Office, an essential component of the plan. Secondly, vigorous attempts at external fund raising will be made, with approaches to international and regional aid agencies, national governments, industry and private foundations for support of various aspects of the plan. Thirdly, in-kind contributions from developed astronomical institutes and national astronomical societies will be sought. Fourthly, consideration will be given to adopting a target of at least 0.7% of the budgets of astronomical institutes and astronomical projects in rich countries for furthering astronomy education and research in developing countries. This would be in line with the well-established United Nations target for development aid.

5.1.4. Submitted Resolutions

RESOLUTION B1
on
IAU Strategic Plan: Astronomy for the Developing World

Proposed by: the IAU Executive Committee

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Robert Williams <wms@stsci.edu>
Seconder: George K. Miley <miley@strw.leidenuniv.nl>

The XXVII General Assembly of the International Astronomical Union,

recognizing

1. the goal of the IAU to encourage the development of astronomy and facilitate better understanding of the universe,
2. that the current activities of the International Year of Astronomy 2009 have made great strides in advancing knowledge of astronomy among citizens of all nations and awareness of its value to society,
3. that science education and research is an essential component of modern technological and economic development,

therefore resolves that the IAU should

1. place increasing emphasis on programs that advance astronomy education in developing countries,
2. approve the goals specified in the Strategic Plan “Astronomy for the Developing World” as objectives for the IAU in the coming decade,
3. assess programs undertaken during the IYA to determine which activities are most effective in advancing astronomy.

RESOLUTION A1
on
Implementing the IAU Strategic Plan

Proposed by: the IAU Executive Committee

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Robert Williams <wms@stsci.edu>
Seconder: George K. Miley <miley@strw.leidenuniv.nl>

The XXVII General Assembly of the International Astronomical Union,

recognizing

1. the goal of the IAU to encourage the development of astronomy and facilitate better understanding of the universe,
2. that the current activities of the International Year of Astronomy 2009 have made great strides in advancing knowledge of astronomy among citizens of all nations and awareness of its value to society,
3. that science education and research is an essential component of modern technological and economic development,
4. Resolution B1 adopting the IAU Strategic Plan and passed by the XXVII General Assembly,

therefore resolves that the IAU should

1. give high priority to supporting the development of astronomy infrastructure in emerging nations,
2. proceed with the implementation of this plan through the creation of a Global Development Office and seek appropriate additional resources for this purpose.

RESOLUTION B2
on
Current best estimates of astronomical constants

Proposed by: IAU Division I WG *Numerical Standards in Fundamental Astronomy*

Supported by: IAU Division I

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Brian J. Luzum <bjl@maia.usno.navy.mil>

Secunder: Nicole Capitaine <nicole.capitaine@obspm.fr>

The XXVII General Assembly of the International Astronomical Union,
considering

1. the need for a self-consistent set of accurate numerical standards for use in astronomy,
2. that improved values of astronomical constants have been made available by recent observations, and
3. that conventional values have been adopted by IAU GA 2000 and IAU GA 2006 resolutions for a number of astronomical quantities,

recognizing

1. the continuing need for a set of Current Best Estimates (CBEs) of astronomical numerical constants, and
2. the need for an operational service to the astronomical community to maintain the CBEs

recommends

1. that the list of constants in the report of the Working Group on *Numerical Standards for Fundamental Astronomy* (Luzum et al. 2009, *Celest. Mech. and Dyn. Astr.*, in preparation) be adopted as the IAU (2009) System of Astronomical Constants.
2. that Current Best Estimates of Astronomical Constants be permanently maintained as an electronic document,
3. that, in order to ensure the integrity of the CBEs, IAU Division I develop a formal procedure to adopt new values and archive older versions of the CBEs, and
4. that the IAU establish within IAU Division I a permanent body to maintain the CBEs for fundamental astronomy.

RESOLUTION B3

on

the Second Realization of the International Celestial Reference Frame

Proposed by: IAU Division I WG on the *Second Realization of the International Celestial Reference Frame*

Supported by: IAU Division I

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Ralph A. Gaume <rgaume@usno.navy.mil >

Secunder: Chopo Ma <chopo.ma@nasa.gov>

The International Astronomical Union XXVII General Assembly,

noting

1. that Resolution B2 of the XXIII General Assembly (1997) resolved “That, as from 1 January 1998, the IAU celestial reference system shall be the International Celestial Reference System (ICRS)”,

2. that Resolution B2 of the XXIII General Assembly (1997) resolved that the “fundamental reference frame shall be the International Celestial Reference Frame (ICRF) constructed by the IAU Working Group on Reference Frames”,

3. that Resolution B2 of the XXIII General Assembly (1997) resolved “That IERS should take appropriate measures, in conjunction with the IAU Working Group on reference frames, to maintain the ICRF and its ties to the reference frames at other wavelengths”,

4. that Resolution B7 of the XXIII General Assembly (1997) recommended “that high-precision astronomical observing programs be organized in such a way that astronomical reference systems can be maintained at the highest possible accuracy for both northern and southern hemispheres”,

5. that Resolution B1.1 of the XXIV General Assembly (2000) recognized “the importance of continuing operational observations made with Very Long Baseline Interferometry (VLBI) to maintain the ICRF”,

recognizing

1. that since the establishment of the ICRF, continued VLBI observations of ICRF sources have more than tripled the number of source observations,

2. that since the establishment of the ICRF, continued VLBI observations of extragalactic sources have significantly increased the number of sources whose positions are known with a high degree of accuracy,

3. that since the establishment of the ICRF, improved instrumentation, observation strategies, and application of state-of-the-art astrophysical and geophysical models have significantly improved both the data quality and analysis of the entire relevant astrometric and geodetic VLBI data set,

4. that a working group on the ICRF formed by the International Earth Rotation and Reference Systems Service (IERS) and the International VLBI Service for Geodesy and Astrometry (IVS), in conjunction with the IAU Division I Working Group on the Second Realization of the International Celestial Reference Frame has finalized a prospective second realization of the ICRF in a coordinate frame aligned to that of the ICRF to within the tolerance of the errors in the latter (see note 1),

5. that the prospective second realization of the ICRF as presented by the IAU Working Group on the Second Realization of the International Celestial Reference Frame represents a significant improvement in terms of source selection, coordinate accuracy, and total number of sources, and thus represents a significant improvement in the fundamental reference frame realization of the ICRS beyond the ICRF adopted by the XXIII General Assembly (1997) (see note 2),

resolves

1. that from 01 January 2010 the fundamental astrometric realization of the International Celestial Reference System (ICRS) shall be the Second Realization of the International Celestial Reference Frame (ICRF2) as constructed by the IERS/IVS working group on the ICRF in conjunction with the IAU Division I Working Group on the Second Realization of the International Celestial Reference Frame (see note 1),

2. that the modified Hipparcos Celestial Reference Frame (HCRF) (see note 2) shall continue to be the primary realization of the ICRS at optical wavelengths,

3. that the organizations responsible for astrometric and geodetic VLBI observing programs (e.g. IERS, IVS) take appropriate measures to continue existing and develop improved VLBI observing and analysis programs to both maintain and improve ICRF2,

4. that the IERS, together with other relevant organizations continue efforts to improve and densify high-accuracy reference frames defined at other wavelengths and continue to improve ties between these reference frames and ICRF2.

Note 1: The Second Realization of the International Celestial Reference Frame – Chopo Ma, et al. (IERS Technical Note 35, Frankfurt am Main: Verlag des Bundesamts für Kartographie und Geodäsie, 2009). See <www.iers.org/MainDisp.csl?pid=46-25772> or <hpiers.obspm.fr/icrs-pc/> .

Note 2: Resolution B1.2 of the IAU XXIV General Assembly (2000)

RESOLUTION B4
on
Supporting Women in Astronomy

Proposed by: the EC WG IYA Task Group *She is an Astronomer*
Supported by: the EC WG *Women in Astronomy*

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Helen J. Walker < helen.walker@stfc.ac.uk >
Seconder: Sarah T. Maddison < smaddison@swin.edu.au >

The International Astronomical Union XXVII General Assembly,

recalling

1. the UN Millennium Development Goal 3: promote gender equality and empower women,
2. the IAU/UNESCO International Year of Astronomy 2009 goal 7: improve the gender-balanced representation of scientists at all levels and promote greater involvement by underrepresented minorities in scientific and engineering careers,

recognising

1. that individual excellence in science and astronomy is independent of gender,
2. that gender equality is a priority of the global scientific community.

considering

1. the role of the IAU Working Group for Women in Astronomy items 1 and 6 (1. monitoring the status of women in astronomy and recommending future actions that will improve the environment for all astronomers; 6. provide a voice for women in non-western countries to ensure that they are well represented in the international community),
2. the role of the IYA2009 Cornerstone Project *She is an Astronomer* (provide access to excellent role models and mentors, formally and informally, and publicise them; provide information about the female 'dual-career' problem and possible solutions),

recommends

1. that all IAU members encourage and support the female astronomers in their communities,

2. that all IAU members and National Representatives encourage national organisations to break down barriers and ensure that men and women are given equal opportunities to pursue a successful career in astronomy at all levels and career steps.

RESOLUTION B5

in

Defence of the night sky and the right to starlight

Proposed by: IAU EC WG IYA Cornerstone Project *Dark Skies Awareness*
and the members of the Starlight Declaration

Supported by: IAU Division XII/Commission 50 WG *Controlling Light Pollution*

The following persons will be available for consultation and, if necessary to speak on the above resolution at the General Assembly on 13 August 2009:

Proposer: Richard J. Wainscoat <rjw@ifh.hawaii.edu>

Seconder: Malcolm G. Smith <msmith@noao.edu>

The International Astronomical Union XXVII General Assembly,

recalling

1. the IAU/UNESCO International Year of Astronomy 2009 goal 8: facilitate the preservation and protection of the world's cultural and natural heritage of dark skies in places such as urban oases, national parks and astronomical sites,
2. the Declaration approved during the International Conference in Defence of the Quality of the Night Sky and the Right to Observe Stars (La Palma, Canary Islands, 2007) promoted by UNESCO, UNWTO, IAC, MaB Programme, IAU, and other international agencies,

recognising

that the night sky has been and continues to be an inspiration of mankind, and that its contemplation represents an essential element in the development of scientific thought in all civilisations,

considering

1. the role of the IAU Division XII Commission 50 WG Controlling Light Pollution,
2. the role of the IYA2009 Cornerstone Project Dark Skies Awareness,

declares that

1. An unpolluted night sky that allows the enjoyment and contemplation of the firmament should be considered an inalienable right equivalent to all other socio-cultural and environmental rights. Hence the progressive degradation of the night sky must be regarded as a fundamental loss.
2. Knowledge – armed with education – is a powerful vector that can heal the growing rift between today's society and science and contribute to the advancement of mankind as a whole. The dissemination of astronomy and associated scientific and cultural values should be considered as basic content to be included in educational activities.
3. Protection of the quality of astronomical areas suitable for scientific observation of the Universe must be given priority in national and international scientific and environmental policies.
4. Control of obtrusive light must be a basic element of nature conservation policies since it impacts on several species, habitats, ecosystems, and landscapes.
5. The intelligent use of artificial lighting that minimises sky glow and avoids obtrusive visual impact on both humans and wildlife should be promoted. This strategy would involve more efficient use of energy so as to meet the wider commitments made on climate change, and for the protection of the environment.
6. Tourism, among other players, can become a major instrument for a new alliance in defence of the quality of the nocturnal skyscape. Responsible tourism, in its many forms, can and should take on board the night sky as a resource to protect and value in all destinations.
7. Necessary measures should be implemented to involve all parties related to skyscape protection in raising public awareness – be it at local, regional, national, or international level – about the contents and objectives of the International Conference in Defence of the Quality of the Night Sky and the Right to Observe Stars.

**5.2. IAU XXVIII General Assembly,
Beijing, China Nanjing, 20 - 31 August 2012**

The web site of this General Assembly has been registered as:
< www.astronomy2012.com/ >. The site will open in due time.

6. SCIENTIFIC MEETINGS

6.1. IAU Symposia in 2009 (see details in IAU IB 103, January 2009)

IAU S262 through S267 will be held during the IAU XXVII GA in Rio de Janeiro, Brazil, 3 - 14 August 2009. Details in PART I of IB 103.

IAU S268 *Light Elements in the Universe*

Date and place: 9 -13 November 2009, Geneva, Switzerland

Coordinating Division: IV

SOC chairs: Corinne Charbonnel (Switzerland) and Monica Tosi (Italy)
SOC members: Beatriz Barbuy (Brazil), ex-officio, Yuri Izotov (Ukraine), Taka Kajino (Japan), David L. Lambert (USA), John Lattanzio (Australia), Paolo Molaro (Italy), H. Warren Moos (USA), Francesca Primas (Germany), Robert T. Rood (USA), and Suzanne Talon (Canada).

LOC chair: Corinne Charbonnel

LOC members: Christina Chiappini, Miroslava Dessauges-Zavadsky, Sylvia Ekström, Michel Grenon, Nadège Lagarde, Chantal Taçoy, and Gilles Simond.

Editors: Corinne Charbonnel, Monica Tosi, Francesca Primas & Christina Chiappini

Contact: Corinne Charbonnel <corinne.charbonnel@obs.unige.ch>

URL: <<http://obswww.unige.ch/iau268/>>

Principal topics: see IB103

6.2. IAU Symposia in 2010

**IAU S269 *Galileo's Medicean Moons – their Impact on 400 years of
Discovery***

Date and place: 6-9 January, 2010, Padova, Italy

Coordinating Division: III on Planetary Systems Sciences

SOC chairs: Cesare Barbieri (Italy), Angioletta Coradini (Italy), Michael Mendillo (USA), Tobias C. Owen (USA)

SOC members: Sushil K. Atreya (USA), Antonella Barucci (France), Supriya Chakrabarti (USA), Marcello Coradini (France), George V. Coyne (Vatican), Therese Encrenaz (France), Manuel Grande (UK), Donald N. Hall (USA), Wing Ip (China Taipei), Torrence V. Johnson (USA), H. Uwe Keller (Germany), Sohichi Okano (Japan), Robert T. Pappalardo (USA), Robert Williams (USA), Nicholas M. Schneider (USA), and Alexander V. Zakharov (Russian Federation)

LOC chairs: Francesca Ferri, Monica Lazzarin

LOC members: Stefano Casotto, Mauro D'Onofrio, Elisa Segato, Lara Vanzan

Editor: Cesare Barbieri, Marcello Coradini & Supriya Chakrabarti

Contact: Cesare Barbieri <cesare.barbieri@unipd.it>

URL: <www.unipd.it/astro2009/iniziativa.html>

Principal topics

- The discovery of the Medicean Moons, the history, the influence on science and humanity
- The Medicean Moons, Jupiter's system, the legacy of NASA Galileo mission, future missions to Jupiter
- Our solar system after Galileo Galilei – the grand vision
- New telescopes, new solar systems, new people out there?

IAU S270 *Computational star formation – playing by the numbers?*

Date and place: 3 - 7 May 2010, Barcelona, Spain

Coordinating Division: VI on Interstellar Matter

SOC chairs: Joao F. Alves (Spain), Bruce G. Elmegreen (USA) and Virginia L. Trimble (USA)

SOC members: Tom Abel (USA), Javier Ballesteros-Paredes (Mexico), Ian A. Bonnell (UK), Frédéric Bournaud (France), Andreas M. Burkert (Germany), Clare L. Dobbs (UK), G. Gensler (Austria), Josep M. Girart (Spain), W.-T. Kim (Rep of Korea), Ralf S. Klessen (Germany), Mark R. Krumholz (USA), Junicgiro Makino (Japan), Fumitaka Nakamura (Japan), Aake Nordlund (Denmark), Ralph E. Pudritz (Canada), and Aleksandr V. Tutukov (Russian Federation)

LOC chairs: Joao F. Alves and Josep M. Girart

LOC members: J. Isern and R. Estalella

Editors: Joao F. Alves, Bruce G. Elmegreen & Virginia L. Trimble

Contact: Joao F. Alves <jalves@caha.es>

URL: tbd

Principal topics

- Computer and algorithmic techniques for gas dynamics and particle dynamics
- Special purpose versus generalized hardware
- Simulations of single star formation
- Simulations of star formation in clusters
- Simulations of early phase cluster evolution

- Simulations of late phase cluster evolution
- Simulations of the IMF
- Simulations of young galaxy evolution
- Simulations of star formation triggering during galaxy interactions
- Simulations of star formation in normal galaxies

IAUS 271 *Astrophysical dynamics – from stars to galaxies*

Date and place: 21 - 25 June 2010, Nice, France

Coordinating Division: IV on Stars

SOC chairs: Nicholas H. Brummell (USA) and Allan Sacha Brun (France)

SOC members: Kwing Chang (China Nanjing), Paul Charbonneau (Canada), Jørgen Christensen-Dalsgaard (Denmark), David Galloway (Australia), Douglas O. Gough (UK), Sirajul S. Hasan (India), Mark S. Miesch (USA), H. Keith Moffatt (UK), Yannick Ponty (France), Annick Pouquet (USA), Steven M. Tobias (UK), Nigel O. Weiss (UK), Ellen G. Zweibel (USA), and Jean-Paul Zahn (France)

LOC chairs: Allan Sacha Brun and Yannick Ponty

LOC members: Nicolas Bessolaz, Pascale Chavegrand, Laurène Jouve, Stephane Mathis, Sylvie Szeles, and Bruno Thooris

Editors: Nicholas H. Brummell, Allan Sacha Brun, Yannick Ponty, and Mark S. Miesch

Contact: Allan Sacha Brun <sacha.brun@cea.fr>

URL: <irfu.cea.fr/Projets/IAUSymp271>

Principal topics

- The Sun and stars: observational constraints, theory and models
- Galaxies: observational constraints, theory and models
- Nonlinear astrophysics
- Astrophysical turbulence
- Cosmic magnetism

IAU S272 *Active OB stars – structure, evolution, mass loss, and critical limits*

Date and Place: 19-23 July 2010, Paris, France

Coordinating Division: IV on Stars

SOC chair: Coralie Neiner (France)

SOC members: Jean-Claude Bouret (France), Lydia S. Cidale (Argentina), Juan Fabregat (Spain), Marc Gagné (USA), Douglas R. Gies (USA), Eduardo Janot Pacheco (Brazil), Georges Meynet (Switzerland), Geraldine J. Peters (USA), Thomas Rivinius (Chile), Hideyuki Saio (Japan), Richar H.D. Townsend (USA), and Gregg A. Wade (Canada)

LOC chairs: E. Alecian, M. Floquet, A.-M. Hubert, O. Martins and A. Oger
LOC members: B. de Batz, F. Espinosa, Lara B. Leroy, C. Neiner, T. Semaan, and S. Taburet
Editors: Coralie Neiner, Gregg A. Wade, Georges Meynet & Geraldine J. Peters
Contact: Coralie Neiner <Coralie.Neiner@obspm.fr>
URL: tbd

Principal topics

- Internal structure of active massive stars: pulsations, rotation, magnetism, transport processes
- Their evolution: stellar environment, formation, binaries, late stages (including magnetars and GRBs)
- Their circumstellar environment: disks, magnetospheres, the Be phenomenon, wind, clumping
- Active massive stars as extreme condition test beds: critical rotation, mass loss, radiation fields
- 'Normal' massive stars as calibrators: fundamental parameters, astronomical quantities
- Populations of massive stars: stellar population studies, tracers of galactic structure, cosmic history

IAU S273 *Physics of Sun and star spots*

Date and place: 23-26 August 2010, Los Angeles, CA, USA

Coordinating Division: II on Sun & Heliosphere

SOC chairs: Debi Prasad Choudhary (USA) and Klaus G. Strassmeier (Germany)
SOC members: Jan O. Stenflo (Switzerland), Carsten Denker (Germany), Eric R. Priest (UK), Edward J. Rhodes (USA), Takashi Sakurai (Japan), Haimin Wang (USA), Cristina H. Mandrini (Argentina), Donald B. Melrose (Australia), Zhang Hongqi (China Nanjing), Oddbjørn Engvold (Norway), Brigitte Schmieder (France), Michal Sobotka (Czech Republic), Suzanne L. Hawley (USA), Ashoke K. Sen (India), Siraj Hasan (India), and Karel A. van der Hucht (Netherlands)

LOC chairs: Ana Cristina Cadavid and Debi Prasad Choudhary

LOC members: Gary Chapman, Anna Cristina Dadavid, Jan Dobias, Dora Preminger, John Lawrence, Dora Preminger, Cristian Damian, Angie Cookson, and John Hodgson

Editors: Debi Prasad Choudhary & Klaus G. Strassmeier

Contact: Debi Prasad Choudhary <debiprasad.choudhary@csun.edu>

URL: <www.csun.edu/PhysicsAndAstronomy/IAUS273.htm>

Principal topics

- Formation and decay of sunspots
- Solar magnetism

- Origin of solar activity
- Formation and evolution of star spots
- Stellar magnetism
- Star spots and stellar Activity
- Observational techniques
- Unified approach in understanding Sun and star spots

IAU S274 *Advances in plasma astrophysics*

Date and place: 6 - 10 September 2010, Catania, Italy

Coordinating Division: II on Sun & Heliosphere

SOC chairs: Alfio Bonanno (Italy), Elisabete M. de Gouveia dal Pino (Brazil), Robert Rosner (USA), and Alexander G. Kosovichev (USA)

SOC members: Axel Brandenburg (Sweden), Anne J. Green (Australia), Marcel Goossens (Belgium), Gerhard Haerendel (Germany), Eun-Jin Kim (UK), Hai-Sheng Ji (USA), Kazanuri Shibata (Japan), Richard V.E. Lovelace (USA), Gaetano Belvedere (Italy), Michael G. Shats (Australia), Katarzyna Otmianowska-Mazur (Poland), Loulas Vlahos (Greece), L.M. Zeleny (Russian Federation), and Dong L. Wu (China Nanjing)

LOC chairs: A. Bonanno and G. Belvedere

LOC Members: D. Recuperio, G. Santagati, G. Umana, C. Trigilio, P. Romano, S. Ivanovski, N. Gammino, and S. Tudisco

Editors: Alfio Bonanno & Alexander G. Kosovichev

Contact: Alfio Bonanno <abo@oact.inaf.it>

URL: tbd

Principal topics

The symposium topics will focus on recent observational, theoretical and experimental efforts in understanding the basic plasma processes in the Universe, with broad synergies with many areas of astrophysics, including:

- the origin and dynamics of magnetic fields (the dynamo problem),
- the origin of X-ray emitting coronas
- the role of magnetic reconnection
- acceleration of charged particles and cosmic rays
- the ejection of winds and jets from highly-evolved stars and SN remnants,
- plasma radiation processes,
- MHD turbulence in astrophysical objects, the ISM medium and the solar wind, and other key problems in modern plasma astrophysics.

IAU S275 *Jets at all scales*

Dates and place: 13-17 September 2010, Buenos Aires, Argentina

Coordinating Division: XI on Space & High-Energy Astrophysics

SOC chair: Gustavo E. Romero, Argentina

SOC members: Tomaso Belloni (Italy), Alberto J. Castro-Tirado (Spain), Stéphane Corbel (France), Elena Gallo (USA), Marat R. Gilfanov (Germany), Elisabete M. de Gouveia Dal Pino (Brazil), Jochen Greiner (Germany), Emrah Kalemci (Turkey), Amir Levinson (Israel), Sera B. Markoff (Netherlands), Shin Mineshige (Japan), Josep M. Paredes (Spain), Rita M. Sambruna (USA), Rashid A. Sunyaev (Germany), and Jörn Wilms (Germany)

LOC chair: Gustavo E. Romero

LOC members: Deborah Aguilera, Ileana Andruchow, Sergio A. Cellone, Soñia A. Cora, Jorge A. Combi, Leonardo Pellizza, Mariana Orellana, and Matías Reynoso

Editors: Gustavo E. Romero, Rashid A. Sunyaev & Tomaso Belloni

Contact: Gustavo Romero, <romero@iar-conicet.gov.ar>

URL: tbd

Principal topics

- Formation and content of astrophysical jets
- Jets from protostars
- Jets from microquasars
- Jets from Active Galactic Nuclei
- Jets from Gamma-Ray Bursts
- Accretion and its relation to jets
- Black hole physics
- Neutron stars and jets
- Multi-wavelength observations of jets
- Radiative processes in jets

IAU S276 *The astrophysics of planetary systems – formation, structure, and dynamical evolution*

Date and place: 20-24 September 2010, Torino, Italy

Coordinating Division: III on Planetary Systems Sciences

SOC chair: Alessandro Sozzetti (Italy)

SOC members: Yann Alibert (France), Pawel Artymowicz (Canada), Isabelle Baraffe (France), Alan P. Boss (USA), Eric B. Ford (USA), Raffaele G. Gratton (Italy), Wilhelm Kley (Germany), Maciej Konacki (Poland), David W. Latham (USA), Gregory Laughlin (USA), Michel Mayor (Switzerland), Tzevi Mazeh (Israel), Tatiana A. Michtchenko (Brazil), Richard P. Nelson (UK), and Ji-Lin Zhou (China Nanjing)

LOC chair: Alessandro Sozzetti

LOC members: Maria Teresa Crosta, Mario Lattanzi, Roberto Morbidelli, Maria Sarasso, and Alberto Vecchiato

Editor: Alessandro Sozzetti

Contact: Alessandro Sozzetti <sozzetti@oato.inaf.it>

URL: tbd

Principal topics

- Multiple-planet systems – observations
- Multiple-planet system – models of formation, structure, and evolution
- Multiple-planet systems – long-term dynamical evolution

IAU S277 *Tracing the Ancestry of Galaxies (on the land of our ancestors)*

Date and place: 13-17 December 2010, Ouagadougou, Burkina Faso

Coordinating Division: VIII on Galaxies & the Universe

SOC chairs: Claude Carignan (Canada) and Kenneth C. Freeman (Australia)

SOC members: Leo Blitz (USA), David L. Block (South Africa), W. J. G. de Blok (South Africa), Martin G. Bureau (UK), Françoise Combes (France), Stéphane J. Courteau (Canada), Kambiz Fathi (Sweden), Natasha M. Forster-Schreiber (Germany), Rafael Guzmán (USA), Cláudia L. Mendes de Oliveira (Brazil), Julio F. Navarro (Canada), Max Pettini (UK), Yoshiaki Sofue (Japan), and Mathias Steinmetz (Germany)

LOC chairs: Monique Mujawamariya and Juliette Bouda

LOC members: Luc Turbide, M.M. de Denus Baillargeon, Olivier Hernandez, Zacharie Kam Sié, Jean Koulidiati, Moussa Sougoti, and Pierre Sanon

Editors: Claude Carignan, Kenneth C. Freeman & Françoise Combes

Contact: Claude Carignan <claude.carignan@umontreal.ca>

URL: tbd

Principal topics

- Multi-wavelength surveys of deep fields
 - Multi-wavelength surveys of large nearby galaxy samples (UV, optical, IR, CO, HI)
 - 3D surveys of low-, intermediate- and high-redshift galaxies
 - Interpretation of high-redshift kinematical data (mergers, star bursts)
 - High-redshift progenitors of local galaxies
 - Downsizing, high-redshift red galaxies, bimodal galaxy populations, scaling relations
 - Baryon acquisition and settling of baryons in cold disks
 - Integrated and resolved stellar populations
 - Star formation and mass assembly history of galaxies

For an overview of all IAU scientific meetings:

<www.iau.org/science/meetings/>.

6.3. Regional IAU Meetings in 2010 and 2011

XIIIth Latin American Regional IAU Meeting (LARIM-2010)

Date and place: 18-22 October 2010, Morelia, Mexico

Coordinating Division: X on Radio Astronomy

SOC chair: Luis F. Rodriguez (Mexico)

SOC members:

Luiz Paulo R. Vaz (Brazil), Rene Mendez (Chile), Gustavo Romero (Argentina), Vladimir Avila-Reese (Mexico), Gonzalo Tancredi (Uruguay), and Anna K. Vivas (Venezuela)

LOC chair: Enrique Vazquez-Semadeni

LOC members: Adriana Gazol, Yolanda Gomez, Ricardo Gonzalez, Jane Arthur and Will Henney

Editors: Will Henney & Silvia Torres-Peimbert

Contact: Luis F. Rodriguez <l.rodriguez@crya.unam.mx>

URL: tbd

Principal topics

- Solar and planetary astronomy
- Stellar astronomy
- Interstellar medium
- Galactic structure
- Extragalactic astronomy
- Cosmology
- Multi-wavelength astronomy
- Instrumentation and telescopes

XIth Asian-Pacific Regional IAU Meeting (APRIM 2011)

Date and Place: 26 – 29 July 2011, Chiang Mai, Thailand

SOC chair: Busaba Hutawarakorn Kramer (Germany)

SOC members: tbd

LOC chair: tbd

LOC members: tbd

Editor: Busaba Hutawarakorn Kramer

Contact: Busaba Hutawarakorn Kramer <bkramer@mpifr-bonn.mpg.de>

URL: tbd

Principal topics : tbd

6.4. Post Meeting Reports 2008

The Post Meetings Reports 2008 are available on the IAU web page

<www.iau.org/static/scientific_meetings/postmr08.pdf> .

6.5. Other meetings of astrophysical interest

Astronomical Instruments from the Antikythera Mechanism to the de Dondi's Astrarium

Date and place: 29 July – 3 August 2009, Budapest, Hungary

Contact: Efthymios Nicolaidis <e.nicolaidis@dhstweb.org>

URL: <www.antikythera-mechanism.gr/node/473>

Co-sponsored by the IAU

Astronomy and its Instruments before and after Galileo

Date and place: 28 September 2009 - 3 October 2009, Venice, Italy

Contact: Luisa Pigatto <luisa.pigatto@oapd.inaf.it>

URL: <web.oapd.inaf.it/venice2009/index.php>

Co-sponsored by the IAU

European Society for Astronomy in Culture 17th Annual Meeting

Date and place: 25-31 October 2009, Alexandria, Egypt

Contact: Mosalam Shaltout <mosalamshaltout@hotmail.com>

URL: <www.bibalex.org/seac2009>

Mathematics and Astronomy, a Joint Long Journey

Date and place: 23 - 27 November 2009, Madrid, Spain

Contact: Rosa M. Ros <ros@ma4.upc.edu>

URL: <www.uned.es/074150/simposium09/>

Co-sponsored by the IAU

For other meetings of astrophysical interest, see the International Astronomy Meetings List, maintained by Liz Bryson of the Canada-France-Hawaii Telescope Corporation: <www3.cadc-ccda.hia-ihp.nrc-cnrc.gc.ca/meetings/>.

7. IAU PUBLICATIONS

7.1. IAU Highlights of Astronomy

Highlights of Astronomy, Volume 13

AS PRESENTED AT THE XXVth GENERAL ASSEMBLY OF THE IAU

Sydney, Australia, 13-26 July 2003

Ed. Oddbjørn Engvold

(San Francisco: ASP) ISBN: 1-58381-189-3, 2006

Highlights of Astronomy, Volume 14

AS PRESENTED AT THE XXVIth GENERAL ASSEMBLY OF THE IAU

Prague, Czech Republic, 14-25 August 2006
 Ed. Karel A. van der Hucht
 (Cambridge: CUP) ISBN: 978-0-521-89683-2, December 2007
 URL: <journals.cambridge.org/action/displayIssue?jid=IAU&volumeId=2&issueId=14>

7.2. IAU Transactions

Transactions of the IAU, Volume XXVB

PROCEEDINGS OF THE XXVth GENERAL ASSEMBLY OF THE IAU

Sydney, Australia, 13 - 26 July 2003
 Ed. Oddbjørn Engvold
 (San Francisco: ASP) ISBN: 978-1-58381-647-9, 2007

Transactions of the IAU, Volume XXVIA

REPORTS ON ASTRONOMY 2003-2006

Ed. Oddbjørn Engvold
 (Cambridge: CUP) ISBN: 0-521-85604-3, 2007
 URL: <journals.cambridge.org/action/displayIssue?jid=IAU&volumeId=1&issueId=T26A>

Transactions of the IAU, Volume XXVIB

PROCEEDINGS OF THE XXVIth GENERAL ASSEMBLY OF THE IAU

Prague, Czech Republic, 14 - 25 August 2006
 Ed.: Karel A. van der Hucht
 (Cambridge: CUP) ISBN: 978-0-521-85606-5, November 2008
 URL: <journals.cambridge.org/action/displayIssue?jid=IAU&volumeId=3&issueId=T26B>

Transactions of the IAU, Volume XXVIA

REPORTS ON ASTRONOMY 2006-2009

Ed. Karel A. van der Hucht
 (Cambridge: CUP) ISBN: 978-0-521-85605-8, January 2009
 URL:
 <journals.cambridge.org/action/displayIssue?jid=IAU&volumeId=4&issueId=T27A&iid=3578468>

7.3. IAU Symposium Proceedings published in 2008 and 2009

As of 2004, starting with IAU S222, the IAU Symposium Series is being published by Cambridge University Press, Cambridge, UK (CUP).

E-version, see: <<http://journals.cambridge.org/action/displayJournal?jid=IAU>>.

Print, see: <www.cambridge.org/uk/series/sSeries.asp?code=IAUP>.

IAU S242 *Astrophysical Masers and their Environments*

12-16 March 2007, Alice Springs, Australia
 Eds. Jessica M. Chapman & Willem A. Baan
 (Cambridge: CUP) ISBN 0-521-87464-5, January 2008

IAU S243 *Star-Disk Interaction in Young Stars*

21-25 May 2007, Grenoble, France

Eds. Jérôme Bouvier & Immo Appenzeller
(Cambridge: CUP) ISBN 978-0-521-87465-6, November 2007

IAU S244 *Dark Galaxies and Lost Baryons*

25-29 June 2007, Cardiff, UK

Eds. Jonathan I. Davies & Michael D. Disney

(Cambridge: CUP) ISBN 978-0-521-87466-3, February 2008

IAU S245 *Formation and Evolution of Galaxy Bulges*

16-20 July 2007, Oxford, UK

Eds. Martin G. Bureau, Evangelia Athanassoula & Beatriz Barbuy

(Cambridge: CUP) ISBN 978-0-521-87467-0, July 2008

IAU S246 *Dynamical Evolution of Dense Stellar Systems*

5-9 September 2007, Capri, Italy

Eds. Enrico Vesperini, Mirosław Giersz & Alison I. Sills

(Cambridge: CUP) ISBN 978-0-521-87468-7, May 2008

IAU S247 *Waves and Oscillations in the Solar Atmosphere: Heating and Magneto-Seismology*

17-21 September 2007, Porlamar, Isla de Margarita, Venezuela

Eds. César A. Mendoza-Briceño & Robert Erdelyi

(Cambridge: CUP) ISBN 978-0-521-87469-4, May 2008

IAU S248 *A Giant Step: from Milli- to Micro-arcsecond Astrometry*

15-19 October 2007, Shanghai, China

Eds. Wenjing Jin, Imants Platais & Michael A.C. Perryman

(Cambridge: CUP) ISBN 978-0-521-87470-0, July 2008

IAU S249 *Exoplanets: Detection, Formation and Dynamics*

22-26 October 2007, Suzhou, China

Eds. Sylvio Ferraz Mello, Yi-Sui Sun & Ji-Lin Zhou

(Cambridge: CUP) ISBN 978-0-521-87471-7, May 2008

IAU S250 *Massive Stars as Cosmic Engines*

10-14 December 2007, Kauai, Hawaii, USA

Eds. Fabio Bresolin, Paul A. Crowther & Joachim Puls

(Cambridge: CUP) ISBN 978-0-521-87472-4, June 2008

IAU S251 *Organic Matter in Space*

18-22 February 2008, Hong Kong, China

Eds. Sun Kwok & Scott A. Sandford

(Cambridge: CUP) ISBN 0-521-88982-7, October 2008

IAU S252 *The Art of Modelling Stars in the 21st Century*

6-11 April 2008, Sanya, Hainan Island, China

Eds. LiCai Deng & Kwing Lam Chan

(Cambridge: CUP) ISBN 0-521-88983-4, October 2008

IAU S253 *Transiting Planets*

19-23 May 2008, Boston, MA, USA
 Eds. Frederic Pont, Dimitar D. Sasselov & Matthew J. Holman
 (Cambridge: CUP) ISBN 978-0-521-88984-1, February 2009

IAU S254 *The Galaxy Disk in Cosmological Context*
 3-13 June 2008, Copenhagen, Denmark
 Eds. Johannes Andersen, Joss Bland-Hawthorn & Birgitta Nordström
 (Cambridge: CUP) ISBN 978-0-521-88985-8, March 2009

IAU S255 *@ck/A YU]WnGHf: cfa Ujcb Zca h Y: jfghGfgr SkUz; UU]g*
 16-20 June 2008, Rapallo, Liguria, Italy
 Eds. Leslie K. Hunt, Suzanne Madden & Raffaella Schneider
 (Cambridge: CUP) ISBN 978-0-521-88986-5, December 2008

IAU S256 *The Magellanic System: Stars, Gas, and Galaxies*
 28 July - 1 August 2008, Keele University, Staffordshire, UK
 Eds. Jacobus Th. van Loon & Joana M. Oliveira
 (Cambridge: CUP) ISBN 978-0-521-88987-2, March 2009

IAU S257 *Universal Heliophysical Processes*
 15-19 September 2008, Ionnina, Greece
 Eds. Natchimuthuk Gopalswamy & David F. Webb
 (Cambridge: CUP) ISBN: 987-0521-88988-9, March 2009

IAU S258 *The Ages of Stars*
 13-17 October 2008, Baltimore, MD, USA
 Eds. Eric E. Mamajek (CE), David R. Soderblom & Rosemary F.G. Wyse
 (Cambridge: CUP) ISBN: 978-0521-88990-2, June 2009

IAU S259 *Cosmic Magnetic Fields: from Planets, to Stars and Galaxies*
 3-7 November 2008, Puerto Santiago, Tenerife, Spain
 Eds. Klaus G. Strassmeier, Alexander G. Kosovichev & John E. Beckman
 (Cambridge: CUP) ISBN: 978-0521-88990-2, April 2009

For a complete list of IAU Symposium Proceedings, see
 < www.iau.org/science/publications/iau/symposium/ >.

7.4. IAU Editorial Board

In of 2008 the members of the IAU Editorial Board were:

Ian F. Corbett, ex officio	chair 2006 - 2009
the editors-in-chief of the IAU Symposia held in 2008	members
Karel A. van der Hucht, ex officio	adviser 2006 - 2009
Michelle C. Storey	adviser 2004 - 2008
Uta Grothkopf	adviser 2007 - 2010

The EC appointed Christiaan L. Sterken as adviser for the period 2009-2011.

7.5. Proceedings of Regional IAU Meetings

Proc. 1st Middle East and Africa Regional IAU Meeting (MEARIM 2008)

5-10 April 2008, Cairo, Egypt

Eds. Athem W. Alsabti, Ahmed Abdel Hady & Volker Bothmer
(University of Cairo Press, in preparation)

Proc. 10th Asian-Pacific Regional IAU Meeting (APRIM 2008)

3-6 August 2008, Kunming, China

Eds. Shuang Nan Zhang, Yan Li & Qing Juan Yu

(Astronomy Research & Technology, National Observatories of China
Press, expected in first half of 2009)

8. THE IAU AND THE PETER & PATRICIA GRUBER FOUNDATION

8.1. Gruber Cosmology Prizes

Information on the annual Gruber Cosmology Prize is available at www.iau.org/PETER_AND_PATRICIA_GRUBER_FOUN.98.0.html.

8.1.1. Gruber Cosmology Prize 2009

Press release: June 3, 2009, New York, New York – The recipients of the 2009 Cosmology Prize of the Peter and Patricia Gruber Foundation are Wendy L. Freedman, director of the Observatories of the Carnegie Institution of Washington in Pasadena, California, USA; Robert C. Kennicutt, director of the Institute of Astronomy at the University of Cambridge in England; and Jeremy R. Mould, professorial fellow at the University of Melbourne School of Physics, Australia.

These three renowned astronomers are being honored for their leadership in the definitive measurement of the value of the Hubble constant, one of the most important numbers in astronomy. The Hubble constant indicates the rate at which the universe has been expanding since the 'Big Bang', thus connecting the Universe's age with its size. The Cosmology Prize was the first to be awarded when the Gruber international Prize Program was inaugurated in 2000; and its tenth anniversary, which the Foundation will celebrate this summer, coincides with the International Year of Astronomy.

Freedman, Kennicutt, and Mould will receive the Prize on August 4, 2009, at the Inaugural Ceremony of the International Astronomical Union's General Assembly in Rio de Janeiro, Brazil. The Prize consists of a gold medal and \$500,000. At the same time, Dr. M.B.N. Kouwenhoven, a young researcher at the University of Sheffield, UK, will be recognized as the 2009 recipient of a \$50,000 grant through the PPGF Fellowship Programme, an annual fellowship sponsored by the IAU and the Gruber Foundation.

"The Hubble constant ties time and space together," says Professor Ron Ekers, past-President of the IAU. "As soon as Hubble saw that the Universe was expanding, astronomers recognized that this number was the key to understanding the Universe's history. It is most appropriate that in the International Year of Astronomy the Gruber Foundation has awarded the Cosmology prize to the team that has made the definitive measurement of the Hubble constant. Galileo's observations answered the question of where we are in the Universe – these Hubble Space Telescope observations answer mankind's quest to know how big and how old it is."

The precise value of the Hubble constant was hotly debated for decades – ever since 1929, when the American astronomer Edwin P. Hubble first realized that the galaxies are moving away from each other at a speed proportional to their distance. The galaxies farthest away are receding the fastest, he determined. But how fast? Initially, Hubble calculated a speed of 500 kilometers per second per megaparsec ($\text{km s}^{-1} \text{Mpc}^{-1}$). (A megaparsec is 3.26 million light years, and a light

year is about 5.9 trillion miles.) By the 1980s, scientists had narrowed the Hubble constant to within 50 and 100 km s⁻¹ Mpc⁻¹, but they did not agree on whether the value was at the high or low end of this range. A low number would indicate a slow expansion – and, thus, a Universe about 20 billion years old. A high number would suggest a fast expansion – and a relatively young Universe of about 10 billion years.

Freedman, Kennicutt, and Mould essentially resolved this long-standing dispute. They led the *Hubble Space Telescope* Key Project on the Extragalactic Distance Scale, one of the three major projects of the Hubble Space Telescope when it was launched in 1990. Working with a team of more than two dozen astronomers at 13 different institutions around the world, Freedman, Kennicutt, and Mould determined that the best value of the Hubble constant is 72 km s⁻¹ Mpc⁻¹, with an uncertainty of only 10 percent. This finding, which was published in final form in 2001, means the Universe is 14 billion years old – which agrees with the age estimates for the oldest stars.

To reach its conclusion about the value of the Hubble constant, the *Hubble Space Telescope* Key Project team observed Cepheids, extremely bright, pulsating stars whose periodic brightening and dimming provide a reliable 'standard candle' that astronomers can use to estimate extragalactic distances. During the ten-year life of the project, the team discovered almost 800 Cepheids in 18 galaxies, and used a wide variety of methods for meticulously measuring and analyzing their distances.

The resolution of the decades-long debate about the value of the Hubble constant is enabling scientists to answer fundamental questions about the Universe. For example, in addition to reconciling the age of the Universe (the time since the Big Bang) with the ages of the oldest stars, astronomers are now able to more accurately estimate the density of the universe – a factor that will determine the fate of the universe, whether it expands forever, as most cosmologists currently believe, or eventually collapses back on itself.

"Generations of astronomers have worked to frame the question – how fast is the Universe expanding? – and then to discover how to measure the answer," says Philip James E. Peebles, Albert Einstein Professor of Science and professor emeritus of physics at Princeton University. *"Freedman, Kennicutt, Mould and their colleagues have at last completed this great task. The result is an essential part of the web of tests that show how our universe has expanded from a hot dense state."*

The official citation reads: The Peter and Patricia Gruber Foundation proudly presents the 2009 Cosmology Prize to Wendy Freedman, Robert Kennicutt and Jeremy Mould for the definitive measurement of the rate of expansion of the Universe, Hubble's Constant. This parameter effectively determines the age of the universe at the current time and underpins every other basic cosmological measurement. An accurate measurement of the expansion rate was one of three major goals of the *Hubble Space Telescope* when it was launched in 1990. From meticulous measurements of a particular kind of variable star, the Cepheids,

Freedman, Kennicutt and Mould met this goal, resolving one of the longest-standing debates in the history of modern cosmology.

See also <www.iau.org/public_press/news/release/iau0911/>.

The Gruber Cosmology Prize 2009 award ceremony will take place during the Inaugural Ceremony of the IAU XXVII General Assembly in Rio de Janeiro, 4 August 2009.

8.1.2 Gruber Cosmology Prize 2010

Nominations of candidates for the Gruber Cosmology Prize 2010 can be submitted up to 15 December 2009. Nomination information is available at: <www.gruberprizes.org/Nominations/Cosmology.php>. General information on the annual Gruber Cosmology Prize is available at <www.iau.org/PETER_AND_PATRICIA_GRUBER_FOUN.98.0.html>.

8.2. PPGF Fellowships

With the aim to promote the science of cosmology and other branches of astronomy, the Peter & Patricia Gruber Foundation has created the PPGF Fellowship Programme. Funded by the PPGF, one Fellowship will be awarded every year, the next one in 2009. A Fellowship amounts to US\$50,000 and will be given as a stipend to cover travel, subsistence and research expenses during a postdoctoral appointment for a period which is typically of one year duration, but may be extended to two years. The Fellowship will be awarded to an extremely promising, young astrophysicist, working in any field of astrophysics, either theoretical, observational or experimental. There are no limitations on nationality, but preference will be given to applicants from countries in difficult economic conditions. For more details, see:

<www.iau.org/grants_prizes/gruber_foundation/fellowships/> .

8.2.1. PPGF Fellowship 2009

The recipient of the PPGF Fellowship 2009 is Dr. M.B.N. Kouwenhoven (UK). He will spend his fellowship at the Kavli Institute for Astronomy and Astrophysics, Peking University (PKU), Beijing, China.

8.2.2. PPGF Fellowship 2010

The deadline of application for the PPGF Fellowship 2010 is 1 March 2010. Instructions for application are available at the IAU web page: <www.iau.org/PETER_AND_PATRICIA_GRUBER_FOUN.98.0.html>

9. THE IAU, THE NORWEGIAN ACADEMY OF SCIENCE & LETTERS, AND THE KAVLI PRIZE IN ASTROPHYSICS

9.1. Kavli Prizes

The Kavli Prizes are awarded every other year to one or more leaders in the areas of astrophysics, nano science and neuro science. Winners receive a US\$1,000,000 prize as well as a medal and a diploma in recognition of their cutting-edge research. The Prizes have been established in order to recognise outstanding scientific research, honour highly creative scientists, promote public understanding of scientists and their work, and foster international cooperation among scientists. The first Kavli Prizes were given in 2008.

The Kavli Prize in Astrophysics is awarded for outstanding achievement in advancing our knowledge and understanding of the origin, evolution, and properties of the universe. It will include the fields of cosmology, astrophysics, astronomy, planetary science, solar physics, space science, astrobiology, astronomical and astrophysical instrumentation, and particle astrophysics.

On 29 May 2008, the Norwegian Academy of Science and Letters and the International Astronomical Union agreed to cooperate on future Kavli Prizes in Astrophysics.

9.2. Kavli Prize in Astrophysics 2010

Nominations for the Kavli Prize in Astrophysics are open to everyone; however, individuals cannot nominate themselves. The prize can be awarded to a single exceptional individual or to a group of individuals who have contributed jointly to the research. An individual cannot be awarded the prize posthumously.

Beginning with the next prize in 2010, the Norwegian Academy will seek advice from the International Astronomical Union in order to establish a balanced prize committee, with respect to the various fields of Astrophysics, to select the Kavli Prize in Astrophysics winners.

The committee is comprised of an international consortium of five leaders in astrophysics chosen by the Norwegian Academy with the advice of the IAU and based on recommendations made by the Max Planck Society in Germany, the National Academy of Sciences in the United States, the Norwegian Academy of Science and Letters, and the Royal Society in the United Kingdom.

Developments in the Kavli Prize in Astrophysics will be posted on the IAU web site <www.iau.org/grants_prizes/kavli_prize> and the Kavli web site <www.kavliprize.no/seksjon/vis.html?tid=27452> .

10. REPORTS OF IAU DIVISIONS, COMMISSIONS, WORKING GROUPS AND PROGRAM GROUPS

10.1. Division I / Commission 19 / Service *Standards of Fundamental Astronomy (SOFA)*

NEW SOFA SOFTWARE RELEASE INCLUDES C VERSION.

SOFA (Standards of Fundamental Astronomy) is an IAU Service that operates under Division 1 (Fundamental Astronomy). It has developed a set of software routines that implement official IAU algorithms for fundamental-astronomy computations. A new release of the software was made on 2009 March 18. The total number of routines is 160, comprising 108 astronomy routines supported by 52 vector/matrix routines. The release incorporates the new IAU precession model that came into force at the start of 2009. There is a 'cookbook' that introduces the SOFA routines associated with precession-nutation and Earth rotation.

The most significant changes since earlier releases are (i) the SOFA collection is now available in C as well as Fortran and (ii) the license conditions have been relaxed to facilitate use by industry as well as by academia and individuals.

The SOFA home page is www.iau-sofa.rl.ac.uk . Further information on the new release is available at www.iau-sofa.rl.ac.uk/2009_0201.html . The Earth attitude 'cookbook' is at www.iau-sofa.rl.ac.uk/2009_0201_F/sofa/sofa_pn.pdf .

*Patrick T. Wallace, chair Standards Of Fundamental Astronomy reviewing board
24 April 2009*

10.2. Division III *History of the Minor Planet Center (MPC)*

Until World War II, the recording of observations and the computation of orbits of the minor planets was principally organized in Germany. This arrangement then broke down, obviously in part due to the war, but also because the ever-increasing number of observations made possible by improving photographic emulsions taxed the ability of astronomers using logarithms and mechanical calculators to utilize them in orbit computations.

After World War II, the organizational work was largely divided between the U.S.A. and the U.S.S.R., with the observations being collected at the Cincinnati Observatory and the publication of the annual ephemeris volumes at the Institute for Theoretical Astronomy in Leningrad, both of these activities being overseen by IAU Commission 20. The Cincinnati operation, given the name *Minor Planet Center* in 1947 by its first director, Paul Herget, became feasible because of the availability of at least some automated computing. Further, continuity with pre-war work became possible because some of the earlier

practitioners continued to be associated with the West German branch of the Astronomisches Rechen-Institut in Heidelberg, and one Rechen-Institut staff member, Eugene Rabe, moved to Cincinnati. Peter Musen also joined the MPC staff and contributed in particular to the development of automated procedures for the computation of planetary perturbations.

Indeed, throughout the 1950s the strength of the MPC lay in that area, with the perturbative effects on many hundreds of minor planets being developed on computers at the Gas Company and at Procter and Gamble in Cincinnati, and eventually on the university's IBM 650. Herget also arranged for orbital computations to be carried out on the Naval Ordnance Research Calculator in Dahlgren, Virginia, a capability he recognized by giving to minor planet (1625) the name 'The NORC'. The actual fitting of the perturbed orbits to the observations was largely done by hand, by many astronomers around the world, including some at the Astronomisches Rechen-Institut, which in fact continued to assign all the provisional designations of newly discovered minor planets until well into the 1960s.

The early efforts of the MPC were devoted to cleaning up the situation with regard to the numbered minor planets, of which there were 1564 when the MPC was established. To secure the necessary new observations Herget enlisted the assistance of Frank Edmondson and others at Indiana University. Initially, well over 10% of the orbit computations were in bad shape, with many observations attributed to the wrong objects. Concentration on this work meant that relatively little attention was paid to augmenting the set with new objects, although a handful of astronomers around the world did take an interest in trying to identify new discoveries with objects observed so weakly in the past that they had not yet been numbered. Conrad Bardwell joined the MPC staff in 1958 and a few years later was developing and using automated procedures for making identifications of this type. Around that same time Herget developed new procedures for the automated computation of preliminary orbits, applying these in particular to the 2000 new discoveries made in the course of the pioneering work of Tom Gehrels, Kees van Houten and Ingrid van Houten-Groeneveld in the Palomar-Leiden Survey. Nevertheless, despite the steady increase in computing capability, and the success of a comprehensive new observing program at the Crimean Astrophysical Observatory in the late-1960s and throughout the 1970s, when Herget retired as MPC director in 1978 the set of numbered minor planets had increased only to 2060, and 1% of the pre-war numberings were still lost.

Herget's retirement as director also meant the closure of the historic Cincinnati Observatory as a research organization. My appointment to succeed Herget as director meant that the MPC would be moving to the Smithsonian Astrophysical Observatory in Cambridge. The continuing operation of the MPC benefited greatly from Bardwell's appointment as MPC assistant director and later as associate director, a position he held until his retirement in 1989. There was also a magnetic tape containing the Cincinnati collection of 190,000

positional observations of minor planets, a compilation intended to be complete back to 1939. As director of the Central Bureau for Astronomical Telegrams I had made a similar collection of 25,000 observations of comets, and it therefore seemed appropriate at least partially to combine the two IAU functions. Although the CBAT was, and still is responsible for announcing the discoveries of comets, it was more efficient to use the MPC resources to publish and file subsequent observations of these bodies. The relationship between the organizations was further cemented by the fact that the CBAT was announcing the discoveries of what were then generally termed 'earth-crossing asteroids'. Thanks largely to the work of Eugene Shoemaker and Eleanor Helin, the 1970s had seen a renaissance of interest in these objects, the observations and orbits of which were obviously being incorporated into the MPC files anyway. Beginning intermittently in 1978, then continuously since 1980, Dan Green joined the staffs of both the MPC and the CBAT, succeeding me as director of the latter in 2000.

The arrival of the MPC at SAO also coincided with a resurgence of observing programs, notable amongst them being those of Ted Bowell at the Lowell Observatory and Antonín Mrkos at Klet. An effort was made to incorporate pre-1939 observations in the MPC files, at least to the extent that every object with a 'new-style' (i.e., post-1925 style) provisional designation would be properly documented there. It was therefore inevitable that the inventory of numbered minor planets with high-quality orbits would soon start to increase, and during the 1980s there was a doubling to 4295 (way ahead of my 1978 estimate we should reach 4000 around the end of the century!), with only two of the early numberings still lost. The MPC and the CBAT had started 'to go electronic' already in 1984, with a dial-up facility that would allow the exchange of messages and a computer program that allowed the user to identify numbered minor planets, a feature that was particularly useful for observers who suspected they had discovered a nova. Gareth Williams joined the MPC staff on Bardwell's retirement; in 1991 he identified the missing (878) Mildred and was soon afterward appointed MPC associate director. By this time CCDs were starting to replace photography for the acquisition of observations, and the idea of discovering 90% of the kilometer-sized 'near-earth asteroids' (as they came to be called) within a matter of decades was becoming a serious aim. Searches for objects in the outer solar system also became a worthy endeavor, with the year 1992 seeing the discovery, not only of the second transneptunian object (after Pluto), but also of the second 'centaur', a body confined generally to the Saturn-Uranus-Neptune region – this coming after the 1977 discovery of (2060) Chiron, the last object to be numbered while the MPC was located in Cincinnati.

Herget initiated the series of *Minor Planet Circulars*. This was the publication, generally in batches two or three times a year, of observations, orbits, ephemerides and the assignment of new minor-planet names, and 4390 pages had been issued when he retired. After the move to Cambridge these batches of

MPCs were issued monthly. In 1993 we introduced the *Minor Planet Electronic Circulars*, principally to document the discoveries of NEAs with the greater immediacy they require, although they also proved useful for announcing new TNOs, in the hope of inspiring adequate follow-up at their discovery oppositions. It was to be understood that these electronic announcements were a temporary publication, the permanent documentation subsequently being in the MPCs. In 1996 we introduced the even more temporary 'NEO Confirmation Page', an internet site on which new discoveries of candidate NEOs would be announced within a matter of hours of their first observation and prior to the assignment of an MPC provisional designation for them. After enough follow-up observations had been received, the objects were removed from the NEOCP, given an MPC designation, and the detailed information was issued on one of the *MPECs*.

We added the millionth minor-planet observation to our files in 1996, and the ever-increasing size of the monthly batches of *MPCs* made it desirable, a year or so later, to transfer the publication of the observations to a supplement series, available only electronically. By 2001 we were frequently also issuing a 'mid-month' supplement batch, and since 2003 this supplement has generally been appearing weekly. Minor-planet numberings reached 10,000 in 1999, and this led us, again a year or so later, to introduce a second supplement series for the publication of orbital elements, including a tabulation of the residuals. The *MPCs* themselves have continued to include summaries of the observations made by the contributing observatories and summaries of the orbital information. This has meant that, as of March 2009, the published *MPCs* still amount to only 65,554 pages (a doubling in little over 10 years), although the orbit supplement amounts to 154,270 pages and the observation supplement to 281,184. The publication of the *MPCs* themselves can still sometimes amount to 500 pages per month, so since the end of 2005 the version that is actually printed and mailed to subscribers has been restricted to the pages with citations for new namings and a summary of the new numberings, which reached 100,000 around that same time. The last remaining lost numbered object, (719) Albert, was identified by Williams in 2000.

Also in 2000, Tim Spahr joined the MPC staff, principally to attend to the burgeoning interest in NEAs. Kyle Smalley (a.k.a. Sonia Keys) also joined the staff, initially as a contractor but since 2005 as an employee, also mainly to work on NEAs. When Spahr was appointed the aim with regard to NEAs had been refined to the idea of finding 90% of the km-sized objects with perihelion distance under 1.3 AU by the end of 2008. The number found so far is around 800 and is estimated to be more than 80% of the likely total. From the point of view of the danger NEAs may represent for the earth, it is more meaningful to speak in terms of 'potentially hazardous asteroids', which have the possibility of passing within 0.05 AU of the earth. Early in the new century Spahr participated in national deliberations in the U.S.A. specifying the need to discover 90% of the PHAs down to a size limit of 140 meters, if possible by 2020. The number

of such objects so far found is already more than 1000. Smaller objects are not ignored, and in October 2008, for the first time, a 5-meter natural object was discovered out in space that subsequently hit the earth. The lead time was only 20 hours, but enough information was garnered that allowed a number of tiny fragments to be recovered from northern Sudan.

The search for NEAs and PHAs has provided the principal impetus for increased automation in the MPC operations. For already more than a decade, a 'Daily Orbit Update' *MPEC* has been automatically prepared (around 2 a.m. local time) with all the orbits computed at the MPC during the previous 24 hours; this *DOU MPEC* also includes the observations of NEAs received during that time. Another longstanding automated feature is that e-mails addressed to the MPC that contain observations are partially processed by the time a staff member actually sees them: minor formatting errors are corrected, and the observations are filed separately, according as to whether they are of comets, TNOs, NEAs or main-belt objects, as well as whether they are numbered objects, other multiple-opposition objects or just discovered recently. A more recent automated feature allows for verifying observations of numbered objects, say, to the point that they are filed for publication in the weekly observation supplement. Some particularly ingenious MPC software allows NEA candidates to be placed on the NEOCP automatically, essentially as soon as they arrive. As further observations arrive the predicted NEA ephemerides are automatically updated. Although there is also automation for the extraction of the names of the observers and their instrumentation directly from the e-mail messages, we have drawn the line – for obvious reasons – at having this go through to publication. Nevertheless, when observers are actually credited on the *MPECs* and *MPCs*, this is usually done with rather minimal human editing.

I retired as MPC director in 2006, and after an interim period, Spahr moved into the position of director. Despite its tiny staff (including myself in an emeritus position), the MPC continues to flourish, and our files now include 62 million observations (455,000 of them being of comets), 210,454 numbered minor planets, 155,183 other multiple-opposition objects, some 6100 NEAs and more than 1300 transneptunians and centaurs. To someone such as myself, who first visited the MPC in Cincinnati some 49 years ago; and to Bardwell, who by then had already been on the staff for two years and still takes a significant interest in what the MPC does, the enormous increase in activity is quite remarkable. One thing that has not changed, however, is the MPC's detailed attention to accuracy and to giving credit where it is due. As we move now toward the era of Pan-STARRS and the Large Synoptic Survey Telescope, we obviously expect to see yet more of the same. Whether anybody will actually care about minor planets (the vast majority of them in the main belt, at any rate) half a century from now remains to be seen.

Brian G. Marsden, Harvard Smithsonian CfA, 27 March 2009

10.3. Division III. A short history of the *Committee on Small Bodies Nomenclature (CSBN)*

When the first minor planets were discovered it was customary to give them the names of classical goddesses, beginning with Ceres, Pallas, Juno and Vesta. In the latter part of the nineteenth century, as the number of known minor planets moved into the hundreds, it became usual to give them more general feminine names, even to the extent of adding -a or -ia endings to masculine or neuter names in order to feminize them. In most cases the names were provided by the discoverers, generally without explanation, and they were deemed accepted upon publication in the *Astronomische Nachrichten*.

After the Minor Planet Center was established by the IAU in 1947, director Paul Herget continued the practice, generally dropping the contrived feminine endings and insisting that proposers provided citations explaining the significance of the names. The names and citations were published in the *Minor Planet Circulars*. It was understood that a name should not be 'too similar' to an existing name or 'deliberately obscene'. If someone proposed a 'political' name, it was published – with the understanding that it could not be changed when another group came along and overthrew the government (a particular problem in Argentina in those days). Soon after the Minor Planet Center moved from Cincinnati to Cambridge in 1978, Tom Gehrels (who is not averse himself to proposing names that could be considered 'political') suggested that there should be a small committee to examine the name proposals prior to publication – this committee originally consisting of the MPC director and the Commission 20 president and vice-president. The committee was made a bit more elaborate by Commission 20 in 1985, when that commission set down the rule that political and military names are to be excluded until 100 years after the politico-military event or 100 years after the death of the politico-military personage. At subsequent meetings of Commission 20 the committee became progressively larger and took on a variety of different names, such as the *Minor Planet Names Committee*. After Division III was established and took over from Commission 20 as MPC overseer, the committee was renamed the *Committee on Small Bodies Nomenclature*. In recent years, in addition to prohibiting political and military names, the CSBN has rejected names that are perceived as blatantly commercial. Further topics added to the duties of the CSBN include the naming of satellites of minor planets and coordinating with the WG-PSN (Working Group on *Planetary System Nomenclature*) on the naming of new transneptunian dwarf planets and their satellites.

The current membership of the CSBN is M.F. A'Hearn (USA), E.L.G. Bowell (USA, Division III representative), J. Fernández (Uruguay), P.M. Kilmartin (New Zealand), D. Lazzaro (Brazil), B.G. Marsden (USA, MPC representative and secretary), S. Nakano (Japan), K. Noll (USA), L.D. Schmadel (Germany, DMPN representative), R.M. Schulz (Netherlands, WG-PSN representative), V.A. Shor (Russia), J. Tichá (Czech Republic, chair), G.V. Williams (USA),

D.K. Yeomans (USA) and J. Zhu (China). In addition, D.W.E. Green (USA, Central Bureau for Astronomical Telegrams) is co-opted as a member for the specific purpose of addressing problems that may arise with regard to the naming of comets.

The 'DMPN representative' is responsible for the publication of the *Dictionary of Minor Planet Names*. This publication, which went through five complete editions between 1991 and 2002 before evolving into triennial supplements issued to coincide with the IAU General Assemblies, effectively arose from the Commission 20 *Study Group on the Origin of Minor Planet Names*, which had been set up in 1988 to research the likely meaning of many of the names assigned prior to the requirement that there be citations.

While the current membership of 15 (excluding the CBAT representative) does have rather good international representation, it is probably too large for really effective communication, and several members are not particularly active. Nevertheless, the CSBN does function quite well, particularly from the point of view of not letting the naming of minor planets get completely out of hand, now that the current great rate of numbering makes so very many objects eligible for naming. In 1991, when the 5000th minor planet was numbered, it was the case that more than 80% had also been named. In early 1999, when the 10,000th minor planet was numbered, this fraction was still 63%. Less than four years later, with 50,000 numberings, the fraction named was down to only 20%. Now, of the 210,454 numberings, there are just 15,118, or 7%, that bear names.

To stem the potential tide of namings, the CSBN requested at the 2003 IAU GA that discoverers refrain from proposing more than two names each two months, which is the usual cycle between the CSBN deliberations and publications of name batches. While a few discoverers routinely and flagrantly ignore this request, a more useful limit on the naming has been that each batch discussed by the CSBN should have a maximum of 100 names. In addition, the LINEAR program, which alone has produced just under half of the numberings, has been naming a few hundred minor planets each year for student winners of science fairs. Although these namings are not popular with several of the CSBN members, the careful manner in which the LINEAR program organizes them greatly reduces the work of the CSBN (particularly of its secretary). Nevertheless, as surveys such as Pan-STARRS and LSST become active, measures will surely be necessary to ensure that the naming of minor planets remains appropriately limited, and the CSBN is starting to address this problem, preferably without recourse to the drastic remedy of terminating the naming process completely.

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10.4. Division III / IAU Working Group *Planetary System Nomenclature – 36 years of very high activity*

Introduction. Solar system nomenclature as defined by the International Astronomical Union (IAU) consists of the names of newly discovered objects and names assigned to surface features on planets, satellites, asteroids and comets. The naming of asteroids themselves is carried out separately by the IAU Committee for Small Bodies Nomenclature (CSBN), and the names assigned to extrasolar objects are dealt with by the Working Group on Extrasolar Planets. The IAU Working Group for Planetary System Nomenclature (WGPSN) was created in 1973 to oversee the naming of the larger bodies and their surface features.

The IAU was founded in 1919, and its nomenclature work was carried out initially under the oversight of Commission 16: Physical Studies of Planets and Satellites and Commission 17: The Moon. Before the days of interplanetary spacecraft, the problems of planetary nomenclature were confined primarily to the large amount of detail charted on the near side of the Moon, and to albedo features on Mars that had been identified with Earth-based telescopes. Prior to 1973, Commission 17 and Commission 16 had formed working groups for lunar nomenclature and Mars nomenclature, respectively. Space exploration began in 1959 with the Soviet spacecraft Luna 1 flying by and Luna 2 crashing on the Moon, while Luna 3 sent back the first images of the far side of the Moon. This achievement was followed in 1965 (Mariner 4, USA) by the first flyby pictures of Mars. The nomenclature working groups of Commissions 16 and 17 established over 500 new names for the Moon (Menzel et al. 1971) and named some 180 large craters on Mars, Phobos and Deimos (de Vaucouleurs et al. 1975).

The Lunar Orbiter and Apollo Programs of the United States led to the casual, unilateral assignment of names to features on the lunar surface by astronauts and others, which angered the Soviets, who also had a lunar program. Matters came to a head at a meeting of the IAU in Sydney, Australia in 1973. There the Soviets requested the right to name features on the far side of the Moon, as they had obtained the first photograph of this hitherto unseen hemisphere in 1959 (Figure 1). Crude as this picture was, it revealed the most striking aspect of the lunar far side, the near-absence of maria. But there was one small mare, and the Soviets proposed to name it the Sea of Moscow.

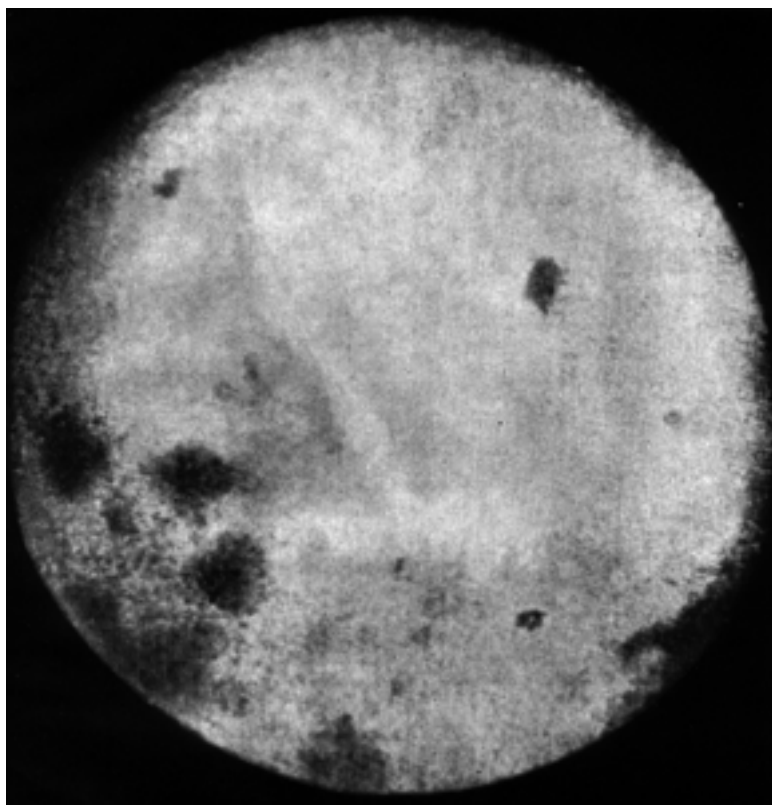


Figure 1. *The lunar far side, first photographed by Luna 3 in 1959. The Sea of Moscow is the elongated black feature to the upper right.*

This caused considerable consternation among other scientists present at the meeting, since the IAU-endorsed tradition for naming maria on the near side of the Moon relied mainly on names of various hydrological phenomena (Mare Imbrium, the Sea of Rains; Oceanus Procellarum, the Ocean of Storms; Palus Putredinis, the Marsh of Decay; etc.) or else states of mind (Mare Serenitatis, the Sea of Serenity; Mare Tranquillitatis, the Sea of Tranquility; etc.). The Soviets were adamant. Clearly some of their frustration at being excluded from previous nomenclature decisions as well as some national pride was in the air. In a beautiful piece of French diplomacy, Audouin Dollfus, the contemporary president of Commission 16, used his authority to rule that Moscow was in fact a state of mind! Thus we have the Sea of Moscow comfortably established on the lunar far side.

This exercise reinforced a formal request from the Soviet Academy of Sciences to the IAU at the Sydney meeting to open up the nomenclature activity to international participation and review. Accordingly, the IAU established the Working Group for Planetary System Nomenclature (WGPSN) which has handled these matters ever since. Until 2000 the WGPSN functioned under the aegis of the IAU Executive Committee, but that year it was transferred to Division III. The original members of the WGPSN are listed in Table 1.

Table 1. WG-PSN Members (1973)

<i>WG-PSN members</i>	<i>Representing</i>
Peter M. Millman, chair	Canada
Boris Ju. Levin	U.S.S.R.
Cornell H. Mayer	USA
David. D. Morrison	USA
Tobias C. Owen	USA
Gordon H. Pettengill	USA
Stanley K. Runcorn	UK
Bradford A. Smith	USA

Table 2. WG-PSN Members and Task Group Chairs (2009)

<i>WG-PSN members</i>	<i>Representing</i>
Rita M. Schulz, chair	Netherlands
Kaare Aksnes	Norway (past President)
Jennifer S. Blue	USA
Edward L.G. Bowell	USA (IAU Div. III)
George A. Burba	Russia
Guy J. Consolmagno	Vatican City State
Régis Courtin	France (IAU Comm. 16)
Rosaly M. Lopes	UK
Mikhail Ya. Marov	Russia
Brian G. Marsden	USA (MPC and CSBN)
Mark S. Robinson	USA
Vladislav V. Shevchenko	Russia
Bradford A. Smith	USA

Organization. The WG-PSN is organized into several Task Groups, each of which has a chair and several members, all drawn from the international community of scientists. The current members of the WG-PSN and the Task Group Chairs are listed in Table 2. In addition to the WG-PSN chair and the Task Group Chairs, the WG-PSN includes the President of Commission 16, a representative of the CSBN and the President of Division III of the IAU, as this Division includes the solar system activities.

The first chair person of the WG-PSN was the Canadian astronomer Peter Millman, who held this office from 1973 to 1981. Millman set the course which has largely been followed since in the nomenclature work (Millman 1976). By pointing out the usefulness of names for geographical features on the Earth, he argued for using names also on extraterrestrial bodies, rather than identifying

them simply by their coordinates or by some other numerical system, as advocated by others. Millman strived for an international selection of names and pushed hard to have name banks established. These were to have enough new names approved to meet the ever-increasing demand generated by planetary missions, especially *Voyager 1* & *2*. In 1982 the American geologist Harold Masursky took over as chair. While Millman had a traditional astronomy background, Masursky was trained as a geologist and was actively involved in planetary exploration by means of spacecraft. He was respected worldwide for his work on astrogeology and did a lot to foster international cooperation. Due to Masursky's failing health, the Norwegian astronomer Kaare Aksnes took over as chair in 1991. Aksnes had returned to Norway after having worked for many years on space related studies in the US. Aksnes was succeeded in 2006 by the German astronomer Rita Schulz, who holds this position at the present time (2009), representing the Netherlands. She is actively involved in the solar system studies of the European Space Agency, being Project Scientist for the *BepiColombo* mission to Mercury and Deputy Project Scientist for the *Rosetta* comet mission.

The WG-PSN member Jennifer Blue deserves special mention. She is the *sine qua non* of the WG-PSN and serves as its secretary and the keeper of the *Gazetteer of Planetary Nomenclature* which is maintained on the website <http://planetarynames.wr.usgs.gov> at the US Geological Survey, Flagstaff, Arizona, USA. In order to explain how names are approved, we quote from this website:

When the first images of the surface of a planet or satellite are obtained, themes for naming features are chosen and names of a few important features are proposed, usually by members of the appropriate IAU Task Group. Later, as higher resolution images and maps become available, names of additional features may be requested by investigators mapping or describing specific surfaces or geological formations. Anyone may suggest that a specific name be considered by a Task Group, but there is no guarantee that the name will be accepted. Names successfully reviewed by a Task Group are submitted by the Task Group Chair to the WG-PSN. Upon successful review by the members of the WG-PSN, names are considered approved and can be used on maps and in publications. Approved names are immediately entered into the official IAU database, the *Gazetteer of Planetary Nomenclature*, and posted on its website. Any objections to these names based on significant, substantive problems must be forwarded in writing or email to the IAU Division III President within three months from the time the name was placed on the website. Approved names are also listed in the Transactions of the IAU. Suggestions should be sent to the chair of the WG-PSN, to the chair of the appropriate Task Group, or to USGS Astrogeology Science Center, attn: Jennifer Blue, 2255 N. Gemini Drive, Flagstaff, AZ 86001, USA, or by e-mail: <jblue@usgs.gov>.

Nomenclature Rules. At the first meeting held in Ottawa, June 27-28 1974, the WG-PSN established naming rules which have been amended and expanded through the years. They now read as follows:

- Nomenclature is a tool and the first consideration shall be to make it simple, clear, and unambiguous.
- In general, official names will not be given to features whose longest dimensions are less than 100 meters, although exceptions may be made for smaller features having exceptional scientific interest.
- The number of names chosen for each body should be kept to a minimum. Features should be named only when they have special scientific interest, and when the naming of such features is useful to the scientific and cartographic communities at large.
- Duplication of the same surface feature name on two or more bodies, and of the same name for satellites and minor planets, is discouraged. Duplications may be allowed when names are especially appropriate and the chances for confusion are very small.
- Individual names chosen for each body should be expressed in the language of origin. Transliteration for various alphabets should be given, but there will be no translation from one language to another.
- Where possible, the themes established in early solar system nomenclature should be used and expanded on.
- Solar system nomenclature should be international in its choice of names. Recommendations submitted to the WG-PSN will be considered, but final selection of the names is the responsibility of the International Astronomical Union. The WG-PSN strongly supports equitable selection of names from ethnic groups/countries on each map; however, a higher percentage of names from the country successfully executing a landing is allowed on landing site maps.
- No names having political, military or religious significance may be used, except for names of political figures prior to the 19th century.
- Commemoration of persons on planetary bodies should not normally be a goal in itself, but may be employed in special circumstances and is reserved for persons of high and enduring international standing. Persons being so honored must have been deceased for at least three years.
- When more than one spelling of a name is extant, the spelling preferred by the person as evidenced by their written works or used in an authoritative reference, should be used. Diacritical marks are a necessary part of a name and will be used.
- Ring and ring-gap nomenclature and names for newly discovered satellites are developed in joint deliberation between WG-PSN and IAU Commission 20. Names will not be assigned to satellites until their orbital elements are known sufficiently well to ensure recovery on post-discovery orbits or definite features have been identified on them.

Results. The WG-PSN has met during every one of the 11 IAU General Assemblies since 1973. The names assigned during the three years preceding each such assembly are listed in the IAU Transactions from the assembly. We have also conducted WG and Task Group meetings, usually several days in

length, in Russia, Kazakhstan, Georgia, Armenia, Hungary, Norway, England, France, Italy and USA. With participation from scientists from most of these countries, the WGPSN has, as of March 2009, assigned 12883 names broken down as follows:

- Moon: 7650 names in and after 1973
- Mercury: 327 names in and after 1976
- Venus: 1963 names in and after 1979
- Mars, Phobos and Deimos: 1520 names in and after 1973
- All asteroids: 142 names in and after 1994
- Jupiter system: 677 names in and after 1979
- Saturn system: 454 names in and after 1982
- Uranus system: 88 names in and after 1988
- Neptune system: 62 names in and after 1991

An early criticism of planetary names was that only scientists, and nearly only male ones, were commemorated. We therefore dedicated craters on Mercury to deceased artists, musicians, painters and authors who have made outstanding, fundamental contributions to their fields. Other name categories for Mercury include ships of discovery and exploration, significant works of architecture and radio telescope facilities.

This work continues, with new names required for discoveries by the Galileo mission studies of Jupiter's satellites, ongoing Moon, Mars, Venus and Mercury exploration, and an overwhelming amount of exciting images from the Cassini-Huygens mission to Saturn and its satellites and rings. In a few years time, we can even look forward to detailed imagery of Pluto and its moons.

Satellites. Names of newly discovered satellites are chosen to conform to established traditions. Discoverers are encouraged to select names in accordance with general guidelines outlined in the *Gazetteer*. The naming of the Jovian satellites has been controversial ever since Galileo insisted on giving only Roman numerals to the four moons discovered by him. He refused to accept the names Io, Europa, Ganymede and Callisto proposed by Simon Marius, who claimed to have discovered the moons independently of Galileo. After a long debate (Sagan 1976, Owen 1976), the WG-PSN approved Marius' names and decided to also give names to all other Jovian satellites.

In the case of Saturn's satellites, the tradition is to use the names of Titans and Giants from Greek mythology, the beings that the Olympian Gods had defeated before becoming the accepted deities of the classical Greeks. When the theme 'Greek Giants' was almost exhausted, the theme was expanded to also include giants in Norse, Gallic and Inuit mythologies. Names of surface features are selected from different categories for each object, preferably with some association to the object itself (Table 3). Thus Mimas, discovered by William Herschel in England, was given the category of King Arthur and Knights of the Round Table, a British legend. Enceladus was also discovered by Herschel, but

its surface is so strange and mysterious that it was given the Arabian Nights as a name bank, linking fantasy landscape with a literary fantasy.

Table 3. Themes for the nomenclature of the major satellites of Saturn (see <planetarynames.wr.usgs.gov/append6.html> for the themes for all bodies in the Solar System)

Janus & Epimetheus	People from myth of Castor and Pollux (twins)
Mimas	People and places from Malory's <i>Le Morte D'Arthur</i> Legends (Baines translation)
Enceladus	People and places from Burton's <i>Arabian Nights</i>
Tethys	People and places from Homer's <i>Odyssey</i>
Dione	People and places from Virgil's <i>Aeneid</i>
Rhea	People and places from creation myths
Titan	Enchanted places, worldwide lakes
Hyperion	Sun and Moon deities
Iapetus	People and places from Sayers' translation of <i>Chanson de Roland</i>
Phoebe	People associated with Phoebe, people and places from the <i>Argonautica</i> by Apollonius Rhodius and Valerius Flaccus

The late German librarian Jürgen Blunck was a WG-PSN member who provided much help on selecting appropriate Greco-Roman mythological names for satellites. In a recent book, *Solar System Moons: Discovery and Mythology* (Blunck 2009), he reviews the very colorful histories behind the discoveries and naming of the satellites of Mars and the outer planets and their rings.

Other aspects of nomenclature activity. Although the WG-PSN is divided into discrete task groups, in practice several of these task groups often met together and members were invited to sit in on WG-PSN deliberations. Thus everyone was aware of what everyone else was proposing. The international emphasis of this work included participation of scientists at the various host institutions where the WG-PSN and its task groups met. This broadening of communication possibilities was particularly critical for the Soviet scientists. We were working during the dark depths of the cold war and it was very difficult for our Soviet colleagues to attend meetings outside the Soviet Union. Beyond providing material support for their foreign trips when we could, we made a point of adding some scientific exchanges to our normal agendas. Furthermore, we made a special effort to hold meetings in Soviet countries. The hospitality with which both foreigners and scientists from various regions of the USSR were greeted by the host institutions made the cold war seem absolutely ridiculous. All of this camaraderie had the desired effect: the original wish of the IAU to make solar system nomenclature an international activity was richly realized. At the time we all wished our countries would follow our example. Remarkably, they did!

The WG-PSN has always felt honored to have had such an interesting assignment. We were lucky to have formed a cohesive, congenial and dedicated group. The present authors salute their colleagues for three decades of hard work. We hope that subsequent generations of space-farers will find these names useful as they continue the exploration of our neighboring worlds.



Figure 2. Attendees at the IAU nomenclature meeting in Montreal, Canada, August 1979.

An anecdote from one of our meetings provides one of the light-hearted moments of this activity. Figure 2 shows a gathering of members and guests of the WG-PSN session that took place in Montreal, Canada at the IAU meeting there in August 1979. Starting from upper left the members were, *Back Row*: A. Brahic, A. Dollfus, K. Aksnes, T. Owen, D. Morrison (behind), B. Smith, E. Docheva. *Middle Row*: H. Holt, K. Runcorn, H. Masursky, D. Campbell, S. Miyamoto, M. Davies. *First Row*: E. Whitaker, G. Pettengill, W. Brunk. It is worth noting that the Soviet delegation was not allowed by their government to attend this particular meeting, despite considerable work by Peter Millman who managed to arrange for their housing and per diem. Shifting political winds and reaction to current events sometimes thwarted our best efforts to break through the icy barricades of the cold war.

One of the main topics of this meeting was the establishment of guidelines for naming features on the surface of Venus (see, e.g. Burba, 1990). The group was divided between those led by Brad Smith who wanted all the names of Venus to be feminine, reflecting the fact that this is the single female planet in our solar system, and the rest of us who wanted to preserve the names originally assigned to a few unusually radar-bright features first discovered by ground-based observers using the powerful radars at Arecibo and Goldstone. Brad was particularly unwilling to compromise, and we were stuck. At that point, as in a chapter from Homer's *Odyssey*, Aphrodite herself intervened, disguised as an attractive Canadian reporter who invited Brad for an interview. He left the room with her and never returned! We decided that was a clear message from Mt. Olympus, and that is why the map of Venus today continues to preserve the original names of the brightest features – among them Maxwell Montes in honor of the person whose four laws of electro-magnetism have made it possible to map Venus' surface in such great detail (Figure 3).

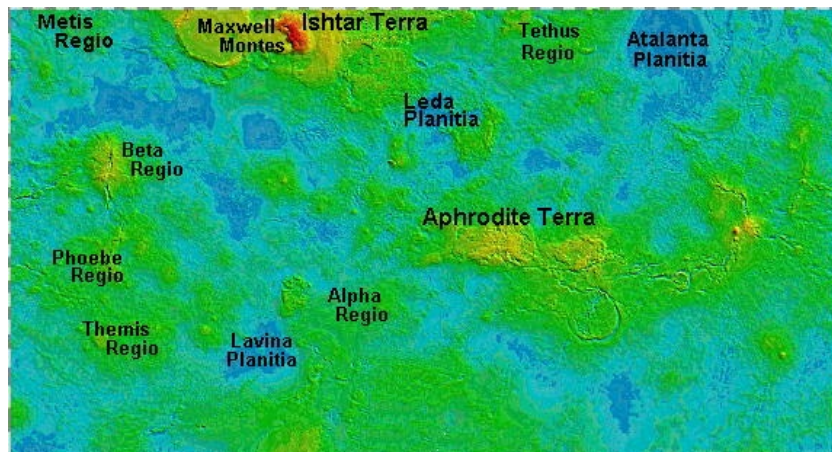


Figure 3. *A map of Venus based on Pioneer Venus results.*

It should be evident from this brief review that the work on nomenclature has its rewarding moments, despite the tedium of sorting through all the names. What makes any enterprise like this worthwhile is the character of the people who do it.

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10.5. Division XII / Commission 6 / Service Central Bureau for Astronomical Telegrams (CBAT)

The Central Bureau for Astronomical Telegrams (CBAT) has recently celebrated the 125th anniversary since its founding by the editors of *Astronomische Nachrichten* at Kiel, Germany, in late 1882. The immediate cause was the sudden appearance of the great September sungrazing comet, for which a coordinated worldwide center was seen to be much needed, due to problems in getting proper information circulated quickly to the astronomical community. The CBAT moved to Copenhagen Observatory out of necessity during World War I, where it took on IAU acceptance in 1922 (after an initial 2-year stint of an IAU Central Bureau floundered in Brussels); the IAU's Central Bureau remained at Copenhagen until its transfer to Cambridge at the start of 1965 (where Harvard College Observatory had maintained the western hemisphere's central bureau for astronomical telegrams since 1883). The Smithsonian Astrophysical Observatory (SAO), located on the grounds of HCO, has overseen the Central Bureau – on behalf of the IAU – since 1965.

The Kiel Bureau and its IAU continuance has long been recognized as the source of official designations for many astronomical objects, providing a trusted source for early information regarding such discoveries. While wide public access to the Internet in the past 1.5 decades has naturally encouraged many different additional sources – both professional and amateur – to produce alerts on various new astronomical discoveries, there is often a lack of oversight to prevent errors from being propagated. The CBAT publications are refereed, and the long history and reputation of the CBAT – together with its efforts to remain fair and non-political, while simultaneously maintaining constructive dialogue with all interested astronomers – will ensure that it remains an important part of the astronomical community. Indeed, at a meeting held

recently between organizers of the Virtual Observatory and the CBAT/SAO staff, it was acknowledged by the VO members that there will continue to be a strong need for the Central Bureau to highlight the important astronomical discoveries, as automated surveys produce an ever-greater flood of data. The CBAT is working with the astronomical community to aid astronomers with this rapid rise in new data.

The primary subjects of CBAT publications continue to be supernovae, comets, novae and other unusual variable stars, and satellites of minor planets and major planets – both discovery information and follow-up information. Contributors also send information to the CBAT regarding novae in other galaxies, and while publication is generally made of novae in galaxies other than M31, the CBAT webpage devoted to M31 novae now appears satisfactorily to provide a venue for designating and announcing new novae in that nearby galaxy, with suitable follow-up observations also provided there. Following discussion with IAU Commission 22 in Prague in 2006, reports on new meteor showers also are now routinely published by the CBAT.

The years 2006-2008 continued the marked transition toward the increased issuance of *Central Bureau Electronic Telegrams* (CBETs) as part of the plan to issue many reports more quickly and to help alleviate the cost of printing the *IAU Circulars* (IAUCs). For example, a policy was begun to issue *all* supernova discoveries on CBETs; initially, short summaries of the designations issued and some limited follow-up supernova information were also put on the IAUCs, but even the summaries have ceased on the IAUCs in the last couple of years due to the effort and cost of printing (combined with declining interest in paying line charges for publication of supplemental information). The IAUCs are still used to note the formal issuance of official IAU designations and names of celestial objects other than supernovae. The natural continued evolution worldwide from print to electronic publication is borne out in the Central Bureau's activity as well, although many astronomers still desire that the CBAT continue to maintain its printing of the IAUCs (which are both printed and electronic). While a total of 137 IAUCs were issued in 2006 – up from the 130 published in 2005 (see *IAU Information Bulletin* No. 98, p. 31) – this number declined to 117 in 2007 and to 102 in 2008, due to the transferral of most supernova material to CBETs, which saw 446 CBETs issued in 2006, 398 in 2007, and 451 in 2008 (well up from the 243 CBETs that were issued in 2005). As the CBAT announced that there are no line charges levied for items on the electronic-only CBETs, many other follow-up items on unusual variable stars, meteor showers, comets, and supernovae also are submitted specifically for publication therein.

In 2006, two notable astronomical objects were the source of a larger-than-usual number of textual items contributed to the Central Bureau: the recurrent nova RS Oph, which experience an outburst to visual mag 4.5 in February; and comet 73P/Schwassmann-Wachmann, which was making its long-awaited close approach to the earth, reaching total visual mag 5 and observed to split into scores of individual pieces. In 2007, again two astronomical objects produced a

larger-than-usual number of CBAT-published items: comet C/2006 P1 (McNaught), the brightest comet since 1965, which was visible to the naked eye in broad daylight in January when near perihelion; and comet 17P/Holmes, which experienced an outburst of some 13 magnitudes over two days in October, to total visual mag 2.5. V1280 Sco (Nova Sco 2007) also produced numerous CBAT-published reports, as it became one of the brighter novae in recent years, at peak visual mag ~ 4 in February (curiously, the nova V598 Pup – announced in November 2007 – was found on archival images also to have peaked near visual mag ~ 4 in June, but it wasn't detected in real time).

The IAUCs continue to have multiple titles (regarding multiple objects) on most issued Circulars, whereas the CBETs contain only one title (one object/subject) per issue. During 2006-2008, the number of IAUC titles regarding supernova discoveries decreased from 74 in 2006 to 20 in 2007, and to only two in 2008 – reflecting the move of supernova items to CBETs; the last IAU Circular with supernova designations summarized was No. 8875 in late September 2007. Meanwhile, the number of items on IAU Circulars pertaining to discoveries of novae (~ 10 items/yr), other variables including follow-up text on novae (~ 35 /yr), natural solar-system satellites and rings (~ 15 /yr), major and minor planets (several per year), comet discovery (~ 90 /yr), and cometary follow-up text (~ 50 /yr) remained rather steady over the past triennium. Some 1017 CBETs were devoted to supernovae during 2006-2008, with another 162 pertaining to other variable objects outside the solar system, while 53 CBETs concerned minor planets (including satellites), 33 CBETs were issued regarding comets, 26 regarding meteor showers, and two dealt with major planetary satellites and rings.

Milky-Way novae (and occasional other unusual variable stars announced by the Central Bureau) have formal IAU/GCVS designations announced in CBAT publications, after they have been assigned by the GCVS staff in Moscow (via an on-going collaboration between the Central Bureau and the GCVS staff). The Central Bureau has initiated a designation scheme for novae in other nearby galaxies, beginning with M31 (and extended now also to M33 and M81), which is now widely used in the astronomical community; these lists are maintained at the CBAT website, along with lists of novae, supernovae, comets, and solar-system satellites announced by the Bureau. The Central Bureau issued 1380 new designations for supernova discoveries announced during 2006-2008, including nine designations for belated discovery reports for objects found in images from 1985, 1996, 2004, and 2005. The type-II supernova 2007it, which peaked at red mag ~ 12 , appears to have been the brightest supernova detected in the past three years. The Central Bureau has continued to report occasional supernova linkages with observed γ -ray outbursts, as with objects that were given the supernova designations 2008D and 2008hw. The CBAT also began a new designation scheme (labelled 'PSN') for (generally fainter) possible supernovae that are unconfirmed spectroscopically, and it maintains a website list with these objects.

The Central Bureau issues designations and names of comets, and during 2006-2008 it announced 176 designations of new and recovered comets observed from the ground, plus 469 designations for presumed comets found by solar-imaging spacecraft (six by *STEREO*, the rest by *SOHO* – none of which were observed from the ground). Presumed comets discovered via *SOHO* spacecraft images are found primarily by amateur astronomers looking at images at the *SOHO* website, and the *SOHO* comets reported in the past three years include many objects found from the mid-1990s through 2005 (though the majority were from 2006 onwards). The last three years also saw a large increase (by ~50-60 percent) over the previous five years in the number of satellites of minor planets reported – continuing the trend that started around 2000; a large portion of this increase involves transneptunian objects, which has naturally created much excitement and investigation in recent years. The Central Bureau also announced the annual recipients of the Edgar Wilson Award for the discoveries of comets by amateur astronomers (three recipients each in 2006 and 2007, and two in 2008).

The continuing close collaboration of the CBAT with the Minor Planet Center resulted in near-simultaneous announcements on IAU Circulars and Minor Planet Electronic Circulars of most of the professional-survey comets, many of which are initially reported as asteroidal but found to show cometary appearance elsewhere by follow-up observers (many of whom again are amateurs) who monitor the MPC's 'Near-Earth-Object Confirmation' webpage. Some initial information on comet discoveries and recoveries appears also on CBETs, which can be prepared and issued more rapidly than the IAUCs.

The Central Bureau is working hard to get all its older IAUCs available online. Plain-ASCII-text versions of Circulars from about No. 1600 onwards should be available at the CBAT website by the end of 2010, and most of the earlier Circulars should also be available at the CBAT website in jpeg image form (from scans) by year's end; they are being added to nearly every week. We thank Sally Bosken (U.S. Naval Observatory Librarian), her assistants, and Lone Gross (Astronomical Observatory Library, University of Copenhagen), for their time and effort in helping to augment the HCO/SAO collection of older IAUCs (which suffered from damage).

Assistant Director G. V. Williams has continued to serve as joint MPC/CBAT webmaster (and has been responsible for the Web CS dissemination of the IAUCs). All of the year's Circulars were prepared by the undersigned, with very helpful editorial backup by Director Emeritus B.G. Marsden, who prepared some CBETs during the Director's absence from Cambridge during the year (and helped to proofread and referee many IAUCs prior to issuance and to discuss many CBAT matters from his decades of experience as CBAT Director).

Numerous referees worldwide, especially some who are Commission 6 members, are also to be thanked for their great help with many items published on Circulars in the past triennium. Correspondence with scientists, the general public, and the news media occupies much of the Director's time, with

thousands of e-mails and many phone calls relating to CBAT science arriving each year. At SAO, Muazzez Lohmiller has continued to handle the accounts, addressing of envelopes, and other administrative matters. Dan Wooldridge continues, as he has for years, with the fine printing of the IAUC cards.

The CBAT has continued its notable presence on the World Wide Web, with those Circulars and CBETs older than about one year being posted freely. The number of paid subscribers to the printed edition of the IAU Circulars continued to fall, from 146 at the end of 2005 to 103 at the end of 2008. However, the subscriptions to the printed IAUCs do pay for the cost of printing and mailing, and there clearly is a continued interest in printing the IAUCs – both from the subscribers and from contributors who perceive a certain prestige for a publication with a very long history in print, despite the simultaneous online presence. In addition, there were 14 free (complimentary or exchange) subscriptions to the printed IAUCs at the end of 2005. The printed IAUCs go to 43 addresses within North America and 74 outside of North America. The number of subscribers to the Computer Service (shared by the CBAT with the MPC, and which includes web access to all CBAT publications plus eligibility for e-mail delivery) remained very stable, at around 460.

Until 2000, the Director's salary was paid by SAO, with two additional CBAT employees paid entirely by subscriptions to the Bureau's publications. The tremendous growth of the World Wide Web has eaten into the subscription revenues of the CBAT, just as it has with magazines and newspapers worldwide: people have come to expect information to be freely available on the Web, expecting that 'somebody else will pay for whatever professional expertise is necessary to make that information available. Thus, the total number of recipients of CBAT publications (both printed and electronic) is down by roughly 50 percent from the pre-Web era.

The Central Bureau is grateful to the U.S. National Science Foundation for funding half of the Director's salary during 2008 - 2010, and to the IAU for its small-but-helpful annual subvention that helps to pay for supplying CBAT publications to astronomers in countries with poor financial support. As noted in recent reports, the subscription and line-charge income is no longer sufficient to sustain fully the salary of the current CBAT Director, as it had done for decades, together with secretarial help. While there are likely sufficient funds through the existing sources to pay the Director's and secretary's salaries into 2010, additional funding is needed for the long-term health of the CBAT. The Director continues actively to seek alternate sources of income to maintain the CBAT. It is hoped that individual countries may help with small contributions to ensure that the important work of the Bureau in serving the astronomical community can continue.

Daniel W. E. Green, Director of the Bureau, 1 May 2009

**10.6. Division XII / Commission 41.
A new Working Group on *Astronomy and World Heritage***

On 2008 October 30 a formal Memorandum of Understanding (MoU) was signed between the IAU and UNESCO agreeing a number of ways in which the two organisations will work together to advance UNESCO's Astronomy and World Heritage Initiative <whc.unesco.org/en/activities/19> and ensure its full implementation. This initiative aims to ensure the recognition, promotion and preservation of achievements in science through the nomination to the World Heritage List (WHL) of properties whose outstanding significance to humankind derives in significant part from their connection with astronomy.

Following the signing, a new Working Group of Commission 41 (*History of Astronomy*) has been set up, which is charged with fulfilling the IAU's commitments under the MoU. Its Terms of Reference are:

1. To work on behalf of the IAU to help ensure that cultural properties and artefacts significant in the development of astronomy, together with the intangible heritage of astronomy, are duly studied, protected and maintained, both for the greater benefit of humankind and to the potential benefit of future historical research.

(The range of properties and objects in question includes ancient sites and monuments with demonstrable links to the sky (such as Stonehenge), instruments of all ages, archives, and historical observatories.)

2. To fulfil, on behalf of the IAU, its commitments under the Memorandum of Understanding with UNESCO on Astronomy and World Heritage.

3. To liaise with other international and national bodies concerned with astronomical history and heritage, in so far as their interests and activities impinge on these aims, to help achieve these aims.

4. To work, in conjunction with IAU C41 (*History of Astronomy*), IAU C46 (*Education*) and other Commissions and Working Groups within the IAU as appropriate, to enhance public interest, understanding, and support in the field of astronomical heritage.

The first main task for the IAU WG is to work with the International Committee on Monuments and Sites (ICOMOS) to produce a global Thematic Study on astronomical heritage. This will provide the basis upon which UNESCO will produce criteria for judging WHL nominations relating to astronomy. A detailed work plan is currently being finalised with UNESCO and ICOMOS and will then be circulated to all those who have expressed an interest in joining the WG. Any others who are prepared to be actively involved are invited to contact myself <rug@le.ac.uk> or the C41 Secretary Rajesh Kochhar <rkochhar2000@yahoo.com>.

Clive L.N. Ruggles, WG Chair, 1 December 2008

11. IAU EDUCATIONAL ACTIVITIES

11.1. 31th IAU-NASL *International School for Young Astronomers*, Trinidad & Tobago, 2009

Venue: University of the West Indies (UWI), St Augustine, Trinidad & Tobago

Date: 7-18 December 2009

Contacts: Dr. Jean-Pierre De Greve, chair PG-ISYA <jpdgreve@vub.ac.be>,
Dr. Shirin Haque, director ISYA2009 <shirin.haque@gmail.com>

URL: <sta.uwi.edu/fsa/physics/ISYA2009.asp>

Preliminary program and lecturers:

- Planetary astrophysics Dirk Schulze-Makuch (USA)
- (Eclipsing) Binary stars, and exoplanet
detection Edward F. Guinan (USA)
- Stellar evolution and sessions for secondary
school teachers and the general public Jean-Pierre De Greve (Belgium)
- Extrasolar planets, planetary & atmospheric
science, astrobiology Giovanna Tinetti (UK)
- Data reduction, queries of databases and related
practical activities R. Barba (Chile)
- Stellar atmosphere (radiative transfer), stellar
fundamental parameters, sessions for
secondary school teachers Michèle Gerbaldi (France)

11.2. COSPAR *Capacity Building Workshops 2009 and 2010*

COSPAR CBW on *Lunar and Planetary Surface Science*,
co-sponsored by the IAU

Venue: Harbin Institute of Technology, Harbin, China

Date: 6 - 19 September 2009

Contact: <norbert.koemle@oeaw.ac.at>

URL: <astro.hit.edu.cn/cospar2009workshop>

Closing date for applications: 28 February 2009.

COSPAR CBW on *Data analysis of the Fermi Gamma-ray Space Telescope*,
co-sponsored by the IAU

Venue: Bangalore, India

Date: February 2010

Contact: <cospar2010@rri.res.in>

URL: http://www.rri.res.in/fermi_cospar_2010

Closing date for applications: 31 October 2009

12. REPORTS FROM IAU REPRESENTATIVES IN INTERNATIONAL ORGANIZATIONS

12.1. *International Council of Science (ICSU)*

The 29th ICSU General Assembly took place in Maputo, Mozambique, 21 – 24 October 2008, at the invitation of the government. It had a very high profile in Mozambique and the Science Minister made the opening and closing speeches and attended a few of the sessions. The President of Mozambique attended the opening ceremony, made an aspirational speech of welcome and attended the formal dinner offered by the host country. The IAU President, Catherine Cesarsky, attended the General Assembly at the invitation of ICSU as a member of the Committee on Scientific Policy and Review (CSPR).

ICSU is an outward looking organisation which enables the scientific community, largely but not exclusively through its Unions, to have a concerted voice in topical matters of profound concern to the whole of humanity, and by doing so ICSU seeks to “strengthen international science for the benefit of society.” The presentations and reports at this GA confirmed that ICSU is taking the necessary initiatives outlined in the Strategic Plan, and it has clearly identified the key issues to be addressed. Overall, this was an interesting, informative and constructive meeting. There are concerns that ICSU tries to do too much, creating overlapping activities involving different partners, that it doesn’t make best use of the expertise available within the Unions, and that it is unable to make sure that actions follow its conclusions and recommendations. These issues are being followed up in the current programmes, and in the preparations for the next ICSU Strategic Plan.

The ICSU General Assembly was preceded by a 'Science in Africa Symposium' and a Union Members' Forum (held in parallel to a National Members' Forum). The Symposium comprised a day of comparatively high level presentations on policy and strategy from senior people, including Ministers and civil servants from several countries, who had come to Mozambique for this Symposium (they were not involved in ICSU). The Union Members' Forum gave the Executive Board an opportunity to explain and discuss major agenda points.

The 8 Geo-Unions have a constructive and collegiate approach and met before the Union Members' Forum to prepare for the GA. Under Union pressure, the ICSU Executive is responding to the Unions concerns for greater transparency, involvement, and better communications.

The proposed new dues structure (already described in IB102) for National and Union Members was supported and a clear majority of unions were in favour of some sort of weighted voting for financial or significant structural matters. The Executive was urged to fine tune the implementation details to produce an equitable outcome for all Unions.

All Unions confirmed their strong support for the ICSU grants programme, and expressed surprise at the low amount (210k) awarded in 2008 and regret at the low level of funding available (~300k EUR p.a.).

General Assembly. The meeting was structured around detailed presentations followed by generous time for discussion. This worked well but meant that the meeting took 3 full days. 64 of the 115 National Members and 26 of the 29 Unions were represented. The Secretary General reported on the establishment of the 3 Regional Offices and the ICSU office move in Paris (with the generous support of the French government). There are 15 people in Paris, 5 in Africa, 5 in Latin America, and 3 in Asia, and active plans to have a Regional Office in the Middle East.

The Executive Director gave a detailed report on progress in implementing the ICSU Strategic Plan, showing how it is keeping up with its objectives, is initiating the planned programmes, and is conducting the necessary reviews of current programmes. He noted that ICSU is working with UN and UNESCO in key areas and is responsible for the science content of the annual report to the UN Commission for Sustainable Development. Later, there was a discussion on the preparation of the Strategic Plan 2012 – 2017. This will follow from the present one, ensuring continuity but with further prioritisation and consolidation, and in preparation an independent review of ICSU should be carried out between 2011 and 2014. Members were asked to input ideas on “the three most important issues to be addressed in the next ICSU Strategic Plan” to the Secretariat for consideration by CSPR.

Integrated Research on Disaster Risk is an area of particular interest to IAU through the inclusion of ‘Space Weather and Impact by Near Earth Objects’ in the programme. Based on the already published report of the scoping group, the presentation outlined the proposed programme for what is an integrated approach to multidisciplinary collaborative research over a 10 year span (initially) aimed at identification and characterisation of disaster risk (natural or man-induced), followed by effective communication and decision making on mitigation and alleviation. This requires the creation of a Scientific Committee and the establishment of a ‘Consultative Forum’. Several people pointed out that there were many disaster studies underway covering specific areas and that their coordination was essential, but this would require ICSU working with many other agencies or institutions, which would need to be involved in both the Scientific Committee and the Consultative Forum.

The outcome would be enhanced scientific knowledge and understanding, so that society – and particularly decision makers and those responsible for risk mitigation – would be better informed. This would require that as the programme developed the conclusions were communicated to those who could take action to follow them up. This was widely stressed as essential if the programme was to be successful.

The Committee on Freedom and Responsibility in the Conduct of Science (CFRS) is one of the most important activities of ICSU, chaired by Bengt Gustafsson. They have produced an excellent booklet:

www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/2205_DD_FILE_Freedom_Responsibility_Universality_of_Science_booklet.pdf .

Bengt gave a summary of the on-going work of the Committee. There will be a 2nd World Conference on Research Integrity in 2010, and a series of workshops 2009 - 2013 in priority areas. The discussion raised the question of free 'Open Access' to publications – not just data – with some countries calling for the removal of subscriptions, conveniently forgetting that it costs real money to edit, referee, and publish a journal. It was pointed out that much was available on open access, unrefereed, web sites.

The Report of the Strategic Committee on Information and Data (SCID) was reported in IB102 and is available on www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/2123_DD_FILE_SCID_Report.pdf. The recommendations for better coordination between the WDC and FAGS through the establishment of a strategic and oversight committee were unanimously supported.

The proposed revised Dues Structure was discussed at length. In essence it recommends 10 bands for National Members based on an averaged GDP, and 4 bands for Unions based on operating costs, with some limited weighted voting an option. The Executive Board received comments from 15 Unions and somewhat fewer National Members, and proposed basing the Union dues on their declared dues income, and to drop any ideas of weighted voting. After the discussions in the Union and National forums, the EB decided to leave weighted voting in as an option. In the simulations provided, 8 of the 10 Unions in the top two bands (including IAU in the top band) would pay more than at present, but all 19 Unions in the lower 2 bands would pay. The IAU urged a more equitable system be adopted before the new structure was implemented in 2012; this will need to be followed up with the Executive.

There was an excellent presentation on the International Polar Year, which was an essentially 'bottom-up' series of centrally coordinated research projects covering the Arctic and Antarctic oceans, land mass (ice), and fauna, with about 50,000 participants (mostly local volunteers carrying out survey and monitoring projects) from more than 60 countries. By any standards, it appears to have been a great success with a durable legacy of data, understanding and cultural change.

Most of the other matters discussed were connected with core ICSU initiatives in the fields of Global Environment, Climate Change, Health and Human Well-being etc., with mention of the work of the ICSU Regional Offices (Asia, Africa, Latin America). There were reports from the Regional Offices, which are working in the ICSU priority areas, giving summaries of their activities and progress and plans for the future.

The Election of Officers and Executive Board members was by secret ballot. The candidates for election as Officers gave presentations as a useful exercise complementing the brief CVs provided. All the candidates (and those for ordinary members of the EB) are outstanding scientists in their own fields. It is good that people of this calibre are prepared to work for the 'common good' in organisations like the Unions and ICSU.

The next ICSU GA is confirmed for Rome in 2011, when we will hear of progress in, and results from, the current programmes and discuss the future work outlined in the next Strategic Plan.

Since the 29th GA, Dr. Catherine J. Cesarsky (France) has been reappointed to the Committee on Scientific Planning and Review (CSPR) 2009-2012. Further information on this important international committee can be found on

[<www.icsu.org/2_resourcecentre/RESOURCE_list_base.php4?rub=35>](http://www.icsu.org/2_resourcecentre/RESOURCE_list_base.php4?rub=35) .

Two important new ICSU data bodies have been established with IAU nominees appointed: Dr. Françoise Genova (France) has been appointed to the World Data Centres Science Committee (WDS-SC), and Dr. Masatoshi Ohishi (Japan) has been appointed to the Strategic Coordinating Committee on Data and Information (SCCID).

Further information on the data committees can be found on

[<www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/2123_DD_FILE_SCID_Report.pdf>](http://www.icsu.org/Gestion/img/ICSU_DOC_DOWNLOAD/2123_DD_FILE_SCID_Report.pdf) .

Ian F. Corbett, IAU Representative to ICSU, 25 May 2009

12.2. Committee on Data for Science & Technology (CODATA)

CODATA continues to ramp up initiatives relevant to astronomy, including exploring a number of cross-cutting initiatives in which astronomy can benefit from expertise and processes developed in other disciplines. Highlights include:

- *New National Members.* Both UK and Australia have joined CODATA in 2008
- *CODATA International Conference Oct. 2008.* The 21st International CODATA Conference in Kiev, Ukraine was attended by about 400 scientists from around the world, and focussed on the role that IT plays in cultivating and nurturing an open access environment to scientific data and information. See [<www.iucr.org/resources/data/meeting-reports/codata-2008>](http://www.iucr.org/resources/data/meeting-reports/codata-2008) (which includes some highlights of the astronomy sessions) and [<www.codata.org/resources/newsletters/newsltr97A4.pdf>](http://www.codata.org/resources/newsletters/newsltr97A4.pdf) .
- *Building European Activities in Public Domain data.* CODATA activities expanded under the EC-funded Thematic Network COMMUNIA on the 'Public Domain in the Digital Age'. CODATA is taking the lead, in collaboration with other partners of the network, on the second international conference in 2009 on Global Science and the Economics of Knowledge-Sharing Institutions (G-SEKSI) [<communia-project.eu/about>](http://communia-project.eu/about) .

- *Collaboration with Global Earth Observation System of Systems (GEOSS).* CODATA continues as scientific lead on GEO Task “Review of GEOSS Data Sharing Principles”, culminating in the GEO-V Plenary in Bucharest in November 2008. See <www.earthobservations.org/meetings/geo5.html>.
- *New Task Groups.* CODATA’s Scientific Agenda for 2008-2010 was strengthened by the approval of ten International Scientific Task Groups and one Working Group. See <www.codata.org/taskgroups/index.html> .
- *CODATA Strategic Plan.* CODATA’s Strategic Plan for 2006 - 2011 was endorsed by the 26th CODATA General Assembly in Kyiv, October, 2008. ICSU have requested CODATA to focus its efforts on implementation of the three main initiatives in its strategic plan – the Global Information Commons for Science Initiative, Advanced Data methods and Information technologies for Research and Education, ADMIRE and Scientific Data Across the Digital Divide.
See <www.atnf.csiro.au/people/rnorris/WGAD/CODATA_Plan.pdf>.

While not formally part of CODATA, the IAU delegate to CODATA also participated in the Strategic Committee on Information and Data of ICSU (International Council for Science), whose report has now been endorsed by ICSU. Amongst other things, the report recommends restructuring of the World Data Centre (WDC) system, and the Federation of Astronomical and Geophysical analysis Services (FAGS). This recommendation is now being implemented by the merging of WDC and FAGS into a new ICSU body, the World Data System. It is hoped and expected that this new body will deliver identifiable value to Data Centres and their users. See <www.atnf.csiro.au/people/rnorris/SCIDReport.pdf>

Ray Norris, IAU Delegate to CODATA, 30 April 2009

12.3. Committee on Space Research (COSPAR)

The Committee on Space Research (COSPAR), established by the International Council for Science in 1958, celebrated its 50th anniversary in 2008. COSPAR has 44 national institution members, 13 Scientific Union members (including IAU), approximately 7,000 individual scientists 'Associates' and 5 Associated Supporters (companies, organizations).

General Assemblies. COSPAR held its 37th Scientific Assembly in Montreal, Canada on 13-20 July 2008 <www.cospar2008.org/> with a strong participation of 2345 scientists. Among the main features of this successful Assembly, we note: an eGY (electronic Geophysical Year) event devoted to “Towards a Global Earth and Space Science Informatics Commons”, three Anniversary Lectures ('COSPAR's First 50 Years', given by Peter Willmore, 'Space and the Spacecraft as a Precision Laboratory', by Stefano Vitale, and 'The Impact of Space on Society', by L.A. Fisk, see <cosparhq.cnes.fr/Meetings/sciass.htm>), five special

lunch time lectures (with topics such as ballooning, Chinese lunar mission, asteroid impact threat, European science exploration policy and NASA program) and interdisciplinary lectures, among which the very well attended lectures on new views of the Sun: *STEREO* and *Hinode*, the role played by space-based probes in our understanding of the cosmos, and extrasolar planets and the search for habitable worlds).

During this Assembly, COSPAR awarded the 2008 COSPAR Space Science Award to Professors Gloeckler and Pounds (former Vice-President of the International Astronomical Union). Six other awards were also presented, as well as eight awards for young scientists, and 15 young authors received Outstanding Paper Awards.

The next 38th COSPAR Scientific Assembly will be held in Bremen, Germany on 18-25 July 2010 and the 39th Assembly in Mysore, India in 2012.

Other activities. COSPAR has set up a Panel on Exploration (PEX) and also participates in GEO (Global Earth Observation), among other activities.

COSPAR's program of Capacity Building supported by the IAU has most recently organized regional workshops in Romania (Solar-Terrestrial Interactions), in Uruguay (Planetary Science), Egypt (Space Astrophysics) and Malaysia (Space Optical and UV Astronomy).

We note that COSPAR has discussed the issue of the formation of space experimentalists.

Publications. *Advances in Space Research* (ASR) is now a fully refereed journal covering all areas of space research. It is open for all submissions and re-established in ISI. It is managed by an editorial Board comprising an editor-in-chief, 2 co-editors and 21 associated editors. *Space Research Today* issued three times a year now includes more science-driven articles.

COSPAR contribution to the International Year of Astronomy 2009 (IYA2009). The point of contact of COSPAR which is associated to this initiative, is Prof. Jean Audouze (Institut d'Astrophysique de Paris, 98 bis bd. Arago, Telephone: +33 1 44 32 80 65, Fax: +33 1 44 32 80 01, E-mail: <audouze@iap.fr>).

COSPAR organizes with IAU the final symposium proposed by J. Audouze, to be held at UNESCO, 14-15 December 2009 or preferably 14-15 January 2010.

The COSPAR executive is now hosted by CNES (Paris).

COSPAR's web site: <cosparhq.cnes.fr/> .

Jean-Claude Vial, IAU representative to COSPAR, 1 April 2009

12.3.1. *COSPAR Scientific Commission E – Research in Astrophysics from Space*

The 37th COSPAR Scientific Assembly took place in Montreal in July 2008. There were about 2000 participants attending more than 110 parallel sessions, 19 of those organized by Scientific Commission E, *Research in Astrophysics from Space*. The next COSPAR Assembly will be in Bremen in 2010.

During the business meeting of Commission E in Montreal, several prizes were awarded. The 2008 Zeldovich prize for Commission E was awarded to Sergey A. Bogachev, from the Astronomical Institute, Moscow State University. The Outstanding Paper Awards for Young Scientists were given to Aya Bamba (Japan), Kathrin Egberts (Germany), Jie Jiang (China), and Xuefeng Wu (China).

In January 2008, COSPAR organised a Capacity Building Workshop in the new library of Alexandria, Egypt. The title of the workshop was *A High-Energy Data-processing School for Young Physicists and Astronomers from North Africa and the Middle East*, and was attended by about 30 students from Egypt and neighbouring countries. The workshop focused on the analysis of data provided by *Chandra*, *XMM-Newton*, *Swift* and *RXTE*, and was co-sponsored by the IAU, ESA, and the UN.

In June 2008, a second COSPAR Capacity Building Workshop took place in Kuala Lumpur, Malaysia, on *Space and UV Astronomy*, focusing on the use of instruments on board *Hubble*, *FUSE*, *EUVIE*, *IUE*, and *GALEX*. This workshop was also co-sponsored by the IAU. The next workshop of this series will be about *Lunar and Planetary Surface Science*, and will take place in Hainan, China, in September 2009; the following one will be in February 2010 in Bangalore, India, on *High-energy Gamma-ray Astronomy* with focus on science with *Fermi*.

In 2008 COSPAR initiated a fellowship programme, by which young scientists who have participated at one of the COSPAR Capacity-Building workshops get the opportunity to build on skills gained at the workshop. The programme provides for visits of 2-4 weeks duration to laboratories which collaborate with COSPAR in providing the fellowship programme for the purpose of carrying out joint research. More information is available on the web page of COSPAR, <cosparhq.cnes.fr/>, under 'Fellowship Program'.

Mariano Mendez, IAU representative to COSPAR Scientific Commission E – Research in Astrophysics from Space, 1 May 2009

12.4. *International Telecommunication Union (ITU)*

Report to the IAU on recent activities of the Radiocommunication Sector of the International Telecommunication Union (ITU-R).

World Radiocommunication Conferences (WRC-07 and WRC-11). World Radiocommunication Conference 2007 (WRC) was held in Geneva in June 2007. Items of interest to the radio astronomy community on the WRC-07 agenda included, among others, the following:

- What are the threshold levels that, when exceeded, could trigger consultations between satellite operators and radio astronomers when transmissions from a satellite downlink spill over into a neighboring band allocated to radio astronomy;
- Under what conditions can radio astronomers share the 1668-1668.4 MHz portion of the band allocated for space-based observations of the 1667 MHz OH line with mobile phones up-linking to satellites;
- Suppression of the provisory allocations to satellite up and downlinks in the vicinity of the 1400-1427 MHz passive band.

A complete report on the decisions of WRC-07 that may be of interest to radio astronomers can be found at:

www.nsf.gov/mps/ast/radio_astronomy_summary_of_wrc-07_v071214.pdf

The next WRC is scheduled to take place in 2011 (WRC-11); a preliminary agenda for this Conference was established by WRC-07. Several WRC-11 agenda items may impact radio astronomy; the most important deals with revision of the so-called 'last footnote to the Radio Regulations (RR 5.565). This footnote details the uses that the passive services make of the spectrum between 275 and 1000 GHz; WRC-11 will revise it and extend its scope up to 3000 GHz. It is important that astronomers participate in this process, e.g., through the IAU Division X WG on *Astrophysically Important Spectral Lines* that will meet at the IAU XXVII General Assembly, as this work may help to establish a favorable position for radio astronomers internationally and domestically when at some future date allocations are addressed. More details on this and other WRC-11 Agenda items can also be found in the report indicated above.

Extension of the ITU mandate to include optical frequencies. The same WRC-11 Agenda item that stipulates revision of footnote RR 5.565 also covers studies of the need to regulate terrestrial optical communications link. At present it appears unlikely that this agenda item will have an impact on astronomers.

Work in ITU-R Study Groups. Work relevant to radio astronomy continues within Working Party 7D (WP 7D), the specific ITU-R group dealing with radio astronomy issues. Chairmanship of this group will pass from Dr. Masatoshi Ohishi, (Japan) to Dr. Tasso Tzioumis (Australia) at the next meeting, scheduled for September 2009. A detailed account of the work of the group is beyond the scope of this report, but more participation by interested astronomers is much

needed and welcome. Those interested in more details should contact one of the authors of this report.

Tomas E. Gergeley, IAU representative, & Masatoshi Ohishi, in coming IAU representative to the International Telecommunication Union, 2 March 2009

12.5. International Union of Pure and Applied Physics (IUPAP)

The membership of IUPAP Commission 19 (Astrophysics) changed at the 2008 General Assembly of the International Union of Pure and Applied Physics, held in Japan in October. It remains the only Commission with a significant number of women members (6 of the 14 regular members and 3 of the 5 associate members). Other events in the past six months were the sponsored conference, the 24th Texas Symposium on Relativistic Astrophysics in Vancouver, BC, where the second winner of the Young Physicists Prize, Eiichiro Kumatsu (U. Texas) delivered his prize address on non-Gaussianity in the CMB; the selection of an IAU Special Session (5) on Accelerating Progress in Astronomy, scheduled for the GA in Rio as our sponsored conference for that year; the revamping of the International Organizing Committee of the Texas Symposium to include more representation from C19 (chair Maria Victoria Fonseca from Spain; secretary Bozena Czerny from Poland; vice chair T. Padmanabhan from India; and new member Victoria Kaspi from Canada; as well as continuing member Virginia Trimble from the USA). This had the additional effect of increasing the number of women members of the IOC by a factor of about five. And the selection of Heidelberg for the 25th Texas Symposium venue in 2010.

The next meeting of the IUPAP Council and Commission chairs will occur in Chicago in October, 2009, and New Delhi and Vienna are likely locations for the 2010 meeting and the 2011 General Assembly. A continuing problem for C19 is how, when, and where to meet. Most other commissions have some natural annual or biennial conference that is attended by most members. We do not: 5 of 13 were in Sydney in 2003; 8 of 13 in Prague in 2006; 1 of 14 in Vancouver (though both our Young Physicists Prize honorable mentions, Marta Volunteri of U. Michigan and Sarah Gallagher of U. Western Ontario were there, and your liason had the pleasure of treating them to a bit of food and drink). And, looking ahead, there will probably not be a majority of current members in either Rio or Heidelberg.

The thought occurs that astrophysics somehow is a broader field than, say, particle physics, cosmic rays, or plasma physics. But splitting the commission into two or more, or exiling some subdisciplines from the fold are definitely not things we want to do. Most C19 members are involved in a variety of IYA activities in their home countries, but the Commission is not spearheading anything of its own.

The C19 web site continues to evolve, though lagging both the science and the politics of astrophysics. See <www.iupap.org/commissions/c19/website.html> .

Virginia L. Trimble, IAU liaison to IUPAP C19, 25 February 2009

12.6. Scientific Committee on Antarctic Research (SCAR)

IAU membership of SCAR. The IAU was invited to send an observer to the XXX SCAR Delegates meeting in Moscow, Russia, 14-16 July 2009. At that meeting, the IAU was admitted to membership of the SCAR as a union member. SCAR now has 31 Full Members (those countries with active scientific research programmes in Antarctica) and, with the addition of the IAU, nine union members (those ICSU scientific unions that have an interest in Antarctic research). The minutes of the SCAR Delegates meeting at which the IAU was admitted as a member of SCAR are available at:

<www.scar.org/publications/bulletins/Bulletin167.pdf> (Sept 2008).

Formation of the AAA SRPPG within SCAR. At the same meeting of the SCAR Delegates in Moscow, the formation of the Astronomy and Astrophysics from Antarctica (AAA) Scientific Research Programme Planning Group (SRPPG) was approved. Currently there are five Scientific Research Programmes (SRPs) within SCAR, each addressing key issues at the frontiers of science:

- Antarctica and the Global Climate System (AGCS), a study of the modern ocean-atmosphere-ice system;
- Antarctic Climate Evolution (ACE), a study of climate change over the past 34 million years since glaciation began;
- Evolution and Biodiversity in the Antarctic (EBA), a study of the response of life to change;
- Subglacial Antarctic Lake Environments (SALE), a study of lakes buried beneath the ice sheet;
- Interhemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research (ICESTAR), a study of how the Earth's outer atmosphere responds to the changing impact of the solar wind at both poles.

Astronomy and Astrophysics from Antarctica (AAA) will replace ICESTAR at the end of 2009. AAA will consist of four working groups covering: (i) site testing, validation and data archiving; (ii) arctic site testing; (iii) science goals; (iv) major new facilities.

More information can be found on the AAA website is at:

<www.phys.unsw.edu.au/JACARA/AAA_SRP_webpage/> .

John W.V. Storey, IAU representative on SCAR, 4 May 2009

12.7. *Scientific Committee on Problems of the Environment (SCOPE)*

SCOPE 2008-2009. SCOPE has had a very difficult year. Financial difficulties arising from adverse exchange rates and a temporary loss of revenue following termination of its current project cycle coupled with a review by its parent body ICSU.

There is a strong possibility that SCOPE could be wound up despite the fact that there has never been a greater need for sound scientific investigation of the complex problems that face mankind – many of these problems arising from a ruthless and expanding exploitation of the Earth's resources.

While there is some justification for regarding SCOPE as having become introspective and taking a, perhaps, unnecessarily restrictive view of its mandate, there is no doubt that the scientific problems of the terrestrial environment are many, difficult and are unlikely to decrease in the long term. There is a very powerful case that a body like SCOPE will remain essential throughout this century.

The SCOPE General Assembly will discuss the future in 2009 June. A report on the outcome will be available soon after that meeting but may miss the IAU deadline for such annual reports. At that General Assembly I shall press for the need for ICSU to retain a body which scientifically reviews the problems of the Environment and suggest that the scope of any such body should be widened and that that body should not only retain the partners SCOPE now has but should widen them to include any science which has environmental impact as appropriate. One might note in passing that while light pollution has serious impact on the prosecution of astronomy, it also has impact on flora and fauna and may even impact human health.

Opinion from members of the IAU would be welcomed by the SCOPE Secretariat (5, rue Auguste Vacquerie, 75016 PARIS, France).

In the report period SCOPE published two further volumes in its series of monographs namely, no. 69 Biodiversity Change and Human Health and no. 70 Watersheds, Bays and Bounded Seas (Island Press 2008). Both are a recommended read.

The principles on which SCOPE was founded 40 years ago are still essential for the health of the environmental sciences. SCOPE may need a new mandate and new ways of making its scientific voice heard but scientific study of the problems of the environment remains as essential now – if not more so – than 40 years ago.

Derek McNally, IAU representative to SCOPE, 12 March 2009

13. MEMBERSHIP OF THE IAU

13.1 Deceased Individual Members

The Union is saddened to learn that the following members and former members passed away, as far as reported to the IAU Secretariat:

K D **ABHYANKAR** (1928 – 2007), India 8 November 2007
Oliveira Grijó **ANTARES** Kleber (1949 - 2009), Brazil, 6 March 2009
Kevin **BEURLE** (1956 - 2009), UK, 29 May 2009
Gianfranco **BISIACCHI** Giraldi (1947 - 2006), Mexico, 16 September 2006
Rolf **BRAHDE** (1918 - 2009), Norway, 25 May 2009
S. V. **DAMLE** (1936 - 2008), India, 29 November 2008
Ilya **KAZÈS** (1926 - 2008), France, 1 December 2008
Tao **KIANG** (1929 - 2009), Ireland, 26 March 2009
Victor M. **LYUTY** (1940 - 2009), Ukraine, 14 April 2009
Paolo **MAFFEI** (1926 - 2009), Italy, 1 March 2009
H. S. **MAHRA** (1938 - 2008), India, January 2008
John Derral **MULHOLLAND** (1934 - 2008), France, 11 November 2008
Yuval **NE'EMAN** (1925 - 2006), Israel, 26 April 2006
Nirupama **RAGHAVAN**, (1940 - 2007), India, 23 February 2007
A. K. **RAYCHAUDHURI** (1923 - 2005), India, 18 June 2005
Sofia **SADZAKOV** (1929 - 2009), Serbia, 13 March 2009

14. FRANÇOIS ARAGO – THREE RECENT BOOKS
PRESENTED AT THE IAU COCKTAIL PARTY,
OBSERVATOIRE DE PARIS, 6 APRIL 2009

14.1. *Arago, un savant génèreux; physique et astronomie au XIX^e siècle*

by James Lequeux, emeritus astronomer at the Paris Observatory
co-edition EDP sciences, les Ulis and Observatoire de Paris (2008)
ISBN 978-2 86883-999-2; 978-2-901057-56-7

Let's now concentrate on a few aspects of Arago's research in astronomy. The most interesting ones are based on the polarization of light, of which Arago became the best specialist worldwide soon after its discovery in 1808 by Étienne-Louis Malus: he wrote the first article on polarization in the *Encyclopaedia Britannica*. Arago discovered that a plate of quartz cut perpendicular to the axis of the crystal produces a rotation of the plane of polarization of light by an angle which depends on wavelength. If a polarized source is observed through this plate followed by a birefringent crystal, one sees two images of the source with complementary colours, which are brightest for a plate thickness of 6 mm. If the source is unpolarized, the two images are white. Using this principle, Arago built a simple and sensitive polariscope, very easy to handle. It can be converted into a polarimeter by putting in front of it a device (a glass plate or a stack of glass plates) which can compensate by a known amount the polarization of the source until the images become white.

With this polariscope-polarimeter, Arago looked first in 1811 at various parts of the Moon, to discover that its light is polarized. Nothing really new here, since it was known that this light is reflected from the Sun and was expected to be polarized following the discovery by Malus of polarization by reflexion on a solid or liquid. Much more interesting are his 1819 and 1835 observations that the light from the tail of comets is polarized: he concluded rightly that this tail should be made of dust reflecting the light of the Sun. In 1811, Arago observed in the laboratory the polarization of light emitted by incandescent solids like hot iron, or liquids like molten copper or platinum, and discovered that it is polarized if seen obliquely. The same year, he turned his polariscope to the edge of the Sun and found it unpolarized. He concluded that the emitting surface – later called the photosphere – cannot be solid or liquid and must be made of an incandescent gas. It is the first time that one could say something about the nature of a celestial object through a remote observation: this is the birth of astrophysics. Unfortunately the crucial observation of Arago was almost forgotten later and the birth of astrophysics is often attributed to Kirchhoff and Bunsen, who observed spectroscopically in 1860 several terrestrial elements in the Sun.

At the end of his life, Arago turned back to polarization and asked his collaborators to observe with his polariscope variable stars, in particular eclipsing binaries like Algol. They saw no polarization, and he concluded that like that of

the Sun, the surface of stars is an incandescent gas. Of course one expects a single spherical star to be unpolarized for symmetry reason, but for the observed stars this symmetry is generally destroyed and polarization would have been seen if their surface was solid or liquid. This observation is typical of the cleverness and ingenuity of Arago.

Even less known is the fact that Arago played an important role in the development of stellar photometry. Photometry has a long history, beginning with Bouguer and Lambert in the 18th century; William Herschel and his son John were amongst the first to obtain measurements of the brightness of a few stars by successive observations of the target and of a reference star with a telescope appropriately diaphragmed, or by comparison with a point-like image of the Moon. These methods were very unreliable. Late in his life, Arago had the idea of polarizing the light of the star with a Nicol prism, and then to form a double image of it with a birefringent crystal located inside the telescope. He had the Nicol prism rotated with respect to the crystal until the weaker image vanished in the sky background. Since attenuation is proportional to the cosinus squared of the rotation angle (Arago took care to verify experimentally this law in the laboratory), the brightness of the target star could be calibrated in this way on the sky background. Observing in the same way a reference star (usually Sirius), the magnitude of the target with respect to the reference could be obtained. Surprisingly for us, this method gave reliable results: at that time the city lights were so weak and there was so little industrial pollution that the sky was black and uniform above the Paris Observatory. Comparison of Arago's measurements with modern determinations shows a good linearity with a standard deviation of half a magnitude. This method being very fast, it could have given approximate visual magnitudes for all bright stars in a few nights, but Arago was too sick and his collaborators not motivated enough to continue these observations. His successors showed no interest in the problem; however, it should be noticed that the best photometers of the end of the 19th century, those of Zöllner and of Pickering, are largely inspired by Arago's techniques (that of Zöllner even uses chromatic polarization to adjust the colour of the reference lamp to that of the observed star).

There are other contributions of Arago to astronomy. His imagination in this domain as well as in many fields of physics is amazing. Léon Foucault wrote after his death : « Arago put into circulation more ideas by himself than a whole generation. » It is sad that he did not always have the perseverance to fully exploit his ideas. This is one of the reasons why they have often been forgotten. My book tries to do justice to this great scientist, who was above all a great astronomer and the true founder of astrophysics.

*James Lequeux,
Paris, 27 April 2009*

14.2. *Full Meridian of Glory: the perilous competition to measure the shape of the Earth*

*by Paul G. Murdin, emeritus astronomer, Cambridge Institute of Astronomy
Copernicus Books, Springer Science & Business Media, NY, USA (2008)
ISBN 978-0-387-75533-5*

In 1661 Jean-Baptiste Colbert was appointed as Minister of Finance in France and set about a full scale reform of the French economy. Calling for reports from many local jurisdictions, he found he could not make sense of what he was being told of France's economic resources, because the map of France was inconsistent. In 1666 he initiated a surveying project to map the whole country. Colbert commissioned the survey from the Academy of Sciences, which he had caused to be founded for such purposes, as an aid to develop a 'knowledge-based economy'.

The scale of the problem was evident from the initial survey. The astronomers Jean Picard, Jean-Dominique Cassini, Philippe La Hire etc determined the latitude and longitude of points on the coasts by astronomical observations. The outline of the country that they produced in 1683 reduced the area of France by 20% from the previous best map – for example, the city of Brest, located on the Atlantic coast, was moved east by nearly 150 km. When told of this King Louis XIV is said to have remarked: 'I have lost more of France to my astronomers than to my enemies.'

The next phase of the survey was to lay out the Paris Meridian, an accurate survey by the Academy of the position of the N-S axis of France passing through the Paris Observatory, to be used as the basis of a general geodesic triangulation over the whole country. This surveying technique had been invented by Willebrord Snell (1617) and used by him to survey the southern part of the Netherlands. In the technique the surveyor measures a baseline on the ground by leapfrogging standard measuring sticks one in front of each other. He then triangulates by measuring, from each end of the baseline, the angle between the other end and the line of sight to landmarks in the countryside. The relative locations of the landmarks can be built up and extended to provide a map of their locations relative to the ends of the baseline. Snell's pioneer survey was limited in extent by the data analysis e.g. the accuracy – number of significant figures – that had been calculated in trigonometric tables. One hundred years later the tables had been improved to support accurate surveys over larger distances.

The baseline for the map was laid out across the plain south of Paris, from Villejuif just south of the city boundary to Juvisy further to the south on the other side of where Orly airport is now located. To lay measuring sticks one after another in a straight line over the ground, the surveyors cut back trees and moved rocks. The line that they made became a track and later a road; it is now Route National 7, a six lane highway.

The French trigonometric survey had an additional feature that was to prove crucial to later uses to which the map was put: the astronomers measured the latitude and longitude of key locations by sighting on stars to produce latitude and by timing eclipses of Jupiter's satellites at both the field locations and in Paris to determine longitude. The Paris Meridian could then be interpolated into the landmark locations, which together with an east-west line running through Paris from Brittany to Alsace formed two axes for the mapping of the entire interior of the country.

The output was eventually the *Carte de France de Cassini*, published in 1790, the first scientific survey of an entire country.

What started as a big applied-science project then turned into a big pure-science project. In his book *Principia* (1687), Isaac Newton examined the issue of the variations in the length of beat of a pendulum of a standard length from place to place over the Earth and related the longer period of a pendulum at the equator to the reduced surface gravity there, due to centrifugal force, itself due to diurnal rotation. This led to a calculation on the shape of the Earth. Newton suggested that the Earth was flattened at the poles, the equator being higher by 25 km.

Newton's work, *Principia*, provoked three threads of reaction in France. His work was regarded as a set of rational, synthetic and brilliant scientific theories (one might use the names of Pierre Maupertuis, Alexis-Claude Clairaut and Émilie de Châtelet as exemplars, the latter because of her work in making the *Principia* coherent and understandable as a taught subject). The work was also a model for evidence-based thought in all areas of discussion, including politics and philosophy, and a work at the heart of the Enlightenment (exemplified by the comments and essays of the journalist Voltaire on the subject). Finally, a body of work existed in the map of France that could be a practical test of Newtonian theory (exemplified by a set of astronomers including Jacques Cassini).

The test from the map of France of the shape of the Earth would be the scale of one degree of latitude as a function of latitude. For an oblate Earth, the distance over one degree of latitude (between local verticals) would *increase* the further from the equator. In 1713 Jacques Cassini concluded from the map that 1 degree averaged from Paris to Bourges (latitude 49° to 47°) was 57,097 toises in length (1 toise was 1.95 metres), while 1 degree from Paris to Amiens (49° to 50°) was 56,096 toises. Thus the map showed that the degree *shortens* as you approach the pole. The Earth is prolate, not oblate, and Newtonian Theory is incorrect. Of course this conclusion depends on an assessment of the errors, and there was no well-developed theory for this: the map had been checked only through closure of the surveying techniques with a second baseline measurement at the conclusion of the survey.

The result was challenged by Pierre Maupertuis. In 1728 he had visited London to study Newtonian theory (in Latin, of course, the *lingua franca* of science at the time). Back in Paris he became an enthusiastic advocate of Newtonian theory with Alexis-Claude Clairaut, working with Voltaire and Marquise Émilie de

Châtelet as popularisers. Maupertuis himself was ridiculed as 'Sir Isaac Maupertuis', when the iconoclastic young scientist criticised the Cassini measurements, which gave 'evidently' the wrong result. The specific criticism was that the measurements were made over too short a latitude span to be decisive. This led to the proposal of an Arctic expedition to Lapland to measure the length of a degree at high latitude, across the Arctic Circle. As often in modern science, theory led the subject, with a proposal of an observational scheme that could settle the matter.

In Lapland (1734-7), Maupertuis and his colleagues Pierre Le Monnier and the Swedish scientist Anders Celsius worked well as a youthful team, surveying a degree of latitude that ran upwards from its estuary along the river Tornio. They endured considerable personal hardship: freezing temperatures, biting flies, unsophisticated living conditions. But they succeeded in measuring the requisite baseline on the ice at the mouth of the river and the positions of mountain tops up to 100 km up-river.

Meanwhile a second expedition was launched to Peru (the region now known as Ecuador) in 1735-44. Charles-Marie de La Condamine led this expedition to the equator, and these scientists also endured personal hardship of complementary kinds to Maupertuis': hostile natives, snakes, scorpions and mosquitoes, freezing deserts, volcanoes and altitude sickness. The expedition was not as easy as the expedition to Lapland and the scientists (La Condamine, Pierre Bouguer, Louis Godin, Antonio de Ulloa and Jorge Juan) split into disharmonious separate expeditions, with arguments over status and co-authorship rights, and squabbles over whose understanding of the science was more sophisticated and who had authored various ideas. The outcome was three separate publications reporting the same data and the same conclusions. The refereeing system of nowadays would make this impossible!

The work had not finished in France. With the aid of a new surveying instrument invented by Jean-Charles Borda, the Revolutionary government decided to sponsor in 1790 a new survey of the meridian as a means to define the metre (to standardise exchange and trade as an aid to political unification of France). This applied-science led, instrument-facilitated project was executed by the astronomers Jean-Baptiste-Joseph Delambre and Pierre Méchain in 1793-'97. They carried out their triangulation along the Paris Meridian (one to the north of France, one to the south and into Spain) as the Revolution came to its crisis, the king was executed and the republic was initiated. It was not an easy time for an astronomer to travel in France, with papers sanctioned under the old royal government, with telescopes and other suspicious instruments, lighting fires on mountains that could very well be signals to royalist supporters, and with no readily understandable explanations. Between them they were captured by militia, threatened with the guillotine, relieved of their duties for lack of revolutionary zeal, imprisoned for espionage, etc, etc.

Nevertheless, overcoming these grave impediments, in 1798 they presented their results in Paris and the metre was adopted as in principle $1/10,000,000$ of the circumference of the Earth from equator to pole. Méchain, however, was unhappy about his measurements and in 1804 he set out to repeat them in Spain. He died of malaria which he caught surveying in the swamps near Barcelona, and left his survey unfinished.

In 1806 François Arago, aged 20, was a mathematics student on gap-year's leave from his university for work experience at Paris Observatory. He asked to be sent with Jean-Baptiste Biot to southern Spain to complete Méchain's survey of the Paris Meridian into the Balearic Islands. He recorded his exciting expedition in an autobiography *The History of My Youth*. It was a time when civil order had broken down in a country at war, both with other countries and within itself. He had to fight off bandits to access his observing stations in the mountains. While observing in the mountains he fell into conversation with monks from a nearby monastery. They belonged to a silent order but spoke against their life as monks. Perhaps they regretted their indiscretions and disobedience, and feared that Arago might inform on them: at mass at the abbey that Sunday Arago observed them putting something into the communion wine that they were preparing for him. Fearing poison he made an excuse and left. In another incident, while he was passing time waiting for his surveying instrument to be repaired he dallied with a girl that he had met. The girl's fiancé was jealous and lay in wait for Arago, who being warned escaped by running the fiancé down with his carriage and killing him.

Arago's observing run was brought to a long end in 1808 with the Peninsular War was in full spate. Britain was fermenting uprisings by the Spanish against Napoleon, and in Majorca Arago was chased by a Spanish mob as a suspected French spy. He was imprisoned for a while by the local authorities, as much for his own protection as anything else. He was freed and set sail for Marseilles, but was captured off Barcelona by Spanish pirates seeking ransom from the ship's Algerian owner. This being paid he was again freed and set off for Marseilles. However his ship was damaged in a storm and was blown onto the North African coast. Here he was again captured and taken hostage by the Algerian authorities against payment by France of some disputed taxes. This problem was also eventually resolved and he was again freed, sailing towards France in a convoy of three Algerian ships. He was yet again arrested, this time by the British Royal Navy executing a blockade of Marseilles; he was again released and set foot back home in 1809.

Arago returned home to the relief of his weeping mother who had given him up for dead and to the astonishment of the Parisian authorities. He was able to produce his observations, on papers that he had stuffed in his shirt, kept safe for 18 months. Home from an observing run more full of incident than any that I have ever experienced, he was feted as a hero. He was elected to the Academy of Sciences at the age of 23 (perhaps prematurely, given the depth of his scientific accomplishments – but he did have an amazing story to tell). This was

the start of an illustrious career, in which as we have heard from James Lequeux he worked on fundamental physics and astrophysics. He was also an influential scientist encouraging Foucault and Leverrier. He took up politics and even briefly became what could be seen as the head of state in France in 1848 as the President of an interim State Commission.

What of the shape of the Earth? The scientific outcome of all these adventures was that 1 degree in Lapland at 67° was measured at 57,196 toises, 1 degree in France at 48° was 57,060 toises and 1 degree in Ecuador at 0° was 56,765 toises. The Earth is oblate. Newton's calculation is proved.

All this is commemorated by the Paris Meridian and the monument to Arago described in the next talk by Philip Freriks. It is a monument not only to history but also to adventure and science. It reminds us of the single-mindedness of scientists in carrying out a cooperative, international scientific endeavour and it memorialises the marriage between science and instrumentation, the link between applied and pure science, the dialogue between theory and observation and the tenacity of young scientists to bring home their science. It is an inspiration to the work of the IAU.

*Paul G. Murdin
Cambridge, UK, 20 April 2009*

14.3. *Le Méridien de Paris. Une randonnée à travers l'Histoire*

*by Philip Freriks, anchorman, author
co-edition EDP Sciences, les Ulis and Observatoire de Paris (2009)
ISBN 978-2-7598-0078-0; 978-2-901057-62-8*

Mesdames, messieurs,
Ladies and Gentlemen,

As we all know, English is the lingua franca of the modern times, but it is also a tradition to express one self in the language of the hosting country. A tradition I cherish particularly today as I feel rather uneasy in the *langue de Shakespeare* and much more comfortable in the *language of Molière*.

So, if you don't mind, j'aimerais continuer en français. C'est la langue de ma deuxième patrie et, plus important encore, la langue de ma femme.

Parmi vous, tous scientifiques de haut niveau, je me sens évidemment tout petit. En effet, mon livre *Le Méridien de Paris*, n'a rien de scientifique et, en dépit de son titre, n'a rien avoir avec l'astronomie non plus. La seule preuve scientifique que j'apporte, je l'ai trouvé chez mon éminent collègue Tintin qui navigue sur le Méridien de Paris pour trouver Le Trésor de Rackham le Rouge. Une oeuvre que je vous recommande. Bref, autant vous l'avouer tout de suite: mon livre

n'est rien d'autre qu'une promenade, une randonnée urbaine si vous voulez. Certes, belle, instructive, mais ce n'est qu'une promenade. I am really sorry.

Cela dit, je ne renie rien. Je dirai même en toute modestie qu'il s'agit d'une promenade pas banale, voir une promenade extraordinaire le long d'une œuvre d'art hors du commun. Un monument en 135 médaillons, fixés dans le sol parisien, du sud au nord, en hommage à François Arago; un de vos prédécesseurs qui a vécu ici, qui était, tout jeune homme déjà, un héros national et a même été chef de l'état. Un grand français, un savant généreux, à défaut d'avoir rejoint les immortels du Panthéon, son nom est inscrit sur le flanc de la Tour Eiffel. En hauteur. C'est peut-être mieux pour un astronome que d'être enfoui dans les caveaux crépusculaires de la nation reconnaissante.

C'est l'artiste néerlandais Jan Dibbets qui a imaginé ce monument. C'est quelqu'un qui est fasciné par la géométrie, par ces lignes virtuelles que, par définition, l'on ne voit pas. Il aime les marquer, les matérialiser, les faire vivre pour ainsi dire, tout comme Christo aime habiller des bâtiments. Et c'est dans cette logique que l'hommage à Arago suit cette ligne virtuelle qu'est le Méridien de Paris. C'est sa matérialisation qui constitue le monument. D'ailleurs le Méridien passe ici, dans cette salle et c'est ici que ce monument a été inauguré en 1993.

Personnellement je suis un peu comme Dibbets, sans avoir son talent, je le précise. Ou pour citer mon livre si vous me permettez : *« Là où les lignes imaginaires sont balisées, naît le besoin impérieux et étrange de suivre ces tracés. La vie « revisitée » d'un artiste célèbre fascine, tout comme la possibilité de refaire le trajet d'une expédition, de suivre les indications d'un journal de voyage d'un autre temps ou la progression d'une ancienne ligne de front. Peut-être avons-nous envie d'être surpris, de nous accorder une aventure sans trop de risque, de frissonner dans la maison hantée de l'histoire, de nous confronter aux émotions de ceux qui se laissaient guider par leur sensibilité. Et à cet égard, Dibbets n'est pas différent des autres. Plus un point ou une ligne sont mathématiques, plus le désir de les avoir sous nos pieds est grand. »*

En d'autres termes, j'aime bien suivre des lignes ou des itinéraires qui m'amènent vers l'inconnu. Me laisser diriger sans savoir où je vais. C'est ainsi qu'une promenade en apparence banale devient une aventure. Et c'est le moins qu'on puisse dire du Méridien de Paris – qui fût jusqu'en 1884 ce que son équivalent de Greenwich est aujourd'hui. A savoir le Méridien zéro. Voyez Tintin en conversation hautement technique de ce point de vue avec le capitaine Haddock.

C'est un méridien qu'il faut mériter. Aussi, mettez de bonnes chaussures, vous serez largement récompensé. Car ce méridien est plein de surprises. Encore faut-il avoir les coordonnées ...

Et c'est là, mesdames et messieurs, que j'interviens. Car il fallait le trouver, ce méridien invisible. Et c'est encore plus vrai aujourd'hui car la ville de Paris se montre bien négligente avec cet hommage à Arago. J'y reviendrai tout à l'heure.

Pour trouver cette ligne, ce graal en somme, je suis allé de médaillon en médaillon, aidé par une personne des services culturels de ville de Paris qui avait pitié de moi. « Il ne trouvera jamais ces trucs tout seul, » dit-elle. Armé de 135 énormes feuilles blanches sur lesquelles les arpenteurs communaux avaient dessiné chaque médaillon à l'échelle, nous avons commencé notre aventure, le regard fixé sur le sol comme si une peur obsessionnelle des crottes de chien nous préoccupait. Des passants nous prenaient pour des fous ou alors pour des agents plus ou secrets à la recherche d'un mystère impénétrable. Cela nous pris deux jours pleins. Un inventaire complet.

C'est pour dire, avec mon livre, l'on suit le méridien à la trace. Mais attention, il faut de la discipline. Il faut le suivre très précisément, en ligne droite, sans vous écarter, sans vous laisser tenter de prendre des chemins de traverse, sans vous laisser séduire par le charme et les agréments que Paris ne manquera pas de vous proposer. D'autant plus qu'on a la sensation que la ligne droite du méridien se superpose rarement au tracé capricieux des rues. Paris, vous n'êtes pas sans le savoir, a son caractère.

En tant que randonneur par méridien interposé, vous devenez une espèce de funambule sur une corde raide. Paris a de quoi vous déstabiliser mais en allant toujours tout droit, en faisant confiance aux calculs de Méchain, de Delambre et d'Arago et aussi à mon livre, vous resterez debout. Avec une étonnante facilité vous arriverez à survoler l'histoire de Paris, qui se confond souvent avec celle de la France, voir du Monde. Détail qui son importance : vous traversez l'histoire de Paris sans aucune chronologie. Comme si vous étiez dans une machine à remonter le temps devenu un peu folle. Seul le méridien est votre guide.

Je vous donne quelques exemples, un peu comme un aperçu. Le premier médaillon fût placé derrière le pavillon du Cambodge à la Cité Internationale. Déjà tout un programme. Vous avez là le périphérique qui encercle Paris, la sépare de sa banlieue et est de ce fait une sorte de mur de Berlin. Comme si Paris est un enclos où l'on n'entre pas sans montrer patte blanche. Une sorte d'oasis dans un monde hostile.

Et puis ce pavillon du Cambodge. Maintenant le bâtiment est rénové, mais il y a 15-20 ans, c'était encore le pavillon des Khmers rouges, tel qu'ils l'avaient laissé. Le pavillon était entouré de fils barbelés, les fenêtres cassées, les murs pleins des graffitis, les portes clouées : on voyaient les restes des batailles rangées entre les différentes factions. Un bout d'histoire cruelle au fond d'un parc bucolique, en contrebas les automobilistes que ne se sont jamais rendu compte de rien en prenant, là sous les fenêtres de ce pavillon de Kampuchéa, l'entrée de l'autoroute du soleil.

Un peu plus loin, nous traversons le parc Montsouris qui a de quoi vous dissiper. D'abord parce que ici la preuve est faite que la science n'est pas sans danger. Le jour de l'inauguration, à l'époque de Haussmann, un des bassins se vida tout d'un coup pour des raisons inexplicables à cet instant. Quelle honte et quel déshonneur pour l'ingénieur responsable ; il se suicida pratiquement sur le champs. Malgré ce contretemps, le parc est devenu un lieu d'agrément très

apprécié, notamment grâce à ce restaurant avec terrasse où il fait tellement bon dîner les belles soirées d'été. C'est là que Mata Hari exerçait tout son art de la séduction avec ces beaux officiers qui n'en pouvaient plus de désir et à qui elle faisait payer cher ces nuits au Grand Hôtel.

On passe ici, par l'Observatoire. Encore qu'il faut souvent faire le tour, car le jardin est régulièrement fermé au public. Un peu plus loin je vous indique les buissons où François Mitterrand a fait un saut périlleux lors de la troublante affaire de l'Observatoire. Et nous repartons quelques siècles en arrière en passant le Palais de Luxembourg où les aristocrates emprisonnés pendant la Révolution s'amusaient bien en espérant éloigner la mort qui les attendait avec le Rasoir National, surnom qu'on avait donné à la machine du bon docteur Guillotin. Il y a des médaillons à l'Académie française, enfin devant la porte. Sur les quais de la Seine. Dans le Louvre dont l'histoire est un roman en soi. Louis XIII aimait courir le renard dans les décombres de la Grande Galerie. Le chameau royal y avait droit de cité également. Bref, un palais peut en cacher un autre ...

Et on continue ainsi jusqu'au Périphérique nord après avoir grimpé jusqu'au sommet de la butte, la commune libre de Montmartre avec ses artistes dans le maquis et ses mauvais garçons dans les bordels, à moins que ça soit le contraire. Et après avoir raconté l'extraordinaire histoire des noirs américains dans cette ville lumière, dont ils disaient qu'elle était « colorblind », daltonien.

Le méridien-hommage à Arago s'arrête à la porte Montmartre. A l'origine il y avait deux médaillons. Le dernier pile poil devant la porte de la bibliothèque municipale. Une bonne entrée en matière pour ainsi dire.

Les deux médaillons disparus de la porte Montmartre ne sont pas les seuls. Sur les 135 médaillons, il ne reste peut être que la moitié. Parce qu'en moyenne on ouvre les de rues de Paris tous les trois ans. La voirie de Paris étant contre ce projet dès le départ – trop fastidieux – les exemplaires enlevés ne sont trop rarement remplacés une fois les travaux faits. Dans les parcs et jardins : la même histoire. Avec la construction du tramway par exemple à la hauteur de la Cité Internationale, les médaillons ne sont jamais revenus. Dans les environs l'on a mis des bancs qui parlent et murmurent, d'amour entre autre, mais enfin il ne se trouvent pas sur le tracé du méridien. L'Hommage à Arago est en passe de devenir la blessure d'Arago.

Souvent des Parisiens ont demandé à des compatriotes qui faisaient la promenade du Méridien, le nez toujours sur les médaillons, ce qu'ils cherchaient et quels secrets le livre qu'ils tenaient, pouvaient bien contenir. Et invariablement il posait la question si ce livre, ce guide du Méridien, existait en français. Voilà qui est fait. Et j'en suis fier. Et espérons que ce livre peut contribuer à ce que la blessure d'Arago redeviendra l'Hommage que ce grand homme, qui a vécu si longtemps ici même, a bien mérité.

*Philip Freriks,
Paris, 6 April 2009*

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INTERNATIONAL ASTRONOMICAL UNION UNION ASTRONOMIQUE INTERNATIONALE

The International Astronomical Union (IAU) was founded in 1919 to promote and safeguard the science of astronomy in all its aspects through international cooperation. Operating through its scientific bodies - 12 Divisions, 40 Commissions and some 75 Working and Program Groups, the IAU covers the whole spectrum of astronomy. The IAU currently has almost 10,000 individual members distributed over 87 countries. Of those, 63 countries are National Members. The IAU is member of the International Council for Science (ICSU).

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Cover picture:

Top left: François Arago (1786 - 1853); top right: statue of Arago, boulevard Arago, Paris (1893 - 1942); bottom left: one of 135 bronze medallions implanted in the ground to mark the Meridian of Paris as a new memorial for Arago (1994); bottom right: cartoon image from *Les Aventures de TinTin*, "Le Trésor de Rackham le Rouge," page 23, bottom middle panel. (Casterman, Brussels, ISBN 978-2-203-00188-6).