Estrela D'Alva
The Morning Star

XXVII General Assembly
August, 2009 • Rio de Janeiro • Brazil

Day 10 — Friday, August 14th, 2009

The **final session** of the **General Assembly**

The second and final session of the XXVII IAU General Assembly, conducted yesterday, began with an upbeat note: the information that the Union has passed the impressive 10,000 individual members mark.

All six resolutions to be voted during the session were smoothly approved, including the ones regarding the IAU Strategic Plan, aimed at promoting Astronomy education, with special attention for developing countries. (More about it can be found in issue 2 of **Estrela D'Alva**, and also in an interview with the new IAU President, Robert Williams, on page 2 of this issue.)

Among the resolutions, one established new current best estimates for astronomical constants (for a look at them, go to http://maia.usno.navy.mil/NSFA/CBE.html). IAU members also approved the accounts for the last three years, as well as the budget for the next three. They were informed that, from now on, IAU will adopt euros, and not swiss francs, as its official currency.

Other perspectives for the future were presented, with the announcement of new teams for several Committees, including the Resolutions Committtee, which will have Daniela Lazzaro, currently chair of the National Organizing Committee for the General Assembly in Rio, as its chair for the next General Assembly, to be held in Beijing, 2012.

The Executive Committee of the IAU was also appointed and duly approved by the General Assembly yesterday (full list on page 3). With them falls the responsibility of advancing the new IAU Strategic Plan and preparing, along with the Chinese National Organizing Committee, the XXVIII GA.

Looking even farther, the Session also announced the country and city chosen to host the XXIX GA, in 2015: the honor will go to Honolulu, in the U.S.A.

Salvador Nogueira

Pluto, **three years later**

Three years after the last IAU General Assembly, Pluto, whatever it is called now, remains under the spotlight and continues to fascinate astronomers. The little world and its moons have slowly been yielding at least some of their secrets.

In March 2009, ESO's Very Large Telescope revealed unexpected amounts of methane in Pluto's lower atmosphere. Prior to this, astronomers could study only Pluto's upper atmosphere, a tenuous layer composed mostly of nitrogen plus trace amounts of methane and carbon monoxide. The new observations reveal a lower atmosphere significantly warmer than Pluto's surface, with an average temperature of –180° Celsius.

Unlike Earth, where temperature decreases at higher atmospheric levels, Pluto has an inverted or "upside down" atmosphere, where temperatures increase at higher levels by 3-15 degrees per kilometer. And, according to a paper by Hussman et al., Pluto may even harbor a subsurface ocean, which could drive a weak magnetic field.

Equally fascinating is Charon, which may also have a subsurface ocean and shows evidence of cryovolcanism. The Gemini Observatory's Adaptive Optics System, in conjunction with its Near Infrared Imager and Spectrometer (NIRI), revealed ice deposits on Charon. High resolution spectra identify these as ammonia hydrates and water crystals in patches on the surface. A combination of liquid water and ammonia from deep within Charon could be spewing through cracks in its crust as geysers, with crystalline water ice possibly falling back to recoat Charon's surface. Spectral data strongly indicates cryovolcanism, which would mean Charon's interior possesses liquid water.

The New Horizons mission, which will study these bodies' atmospheres and geology in its 2015 flyby, took its first images of Pluto from a distance of 4.2 billion km in September 2006. The fastest spacecraft ever launched, it flew by Jupiter in January 2007 and crossed Saturn's orbit in June 2008.

Laurel Kornfeld

Fostering astronomy around the world: an interview with the IAU President

Dr. Robert Williams is taking office as President of IAU with clear goals: to continue the efforts of helping organize astronomy internationally and, furthermore, to assist countries into developing regionally their scientific potential. But there's much more to it than just that.

In the following interview, Williams speaks of how he sees the interaction between public interest and astronomy, the promise of exoplanet research and the development of astronomy in developing countries, in face of a spreading "misguided" view of science as a purely utilitarian endeavor. More of his thoughts below.

So, what are the main objectives for the IAU in the upcoming years?

Robert Williams - Historically the IAU has done a fine job of supporting international meetings and helping in the organization of astronomy, and it should continue to do so. In the coming decade it would be good for the IAU to also place increasing emphasis on the global development of astronomy. The new Strategic Plan discussed at this GA advocates this and proposes a number of initiatives that will assist countries in strengthening their astronomy infrastructures, education and outreach efforts.

There has been recently a great emphasis in innovation, patent-seeking research, coming especially from policy-makers. Is that damaging basic science?

Williams - I wouldn't say damaging so much as misguided. Astronomy is a pure science; it exists to satisfy human curiosity. Yes, there is great pressure in governments to justify programs that can address basic human needs. One cannot argue against this, but satisfaction of curiosity and the creative spirit have fallen out of favor. My response is: if you seek the ideal society where the basic needs are all satisfied, visit your local prison! The pursuit of knowledge has a far greater effect on the human spirit than it is given credit for.

In which areas of astronomy do you feel will come the most exciting discoveries in the immediate future?

Williams - Exoplanets. Dark energy and matter will certainly be great discoveries when they have been understood, but I suspect that is likely to require a few more years. As someone who has devoted so many years to trying to understand the many aspects of the nova outburst, I would like to answer your question: novae! But, let's be realistic.

Having spent a significant fraction of your professional life in a developing country, how do you see astronomical research in South America?

Williams - It has been a source of real satisfaction to see astronomy developing so well in South America. There is still much to be done, especially in some of the countries with smaller economies. My impression of astronomical research in this continent is that, while appreciated and valued by the public, it may be considered more of a luxury, i.e., less essential, than it is in developed countries.

How do you see the importance of astronomy as part of the educational system?

Williams - Education is one of astronomy's greatest strengths. The public is fascinated with astronomy, the universe, life on other worlds, and we should place high priority on making astronomy a key part of early childhood education. It is said that images from the Hubble Space Telescope have overtaken dinosaurs as the most common classroom poster in U.S. schools!

Today, it is undeniable that astrobiology is what captures the public's attention. Do you feel that is good or bad for astronomy in general?

Williams - Frankly, I share that same interest in astrobiology. Any interest the public has that is related to astronomy is good. We should encourage it. Astronomy is funded largely by the public, through taxes, so we should take their interest into account. At the same time, we should try to influence public thinking with our discoveries.

Some astronomers, especially in the U.S., have been critical of IAU's authority to establish which celestial bodies are or aren't planets. Do you feel that, behind that, there's a deeper challenge for the organization, that is, to keep all astronomers united?

Williams - The Statutes and Bye-Laws allow for the introduction of resolutions, some of which are controversial. Do I feel that there is a challenge for the IAU to 'keep all astronomers united'? NO. Inconceivable. The IAU has the responsibility to encourage every individual who has the good fortune to be able to look up at the sky to try to understand what they see. Honest differences are inevitable and healthy.

Salvador Nogueira

Pulsar Planets

The IAU Working Definition of "exoplanet" currently describes any and every planetary-mass type object found beyond our Solar System. The term necessarily covers pulsar planets too (they are listed in Comission 53's working list).

Yesterday, **Estrela D'Alva** reported that the first exoplanet ever found was that of 51 Pegasi (in 1995). However, Alex Wolczcan and Dale Frail discovered the first exoplanets of any kind known to mankind in 1992. These orbit a pulsar. They were found from timing observations made at Arecibo, and then confirmed, by reobserving them at the VLA.

Attendees at the IAU General Assembly in Buenos Aires in 1992 may remember that an earlier claim had been made for a similar discovery by Andrew Lyne. That system had a period very close to an Earth year. It had in the fullness of time to be retracted.

B. M. Lewis

Message from the outgoing IAU President

For the 90th anniversary of IAU, the Secretary General has collected the memories of six past Presidents of the IAU in the Information Bulletin 104. Like them, I can state with confidence that being an IAU President is a light job: the entire burden of running IAU falls upon the General Secretary. I was fortunate in that "my" General Secretary was Karel van der Hucht, whose dedication to the union has been total. We suffered a bad blow when IAU Executive Assistant Monique Orine died in January 2008, leaving the office in a difficult situation. Luckily, we hired almost immediately Vivien Reuter to replace Monique, and Karel and Vivien together have orchestrated a fantastic recovery.

Like Karel and Ian, I can rejoice retrospectively at the excellent working atmosphere prevailing in our little group of Officers, as well as in the Executive Committee and also with the experienced Chair of the Finance sub-Committee, Paul Murdin, who has really been there for us in the hour of need. The Vice Presidents have each agreed to carry out a specific task for the Union. George Miley spearheaded the IAU Decadal Plan for Astronomy for the developing world; it remains for Bob and Ian, and then Norio and Thierry, to bring it to fruition: in particular to undertake the difficult task of raising the necessary funds, and, if possible, generate a generous host for the Global development office. Note that this plan covers only one subset of IAU activities, so there is more strategic thinking ahead; in fact, strategic plans always need to be reconsidered and adapted, but they remain an excellent method to trigger meaningful changes.

Like Karel, I have learnt a lot about the IAU these three years, and the more I know, the more I find the Union interesting and useful. I had a number of new experiences: I have taken part in a teaching venture in Kathmandu, and found it extremely gratifying. I advise all of you to try, as we have a great need for volunteers. I have also helped setting up the first MEARIM, in Egypt, and for this I am very pleased, as it was successful and will soon become a tradition at IAU.

But of course the highpoint of my presidency was the preparations and the launch of the International Year of Astronomy 2009 (IYA 2009). One of my early tasks was to lead the IAU delegation that went to New York, at the end of 2007, to lobby in favour of IYA at the United Nations. It was a momentous time. We were delighted to see that our proposal was extremely well received, and indeed the UN endorsement soon followed. In 2006 the Executive Committee established an IYA Working Group. I felt that this task was so important, in the years of my presidency, that I held the Chair of the Working Group, with the IAU Press Officer, Lars Christensen, as super efficient secretary. We soon agreed on the necessity of establishing an IYA Secretariat in charge of the global coordination of the activities. I was at ESO at the time, and we decided to put it at ESO, managed by Lars. We hired Pedro Russo, and later Mariana Barrosa, and, I am tempted to say, the rest is history. I have enjoyed working on a regular basis with Lars, Pedro and Mariana. I am proud of the work accomplished and of the results obtained. I will continue chairing the Working Group till the end of next year, which will be devoted to an evaluation of IYA activities and impact. The exchanges and feedback with Single Points of Contact, chairs of Cornerstones and of Special projects, astronomers and amateurs, have been an incredibly rewarding personal experience which I will never forget.

One of the goals of IYA is:" Provide a modern image of science and scientists", and I'll end this farewell as IAU President with a quote from the Guardian, on its editorial page on IYA2009, Saturday 25 July 2009: "Astronomers around the world compete, co-operate and confer; they are a global community, in the richest sense of the term, and we owe to them our understanding of space and time, and light, and mass, and gravity: in a word, everything."

Catherine Cesarsky

Millimagnitude Photometry at Every Observatory

Would you like to produce high precision light curves that when analyzed could provide fundamental data of unprecedented precision? If so, consider doing infrared photometry with the passbands designed by the Infrared Working Group (IRWG) of Commission 25.

But, you say, we have never done any IR photometry at my observatory; it is located at a site with modest elevation, not high in the mountains. Not to worry: the IRWG suite of near-IR passbands is designed so that you too can use these passbands and potentially get good results — provided the sky is photometric (in other words, good enough to do high-precision optical photometry).

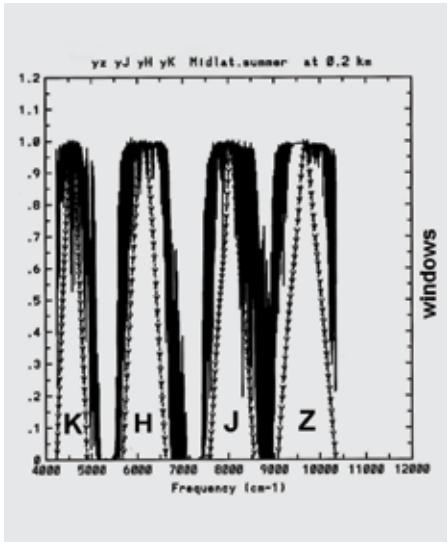
The IRWG passbands are specifically shaped and placed within the spectral windows of the Earth's atmosphere to avoid the worst effects of water vapor, and for all models. They have lower atmospheric extinction, better S/N, and less sensitivity to water vapor, than the existing JHK... passbands — new or old.

An IAU Joint Commission Meeting (9 & 25) met at the 1988 GA to discuss why JHKL photometry, although capable of producing excellent photometric light curves (Raleigh scattering is weak in the IR), suffered unexpected extinction variations.

The JCM identified the cause of the problem and recommended solutions. These, described in Milone (Springer Lecture Notes in Physics, 341,1, 1989), involved a recommendation that the Johnson JHKLMNQ filters then in use be examined and, if needed, new filters designed that would be better located within the windows.

In 1991 the IRWG was formally established by Commission 25 at the Buenos Aires GA. The tools to do this, the plan of attack, and recommendations were published in Young et al. (A&AS 105, 259, 1994). In the late '90s Custom Scientific of Phoenix, Arizona produced the near-IR suite of filters (iZ, iJ, iH, iK).

Testing and results are described in Milone & Young (PASP 117, 485, 2005). News: Custom Scientific now offers low prices for the IRWG filters if ordered in bulk. If you are interested in getting a set of IRWG filters, contact Eugene F. Milone (milone@ucalgary.ca).



Eugene F. Milone

The new IAU Executive Committee

The IAU Secretariat has the pleasure to announce the constitution of the IAU Executive Committee 2009 – 2012.

Officers:

President
Robert Williams (USA)
President-Elect
Norio Kaifu (Japan)
General Secretary
Ian F. Corbett (UK)
Assistant General Secretary
Thierry Montmerle (France)

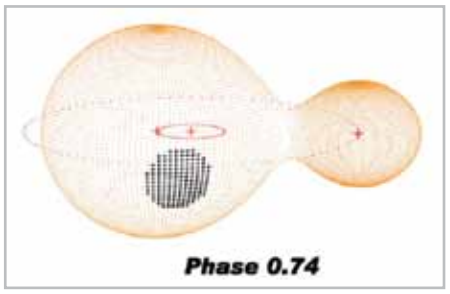
Vice-Presidents:
Matthew Colless (Australia)
Martha P. Haynes (USA)
George K. Miley (Netherlands)
Jan Palouš (Czech Republic)
Marta G. Rovira (Argentina)
Giancarlo Setti(Italia)

Advisers:
Catherine J. Cesarsky (France)
Karel A. van der Hucht (Netherlands)

AW UMa is not an **AW UMa-type Binary!**

Often, variable star astronomers name binaries after prototypes. Of particular note are the Algols (EA), Beta Lyrae (EB) and WUMa (EW) binaries. Two other major types are the V1010 Oph and the AW UMa Binaries. V1010 Ophiuchi objects are solar type near contact binaries. However AW UMa's are thought to be the final stage in binary star evolution. After this stage the stars coalesce and become fast single rotating FK Comae stars or fast rotating A-type stars. In clusters, these are known as 'Blue Stragglers'.

The AW UMa's are over contact, high fill-out binaries usually with wide total eclipses but shallow amplitudes. This betrays the fact that they have extreme mass ratios, on the order of 0.2 or less. These stars are thought to be billions of years old and are heavily spotted solar type binaries. The driving mechanism for their slow coalescence is the torque supplied by out flowing winds along 'stiff' magnetic field lines originating from the solar-type stars. Their periods steadily decrease as they lose angular momentum. However, recent precision photometry by T. Pribulla and S.M. Rucinski (MNRAS 386, 2008, 377) has called into question this whole scenario. They have found that AW UMa is not even in contact! It is a detached binary with gas streams that simulate contact. AW UMa is not an AW UMa-type Binary!



GSC 1283 0053. The Surface Geometry of a "AW UMa" Binary.

Thus, it joins Beta Lyra, which is not a Beta Lyra system either! (It is a W Serpentis Binary!) So much for prototypes! This system was discussed at the commission 42 science session on Wednesday. Dr. Ron Samec (Bob Jones University) discussed the characteristics of this group. This opened up to a discussion by Dr. Slavek Rucinski of the prototype—which is no longer an AW UMa So much for prototypes!

Ronald G. Samec

Invitation to **Beijing**

With great pleasure, we invite you to attend the IAU 28th General Assembly (GA), which will be held in Beijing, China, August 20-31, 2012.

Beijing, the capital of China, is situated in the northeastern part of the country with more than 3,000 years of history and a population over 17 million people. Many historical places of interest including the Great Wall, Summer Palace, Temple of Heaven and Forbidden City are located in Beijing. The successful hosting of the 2008 Olympic Games has improved the city's infrastructure vastly.

Chinese astronomy has over 4,000 years of history with great development over the past 30 years. During the IAU 26th GA in Prague 2006, Beijing was appointed to host the IAU 28th GA. The formal agreement between the IAU and the Chinese Astronomical Society (CAS) was signed on April 18, 2007.

The IAU 28th GA will be held at China National Convention Center (CNCC). Opened on the July 26th 2009, CNCC is China's latest and largest conference center, with superior geographical location and full facilities. It is ideally located in the heart of Olympic Park, with the Bird Nest (China National Stadium) and Water Cube (National Aquatics Center) on either side.

There are around 30 hotels ranging from budget to 5-star within 3 kilometers with ample restaurants and food courts nearby. Related information is available at http://www.astronomy2012.com.

We will do our utmost to organize a successful and unforgettable IAU GA in Beijing for you. As we always say, China loves IAU and IAU needs China! Looking forward to seeing you in Beijing 2012!

Chinese Astronomical Society
NOC and LOC of the IAU 28th GA

Message from outgoing **IAU General Secretary**

The International Astronomical Union was founded in Brussels 90 years ago, with the mission of fostering collaboration among scientists in the world. Young in comparison to the world's oldest science, the IAU is still sufficiently long-lived to have a rich tradition. I am pleased to be part of this venerable heritage.

Trained as a research astronomer and specializing in the astrophysics of Wolf-Rayet stars, I focused my research mostly on that field, observing at all wavelengths from the ground and from space. Between 1990 and 2002 I helped to organize, among other things, four IAU Symposia and edited the proceedings. That may have been why I was suggested for the position of IAU General Secretary - a role which I have strived to fill these past three years.

I give you 3 good reasons why I have enjoyed being your General Secretary.

1. Working for the IAU as General Secretary brought me in touch with colleagues working in all fields of astronomy. That enriched my life.

2. I had the privilege to work with very motivated and dedicated fellow Officers and fellow EC members. That made my job as General Secretary very gratifying.

3. Working for the IAU Secretariat as General Secretary means working for three years part-time in Paris: a rare opportunity to become familiar with a beautiful and fascinating city. Due to circumstances beyond my control, I saw mostly the walls of my office at the IAU Secretariat. My wife got to see Paris. That's fine too.

It would be exaggerated to claim that I now know all about the IAU. In a Union with 63 National Members, over 10000 Individual Members organized in 12 Divisions, 40 Commissions and 75 Working Groups & Program Groups, there is always more to learn. The best way to get to know the IAU is doing the editing of the General Secretary's trilogy: the Highlights of Astronomy, the Proceedings of the General Assembly (Transactions B), and the Reports of Astronomy (Transactions A). These volumes may be described by some of you as the books which nobody reads, but editing them was for me an extremely useful and revealing exercise to become informed about the activities of the IAU membership.

Three years may seem a long period in the beginning, but they feel like a short stretch at the end. The triennium from August 2006 to August 2009 was marked by continuous series of important activities and developments, both anticipated and unexpected. There is much to be grateful for and there are many to be grateful to. My sincere thanks go to:

• my home institute SRON in Utrecht, the Netherlands, for giving me leave of absence for effectively 4.5 years, to work as AGS and as GS for the IAU;

• my fellow Officers Catherine Cesarsky, Bob Williams and Ian Corbett. In the past three years we have shared much of our work for the IAU, leading to a fruitful and effective cooperation;

• all preceding General Secretaries, who were always there to give advice in a most constructive way;

• the staff of the IAU Secretariat in Paris, in particular my Executive Assistant Mme Vivien Reuter. Mme Reuter joined the Secretariat at a very difficult time. Together we had to re-invent the Secretariat, often hanging on by our fingernails, but surviving. Vivien, without you the IAU Secretariat would not be in as good shape as it is today;

• and our very motivated National Organizing Committee for this IAU XXVII General Assembly, co-chaired by Daniela Lazzaro and Beatriz Barbuy, who have invited us to this beautiful city, Rio de Janeiro, and who made this General Assembly happen. We would not be here without their intense efforts.

But most of all I want to thank my wife Riëtte. Riëtte, I could not have done this job without you. I am here because of you. Thank you.

Karel A. van der Hucht