



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

Newsletter 57 – October 2002

**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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This newsletter is also available at the following website
<http://physics.open.ac.uk/IAU46>

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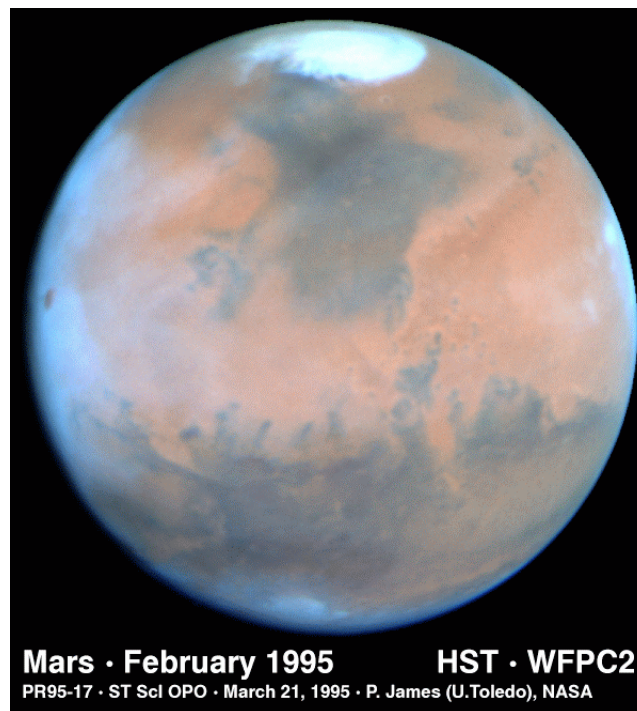
(see separate supplement for the actual reports)

Officers & Organizing Committee of Commission 46

EDITORIAL

Next year (2003) offers some excellent astronomical events through which we can promote astronomy education and public understanding. One such is the transit of Mercury. This occurs 7 May, when Mercury is near aphelion and thus moving at its slowest in its eccentric orbit. The transit is correspondingly lengthy. At aphelion Mercury is also comparatively close to the Earth, but even so it will be a tiny point, about 12 arcsec across, smaller than most sunspots. The whole transit will be visible from Asia and from all of Africa and Europe except the western extremities.

Another notable event is a favourable opposition of Mars. For a few days towards the end of August, Mars will be closer to the Earth than at any other time in written history, though it will have been within 0.1% of that distance on many occasions! Nevertheless, it was 1988 when Mars was last anywhere near as impressive a sight in the sky. In the UK one of the occasional National Astronomy Weeks will take place in the last week of August, centred on the theme of Mars, with many events countrywide, a large proportion centred on local astronomical societies.



Mars – the focus of the UK National Astronomy Week in 2003

With the approach of another triennial General Assembly the reports from National Liaisons are due, and many of these have already been received. The remainder is *urgently* required, by 9 December 2002 at the very latest – see the item on triennial reports below for further details.

The next edition of the Newsletter will be in March 2003. The deadline for the receipt of material is Friday 7 March 2003. Contributions can be sent as emails to me, either in the body of the email or as editable attachments e.g. Word, LaTeX. Illustrations should be in a common format – JPEG, GIF, TIFF – but individual emails with attachments should not exceed one megabyte. Material can also be sent to me by mail or fax.

Barrie W Jones

(for contact details see ‘Officers & Organizing Committee of Commission 46’)

MESSAGE FROM THE PRESIDENT

At first, I would like to express my sincere thanks for your encouraging emails during my surgery at a hospital in February and March this year, and my recovery phase in April. Fortunately, I am fully recovered and I started work from May. Our Commission activities have been well managed during that period.

Action Team 17 'Capacity Building', a follow-up activity of UNISPACE III, continues to work under the leading country Japan (Johannes Anderson, Newsletter 56 pp8-9). At the June meeting of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS) it was decided to have further detailed discussions during the World Space Congress, Houston, 15 October 2002. I, as the IAU representative, will attend to introduce the IAU Commission 46 Program Groups' activities and also the idea to produce a 'Cook Book' (proposed by Johannes Andersen) for this kind of international activity. It is expected to have some conclusions within a year or so.

Now, it is time to start preparations for the XXV IAU General Assembly in Sydney 13-26 July 2003. We should nominate candidates for our next Vice-president and the Organizing Committee members. It is also requested that each National Liaison consult their national committee of astronomy to decide whether they will continue or whether a new candidate will be proposed.

Syuzo Isobe

(for contact details see 'Officers & Organizing Committee of Commission 46')

OBITUARY & REMINISCENCE – PROFESSOR TROCHE-BOGGINO



Professor Alexis Emilio Troche-Boggino – a star in the southern sky

On 29 July 2002, Professor Alexis Emilio Troche-Boggino passed away at the age of 56. The loss of Professor Alexis from the Universidad Nacional de Asunción (UNA) and the National Liaison of Paraguay in IAU Commission 46 is a great blow for the international astronomy community and particularly for South America.

Born in 1946 in Asunción, Paraguay, he began his studies in physics in 1965 at UNA. In 1971 he got his BA degree in physics from the State University of New York at Buffalo where he also got his MS in 1974 from the Department of Physics and Astronomy with a project on double stars. He thus became the only Paraguayan graduated in astrophysics until today.

He taught physics, mathematics and astronomy at UNA and was a member of various scientific societies, such as the Astronomical Studies Society and the Astrophysics Club of Paraguay. He was also a Consulting Member of Commission 46 and, since 1985, National Representative/Liaison for Paraguay and Local Coordinator of the Visiting Lecturers Program.

He published many articles on the teaching of astronomy, and he participated in meetings and IAU colloquia, such as # 105, in Williamstown USA, where he presented a paper ‘The relevance of the Teaching of Astronomy in the Developing Countries; a Case: Paraguay’, and # 162, in London, with a paper ‘History and Local Traditions to Motivate Astronomy Learning’. In the IAU General Assembly in Manchester UK, he talked about the experience of the development of an astronomy programme in Paraguay.

Professor Alexis summoned the international community to observe the solar eclipse of 1994 from Paraguay and he was a member of the International Eclipse Organizing Committee Forum. He started an effort, in conjunction with the Japanese government, to acquire a telescope and thus participated actively in the National Astronomical Observatory at UNA. The Observatory, equipped with a 45-cm Cassegrainian, was opened in June 2000 and now bears the name ‘Prof. Alexis Emilio Troche-Boggino’.

Those who knew him well will never forget his kindness and warm-hearted nature, always courteous and cheerful. I had the pleasure of visiting him last year at the LIADA Meeting when he showed, despite his illness, great enthusiasm and hospitality with everyone.

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Reminiscence

I feel a deep sorrow to hear of the death of Professor Alexis Troche-Boggino of the National University of Asunción in Paraguay. It was 3 February 1994 when I first visited Paraguay. I paid a short visit together with the ex-President of Meisei University, Dr Eijiro Hiei, to study the possibility of sending a 92-student solar eclipse party from Meisei University to South America. On that occasion, the first person who Mr Fujii, Director of Mitsui Trading Asunción Office, introduced to us, was Professor Troche-Boggino.

Thanks to the cooperation of Professor Troche-Boggino, we decided to make eclipse observations in Paraguay, and we started the preparations for it. On 1 November 1994, the International Solar Eclipse Forum was held at the campus of the University of Asunción under the joint auspices of Meisei University and the National University of Asunción, and we were also successful in observing the total solar eclipse on 3 November.

Professor Troche-Boggino visited Japan in the summer of 1997, when the IAU General Assembly was held in Kyoto. At that time we heard his plan to construct an astronomical observatory in Paraguay as a base of astronomy education in South America. I was strongly impressed by his enthusiasm to realize his long-years' dream, and we promised assistance for his plan when he went back to his country.

His dream came true in the form of a grant of a telescope from the Japanese government. As a result, the construction of the Troche-Boggino National Astronomical Observatory was completed at the campus of the National University of Asunción on 6 June 2000. The physical condition of Professor Troche-Boggino did not seem very good when I was invited to the splendid inauguration ceremony of the astronomical observatory, but he kindly took me to the Iguazu Falls. On the way to and from the Falls I was deeply moved by his warm personality, his love of Puccini's music, and heartfelt affection for his mother.

I firmly believe that his meritorious work, and the astronomical observatory at the National University of Asunción, will be seen by the people of South America as promoting the ideal of astronomical education and popularization pursued for long years by Professor Troche-Boggino.

I tender hearty thanks for the friendship he showed me during his lifetime, and pray for the repose of his soul in heaven.

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ASTRONOMY COURSES FOR NON-SPECIALISTS IN THE USA

As many of you will already know, students in US universities do not begin to specialize in a particular field until their second or third year. Indeed, in many US colleges and universities, students are *required* to take courses outside the area of their eventual specialization. As a consequence, American astronomers in academic settings teach large numbers of students each year who do not go on to study the physical sciences. These may be students of history, economics, business, or philosophy. In North America, we estimate that roughly 250 000 students are enrolled in such courses each year.

What is our purpose in teaching astronomy to such students? This question was addressed by two national meetings held in the US in May and June of 2001. Leaders from roughly 30 US research institutions met to draw up a list of goals for courses of this description. The brief report of that group, endorsed by all present, is reproduced below. For the information of those not familiar with US academic structures, 'Astro 101' is used as a generic term to indicate a course at the introductory level in astronomy, not intended for a student going on in the physical sciences.

Recommendations of two national workshops on 'Astro 101'

I Goals (content)

Students should gain

- a cosmic perspective – a broad understanding of the nature and scope of the Universe, and where the Earth and Solar System fit in
- an understanding of a limited number of crucial astronomical quantities together with some knowledge of appropriate physical laws
- the notion that physical laws and processes are universal
- the notion that the world is knowable, and that we are coming to know it through observations, experiments and theory (the nature of progress in science)
- exposure to the types, roles and degrees of uncertainty in science
- an understanding of the evolution of physical systems
- some knowledge of related subjects (e.g. gravity and spectra from physics), and a set of useful 'tools' from related subjects such as mathematics
- an acquaintance with the history of astronomy and the evolution of scientific ideas (science as a cultural process)
- familiarity with the night sky and how its appearance changes with time and position on Earth.

II Goals (skills, values, and attitudes)

1 Students should be exposed to

- the excitement of actually doing science
- the evolution of scientific ideas (science as a cultural process).

2 Students should be introduced to how science progresses, and receive training in

- the roles of observations, experiments, theory and models
- analysing evidence and hypotheses
- critical thinking (including appropriate scepticism)
- hypothesis testing (experimental design and following the implications of a model)
- quantitative reasoning (and the ability to make reasonable estimates)
- the role of uncertainty and error in science
- how to make and use spatial/geometrical models.

3 And we should leave students

- more confident of their own critical faculties
- inspired about science in general and astronomy in particular
- better equipped to follow scientific arguments in the media.

Bruce Partridge

Education Officer of the American Astronomical Society

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REPORT FROM THE PROGRAM GROUP ‘PUBLIC EDUCATION AT THE TIMES OF SOLAR ECLIPSES’

(Members: Jay M Pasachoff, Ralph Chou, Julieta Fierro)

The Program Group provides information and advice about safe observation of partial, annular, and total solar eclipses and can try to help publicize astronomy in general when a country's attention is focused on astronomy by the approach of an eclipse. It maintains a web page for the general public at www.eclipses.info. This web page is similar to that of the Working Group on Eclipses but has safety and other information of particular interest to the general public appearing first, before maps and more technical information.

The total solar eclipse of 21 June 2001 swept across southern Africa, and provided partial phases for all of Africa south of the Sahara. The Working Group on Eclipses of Division II of the IAU maintained a homepage at www.totalsolareclipse.net (which links to the website www.williams.edu/astronomy/IAU_eclipses) that provided links to maps, information about observing eclipses, and information on eye safety at eclipses, including filter evaluations by Ralph Chou. Jay Pasachoff lectured about watching eclipses safely at a Professional-Amateur Conference on Solar Eclipses held at Antwerp in November 2000, and at various venues in Zambia in March and June 2001.

In spite of the best efforts of all professionals and educators concerned, confusion reigned in 2001 about when to look at the eclipse through filters and when directly. The growing popularity of solar viewers of Mylar in eyeglass form has probably contributed to the confusion. We are working with the makers of such glasses and viewers to label the products more clearly, assuming people do not read accompanying instructions. In spite of numerous newspaper interviews, newspapers continued to print incorrect information how to observe eclipses.

Solar filter material was distributed at low cost or no cost to universities in Zambia and Zimbabwe, and representatives of many countries in the zone of partial eclipse were advised on safe observing methods. No eye injuries have been reported, to my knowledge. National Liaisons were appointed in Zambia, Zimbabwe, and South Africa, and they did their best to provide accurate information.

The annular eclipse of 14 December 2001 in Costa Rica provided partial phases from northwestern South America through Central America to all of the United States except for the east. The 10 June 2002 annular eclipse provided partial phases for viewers in eastern Asia (including Japan, China, Russia, and Korea) and northwestern Australia, and then ranged across the Pacific Ocean to western Mexico, United States, and Canada. Annularity was viewed in certain Pacific Islands and near Puerto Vallarta, Mexico, usually through clouds. Images can be seen in links from www.eclipses.info.

The 4 December 2002 total eclipse will provide partial phases across all of Africa except its northern rim and, at sunset, western Australia. Information about safe watching of partial phases of eclipses was widely disseminated in those regions, though, as usual, the local ophthalmological societies sent out some misleading and overly harsh warnings.

Maps for future eclipses are available on the Web site, www.eclipses.info

Jay M Pasachoff, United States National Liaison to Commission 46
(for contact details see ‘Officers & Organizing Committee of Commission 46’)

NEWS OF MEETINGS

NINTH CONVENTION OF THE IBERO-AMERICAN ASTRONOMICAL LEAGUE (OCTOBER 2001)

The ninth Convention of the Ibero-American Astronomical League (Liga Iberoamericana de Astronomía – LIADA) was held in Asunción, Paraguay, 5-7 October 2001. Along with the meeting, the first Congress of Astronomical Studies Society (Sociedad de Estudios Astronómicos – SEA) and the fifth Latin American Symposium on Variable Stars (Simposio Latinoamericano de Estrellas Variables) were also held.



Attendees at the ninth LIADA Convention

LIADA was created in 1982 as a reorganization and as heir to the earlier LLADA (Latin American League of Astronomy), founded in 1958. It tries to organize, conduce and facilitate the efforts of amateurs and semiprofessionals of Ibero-America. Some professional astronomers also take part establishing this way the collaboration between the two groups that share our beloved activity. Its aims are: to promote the study of astronomy and the observation of the sky in the more significant areas; to assemble the observers from around the world that speak Spanish or Portuguese; to promote the communication between professionals and amateurs; to publicize and expand the respect and appreciation of the Earth as a planet; and to publish members' works.

There were about 90 attendees (75% male and 25% female) from Paraguay, Argentina, Uruguay, Brazil and Bolivia. The programme, organized through the efforts of the convention's scientific chairman, Jaime Garcia (Argentina), included 3 invited talks, 1 debate, 3 workshops, 29 oral communications, 18 poster presentations, and 2 exhibitions devoted to various astronomical sub-areas, including teaching and the history of astronomy.

The opening lecture was given by Alexis E Troche-Boggino, from the Universidad Nacional de Asunción. The title was 'Experience in the development of an astronomy program in Paraguay'. There was a debate on 'Amateur - Professional Collaboration in Astronomy', under the coordination of Jaime Garcia.

Among the oral communications, eight were related to the teaching and popularization of astronomy, and one had the topic 'LIADA Teaching and Popularization Section: new perspectives and challenges', presented by the coordinator of the Section, Paulo S Bretones (Brazil). Among the posters, three were on the teaching and popularization of Astronomy.

There was a workshop on astrophotography by José Carlos Diniz (Brazil), another on variable stars by Sebastián Otero (Argentina), and 'Hands on Astrophysics' prepared by Janet Mattei (USA) and presented by Andrés Risi and Juan Marcos Santander (Argentina).

The morning programme on 6 October was developed at the National University of Asunción and included a visit to the astronomical observatory opened in June 2000, that has the name of Professor Troche-Boggino.



Paulo Bretones and Alexis Troche-Boggino at the National Astronomical Observatory at UNA. The Observatory, equipped with this 45-cm Cassegrainian, bears the name 'Prof. Alexis Emilio Troche-Boggino'

There was a general assembly coordinated by the president of LIADA, Sergio A Dominguez, and the final session included the presentation of certificates and distinguishing awards.

More information is available at <http://www.liada.net>

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LIBRARY & INFORMATION SERVICES IN ASTRONOMY IV (LISA IV) (JULY 2002)

The fourth conference on Library and Information Services in Astronomy (LISA IV), was held 2-5 July 2002 in Prague, Czech Republic, and was hosted by the Astronomical Institute of Charles University and the Astronomical Institute of the Academy of Sciences of the Czech Republic. The conference theme, 'Emerging and Preserving: Providing Astronomical Information in the Digital Age', emphasized the vast changes librarians and other information professionals are facing today, not only in methods of information delivery and the kinds of information being delivered, but also in innovative ways of preserving and presenting to users an array of older and historical materials.

The conference brought together almost one hundred librarians, astronomers, publishers, and computer specialists representing astronomical institutes, observatories, and affiliated organizations worldwide. The SOC was co-chaired by Liz Bryson (CFHT librarian) and Genova Francoise (Strasbourg).

As was the case with previous LISA conferences, a 'Friends of LISA (FOL)' committee began fundraising more than a year prior to the conference. The committee consisted of Ellen Bouton (National Radio Astronomy Observatory), Brenda Corbin (United States Naval Observatory), Marlene Cummins (University of Toronto), along with Ron Enders. FOL raised enough funds from publishers, institutions, and individual librarians to assist a record 29 librarians from 12 developing countries. The presence of these colleagues greatly enriched the meeting for all attendees; FOL grantees were enthusiastic participants in the conference and will most certainly have much to share in their home institutions and countries.

The conference proceedings will be published later this year by the US Naval Observatory. As papers proceed through the editorial process, electronic versions will be available on the Web at <http://www.eso.org/libraries/lisa4/>

Marlene Cummins (for the Friends of LISA IV Committee)
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EDUCATION SESSION AT THE UK NATIONAL ASTRONOMY MEETING (APRIL 2003)

The UK National Astronomy Meeting (NAM) in 2003 will be held in Dublin, Ireland, 7-11 April. On 10 April there will be a 90 minute astronomy education session, that is being organized by Margaret Penston.

For further details keep your eye on the NAM 2003 website <http://star.arm.ac.uk/~csj/nam2003/>

Barrie W Jones

(for contact details see 'Officers & Organizing Committee of Commission 46')

EDUCATION SESSION AT THE IAU GENERAL ASSEMBLY (JULY 2003)

A Special Session, SPS4 'Effective Teaching and Learning of Astronomy' will take place on Thursday 24 July and Friday 25 July 2003 during the IAU General Assembly in Sydney. It is being organized by Commission 46.

The health of astronomy depends critically on the quantity and quality of astronomy which is taught in our schools. It affects the recruitment and training of future astronomers. It also affects the awareness, understanding, and appreciation of astronomy by the citizens who, as taxpayers and decision-makers, support our work. They form the society and culture within which we work. In many countries, astronomy does not appear in the school curriculum; in others, it has a place in the curriculum, but the curriculum may be flawed, or teachers may have neither the training nor the resources to present it effectively. Much is known about effective teaching and learning of astronomy. Very little of this understanding is implemented in schools and universities. Rather, teaching sometimes intensifies misconceptions, and may create an incorrect or negative impression of our subject.

The Special Session at the forthcoming IAU General Assembly will bring together experienced and knowledgeable astronomy educators and education researchers from around the world to

- (i) review what is known about effective teaching and learning of astronomy, and how it can be implemented
- (ii) examine specific examples of successful (or unsuccessful) approaches to teaching
- (iii) provide guidance for improvement in the future.

The emphasis will be on identifying and implementing practices which are practical and widely applicable, taking account of contemporary education research, and the widespread interest in topics of astronomy, including current developments. The needs of the developing world will be explicitly addressed. Large parts of the industrialized world could be considered undeveloped as far as astronomy education is concerned!

This Special Session will focus on formal education in elementary and secondary school. Pre-service and in-service teacher education will be considered, as will introductory astronomy courses at the university level insofar as they affect general scientific literacy – especially among teachers. The roles of planetariums, science centres, print and electronic media, professional and amateur

astronomers in supporting school education will also be discussed, as will the challenge of forming productive partnerships among astronomy educators, education researchers, teacher educators, and all the other individuals and organizations which have a role to play. The many forms of instructional technology (from robotic telescopes to the Internet) will be discussed, where these can be shown to promote effective teaching and learning.

The training of astronomers at the undergraduate and graduate level, and public education, are outside the scope of this Special Session.

Contributed poster papers may be submitted through the usual channels (see the IAU Newsletter, not this C46 Newsletter, for instructions). There will be no contributed oral papers in this Special Session.

The Scientific Organizing Committee comprises: John Dunlop (New Zealand), Julieta Fierro (Mexico), Michele Gerbaldi (France), Mary Kay Hemenway (USA), Syuzo Isobe (Japan), Barrie Jones (UK), Margarita Metaxa (Greece), Jayant Narlikar (India), Wayne Orchiston (Australia), Jay Pasachoff (USA), John R. Percy (Chair, Canada), Case Rijdsdijk (South Africa), Rosa Ros (Spain), Graeme White (Australia). The contact is John Percy (see below).

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TRIENNIAL REPORTS FROM NATIONAL LIAISONS

The Triennial Reports from National Liaisons are being collected into a supplement to this Newsletter. It will be published in mid October on the Commission 46 website <http://physics.open.ac.uk/IAU46>. Thereafter further reports will be added and any corrections made from time to time, until December. The supplement will then be produced in hard copy and distributed to those who get hard copy of this Newsletter. It is not expected that any further additions or other changes will be made once the hard copies have been produced.

Please send reports to Jay Pasachoff, with a copy to me – see ‘Officers & Organizing Committee of Commission 46’ below for contact details. Submissions in Microsoft Word should contain accents and acutes etc on Roman characters as appropriate. Plain text in the body of an email is acceptable, though any special alphabetic characters will have to be described.

A possible format for a report is under the following headings: general information, schools education, university education, public understanding (including amateur astronomers), though local circumstances or personal preference might dictate otherwise.

The final deadline for the receipt of reports is Monday 9 December 2002. This also applies to me for the UK report, but my excuse is that I’ve only just taken over as the UK National Liaison!

Barrie W Jones

(for contact details see ‘Officers & Organizing Committee of Commission 46’)

OFFICERS & ORGANIZING COMMITTEE OF COMMISSION 46

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Organizing Committee

This presently consists of the President, Vice-president, Past-president, a representative from the IAU Executive Committee, the chairs of the program groups, and the vice-chair of the program group Exchange of Astronomers. For details of the OC, and for the other members of the program groups, see the website below, and also Newsletter 53, under Section B of the item, The Business Meeting of C46 2000.

National liaisons

These are listed on the website <http://physics.open.ac.uk/IAU46>
