COMMISSION 46
ASTRONOMY EDUCATION AND DEVELOPMENT
Education et Développement de l'Astronomie

Newsletter 71 – October 2009

Commission 46 seeks to further the development and improvement of astronomical education at all levels throughout the world.

Contributions to this newsletter are gratefully received at any time.

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http://physics.open.ac.uk/~bwjones/IAU46/

Note that the "official" site http://iau46.obspm.fr/ is no longer in operation

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EDITORIAL

Thanks to everyone who has made a contribution to this edition of the Newsletter.

For the March 2010 issue the copy date is **Friday 12 March 2010**. If you can include photos or illustrations with any material, please do so. Feel free to encourage others to submit material – anything with an astronomy education or development aspect will be considered.

IAU C46 NEWSLETTER – GUIDANCE FOR CONTRIBUTORS

> The editor is happy to accept articles on any aspect of astronomy education or development, including obituaries and other articles on people. 500-2000 words are the approximate upper and lower limits. Shorter contributions, up to a few hundred words, such as meeting announcements, meeting reports, and other news items, are also welcome.
>
> Send contributions to me by email, at b.w.jones@open.ac.uk. You can either send a Microsoft Word attachment (preferred) or include the text in the body of the email. **Illustrations should be sent as separate, individual files**, preferably as JPEGs or TIFFs no larger than about 3 Mbytes each. **DO NOT SEND ANYTHING AS A PDF.**

I try to edit as lightly as possible, and I certainly don't care whether US English or British English is used. I also leave local turns of phrase untouched unless the meaning is obscure. Clarity, conciseness, and being interesting or informative are what is needed. Only in rare cases is heavier editing necessary.

In this issue I've included **three book reviews**. This is a new feature which will be reconsidered on the basis of feedback from you. Reviews must be of books centred on astronomy education or development. If there's such a book that you think is worth reviewing, please send your review to me. If I'm inundated with reviews then either the feature will be dropped, or I'll select a few that I consider to be the most appropriate and useful.

The C46 websites

Recall that in September 2007, the C46 website was transferred to the Observatoire de Paris. The URL is on the title page of this Newsletter – http://iau46.obspm.fr/ Unfortunately this has not worked out. Therefore, our President and others are in the process of establishing the "official" C46 website elsewhere, where it will be properly maintained.

My mini-website was set up over a year ago in order to overcome the inadequacies of the Paris website. It includes the things for which I am responsible: the Newsletter (including back issues – see below); National Liaison details; and National Liaison triennial reports for 2003-2006 and 2006-2008. The URL is http://physics.open.ac.uk/~bwjones/IAU46/.

Back issues of the C46 Newsletter

Since I took over as editor in October 1998, the Newsletters have appeared in March and October in every year. These are all available on my website, at http://physics.open.ac.uk/~bwjones/IAU46/. Newsletter 49, October 1998, has been scanned from hard copy, so the quality of reproduction is only modest. This is also he case for earlier ones, edited by John Percy. These extend back to February 1992, but there are gaps.

Barrie W Jones
(for contact details see Program Group Chairs and Vice Chairs)

MESSAGE FROM THE PRESIDENT

The International Year of Astronomy 2009 is an important challenge for the IAU and this is a challenge for our Commission 46. For 12 days, the General Assembly in Rio had the special opportunity of introducing new changes in accordance with the Decanal Plan put forward by George Milley, in order to prepare the way for new IAU enterprises in future years. According to this plan a different framework is necessary for the future of Commission 46. We have to introduce some changes.

The most important Program Groups (PGs) retain their activities. Some others were integrated in order to be more operational. The new Program Group, announced in March 2008, on training teachers for primary and secondary schools, starts operating under the name of NASE (Network for Astronomy School Education). At the moment the list of Programme Groups in service is:

PG for the Worldwide Development of Astronomy – WWDA
chair: John Hearnshaw (New Zealand)

PG for Teaching Astronomy for Development -–TAD
chairs: Ed Guinan (USA) and Larry Marschall (USA)

PG for International Schools for Young Astronomers – ISYA
chair: Jean-Pierre de Greve (Belgium)

PG for Network for Astronomy School Education – NASE
chair: Rosa M Ros (Spain)
vice-chair: Beatriz García (Argentina)

PG for Collaborative Programs
(activities co-sponsored by UNESCO, COSPAR, UN, ICSU & other international organizations)
chair: Hans Haubold (Austria)

PG for Commission Newsletter & National Liaisons – CNNL
chair: Barrie Jones (UK)

PG for Public Understanding at the Times of Solar Eclipses and Transits Phenomena – PUTSE
chair: Jay Pasachoff (USA)

The Program Group, Exchange of Astronomers, was moved from Commission 46 to the new office created according to the Decanal Plan, with the aim of achieving visibility, promoting future young astronomers' interests, and planning to increase exchange activity.

Due to the important work carried out by the Cornerstone Projects of IYA2009, its continuity after 2009 was considered. Several of these Cornerstone Projects could be integrated into Commission 46 in some way. Those involved in the Galileo Teacher Training Programme, Universe Awareness, and Developing Astronomy Globally showed interest in this possibility, but the IYA2009 EC WG decided to take a decision after December 2009. The best idea is to find a general solution for all of the projects, when we know how many of them are planned to continue after IYA2009.

As on other occasions, there are now new members in the IAU after the General Assembly in Rio. Commission 46 needs to attract several of them to work with us. If you know some of these new members, encourage them to join our PGs and participate in our activities. After IYA2009, astronomy should be even more present in society and our Commission should be one significant way of achieving this. We need to involve dynamic members, and in particular young members, in order to increase our actions and promote astronomy education and astronomy development in all the countries.

Finally, we need further new members, but especially in my considered opinion we need new ideas, programmes and suggestions in order to contribute as a group in the progress of astronomy education in the world. Please, if you have new proposals email ros@ma4.upc.edu

The new C46 Organizing Committee (OC) is as follows
President: Rosa M Ros (Spain)
Vice-President: John Hearnshaw (New Zealand)
Retiring President: Magda Stavinschi (Romania)
plus a Society Organizing Committee (SOC) consisting of chairs (and vice-chairs) of the Program Groups
Jean-Pierre de Greve, Ed Guinan, Hans Haubold, Barrie Jones, Larry Marschall, Jay Pasachoff and Beatriz García.

Rosa M Ros
(for contact details see Organizing Committee of Commission 46)

ASTRONOMY IN CAMBODIA

1 Introduction

This report to the IAU Executive Committee and the IAU President describes my visit to Cambodia between 27 April and 02 May 2009, sponsored by IAU Commission 46. The purposes were to deliver lectures at the Royal Phnom Penh University, to introduce the IAU, and to learn about the present state of astronomy teaching and research in Cambodia, by meeting with professors and students of the Faculty of Sciences, Royal University of Phnom Penh (RUPP), and the Institute of Science and Technology, Royal Academy of Cambodia. It is noted that Cambodia is not a member state of the IAU yet. On my trip to Cambodia I was accompanied by Dr Boonrucksar Soonthorntum of the National Astronomical Institute of Thailand (NARIT).

Cambodia is a country with a population of around 14 million and led by a prime minister in a monarchy parliamentary system. The national language is Khmer, but French is widely spoken among people with a higher academic background.

2 Royal Phnom Penh University

The Royal Phnom Penh University (RUPP) is the biggest university in Cambodia, consisting of more than 9000 students. A very nice looking homepage of this university can be found at http://www.rupp.edu.kh. During my time in Cambodia, I visited the Faculty of Sciences, where study and teaching in astronomy can be pursued. Our formal host was Professor Ing Heng, the Dean of the Faculty of Science. Along with him was Dr Chuum Navy, the head of the Department of Physics. Other younger staff members with a Master's degree who acted as guides and had a lot of discussions with us were Chey Chan Oeurn, Hen Koy, and Tharit Sriv.

Dr Boonrucksar (left) and staff of the Department of Physics of RUPP

I gave two lectures at RUPP, mostly with a scientific audience. Those two lectures were
The Stars (28 April 09.00)
Optical Astronomical Observations (30 Apr 09.00)
and were attended by more than 50 students, mostly undergraduates of the Department of Physics.

On 30 April 2009, I and Dr Boonrucksar met staff of the Department of Physics. On that occasion three presentations were made, i.e.
Why all countries should support astronomy and how the IAU can help (Hakim L Malasan)
South East Asia Astronomy Network (Boonrucksar Soonthorntum)

International Olympiad on Astronomy and Astrophysics (Boonrucksar Soonthorntum)
We had a limited, yet lively, discussion with the staff that apparently showed their interest in IAU programs, especially Teaching Astronomy for Development. Obviously the astronomical community in Cambodia badly needs good resources, such as text books and educationally oriented journals in astronomy and astrophysics. Access to astronomical equipment is badly needed by staff of RUPP. In this connection, Thailand has offered a good opportunity to RUPP staff to visit and use the forthcoming NARIT facility in terms of joint research as well as pursuance of higher degrees in Thailand's universities.

A quite memorable activity was the practical session, conducted on 29 April 2009. I introduced the You are Galileo telescope kit to the students, and led them in the assembly of this small telescope. At the same time Mr Oeurn brought the Celestron 80 mm refractor presented to Cambodia during the 2nd International Olympiad in Astronomy and Astrophysics held in Bandung Indonesia last year. This telescope had never been taken out of its box until I came. Then, we opened the box and installed the telescope together with the staff and students. This date marked the beginning of telescope use in the classroom for the students of the Department of Physics.

Students after their assembly of the You are Galileo telescope

3 Royal Academy of Cambodia

The Royal Academy of Cambodia is the biggest research institution in Cambodia, located in a small area divided from RUPP. Its establishment is aimed at advanced research in several strategic fields, including Asian Studies, the Institute of Humanities and Social Sciences, and the Institute of Science and Technology. Although it was established several years ago, no significant activity has yet taken place. The Institute is led by the General Director, Professor Eap Ponna, PhD. I took an opportunity to visit this Institute on the last day. Unfortunately there is no written document on the profile of this Institute which can be acquired. I feel that this Institute should be a base for advanced research in science including astronomy, and could be a prospect for the exchange of researchers in astronomy and astrophysics in the future.

4 Overall impressions

It seems clear that Cambodia has a minor development of professional astronomy. As is usually the case, human resources are one of the main problems in starting astronomy studies in Cambodia.

Publications in astronomy are almost absent from the libraries and this is also an important problem.

5 Conclusions and Recommendations

It is clear that poor human resources are the main problem in Cambodia in boosting astronomy at graduate level. It is a long way from being able to initiate a viable PhD program. It is mandatory first to establish some courses on astronomical subjects so that students of physics can take these courses and be trained in astronomical research. This should be done initially with the help of visitors from abroad.

It is recommended that

1. The IAU supports the visit of professors to Cambodia to help to establish courses on astronomy that may be selected by physics students. This support should last at least 2 or 3 years.
2. It is not necessary to invest in expensive observing equipment if there are no people able to treat and discuss the observations in a proper way.
3. There should be a way by which some of the most important astronomy journals at graduate level are made available to the physics students.
4. For a university like RUPP the usage of the concept of the Virtual Observatory is also very important and promising. Properly trained visitors should teach how to search for data and treat them on a physical basis. This is a very important subject in training courses in astronomy.
5. Probably a Visiting Professors Program, sponsored by the IAU (through TAD), would be quite useful at this time in Cambodia.
6. It will be also be useful for visiting scientists and professors to talk with the Faculty of Science RUPP and the Institute of Science and Technology, Royal Academy of Cambodia, which are the government agencies promoting science in Cambodia, in order to explain some requirements of the research process with an emphasis on astronomical research.

The author (Middle, second row), Dr Boonrucksar, Dr Navy, Mr Oeurn, with students of the Department of Physics, RUPP after a lecture by the author.

Appendix: Contacts in Cambodia

- Prof Ing Heng, Dean of Faculty of Science, Royal University of Phnom Penh (RUPP). Ingheng@rupp.edu.kh, ingheng1951@yahoo.com

- Prof Eap Ponna, PhD, General Director of Institute of Science and Technology, The Office of the Council of Ministers, Royal Academy of Cambodia. Eap_ponna@yahoo.com
- Mr Chey Chan Oeurn, MEIE, Lecturer at Physics Department, Faculty of Science, RUPP. chanoeurn@rupp.edu.kh
- Dr Chumm Navy, Head of Physics Department, Faculty of Sciences, RUPP
- Tharith Sriv, MEng, Lecturer, Physics Department. tharith@rupp.edu.kh

Acknowledgements

I wish to thank my principal host, Professor Ing Heng, Dean of Faculty of Sciences, Royal University of Phnom Penh, for making all the arrangements for my visit to Cambodia.

I also thank M Chey Chan Oeurn and Mr Tharit Sriv and also Prof Boonrucksar Soonthornthum (NARIT, Thailand) for accompanying me throughout our stay in Phnom Penh. Dr Chumm Navy is also acknowledged for arranging class and student attendance at our lectures.

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ASTRONOMY IN THE REPULIC OF MAURITIUS

Summary

A report is presented (to the IAU Executive Committee and the IAU President) on astronomy in Mauritius, based on a nine-day visit there by the writer in March 2009, sponsored by the International Astronomical Union. The visit was hosted by the Physics Department of the University of Mauritius.

Arising from this visit, several recommendations are made to the IAU for developing astronomical teaching and research in Mauritius. The key recommendations are that astronomers currently working in Mauritius should be nominated to join the IAU as soon as possible, and that the national membership of Mauritius in the IAU should be a goal for some date in the near future, probably in 2012. Follow-up activities by other C46 Program Groups in Mauritius should now be encouraged; in particular, there are good opportunities for TAD (Commission 46 program group Teaching for Astronomy Development) to hold an astronomy school for undergraduate and graduate students in Mauritius at some time within the next few years.

1 Introduction

I visited the Republic of Mauritius over nine days in early March (02-12 March) 2009 as chairperson of the IAU Commission 46 Program Group for the World-wide Development of Astronomy (PGWWDA). The purpose of my visit was to assess the current situation in Mauritius concerning astronomical teaching and research and to make appropriate recommendations to the IAU on possible future development of astronomy in that country.

Mauritius is a small island nation about 900 km east of Madagascar in the Indian Ocean. It lies at about 20° S, so is within the tropics (coordinates are 57.7° E, 20.1° S). The dimensions of Mauritius are about 45 km E-W and 65 km N-S. Within this small area (of just 2040 km^2) there live 1.26 million people, so the population density is relatively high. The topography is partly undulating arable land used for sugar cane plantations, as well as a number of mountain ranges rising to about 800 metres. The mountains are volcanic in origin, and many have precipitous cliffs and dramatic jagged peaks.

In its history Mauritius was visited by Arabs, Portuguese and Dutch, but none of these settled permanently. The French came in 1715 and established a colony. They imported slaves from Africa to work the sugar cane plantations in the 18th century. The British invaded Mauritius in 1810 and replaced the French administration. During the nineteenth century indentured Indian labour was brought to Mauritius by the British. The island then remained a British colony until independence in March 1968.

As a result of its history, Mauritius has a unique mix of Indian, African, French, and British cultures. Ethnically about two-thirds of the population are Indian, a quarter creole (African mixed race) and there are small numbers of Chinese (3%) and French (2%). All Mauritians are fluent in English (the official language, which is used in all government departments, schools and universities), French (the main language of business and the media), and Creole (a derivative of French and African languages). In addition many also speak Hindi, Bhojpuri (a derivative of Hindi) and a few speak Chinese. The main religions are Hinduism, Islam and Christianity.

The country is therefore a remarkable mix of cultures, languages and religions, all living harmoniously together in a very progressive and stable parliamentary democracy based on the British Westminster system. The education, health care and social security systems are all highly developed. The standard of living and literacy rates are correspondingly high. The economy is based on tourism, sugar, textiles, financial services, ICT, and fish processing. Economic growth of 5-6% was maintained for many years until 2008, and the GDP/capita is $12400 (US) (PPP adjusted, in 2008). This is amongst the highest of any African nation. Although Mauritius has few natural resources, the prosperity of the country immediately strikes the visitor, with the high standard of housing, excellent road system, and relatively low unemployment rate (8% in 2008) compared with many African countries.

2 Astronomy and science in Mauritius

2.1 Physics Department, University of Mauritius

The University of Mauritius is the main university of the country and the Physics Department is one of six departments in the Faculty of Science. There are eight physics academic staff, three of whom are radio-astronomers. Astronomy is taught as an option in the three-year physics BSc program, with two second-year courses (Astrophysics and Astronomical Techniques) and the possibility of a research project in astronomy at the third year.

My host at the University of Mauritius was Dr Shailendra Oree, one of the eight academic staff members in the Physics Department. His interests are in electronics and thermal and microwave physics. At the time of first contacting the university, Dr Oree was Head of the Department; this role is now undertaken by Dr Girish Beeharry (a radio-astronomer). Dr Oree made all the local arrangements for my visit.

The prominent role of astronomy in the physics teaching at the university arises from the establishment of the Mauritius Radio Telescope (MRT) in the east of the island in the early 1990s by astronomers at the Raman Research Institute in Bangalore, India, notably Prof Ch V Sastry.

The university has about 8500 students of whom some 900 are enrolled in the Science Faculty and about 120 are majoring in physics (that is 40 per year). In addition to the BSc degree, the university also offers MSc, MPhil and PhD degrees in physics and astronomy. At the present time the MRT has produced about seven PhD theses, two MPhil theses (this is higher than an MSc), and one MSc thesis. It has also produced about 50 undergraduate reports.

The three astronomers in the Physics Department are

- Associate Prof Dinesh Somanah (dinesh@uom.ac.mu), formerly Head of MRT
- Associate Prof Nalini Heerall Issur (nalini@uom.ac.mu), head of MRT
- Dr Girish Beeharry (gkb@uom.ac.mu), head of the Department of Physics

In addition, Mr Gauribidanur Rajasekhara is an expert observer at the MRT (r.gauribadinur@uom.ac.mu). The Pro-Vice Chancellor for Research, Consultancy and Innovation, Prof Soonil Rughooputh, also has a professional interest in astronomy and has published in the area of image processing for the automated classification of galaxies.

In June 2001 a UN-ESA Workshop on Basic Space Science was organized in Mauritius and hosted at the University. The workshop was attended by about 65 students and other participants from 28 countries, and had the theme Exploring the Universe – Sky Surveys, Space Exploration and Space Technologies. The proceedings were published in Developing Basic Space Science World-Wide: a Decade of UN/ESA Workshops, edited by Willem Wamsteker, Rudolf Albrecht, and Hans J Haubold. Kluwer Academic Publishers, Dordrecht, 2004.

There have been other astronomical meetings held in Mauritius. In 1997 a conference was organized at the MRT, Low frequency Radio Astronomy, where there were some 40 participants, including some leading radioastronomers from the USA, Netherlands,, Australia, India, France, Italy, UK etc.

In June 2004, there was a small conference organized on the occasion of the transit of Venus. At the same time, a team from NASA visited Mauritius. They took the opportunity to give an award to the MRT team for excellence in education and discovery.

The University of Mauritius is one of two universities in Mauritius. The other is the University of Technology, Mauritius (UTM) which has about 1500 students and was founded a few years ago.

2.2 Mauritius Radio Telescope

I visited the Mauritius Radio Telescope (MRT) on the afternoon of 6 March. It is located near Flacq in the north-east of the island, about 45 minutes drive from the university campus.

The telescope was established in the early 1990s as a result of a collaboration between the University of Mauritius and the Raman Research Institute in Bangalore. The leading astronomer promoting the project was Prof Ch V Sastry (who is now retired). The MRT represents one of the largest and most expensive single pieces of scientific research equipment in Mauritius, and therefore it has a high profile in the country. A description is found in the paper Low Frequency Radio Telescope at Mauritius for a Southern Sky Survey, Golap K, Shankar N U, Sachdev S, Dodson R, and Sastry C V, J Astrophys Astro, Vol 19, 35 -53 (1998).

The MRT is a synthesis radio telescope that is used to make images of the sky at a frequency of 151.5 MHz. The MRT was primarily designed to make a survey with a point source sensitivity of 150 mJy. The plan was to produce a southern extension of the Cambridge 6C survey at this same frequency. Its resolution is about 4 arcmin. The MRT is a T-shaped array consisting of 1019 fixed helical antennas in the east-west arm (2 km) arranged in 32 groups, and 64 helical antennas, four per trolley, on 16 movable trolleys in the north-south arm (880 m). There is a single trolley in the north arm. The north-south arm is built along the old Port Louis to Flacq railway line. The MRT uses aperture synthesis to simulate a 1 km by 1 km filled array.

Although the MRT was primarily designed to conduct the 151.5 MHz survey, it has also been used for pulsar observations, which is the special interest of Dr Nalini Issur. During pulsar observations, only the east-west arm is used. The group outputs are added together, with a tracking capability of about two degrees for a source transiting at the meridian. This corresponds to 8 minutes for an equatorial source

A point source catalogue of around 100 000 objects is to be produced. Already 3 observation rounds of the southern sky have been made. In addition, solar data have also been collected. About 300 gigabytes of raw data have been collected over some 6 years until 2001. There are plans now to upgrade the telescope, possibly converting it into a solar radio-heliograph.

At the present time the MRT has produced about seven PhD theses, two MPhil theses (this is higher than an MSc) and one MSc thesis. It has also produced about 50 undergraduate reports. One of the PhD graduates is Dr Kumar Golap, who is now permanently in the USA working on the VLA in New Mexico. The pioneers of the MRT in Mauritius from the late 1980s were Kumar Golap, Dinesh Somanah and Nalini Issur (the latter two being still at the University of Mauritius). All of these people completed their PhDs using the MRT.

Another PhD graduate is Dr Nadeem Oozer who is now working as a radioastronomer in South Africa for that country's SKA bid. Mauritius could play an important role in the SKA if South Africa is chosen as the main site.

2.3 Mauritius Astronomical Society

The Mauritius Astronomical Society (MAS) was founded in 1988 by Father Eamonn Mansfield (1934-95), an Irish Catholic priest who taught physics at St Esprit College.

They hold monthly meetings. I met the treasurer of the society, Mr Bhasker Desai, at the Rajiv Gandhi Science Centre (RGSC), and I also met Mr Serge Florens, an MAS member both at RGSC and at St Esprit College, but I had no formal meeting with any other society officers.

2.4 Rajiv Gandhi Science Centre, Port Louis, Mauritius

The Rajiv Gandhi Science Centre is a non-formal educational institution for the promotion of science and technology among students and members of the public. It is the first of its kind in Mauritius and the region, and the centre operates under the aegis of the Ministry of Education and Human Resources of the Republic of Mauritius. About 20 staff members are employed at the centre in a modern, spacious building on the outskirts of Port Louis, the capital city. The Centre was inaugurated on 30 November 2004 by Mrs Sonia Gandhi.

I spent a morning there on 06 March and presented two lectures to about 350 high school students from half a dozen schools who were invited to attend.

Before my lectures I met with the RGSC director, Dr A K Maulloo, and between my lectures I had lunch with staff and school teachers.

The Science Centre has an impressive number of displays for school students and the public, and it also has a portable planetarium. There are plans for a larger more permanent planetarium.

2.5 Mauritius Academy of Science and Technology

I met with the president of the Mauritius Academy of Science and Technology (MAST), Prof Soodursun Jugessur and had a wide-ranging discussion on the benefits of science to society. Professor Jugessur is a strong advocate for the development of science in Mauritius.

At present MAST has about 30 fellows who are elected to it. The Academy has no official status recognized by government at the present time. However moves are afoot to achieve this status and have the role of the Academy defined by an Act of Parliament.

Professor Jugessur is also Chair of the Mauritius Research Council, a government agency that funds small research grants to Mauritian academics and researchers. He also serves as Pro-Chancellor of the University of Mauritius, in which role he chairs the governing council of the university.

3 Schedule for visit to Mauritius

During my time in Mauritius I gave five lectures, as follows.

- One was in the Science Faculty, on why all countries should support astronomy and how the IAU can help. This was attended by about 150 students as well as key staff members in science at the University and the Pro-Chancellor, Professor Jugessur. (03 March)
- One public lecture was given, at the University on the work of Mt John University Observatory in New Zealand. Over 100 attended, mainly university students. (05 March)
- Two lectures were given at the Rajiv Gandhi Science Centre in Port Louis, to about 350 high school students who were invited to attend. They came from about half a dozen of the leading high schools in the country. These were on Time and Evolution in the Cosmos, and Astronomy, Planets and the Universe. The first of these discussed the application of physics to measure the ages of objects in the Universe; the second was a general introduction to modern astrophysics research, with an emphasis on the search for extrasolar planets. (06 March)
- A final lecture was given to the St Esprit College, a leading boys school in Mauritius with an active astronomy club. This repeated the lecture Time and Evolution in the Cosmos. About 100 students were present. (10 March)

In addition I had meetings with

- Dr Girish Beeharry: Head of the Department of Physics, University of Mauritius (a radioastronomer) (10 March)
- Associate Prof Nalini Issur, Director of the MRT at UoM
- Dr Henri Li Kam Wah, Dean of Science, UoM (he is a chemist) (09 March)
- Prof Soonil Rughooputh, Pro-Vice Chancellor for Research, Consultancy and Innovation, UoM (09 March)
- Prof Soodursun Jugessur, Pro-Chancellor of the University of Mauritius, President of the Mauritius Academy of Science and Technology and Chairman of the Mauritius Research Council (11 March)

I visited the MRT on the afternoon of 06 March.

4 Mauritius and the IAU

There are no individual members of the IAU currently working in Mauritius. The IAU website currently lists one member in Mauritius, but no names are in the document listing names by country.

A few years ago two individual members were listed. These were probably Dr Kumar Golap (who is now permanently in the USA) and Orhan Goelbasi. The latter is listed on the IAU website as belonging to the Science Faculty at the University of Mauritius; however, no-one at the University appears to have heard of this person, and there is some scepticism that Orhan Goelbasi is a bona fide astronomer. It may be worth trying to track down who this person is.

There are four people currently at the University of Mauritius who would be qualified for IAU membership (Drs Beeharry, Issur, Somanah and Prof Rughooputh) and several of these expressed interest in IAU individual membership as soon as possible. Nominations will be made through Division X president, Dr Nan Rendong and hopefully can be received in time for the August 2009 General Assembly.

There is a strong case for Mauritius to seek National Member status of the IAU in the future, and possibly they may wish to make an application from 2012. Such membership would strengthen the international contacts between astronomers in Mauritius and the rest of the world, and could lead to support for astronomy in Mauritius, for example if the Commission 46 TAD program were able to hold an astronomy school in the country.

I was able to discuss with Prof Jugessur, President of the Mauritius Academy of Science and Technology, the possibility that Mauritius might in the future seek national member status. He was generally supportive of such an application being made at some time in the next few years, possibly in time for the 2012 General Assembly.

5 Recommendations to the IAU

Mauritius is one of the world's most isolated countries. In spite of its fairly high standard of living, the astronomers and physicists at the University benefit from far fewer contacts with the outside world than is the case in most developed countries. Relatively few astronomers pass through Mauritius on the way to other places.

This being the case, Mauritian astronomers would certainly benefit greatly from IAU membership as a way of improving their scientific isolation. It is likely that two or three individuals at the University of Mauritius would welcome membership of the IAU. I was able to initiate the process of their nomination with the President of IAU Division X (Radioastronomy), Dr Nan Rendong, China.

A second step would be to encourage Mauritius to become a national member of the IAU, if possible in 2012. I discussed this with Professor Jugessur, and he was supportive of the idea in principle.

There are good opportunities for holding an astronomy school in Mauritius some time in the next few years. The University of Mauritius can offer an excellent infrastructure to support such a school, and the Commission 46 TAD Program Group should be encouraged to support such a development.

Finally, one of the biggest needs in Mauritius is to upgrade the Mauritius Radio Telescope. This probably needs the support of another, larger country to work in collaboration with Mauritius, as Mauritius hardly has the capital available to undertake an upgrade alone. If the IAU could promote this cause within Division X, then possibly a new partner institution could be found to help Mauritius achieve the next step in this research facility.

Appendix: Contacts in Mauritius

- Dr Shailendra Oree, Physics Dept, University of Mauritius. oreesh@uom.ac.mu (former Head of Dept; physicist)
- Associate Prof Radhakhrishna (Dinesh) Somanah, Physics Dept, University of Mauritius. dinesh@uom.ac.mu (former head of MRT and former Head of Dept). The minor planet Somanah 19318 (found in the asteroid belt) is named after him.
- Associate Prof Nalini Heerall Issur, Physics Dept, University of Mauritius. nalini@uom.ac.mu (Head of MRT)
- Dr Girish Beeharry, Physics Dept, University of Mauritius. gkb@uom.ac.mu radio-astronomer, Head Dept of Physics.
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- Prof. Soodursun Jugessur, Pro-Chancellor, University of Mauritius. Also Chair of the Mauritius Research Council and President of the Mauritius Academy of Science and Technology. s.jugessur@uom.ac.mu
- Dr A K Maulloo, Director Rajiv Gandhi Science Centre, Bell Village (near Port Louis), Mauritius. rgsctf@intnet.mu
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John Hearnshaw
(for contact details see Organizing Committee of Commission 46)

AN ASTRONOMICAL ADVENTURE IN PARAGUAY

At the end of August I had the chance to visit Paraguay for a week and lecture at the Universidad Nacional de Asunción (UNA), thanks to the support of the IAU Commission 46 and as part of the work of the Program Group for the World-wide Development of Astronomy (PGWWDA). I went there with Hugo Levato from the CASLEO institute in San Juan, Argentina. I had a preconceived notion that Paraguay, being a remote land-locked country, was completely off the well-beaten tourist track. It was interesting to see how preconceptions and reality differed so markedly!

Paraguay is a country of some 6 million people, surrounded by Bolivia, Brazil and Argentina. There is a significant native American population, the Guaraní people, with the result that Paraguay is the only South American country with two official languages, both Spanish and Guaraní, which nearly all Paraguayans can speak. The whole country is flat and in, or close to, the tropics. The climate is hot and humid, and the south-eastern part or Paraná region, is very fertile. The landscape is dark red from the characteristic soil and everywhere there are trees, so green and red are the abundant colours.

Fredy Doncel, Hugo Levato and John Hearnshaw on the campus
of the Universidad Nacional de Asuncion, Paraguay

There are two astronomers working at Facultad Politécnica of UNA. They are Fredy Doncel and José Gómez. They have a 45 cm Goto Cassegrain telescope donated by the Japanese about a decade ago.

The leading astronomer of Paraguay was previously Alexis Troche-Boggino who worked at UNA until his early death in 2002. He promoted astronomy to students and the public. The fine tradition he established is now being continued by Fredy and José. I found the telescope in good working order. It has a small SBig CCD camera and some useful research on variable stars has been completed and published with it. The telescope is located on the UNA campus, about 25 km from the city centre and in a suburban environment with some but not high light pollution. The observing season is however short, mainly limited from May to July, with occasional nights at other times of year. It is still an invaluable tool for student training, for public outreach as well as for research.

The 45-cm GoTo telescope on the UNA campus, donated by Japan in1999. Fredy Doncel is at the telescope

Amateur astronomy is also alive and well in Paraguay. We visited the Observatorio Bicentario Buenaventura Suárez in Asunción (also known as the Centro Astronómico Bicentario), a public facility for school students and others. It has some small telescopes, a library and a small planetarium able to seat about a dozen. We were shown around the Centro Astronómico Bicentario by Blas Servín, an amateur astronomer and director of the Centre. The observatory is named after Buenaventura Suárez (1679-1750), a Jesuit priest who established an observatory in Argentina and was also active in Paraguay in the 18th century. The Bicentario part of the name recognizes the forthcoming bicentenary of Paraguay's independence from Spain in 1811.

At the start of an astronomy lecture by John Hearnshaw to 300 high school students from 3 Asuncion schools

Hugo Levato and I each gave three lectures on astronomy at UNA, though the audience varied from university staff and students to an open public lecture and two lectures for invited high school students. For me the highlight was a lecture to about three hundred high school students from three different Asunción high schools over a two-hour time slot. Hugo translated into Spanish as I went, so it went slowly! From the half hour of questions after the talk (many in English), I knew the event had been a success.

In addition, Hugo Levato had a radio interview in which listeners could call in with their astronomical questions. We met with the Deans of Science and of the Politechnic Engineering Faculty at UNA and as a result there was much interest in Paraguay becoming a provisional member of the IAU (a new membership category) and also in the possibility of Commission 46 (the NASE program group) returning to run a school for astronomy educators

In Paraguay, high schools can teach astronomy as an elected option, and at least six high schools in Asunción have astronomy being taught right now. What is more, at the Instituto Superior de Educación (ISE) in Paraguay, about thirty teachers are at present training to give courses in astronomy in Paraguay's high schools. Therefore if a week-long NASE workshop were organized in Asunción, there would be every chance of attracting several dozen participants to such an event. The possibility of a NASE course was discussed on several occasions to the astronomers and Deans at UNA. They all agreed with this suggestion, that a NASE school would be the best way of promoting astronomy in Paraguay in the near future. It is hoped that such a school can be organized for 2010 or 2011.

One of the surprises of Paraguay is how green and beautiful the central part of the city was. Asunción is very spread out with wide and leafy streets and many fine commercial and government buildings and beautiful mansions. There are many modern shops and shopping malls full of goods as in any flourishing economy. No doubt membership in Mercosur, the South American common market with Argentina, Brazil and Uruguay, and the strong agricultural sector in Paraguay have helped the economy grow and flourish in recent years.

The author at the Iguazu Falls on the border between Brazil, Argentina and Paraguay. They are one of the world's major waterfalls.

At the weekend of my stay in Paraguay I travelled with Fredy Doncel to the Iguazu Falls, one of the largest water falls in the world in terms of water volume. Iguazu is 350 km east of Asunción on the Iguazu River, at the point where the borders of Paraguay, Brazil and Argentina all meet. We travelled to Ciudad del Este (a modern trading city on the Paraguay-Brazil border) on Saturday, and stayed there overnight. Early on a beautiful sunny Sunday morning we crossed over into Brazil and descended to the Iguazu Falls, set in a native forest area around the Rio Iguazu. The thunder of the water, the foam and 150 metre column of spray, the enormous power and majesty of one of the world's most dramatic natural wonders was a truly inspiring experience. The visitors to Iguazu are

able to get excellent close-up views of this awesome sight. The pathways take one right to the base of the waterfall, where getting wet is an essential part of the experience! Having the rising Sun at low altitude resulted in some magnificent rainbows in the spray-laden air.

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A LIFE IN ASTRONOMY EDUCATION

1 Introduction

My introduction to education did not start well. I went to primary school in 1939 just after the outbreak of World War II. At least the war brought the blackout, and stars were prominent when the weather allowed (not often in Belfast), and my interest in astronomy was reduced by a broken arm when stargazing while walking at the same time. Science was very poor at primary school but arithmetic was excellent. Astronomy was on the curriculum when at secondary school but it was deadly dull – not at all helped by the termination of the wartime blackout and Irish weather – so I got keen on physics after a short flirtation with chemistry. I went to the Queens University Belfast (QUB) to read Physics.

There followed 4 exciting years in which I studied, besides physics, pure and applies mathematics and, in my first year only, a superb course in geology (I considered a change to geology quite seriously until the Field Trip – whose only blemish, besides the Irish weather, was the geological tendency to walk in straight lines – never mind the obstacles like thorn hedges, solitary bulls, bogs.....). After a postgraduate year as a Demonstrator in Physics I ended up at QUB with an MSc in physics and had found Fred Hoyle's book Frontiers of Astronomy. I was exceedingly fortunate to be offered a postgraduate studentship to do a PhD with W H McCrea. I went to the Royal Holloway College, arriving on 1957 Oct 01 only 3 days before Sputnik I was launched. A PhD and a wife were duly acquired and I was appointed an assistant lecturer in astronomy at University College London (UCL) in 1960 (my PhD was awarded in 1961 as Bill McCrea was travelling in the USSR and managed to lose my thesis along the way). UCL proved so congenial I stayed there with the odd excursion elsewhere till retirement in 1999.

2 Astronomy Education in the 1960s

In the early 1960s very few English universities offered astronomy at degree level. UCL had offered astronomy within the context of their mathematics degree since the twenties and astronomy had been taught there since the College's foundation in 1825 on and off. It was not until UCL received a donation from a local builder, F Perren, to found a professorship in astronomy attached to the University of London Observatory (ULO), that a Department of Astronomy was founded in 1952. The first Perren Professor (who was also the Observatory's Director) was C W Allen. If Bill McCrea was a stickler for the mathematics, CWA was a stickler for the physics – it was very definitely out of the mathematical frying pan into the physical fire.

CWA had very definite ideas about what constituted astronomy – an external examiner who had the temerity to suggest to CWA that his degree lacked a course in cosmology was told very sharply that speculation had no place in his astronomy degree. I was, as the last man in, set down to give the lectures on Positional Astronomy – a highly salutary learning curve for a somewhat theoretical astrophysicist. That, stellar structure, interstellar physics and interstellar dynamics became my staple courses over succeeding years with the odd short course on astronomical history from time to time. I also had to take part in practical classes – very good training indeed. Eventually I served as Tutor to astronomy students and finally as Director of ULO.

In the early sixties there was considerable opposition to reading astronomy in England for a first degree. In Scotland (an altogether more enlightened country educationally and it was the Scottish form of education I had experienced in my school and university years), degree level opportunity to study astronomy had existed for very many years. That opportunity did not exist in England till 1952. It was commonly argued that if you wanted to study astronomy you should take physics or mathematics as an undergraduate – I could not argue with that without being hypocritical! However, I could see that as astronomy undergraduates took physics for 2 years and up to 2 years in mathematics, why should they not take a subset of astrophysical courses and courses of particular relevance to astronomy given a strong interest in astronomy. Consequently when I first arrived at ULO I found classes of 2 and 4. No one then cavilled at such small class sizes. Class size and economics were not then linked.

It was an ideal teaching millieu. One could structure lectures to students. One could get the pace of lectures right and ensure the each student was well suited to the degree courses. If they had made the wrong choice of degree course, it was possible to change direction at the end of their first year. Now, when students equate with money, it is not easy to organise a change of degree course for a student who has made a wrong initial choice of field of study – the original admitting department loses money.

But attitudes towards astronomy degrees were changing – Sputnik had seen to that. Space was beginning to work its magic and student numbers on the astronomy degree began to increase. Computers were becoming more powerful and it was possible in 1966 to obtain from IBM a small computer for ULO which could communicate with the central IBM computer at UCL. This was no end of an aid to my personal research on computation of gravitational collapse relevant to star formation, but it was also a great help in the way we could extend practical classes. The passing of paper tape was not mourned, the punched card was embraced with open arms, and gone were the days when tapes had to be carried by hand from ULO to UCL and results collected in the same way. No one today can appreciate the knots paper tape could contrive! And they tore at the drop of a hat.

Our courses changed. Courses on the planets were introduced as were planetary observations. While the UCL degree was strong on matters such as solar physics, stellar structure and stellar atmospheres, the advent of space brought the possibility of planetary observation from space. This was reinforced by the lunar landings and flybys at the end of the decade. Attitudes to teaching were also changing. Universities were beginning to attract increasing numbers of students in all subjects. New ideas on how to teach were being discussed. It had always concerned me that a university student's progress was determined by performance in year end examinations. Practical examinations were a feature of the sciences but I felt there must be some other way to add to student assessment to give a better quantification of ability. I found it in the project.

Fortunately the concept of the project had appeal for colleagues and so introducing the project as a compulsory course in the astronomy degree was welcomed. But assessment of the project was more difficult. At that time all courses taught within the constituent Colleges of the University of London had to have the approval not merely of the College but the University as well. The University was not so easy to convince. The examination of taught courses by one or more year-end examination papers was well understood and teacher assessments of a student selected project engendered suspicion – not unreasonably in my view. However, I was able to devise a scheme of assessment which satisfied the doubts. Each final year student was required to find a project which an existing member of the astronomy staff felt willing to supervise and assess. If the student could not decide on a project topic, I discussed a range of possibilities with the student and usually got a satisfactory outcome. If the student still could not come to a decision I chose the project and supervised it myself. The students were expected to submit a detailed report on their chosen project and give a short talk describing what they had done and their conclusions. The assessment was done by the supervisor for the project supervised and I assessed all the projects myself. Sometimes a little smoothing was necessary. Later when projects were well accepted as a legitimate assessment means, double marking of each project was introduced, but I still assessed all the projects to ensure inequities (and there were occasional considerable inequities) were reduced. Additionally, the student was required to give a short (no longer than 20 minutes including questions) talk to peers and interested staff.

The project did have the desired effect – most students liked the opportunity to try their hand at some "real" research. Staff liked it as it gave them opportunity to assess students for consideration as potential postgraduates. But as one might expect it did not suit all students. Nevertheless, the project remained a compulsory course. It was the talk that proved most unpopular among the students. Some students simply did not wish to speak in public where they had to defend their ideas – it was too personal an exposure. Usually all could be persuaded, but there were a few over the years who had to be given a rather restricted audience. On balance the project improved the students' overall degree performance, in a few cases strikingly so where the student had difficulty with the standard 3 hour examination paper.

3 Astronomy Education 1970-1999

In these decades the development of the astronomy degree at UCL continued. On the retirement of CWA in 1972 the Department of Astronomy merged with Physics, the new department becoming Physics and Astronomy. On the educational side the width of the astronomical input widened since the former Physics Department incorporated the Mullard Space Science Laboratory (MSSL) and a very distinguished theoretical atomic physics staff. The Head of Physics was Sir Harrie Massey, MSSL was directed by Sir Robert Boyd and theoretical atomic physics by Mike Seaton. Robert Wilson (later Sir) was the new Perren Professor.

The impact on astronomy was immense and very much for the better. At a stroke the staff available to give astronomy courses increased greatly, the range of astronomical research covered expanded rapidly and as a result so did the numbers of undergraduates opting to study astronomy as a first degree. At this time Bob Wilson was very much occupied with the development of the IUE spectroscopic satellite and delegated much of the management of ULO to me. A new professor meant a new telescope to install and redome-ing of our major 26"/18" double astrometric refractor. So while still actively teaching, there was additional project management to be done.

The most interesting project was bringing the Radcliffe Telescope under computer control. Refractors dating from the start of the 20th century are not well suited to such a change. We had little money to make the change but the observatory did have an appropriate electronics technician and fine mechanic who not only could do the necessary technical work but had a high regard for the integrity of older telescopes. The actual work took a decade – partly because of lack of funds but principally because the technicians only could work on the telescope between March and September because the telescope remained an essential element in our practical classes. So each September the telescope had to be operational. But we got there!

My principal contribution was the realisation that the usual approach to digitization, involving a cut across a diameter of the gear wheel mounted on the declination axle, was not necessary in order to fit it onto the declination axis in an economical manner. Dismantling the declination axis was not an option for us either in regard to time or expense. On looking at the problem I realised that the digitising gear wheel did not travel over a full 360 degrees. But I was left in no doubt that cutting a triangular section from a gear wheel would be perilous – the grip on the declination axis might slip and there was no guarantee that the triangular section would ever mate properly with the gear wheel. We needed the full winter observing season to sort out the risks. The fine mechanic sorted out a suitable way of mating the 2 pieces of the gear wheel and anchoring to the declination axis and because ULO is located sufficiently far north, the triangular cut allowed the remaining part of the gear wheel to be slipped onto the declination axle. It proved very successful and although some hand slewing remains essential, setting the Radcliffe on any star of choice is made much quicker thus allowing more undergraduates to use the telescope within the duration of a standard practical class as well as allowing better use of time for students using out of hours observing time for project work – a great advantage for a site whose weather patterns are not in the observer's favour. The system was a success and we do not have loss of positional information that ensues when the digitising gear crosses a cut.

A surprising amount of time was taken up in dealing with local outdoor lighting installations – churches, schools, sports facilities, supermarkets and roads caused problems continuously. Added to that, the Observatory's Radcliffe Dome seemed to be a lining up feature for the run down to Heathrow – one could have up to 3 brightly flashing aircraft in the dome slot at once. But although the Observatory, while originally well removed from the quiet country lane that ran past the gate when the ULO was founded, was now on the side of the major 3-lane (in each direction) road north out of London, our founding fathers had foundationed the telescope mounts so well that we did not suffer from traffic vibration. So I acquired a highly practical education on "environmental impact" on astronomical observation. But just after I retired in 1999, after at least a decade of negotiation, the road was relit with excellent shielding of the road lighting in the vicinity of ULO so that my claim of being able to read a newspaper by street light in any of our domes is no longer valid. Avoidance of obstacles still does not require a torch!

Road lighting effectively stopped direct photography of the sky, thus denying our students the satisfaction of building a portfolio of their favourite objects – in particular, extended objects. The Moon was as far as photography went for us. Photometry was possible but the local atmosphere was usually too unstable for precision. So we concentrated on spectroscopy and turned a blind eye on what was happening to the lines of Na! But the arrival of the CCD changed all that and direct imaging and better photometry was possible again from the late 1980s and the new road lighting has even permitted the recent detection photometrically of an exoplanet. An astronomer by being an unreasonable optimist can sometimes win out against the odds!

My time as a university teacher came to end having completed 41 years of service – 39 at ULO. In that time not only had astronomy been transformed technically but many old concepts across the whole area of the subject had been laid to rest and new and exciting concepts replaced them. It was a superb time to be in astronomy and it is a source of considerable satisfaction to see how many of our former undergraduates have contributed in a major way to those changes. Even more encouraging are the careers of former students who did not choose to opt for astronomical research and who have had distinguished careers in areas where astronomical experience has proved useful. We must have got something right some of the time!

4 The International Astronomical Union

My first taste of the IAU was at the Hamburg General Assembly in 1964. I was very fortunate to be able to attend all subsequent GAs until 2006. It was not however, until the Brighton GA that I found myself attending meetings of the newly established Commission 46. I must have said too much for I found myself with Edith Muller on one side of me and Bart Bok on the other. Would I like to join the Organising Committee? As Vice-President? They were very persuasive, indeed pressing. And that was how it all started – taking over as President from Edith at the end of the 1973 GA.

By then the International Schools for Young Astronomers (ISYA) were up and running under the direction of Josip Kleczek. We take for granted the success of those schools now – but it was not always the case back then. The financial support engendered by the space programmes of the 60s was declining. Jobs in astronomy were getting harder to find and the Executive Committee (of the IAU) baulked at the expense of the schools. We had to mount a very stout defence of the schools and just saved them by a whisker. Now we can point to distinguished graduates e.g. Maslen Othman, now in charge of space science activities for Malaysia by way of establishing a planetarium, and distinguished service for the UN through direction of the COPUS secretariat. Those graduates of the schools speak for their success – but in the 70s none had had the time to become household names!

I got the C46 Newsletter off the ground and C46 had a programme to provide astronomical images freely for those countries who could not afford their cost. The programmes multiplied as the years went by to meet perceived need but the flagship project remains the ISYA. C46 has also organised 3 major meetings on Astronomical Education with great success, and looking at the papers of these meetings one notes the range of ways that astronomical education has developed from public outreach

though primary and secondary school to early university education. Outreach has become much more than an observatory tour on an open night – which was the traditional form of outreach at ULO – public observing did not happen often because of our weather but we did lay on a slide show when it was so frequently cloudy, wet, or both; we did not then have today's more sophisticated approaches now so apparent all round the world. Schools were not into astronomy in the 70s – apart from those fortunate schools who happened to have and enthusiastic science teacher who was also a dedicated amateur astronomer. But eventually the penny dropped and one notes that in the UK a growing number of schools encourage pupils to take a General Certificate of Education (the national examination at age 15-16) paper in astronomy – only recently breaking even in cost of provision I am told.

What I have found disappointing is that C46 does not have too much to say on degree qualifications in astronomy and I shall return to this in the next section.

But once in the IAU mill, events can occur which can alter the course of one's entire life. In 1984 I was approached to see if I might like to be considered for the post of next Assistant General Secretary (AGS). The bait was that the AGS looks after the Symposia and Colloquia – and that was tempting as it was contact with astronomical science at its widest. I had experience of scientific publication from my time as a secretary of the Royal Astronomical Society, and it looked like a good use of that experience. It was. But then came the rub – the AGS normally succeeds the General Secretary (GS) and as I did not seem to have erred as AGS too heavily the normal path was followed. But I was not a diplomat – by and large I like to call a spade a spade. I was on a steep learning curve! Fortunately I had then the opportunity to help C46 by direct defence on the Executive Committee – but by then people were more well disposed to spending a little of the Union's cash on education and I was also in a position to help along other bodies of value to astronomy and related sciences.

I have no intention of relating my diplomatic gaffes but I managed to survive them. The one thing that I feel pleased about came with the launch of the Hipparcus satellite. It failed to go into the desired orbit. The EC were meeting in Shanghai when we received that most disappointing news. It looked as though the satellite could not fulfil its astrometric mission. I persuaded the EC to send a telegram back to the consortium to ask them to reconsider before making any decision on switching the satellite off. They did reconsider and their remarkable achievement in precise astrometry is the lasting heritage of the ingenious satellite and the very remarkable team who ran that project and who used their considerable talents to attain their astrometric goals in spite of not acquiring the ideal satellite orbit.

6 Retrospect

Looking back on my career as astronomer and teacher I can honestly say were I looking for a career today, astronomy would still be my choice. My time in astronomy was a unique period in which to be an astronomer. The stimulating period of 1930s atomic and nuclear physics had settled down. Quantum mechanics was well understood – at least at undergraduate level. As a 3rd year student we got the news of the astronomical detection of the hydrogen 21 cm line and the opportunity that offered. New elements that did not occur in nature were being made in the laboratory, nuclear power generation was becoming a reality and nuclear fusion was becoming more than a gleam in the eye.

I started as a postgraduate with the launch of Sputnik I. But computational techniques were still being implemented on mechanical machines and the height of modernity was having an electric motor to turn the crank! Now such machines for years have only been seen in museums! It was an exciting time and I was intrigued by the interstellar medium – a good choice if the growth of C34 is anything to go by!

I enjoyed teaching. But I feel that while facilities for study have improved out of all recognition, something has been lost in contact with undergraduates. We are too concerned in the UK with outside targets and fluctuation of finances with student numbers. Astronomy remains a niche degree. Despite the increase in degree provision in the UK and courses on astronomy in most UK departments of

Physics, it seems to me that we do not pay sufficient attention to those high flying undergraduates who have elected to study astronomy. High flyers need nurturing in any subject but particularly in a niche subject.

On the other hand I am deeply impressed by the IAU. In a world which seems to be becoming ever more fractured, the IAU provides an atmosphere where class, creed and colour have no place, and that competition between individuals is devoted to the advancement of astronomical science. That has been achieved by the IAU's strict insistence that politics have no place in IAU meetings (with the possible exception of astronomical politics). It is rare to find such an atmosphere today and we should do all in our power to see that this virtue is preserved.

It has been my very great pleasure to meet so many interesting people through the IAU. It is an even greater pleasure to see so many of our graduates playing an active role in the IAU. I hope I may be able to attend a GA or two in the future but may I take this opportunity to express my gratitude to all those I have had the pleasure of meeting, too many to list by name, for their interest, their science, and their companionship, and to wish C46 sustained success in promoting astronomical education in all its variety of forms.

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GALILEO LESSONS

Six years ago, an award-winning astronomy documentary was made right here in Toronto, and I wasn't even aware of it, even though two of my colleagues were directly involved! Fortunately, the documentary has resurfaced in International Year of Astronomy 2009, which is very appropriate, because it's called Galileo's Sons.

Galileo's Sons (Inigo Films, 48 minutes, produced/directed by Alison Rose) is a behind-the-scenes look at the work of the Vatican Observatory, both at the headquarters in Rome, and at Vatican West in Arizona – how its Jesuit astronomers live and work, and how they integrate their research and their theology. Observatory director George Coyne figures prominently, as does his colleague Guy Consolmagno; both are Jesuits and PhDs in astronomy. Pope John Paul appears briefly.

This thought-provoking documentary is an important contribution to the dialogue between science and religion, a topic that we astronomers should not shy away from, whatever our own beliefs. Galileo was a devout Catholic, but still ran afoul of the Church. This documentary follows the 400-year historical thread from then to now.

It also highlights an important educational project – the Vatican Observatory Summer School. VOSS brings advanced students from developing countries, on scholarship, together with students from the more developed countries, for a one-month program of interactive seminars and field trips. For many students, it is a defining step in their careers. They acquire a cohort of colleagues, and a sense of community. Several of my young colleagues in astronomy research or education are graduates of VOSS.

The documentary's production values are excellent. The astronomy, its history and philosophy are clearly and intelligently described. There is a balanced mix of interviews with Vatican and non-Vatican astronomers (e.g. Chris Impey), and with VOSS students. There are the usual beauty shots of the night-time and day-time sky, and of Vatican buildings including the observatory headquarters at Castel Gandolfo, near Rome. But its most important asset is the relevance and depth of its content.

This documentary has received four awards, and excellent reviews. It deserves to be widely shown, on TV, in schools, in clubs, and in public settings. For more information, and to order a copy, see

http://www.inigofilms.com

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RESOURCE GUIDE TO THE MOON

An annotated list of resources for helping students and the public to understand and appreciate the Moon is now available on the web site of the non-profit Astronomical Society of the Pacific, at http://www.astrosociety.org/education/family/resources/moonguide.html

The guide – for educators, amateur astronomers, and everyone who would like to know more about the Earth's only natural satellite – covers our scientific understanding of the Moon as a world, the appearance of the Moon in our skies, and tips for observing the Moon through binoculars or small telescopes. It also suggests a few ways to learn more about the Moon in popular culture and historical events.

This resource list is part of a series of guides for educators from the 120-year old Society, which is dedicated to improving the public understanding of astronomy and advancing science literacy. See all their materials at http://www.astrosociety.org/education.html

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PBS TELEVISION WEBSITE
Educational resources on telescopes and astronomy in general

A new web site, accompanying the PBS television special 400 Years of the Telescope, offers background information, classroom and family activities, and practical tips for everyone who is teaching about the development of telescopes, the history of astronomy, or the exploration of the Universe. You are invited to discover its features at http://www.pbs.org/soptv/400years/

Information on the site includes

- an introduction to telescopes
- getting your family involved with astronomy
- the expanding Universe explained
- the astronomy of many cultures
- how astronomers search for intelligent life in space
- science fiction with good astronomy
- telescopes of the world (a table and database)
- frequently asked questions about Galileo
- video clips of interviews with noted astronomers
- an activity for observing the cycles of Jupiter's moons
- a glossary of astronomical terms
- teaching Ideas for 14 key topics related to the show
- a “toolkit” for demonstrating ideas in optics
- a guide to the changing role of women in astronomy

and many other resources and tools.

Information on the site was put together by the educational staff of the Astronomical Society of the Pacific (a 120-year old educational organization which has developed outreach materials on astronomy

for a wide range or projects), and Interstellar Studios, the production company that made the TV special.

Both the TV show and the web site are among the key outreach projects of the International Year of Astronomy in 2009, celebrating the 400th anniversary of Galileo turning the telescope toward the heavens.

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UNITED NATIONS BASIC SPACE SCIENCE INITIATIVE (UNBSSI)

The UN/ESA/NASA/JAXA Workshops on Basic Space Science is a long-term effort for the development of astrophysics and space science and regional and international cooperation in this field on a worldwide basis, particularly in developing nations. The first series of such workshops was held from 1991 to 2004 (India 1991, Costa Rica and Colombia 1992, Nigeria 1993, Egypt 1994, Sri Lanka 1995, Germany 1996, Honduras 1997, Jordan 1999, France 2000, Mauritius 2001, Argentina 2002, and China 2004 (http://www.seas.columbia.edu/%7Eah297/un-esa/), and addressed the status of astronomy in Asia and the Pacific, Latin America and the Caribbean, Africa, and Western Asia, respectively. One major recommendation that emanated from these workshops was that small astronomical facilities should be established in developing nations for research and education programmes at the university level. Subsequently, material for teaching and observing programmes for small optical telescopes were developed or recommended and astronomical telescope facilities have been inaugurated in a number of nations. Such Workshops on Basic Space Science emphasized the particular importance of astrophysical data systems and the virtual observatory concept for the development of astronomy on a world wide basis. Since 2005 these workshops focused on the International Heliophysical Year 2007 and subsequently on the International Year of Astronomy 2009 (UAE 2005, India 2006, Japan 2007, Bulgaria 2008, South Korea 2009
http://www.unoosa.org/oosa/SAP/bss/ihy2007/index.html).

Starting in 2010, the workshops will focus on the International Space Weather Initiative (ISWI) as requested by a three-year workplan as part of the deliberations of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) http://www.stil.bas.bg/ISWI/. The first UN/ESA/NASA/JAXA workshop on the ISWI for the region of Western Asia will be held in Egypt in 2010, the second for the region of Africa in Nigeria in 2011, and the third for the region of Latin America and the Caribbean in Ecuador in 2012. First work on the ISWI was accomplished in the UN/ESA/NASA/JAXA Workshop on Basic Space Science and the International Heliophysical Year 2007, held at the Korean Astronomy and Space Science Institute (KASI), Daejeon, Republic of Korea, 21-25 September 2009 (http://bssihy.kasi.re.kr/,
newsletter http://bssihy.kasi.re.kr/unbssw_newsletter.aspx).

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ASTRO BOOK DRIVE

Cultivating astronomy education in developing countries

As we reach the end of IYA2009, we have achieved many great things by making the public and students worldwide aware of the Universe we live in. But with so many projects and efforts running, we are yet to overcome the difficulties in astronomy education in developing countries.

Astro Book Drive aims to contribute to astronomy education in developing countries by sharing "excess" reading materials and making contact. The program is co-founded by Thilina Heenatigala of Sri Lanka Astronomical Association and Prof John T Clarke of Boston University, MA.

How it works

There are many astronomical societies coordinated by volunteer amateur astronomers in developing countries. But the common problem they all face is lack of proper resources to gain knowledge and to conduct programs.

Many of you have "excess" books, magazines and other reading materials lying around at home, in the office, in your departments or in some of your departmental libraries. Various astronomy/space related societies have "excesses" as well. Usually these reading materials are buried under dust with no one using them.

The objective of Astro Book Drive is to get these excess reading materials to a place where they could be best used.

Get involved

Astro Book Drive is more of a backyard project which anyone can get involved in personally or as a group. Most of you have reading materials you would like to find a better home for, or maybe you know someone who would like to gift some books. Even as a group through your department, institution, library or some other association, you can run a Book Drive to collect books from everyone and then gift them to an astronomy society in a developing country.

With a minimum effort you can harvest a lot of potential in developing countries.

Please show your interest in Astro Book Drive because ……
one book can make an immense difference – get involved and make a difference.

Please visit http://astrodrive.lakdiva.net for more information

For any inquiries feel free to email me.

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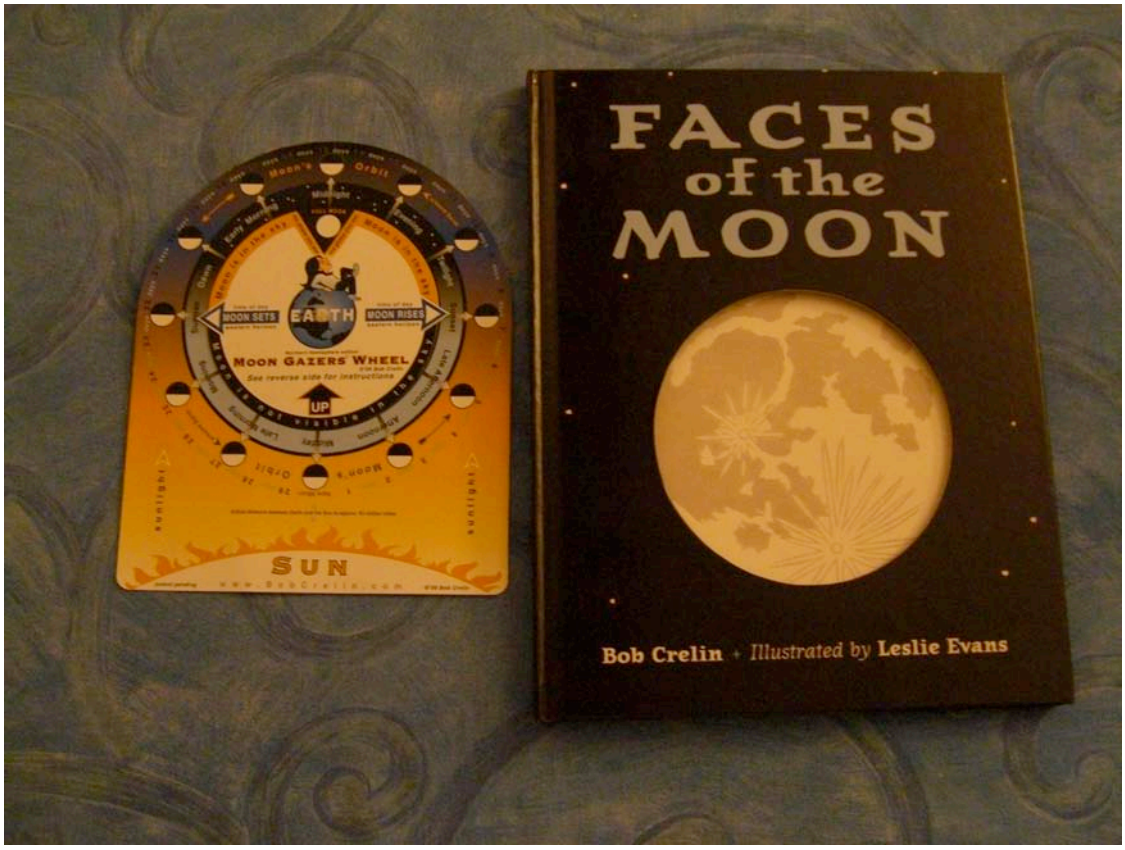
BOOK REVIEWS

FACES OF THE MOON

Bob Crelin, (Charlesbridge Publications, Maryland, 2009), illustrated by Leslie Evans. Hardback, 32 pages, $16.95 ISBN 978 1 57091 785 1

Faces of the Moon can be enjoyed by anyone who has ever looked at the Moon and wondered about its changing shape and position in the sky. Although it is a picture book for the younger age range (6–12), its information and use of language is suitable for children of all ages.

The author effortlessly combines poetic language with scientific fact as he explains how and why the appearance of the Moon changes during the course of a lunar month. The book, written in verse and colourfully illustrated, clearly describes each of the eight phases of the Moon ending with a prose summary and some useful Moon facts in Moon Memo Rhyme couplets.



Left, the 'Moon Gazers Wheel' Right the front cover with a circular aperture

The first page starts with a question "Do you wonder…?" as we see two children looking up at a crescent Moon with the Sun sinking behind them. In two short verses, the author sets the scene. This is followed by a page by page description of each phase of the Moon in four lines of carefully worded verse. So, after the new Moon we turn the page to read

"A few days pass and Moon's less shy
Her smile lights the twilight sky.
The more her sunlit surface shows
The more the Moon's WAXING CRESCENT grows."

At the bottom of each page we are told when that phase of the Moon rises and when it sets. Once again, the language is simple and clear

"Waxing Crescent Moon rises in the mid-morning and sets in the mid-evening."

This is a delightfully tactile book. The immediate appeal of the book is the cover with its big cut away full Moon on a black background. Most pages have its aperture of the Moon. The reader's eye is drawn from the waxing crescent Moon through its aperture, to the full Moon and then back, page by page, to the new Moon. Another attractive feature is that each page has a picture thumb index showing the phase of the Moon described on that page. This makes a pleasing pattern down the side of the book.

The crescent aperture on the left, the half Moon aperture on the right

Faces of the Moon stands as a book on its own but it can also be used as part of an interactive classroom lesson. An eight page illustrated lesson plan can be downloaded from the website. With some preparation, including the creating of a very dark room which may be difficult, children can turn their own Moons through the phases of the lunar cycle.

I tried a simplified version of this with several seven year olds. They enjoyed talking themselves through the phases and then relating this activity to the book.

A clever Moon Gazers Wheel, appropriate for the northern hemisphere, is also available and would make a good addition to the book, tucked into a pocket at the end. There are instructions on the back for its use. By noting the face that you see, the reader can match it up on the dial and read off what its name is, when you can see it in the sky, and when and where that Moon rises and sets. There are, however two points of confusion. It is possible to read off, for instance, that the full Moon can only be seen at midnight, and that at any given phase of the Moon it can be seen in the sky for a full twelve hours. I would suggest a little more explanation is needed. But in spite of this, the wheel is an intriguing piece of equipment for the older child and even for adults.

Faces of the Moon does what it sets out to do. It simply describes, explains and names the phases of the Moon. But it does more than that. By asking the question at the beginning and then at the end, putting the Moon in the context of our Universe.
"The Moon reminds us of our place

A spinning world in endless space."
The author appeals to the curiosity and the wonder that is at the heart of every child.

Faces of the Moon should be on the shelf in every school for both teachers and children to use when studying topics such as Night or The Solar System or Light. For the home it would not only become a well thumbed reference book but a favourite book to choose to share at bedtime.

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THE PLANET HUNTER: THE STORY BEHIND WHAT HAPPENED TO PLUTO

Elizabeth Rusch, (Rising Moon Books, Flagstaff, Arizona, 2007), illustrated by Guy Francis. Unpaged, $15.95 ISBN 13: 978 0 87358 926 0 ISBN 10: 0 87358 926 2

I am a firm believer in the role biographies can play in instilling in people of all ages an appreciation of science. For astronomy educators, I can recommend this illustrated children's book about the life and work of Mike Brown, the "planet hunter" in Elizabeth's Rusch's charmingly written and engagingly illustrated book. This dynamic and endearing portrait of Brown, now in his mid-forties, a professor of planetary astronomy at Caltech, should appeal alike to preschool and primary school pupils and to their teachers.

From the outset, the book makes clear that it is no hagiography, as so many "inspirational" biographies for children, young adults, and even general readers tend to be. The book opens literally with a bang, or at least a "Zing! Splat! Splash!". Children should be delighted to learn that they, like Mike as a schoolboy, can justify wreaking havoc with rocks in a muddy backyard by claiming they are merely modeling the Moon's crater-pocked surface. Early on, Rusch's Mike encounters experimental failures but does not let them discourage him. He makes use of his personal shortcomings, like routinely misplacing his sneakers, to devise a strategy for discovering trans-Neptunian objects (TNOs – objects in the Solar System that orbit the Sun at a greater distance on average than Neptune).

Sidebars every few pages include Fun Facts about some of the TNOs Brown has discovered over the years, such as Quaoar and Sedna. Another sidebar, Sleeping on the Job, explains in kid-friendly terms Brown's method of surveying for distant objects orbiting the Sun by comparing digital photos taken of the same region of the sky over several hours and looking for bright, moving objects.

In early 2005, five days after losing a bet with a colleague that within four years someone would find a planet bigger than Pluto, Brown's careful review of such a series of photos revealed the first such TNO, for which Brown eventually chose the name Eris, after the Greek goddess of discord.

Rusch makes clear Brown's role in the much debated "demotion" of Pluto from planetary status. If "all the round, orbiting objects recently discovered in our Solar System" were to be dubbed planets, then by the time his daughter, Lilah, went to school, there might be hundreds of such objects. Without locating the decision at the rancorous sessions of the IAU in Prague in summer 2006, Rusch describes the outcome of an international gathering of astronomers "to decide once and for all what a planet really is," as well as Brown's satisfaction with the controversial outcome: "Astronomers had fixed a mistake. Science had progressed!"

The book concludes not only with Brown's belief that, contrary to general expectation, "something bigger than Mercury or even Earth" remains to be found far out in the Solar System, but also with a challenge for "the next generation of planet hunters" to harness not-yet-developed technologies to expand our knowledge of the Universe.

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MARIA MITCHELL AND THE SEXING OF SCIENCE:
An Astronomer among the American Romantics

Renée Bergland, (Beacon Press, Boston Mass., 2008).
300 + xviii pages, $29.95 ISBN 978 0 870 2142 2

Members of IAU Commission 46 will find much of interest and, perhaps, much to object to in this polemical biography of astronomer Maria Mitchell (1818-1889). Mitchell came to international attention in 1848 when she became the first American to be awarded a medal by the King of Denmark for her discovery of the telescopic Miss Mitchell's comet of 1847. Hired as a "computer of Venus" for the US Nautical Almanac, she began to draw a salary for work based on her observations and calculations, thus becoming one of the few professional astronomers of either sex in 19th century America.

Arguably, however, Mitchell left her greatest mark on the profession through the educational practices she innovated as professor of astronomy at Vassar College, where she taught from its opening in 1865 until her retirement in January 1888. While Harvard and other male colleges were still emphasizing classics and divinity, Mitchell exposed her students – women all, since Vassar was a single-sex institution until 1969 – to hands-on training with astronomical instruments, including a twelve-inch telescope designed by Henry Fitz. "Vassar students were the very first wave of American college students to study what would become known as astrophysics, a natural result of a pedagogy that focused on student fieldwork rather than memorization. Cornell, Dartmouth, and eventually Harvard all followed Mitchell's lead in this respect." Even as she steered her students away from what she called "astronomical geography (learning the positions of objects in the sky)" and toward "mathematical astronomy", Mitchell understood that more important than drumming "the particulars of astronomy into her students" was promoting their development as independent and critical thinkers (page 204).

As the subtitle of Bergland's book indicates, Mitchell was "an astronomer among the American Romantics," and – not surprisingly, since Bergland teaches English and Gender/Cultural Studies at Simmons College in Massachusetts – some of the most interesting things we learn involve Mitchell's connections to the New England intellectual circles that included writers Nathaniel Hawthorne and Herman Melville. Mitchell spent part of her European trip of 1857-58, which played an important role in her development as both an astronomer and a feminist, in the company of Hawthorne and his family. Even before Mitchell's departure, Hawthorne's "remarkable" sister-in-law Elizabeth Peabody had undertaken to lead a fund-raising drive "to purchase a telescope for this distinguished and truly noble woman, who has devoted herself with so much zeal to the pursuit of science" (157). Perhaps most fascinating of all, in Bergland's discussion of Melville's 1891 poem narrated by a woman astronomer, we learn how the associations evoked by this narrator's name, Urania, changed over the course of the 19th century.

At the beginning of the nineteenth century, people knew Urania as the muse of astronomy. The word "Uranian" meant an astronomer, most often a woman astronomer. By the end of the century "uranian" became a medical term for someone with an unconventional sexual sensibility. At the middle of the century, calling Mitchell the "American Urania" (as the Atlantic Monthly had done in 1860) was a way to celebrate her inspiration of a generation of astronomers. By the time of her death an "American Urania" would have been someone who lured unsuspecting followers "into the realms of sexual inappropriateness" (243).

A 1951 biography of Melville identified Maria Mitchell, whom Melville had first met in 1852, as the model for the poem's Urania, an identification that has been generally accepted in the years since (244-245).

As interesting as this point is about the shift of meaning of the name Urania, however, it is with the polemical side of this book, concerning "the Sexing of Science," that I take issue. Bergland argues that the door of opportunity that had been opened to women interested in science at the beginning of the 19th century closed by its end, in the decades following the Civil War. "When Mitchell was young, science was considered a ladylike avocation, and girls were actively encouraged to study it … But later generations of female students would not meet with the same encouragement" (xiv). True as that may be for the 19th century, and perhaps even for much of the 20th century, Bergland's assertions that "We currently live in an era when the bias against women in science seems an eternal constant" (xviii) and "the climate for women in the sciences at the beginning of the twenty-first century is still much harsher than the corresponding climate for women" in a variety of other fields (258) seem too unrelievedly negative in the face of encouraging evidence to the contrary, about which more below.

In support of her assertions, Bergland chooses to end her book on a very downbeat note, with the posthumous granting of the 2006 Maria Mitchell Association Women in Science Award to Denice Dee Denton, an engineer and university administrator, who had committed suicide a few months earlier during a bout of clinical depression. Denton had been involved in the effort to refute an intentionally provocative suggestion that there might be innate differences in men's and women's mathematical abilities, which then Harvard President Lawrence Summers offered at a small January 2005 conference on women and minorities in the science and engineering workforce. Though Summers had been invited to the meeting as a top economist, not as a Harvard administrator, his remark, blown out of all proportion, led to the formation of a task force, headed by former Secretary of Health and Human Services Donna Shalala, which ultimately presented a report to the National Academy of Sciences. The report concluded that while there was "no clear evidence that men are biologically advantaged in learning and performing mathematics and science," what keeps women from achieving the same success as men in the scientific professions is "not lack of talent, but unintentional biases and outmoded institutional structures that are hindering the access and advancement of women" (252-253).

Without challenging the conclusions reached by Shalala's task force, I think Bergland has herself unintentionally done a disservice to future women scientists by accentuating the negative. We *do* live in an era when young women are "actively encouraged to study" science, and many are highly successful in their fields. At the time of the writing of this review, not only is the past president of the International Astronomical Union a woman, Catherine Cesarsky, but the president-elect of the American Astronomical Society is also a woman, and not just any woman. Dr Debra Elmegreen happens to be the Maria Mitchell Professor of Astronomy, as well as Department Chair in the Department of Physics and Astronomy at Mitchell's own institution, Vassar College! Among Elmegreen's other responsibilities is participation on the National Academies' Decadal Survey Committee on Astronomy and Astrophysics, which is tasked with outlining priorities for American astronomy for the next decade. Instead of arguing that "an age can surely come again," like that "from around the time of the American Revolution" through much of the 19th century, when "American girls and women were expressly encouraged to study science" (258-259), Bergland could have honored the legacy of Mitchell much more aptly by pointing to the many American women astronomers who have, like Elmegreen, managed to rise to the heights of the profession, despite the lingering vestiges of sexism.

I have other quibbles with Bergland's book, including the presence of errors and typos that a thorough editing should have picked up, as well as the absence of a chronology that could have highlighted important turning points in Mitchell's career and of photos and other illustrations that could have deepened the portrait the book paints of her. Rather than allow myself to conclude on a downbeat note, however, let me mention another aspect of the book that I did enjoy – its emphasis on the poetry written by and about its heroine.

Which astronomy professor, male or female, wouldn't be thrilled to be honored by his or her students with an ode sung to the tune of a patriotic hymn, like the one a group of Mitchell's Vassar students wrote to the tune of the Battle Hymn of the Republic by Julia Ward Howe (also a friend of Mitchell)?

Among the six stanzas, I particularly enjoyed the first two, notwithstanding the occasional problem with scansion.

"We're singing for the glory of Maria Mitchell's name;
She lives at Vassar College and you all do know the same.
She once did spy a comet and she thus was known to fame,
Good woman that she was.

She leads us through the mazes of hard astronomy;
She teaches us nutation and the laws of Kepler three,
Th'inclination of their orbits and their eccentricity.
Good woman that she be."

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NEWS OF MEETINGS AND OF PEOPLE

SYMPOSIUM MATHEMATICS AND ASTRONOMY

As part of IYA2009 the Spanish National Research Council CSIC in cooperation with the Spanish Open University UNED are organizing the Symposium Mathematics and Astronomy: A Joint Long Journey with the support of IAU and International Mathematical Union. The main objective of this Symposium is to meet astronomers and mathematics from different countries in order to discuss common aspects in their work, in Madrid, 23-27November. More information can be found at www.astromath2009.com

Rosa M Ros
Co-chair of Mathematics and Astronomy: A Joint Long Journey
(for contact details see Organizing Committee of Commission 46)

STAR PARTY 2009 SRI LANKA

The Star Party 2009, Rendezvous of Celestial Surveillance was the biggest IYA2009 event to take place so far in Sri Lanka. The report on this event is below. See also
http://thilinaheenatigala.blogspot.com/2009/10/iya2009-sri-lanka-starparty2009.html

Commencing in 2004, Star Party is an observational astronomy competition where student groups from different parts of Sri Lanka compete together. It is organized by the astronomical societies of Ananda College Colombo, and Mahamaya Girls College Kandy. Since then it has been held annually and has gained a good reputation as an observation competition and astronomy workshop over the years.

The 6th consecutive Star Party, in 2009, Rendezvous of Celestial Surveillance, concluded successfully on the 26th of September, giving an unforgettable celestial experience to students, teachers, amateur observers, and organizers as well.

Students at the workshop

The Star Party 2009 project was named as the main IYA2009 Sri Lankan event and had a massive participation with more than 50 groups competing with each other. One of the key highlights was, for the first time ever, a live web streaming that continued throughout the program via the StarParty and SkyLK websites. The program kicked off with delivering a message about the importance and

significance of the International Year of Astronomy 2009 and how proud the students were to continue the event for the sixth time.

Along with the competition, a workshop was held as well. The workshop focused on the beginner level students. It covered basics of observational astronomy and mainly ran as training for the beginners to be able to compete next year. About 100 students participated in the workshop, along with teachers. The students were divided into 5 groups and were introduced to the basics of all aspects of astronomy: observational, cosmology, stars, black holes, extraterrestrial astronomy, and new technology. The participants were also given a chance to experience the beauty of Jupiter, the mighty object observed by Galileo 400 years ago. At the observing site, they were taken on a ride across the night sky that introduced many celestial objects and constellations. It was an unforgettable moment for most students as it was the first time they experienced the beauty of the Universe they have been living in for so long.

While the workshop was running, elsewhere on the event site, many students groups were busy catching glimpses of Jupiter, Moon, constellations, and other celestial objects. The observation site, Kandy, is one of the nicest places to observe in Sri Lanka: it is less polluted and with fresh air to breath, it treats you with countless stars.

Students observing

The competition also included two paper based exams, which covered the topics: solar observation, general astronomy, astrophysics, cosmology, and rocketry. Everything concluded the next day on the morning of the 26th, with the distribution of the awards.

De Mazenod College, Kandana won the competition as Champions. Sangamitta College, Galle were the runners-up.

Other awards ……

Theoretical Round & Spot Test: Dharmaraja College, Kandy
Solar & Observational Astronomy: Royal College, Colombo
Constellation & Deep Sky Observation: Sangamitta College, Galle
Moon Mapping: De Mazenod College, Kandana
Planetary Observation: De Mazenod College, Kandana

The champions of Star Party 2009, De Mazenod College, Kandana

This year's event gathered international attention thanks to the support and dedication of a few people. It was featured in Cosmic Diary, IYA2009, Cloudy Nights Telescopic Review, Portal to the Universe, Sidewalk Astronomers, and in many other web sites, forums and email listings.

Clearly, Star Party has become the foremost biggest annual event among the astronomy community in Sri Lanka. It is has influenced many student groups to go as far as to study and sharpen their observation skills months before the competition. For many this is a competition, an event to experience the celestial beauty, but personally I find it as an event that gathers all the keen future possible astronomers and a place to meet old friends.

Thilina Heenatigala, National Node Secretary
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ASTROFEST IN ODESSA

The astronomical observatory of Odessa National University (Ukraine) has always been known as an organization w active in Ukrainian astronomical education. Its staff astronomers spend a lot of time working with amateurs, answering the letters of people interested in astronomy, delivering lectures for the broad groups of society, organizing conferences for the young astronomers and amateurs.

Despite the various economical and political problems that significantly affect all sides of life in Ukraine, an interest to astronomy among people is still high, and even shows a clear signs of growing during the last years. In part, it is demonstrated by the traditional annual conferences of amateur astronomers, who come to Ukraine from different countries of the FSU and some countries of Eastern Europe.

The name of this conference is ASTROFEST. Its scientific organizing committee consists mainly of professional astronomers, who deliver during the conference general lectures on stellar physics, physics of the Solar System and the Sun. As a rule, this conference gathers many amateur astronomers interested in variable stars investigation. They present their results on the long-term light curve monitoring of the pulsating and eclipsing variable stars of the different types. Some years ago the great majority of the presented results was based on visual monitoring, while now the CCD technique is more widely used by amateurs.

ASTROFEST 2009 was held during the last week of August in Odessa (this was the second time that Odessa hosted this conference; the previous time was in 2005).

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USEFUL WEBSITES FOR INFORMATION ON ASTRONOMY EDUCATION AND OUTREACH MEETINGS

The following websites contain information on future (and recent) meetings and conferences on, or very relevant to, astronomy education and development. In compiling this short list I am well aware of a strong European bias. **Please send me by email URLs for relevant websites in other areas of the world.**

UK

The Association for Astronomy Education	http://www.aae.org.uk
The British Association of Planetaria	http://www.bap.redthreat.co.uk
The National Schools Observatory	http://www.schoolsobservatory.org.uk

Europe

The European Association for Astronomy Education	http://www.eaae-astro.org
The European Astronomical Society	http://www.iap.fr/eas
The European Southern Observatory	http://www.eso.org/outreach/eduoff

USA
(among several other good sites)

The Astronomical Society of the Pacific	http://www.astrosociety.org

Barrie W Jones
(for contact details see Program Group Chairs and Vice-Chairs)

INFORMATION THAT WILL BE FOUND ON THE IAU C46 WEBSITE (when it is re-established)

Among the information that will be contained on the IAU C46 website is the following

- Overview (of C46, in English, French, and Spanish)
- Organizing Committee and Program Group Chairs and Vice-Chairs
- Program Groups
- Presidents and Current Vice-President
- Resolution on the Value of Astronomy Education (passed by the IAU General Assembly 2003)
- External links
- Announcements/News
- Commission 46 Terms of Reference, Rules & Guidelines

At present, the only active and maintained website is my own mini-website. It includes the things for which I am responsible: the Newsletter (including back issues); National Liaison details; and National Liaison triennial reports for 2003-2006 and 2006-2008. The URL is http://physics.open.ac.uk/~bwjones/IAU46/.

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The Organizing Committee also includes a Society Organizing Committee that consists of the Program Group Chairs and Vice-chairs.

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