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

Newsletter 73 – October 2010

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.

**PLEASE WOULD NATIONAL LIAISONS
DISTRIBUTE THIS NEWSLETTER
IN THEIR COUNTRIES**

This newsletter is available at the following website
http://astronomyeducation.org
(a more memorable URL for the IAU C46 website than
www.iaucomm46.org, which the new URL links to)
and also at
http://physics.open.ac.uk/~bwjones/IAU46/

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EDITORIAL

Thanks to everyone who has made a contribution to this edition of the Newsletter. Please note the text in the Newsletter (not just in this Editorial) highlighted in RED.

For the March 2011 issue the copy date is **Friday 11 March 2011**. 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.

Book reviews

I received no book reviews for this issue. This feature first appeared in the October 2009 issue and was repeated in the March 2010 issue. 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.

The C46 websites

The "official" handsome website is at http://www.iaucomm46.org. Jay Pasachoff has secured for C46 the more memorable http://astronomyeducation.org which links to the "official" website. I'm sure that you'll join me in thanking Jay.

My mini-website 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/. Everything on my website should be on the "official" website.

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.

Back issues are available at http://astronomyeducation.org (http://www.iaucomm46.org) and also 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

For several years the website of our Commission was not active for various reasons. The most important was the lack of financial support. At present our site is running (see page 1) and the activities of our programme groups have a place to be shown. All members of C46 are invited to send their contributions for the website and the Newsletter. Both channels can be useful for all of us in showing what we are doing in astronomy education and development.

The list of C46 National Liaisons has been revised by Barrie Jones. The main page of our website links to this list (via National Contacts). Please, if you detect errors or omissions inform Barrie Jones or myself Rosa M Ros. Whereas the NLs have names, addresses and emails, Barrie Jones has also compiled a list of all the C46 members with email addresses. This list will shortly be available on our website.

Commission 46 Programme Groups are very active. The 32nd International School for Young Astronomers (ISYA) took place in Armenia during the second part of September. About fifty students from different countries participated in this well establish PG. The PGs Teaching Astronomy for Development (TAD), Worldwide Development of Astronomy (WWDA), and Network for Astronomy School Education (NASE) are organising their visits. Their efforts are focused in Latin America, Africa and Asia. The new IAU Office for Astronomy Development in South Africa, and the IAU XXVIII General Assembly in Beijing in August 2012 will promote astronomy in these regions too.

A working group, Remote Telescopes, has been created through the initiative of Jean Pierre de Greve. The main goal is to use remote telescopes for the PGs of C46 involved in education. We could operate in rural areas and show people (teachers), and children in particular, real time images, and at the same time introduce explanations connecting concepts in science and astronomy. Through agreements with organizations or institutions the IAU would have the option on a certain amount of telescope time for its educational projects (ISYAs, NASEs, TADs and WWDAs). IAU C46 cannot pay for telescope time, but can offer other kinds of return to the remote telescope agencies. Most of the professional remote telescopes are obliged to organize Outreach activities too. The IAU provides them with high quality activities to fulfil these requirements. We can help them in some way and we can propose to help with publicity asking for support (at symposia, in the Newsletter, at the General Assembly). The Remote Telescopes working group could come up with creative solutions in the preparation of an inventory of available remote telescopes, their location and characteristics, their use (some of them may not be suitable for educational purposes), the organization responsible, and the person responsible for the facilities. This working group involves Michele Gerbaldi (ISYA), Peter Kammeyer (NASE), Larry Marschal (TAD), and Kaz Sekiguchi (WWDA), Eventually, we can invite remote observatory staff members to participate in C46 events.

A new initiative has been implemented in order to coordinate C46 with C55, Communication Astronomy with the People, to work together in a more efficient way in commons goals. The person involved from C46 is Magda Stavinski (past president of C46) and Rosa Doran from C45. We believe that this effort will be very useful in increasing and facilitating cooperation between both Commissions.

The newsletter and the website are waiting for your contributions. Participate in them!
Newsletter: Barrie Jones bwjones@talktalk.net
Website: Rosa M. Ros ros@ma4.upc.edu

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

THE KIEV PLANETARIUM

Creation of the Kiev Planetarium was initiated in 1952 by the famous Soviet astronomer Sergei K Vsehsvjatsky. At first the Planetarium occupied the Alexander Church, and only after 36 years, in 1988, did it obtained its own site built by the "Znanye" ("Knowledge") Society. This specialized building can accommodate about 320 visitors.

Professor Sergei K Vsehsvjatsky

Today the Kiev Planetarium is one of the biggest in Europe. The stellar hall has a cupola 23 metres in diameter, and a height of 11.5 metres. At the centre of this building there is the main apparatus, The Grand Zeiss.

The Planetarium apparatus, the Zeiss projector

The Kiev Planetarium has, for some years, been a cultural and educational centre that spreads astronomical knowledge among those people who want to feel the fascination of our Universe.

A very important part of the Kiev Planetarium activity is the ongoing education programs that are elaborated on the basis of the school curricula, and are intended to supplement the material delivered in school astronomy lessons. The Planetarium promotes a visual understanding of Nature laws, and the feel that that neither school, books, nor the Internet can provide.

Today there are several education programs that have been developed in the Planetarium. Among them are Astronomy, Science about Nature, Geography, Fantastic Universe, Cosmic Journeys, Your Cosmos, the Sky's and Earthly Miracles, and Cosmic Kaleidoscope. During 2009 the Kiev Planetarium was visited by about 6000 pupils from the 220 schools with season tickets.

Together with traditional educational lectures, the Planetarium also organizes lectures for children in the form of fairy tales or interesting stories to familiarize them with cosmic mysteries.

Prof K I Churyumov, present director
of the Kiev Planetarium

As a rule, for the public, the Planetarium is open during the week-end. Visitors can see the 'skies', can attend a traditional lecture about the Universe, special lectures about the most important astronomical discoveries, and audio-visual lectures with special video-effects and computer graphics that allow the public to participate in the cosmic performance.

The Planetarium has introduced educational programs orientated at young people (scientific-entertainment programs). They start at 6 PM. In such programs the scientific information is creatively combined with some elements of edutainment software (music, animation etc). For this, additional equipment is used.

As an aid to people studying English and French, the Planetarium organizes special programs that are conducted by foreign radio and TV announcers having a native language. This is a very important activity, because Euro 2012 will be held in Kiev, and many tourists are expected during this event. The Planetarium is also attended by Russian and other former Soviet Union citizens. Therefore a part of the lectures is delivered in Russian.

The Planetarium has an Astronomy School that is attended by children 5-12 years old. This is quite unusual, since as a rule out-of-class astronomical activity concerns pupils with of about 11-12 years.

Staff of the Kiev Planetarium

In 2008 the Planetarium started a new education project, Philosophic Soiree (two times per month). Within this project the most interesting for the public are discussions about ancient and modern philosophy. The audience can meet representatives of the foreign consulates and embassies, to pose questions about the philosophical traditions and achievements in the different countries, as well as to learn more about the art culture of those countries.

Today Kiev Planetarium has four lecturers – three of them are astronomers and one is a geographer. More information about Kiev Planetarium can be found at www.planet.org.ua.

S Gerasimenko, K Churyumov, and S Andrievsky
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CENTRE FOR BASIC SPACE SCIENCE, NIGERIA

The National Space Research and Development Agency (NASRDA), Abuja Nigeria, was established in 2001 and one of its activity centres is the Centre for Basic Space Science (CBSS). This name was coined after the UN initiatives of 1991. Prof P N Okeke is the first and current Director of the Centre.

The mandate of the Centre includes conducting research to expand the frontiers of knowledge in astronomy and atmospheric sciences, with the primary objectives of developing the skills and knowledge of researchers. This has to be done in collaboration with both national and advanced international organization.

The Centre is located temporarily in the University of Nigeria, Nsukka, but is currently developing its permanent site about 10 kilometers outside Nsukka town in a beautiful valley free from noise and interference.

Today, CBSS is collaborating with relevant Nigerian universities and research institutes, the National Astronomical Observatory Japan, the National Institute for Optics and Astronomical Science China, Urunqi Observatory China, the South African Astronomical Observatory Cape Town, Hart-RAO Observatory South Africa, the University of Delaware USA, etc.

CBSS participated actively in the 2005–2009 International Heliophysical Year (IHY) projects, including the hosting of the International School IHY for all African countries. The Centre has also been billed to host the UN/NASA/JAXA/ESA/NSRDA/ISWI workshop in October 2011. {Ed. See the Internet for the meaning of these acronyms.}

Other achievements recorded by the Centre include the following

(i) The construction of one of the largest Radio Telescopes in Africa – a 25 metre dish which is currently being constructed in collaboration with China and will be installed in Nigeria by 2012.

(ii) The installation of a wireless network of 20 automatic weather stations spanning the entire country for monitoring real time climatic and environmental hazards. It is known as NECOP, Nigerian Environmental and Climatic Observing Programme.

(iii) The installation of systems for studying radio propagation in the troposphere with the aim of producing accurate characterization curves for Nigeria.

(iv) Participating in all the IHY projects through installation and use of magnetometers, SID, GPS, aerosols and pollution research, and the study of near-Earth objects.

(v) CBSS received a prize for its outstanding performance in IYA 2009, 100 Days of Astronomy.

(vi) CBSS is responsible in Nigeria for publishing primarily all the original results by researchers in space science and technology in the country through the journal known as the Nigerian Journal of Space Research. Staff members of the Centre have additionally published extensively in other international journals of space science.

ABOUT THE DIRECTOR OF CBSS: PROF. P N OKEKE, FAS, FRAS

Prof P N Okeke has two major visions/missions which he has pursued relentlessly over the past 40 years. The first is to participate actively in the development of basic space science, not only in Nigeria but Africa in general. The following appointment buttresses this fact: he served as an external board member of NFR, South Africa, for Astronomy from 1996–2000. During this period he encouraged black people to participate in astronomy programmes.

Second, Prof Okeke and the late Bob Stobie were instrumental in the planning and sitting of the South African Large Telescope (SALT) in Southland, South Africa, and trained a number of PhDs using facilities in South Africa. He is currently serving as the Director of Nigeria's National Space Research and Development Agency (NASRDA) Centre for Basic Space Science (Astronomy and Atmospheric Sciences), as well as a member of the Technical Advisory Board of NASRDA. Prof Okeke was given a letter of commendation by the United Nations during one of UN's meetings in Tokyo 2007, for his tremendous role in the development of astronomy in Africa, and he is still a single point contact for astronomy in Nigeria.

Apart from the above, Prof Okeke works extremely hard to make the study of physics and astronomy easy and interesting in West Africa. He has written over fifteen textbooks in physics and astronomy at both tertiary and higher school levels. These books are today, the most popular books in Nigeria and some other parts of West Africa.

Prof Okeke has published extensively in various areas of space science, and his final ambition is to complete the construction of a 25 metre radio telescope which he intends to operate with over twenty former PhD students whom he produced in collaboration with various research groups around the world.

Hans Haubold
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NASE ASTRONOMY COURSES IN SOUTH AMERICA

The mission of the IAU in world astronomy development is to stimulate the application of astronomy in all its forms as a benefit to society and human kind.

The IAU, through its commissions, has projects which involve: public understanding, school education, university education, research training, and research infrastructure.

It is crucial to act in the curricula of children and teenagers, before the university and research periods. If the pupils have a positive contact with astronomy, maybe they will decide to be astronomers. But it is very difficult to choose to study something which is not known to them. Astronomy should be more present in the school. It is necessary to educate teachers in astronomy topics. In general, there is astronomy in school curricula, but if teachers do not introduce observing possibilities this will limit their astronomy lessons to book contents in a very theoretical way. All schools in all the countries in the world have an 'astronomy lab': the outdoor grounds/fields of the school. The teachers with enough instruction can use it. It is necessary to promote astronomy among primary and secondary school teachers.

In August 2009, C46's NASE (Network for Astronomy School Education) was born at the IAU General Assembly in Rio de Janeiro (Chair, Rosa M Ros, Spain); Vice-chair, Beatriz García, Argentina). The main goal of this new Program Group of C46 is to promote astronomy at secondary and primary schools in all countries, with a special interest in developing countries. The first objective is to create a basic course in astronomy, and teach this course in the language that teachers normally

use, with the aid of a group of IAU C46 members and teachers. A small group of three members of NASE would visit a country and teach the course in cooperation with any IAU members in the country, and any teachers there interested in astronomy. The teachers and astronomers in the country that cooperate with the NASE members will have created a new NASE working group, and they will have to repeat the course at least once per year. Of course they are invited to cooperate with NASE in relation to other courses and in the creation of materials in order to increase their knowledge. The Local NASE group should be born in cooperation with local institutions: Ministry of Education, Universities, and/or Observatories interested in cooperation with NASE.

It is necessary to create a set of complementary materials for the teachers that participate in the basic course to introduce them to ideas to continue and increase their activities during the academic course with their students.

The course (for teachers)

The basic course will be the same in all the countries, with changes in the presentation related to the latitude and longitude. The topics appear in Table 1 and the timetable in Table 2. The course can be seen in detail at the website of NASE (http://www.iau.org/education/commission46/nase).

Table 1 Authors of lectures and workshops of the NASE Basic Course

Lectures	Solar System	Magda Stavinsky (Romania)
	Stellar Evolution	John Percy (Canada)
	History of Astronomy	Jay Pasachoff (USA)
	Cosmology	Julieta Fierro (Mexico)
Workshops	Local horizons and Sundials	Rosa M. Ros (Spain)
	Stellar, solar, and lunar demonstrators	Rosa M. Ros (Spain)
	Earth-Moon-Sun System: Phases & Eclipses	Rosa M. Ros (Spain)
	Planets and exoplanets	Rosa M. Ros (Spain)
	Solar Spectrum and Sunspots	Alexandre Costa (Portugal), Beatriz García (Argentina), Ricardo Moreno (Spain)
	The life of stars	Alexandre Costa (Portugal), Beatriz García (Argentina),
	Astronomy outside the visible	Beatriz García (Argentina), Ricardo Moreno (Spain)
	The Universe's Expansion	Ricardo Moreno (Spain)
	Young astronomer briefcase	Rosa M. Ros (Spain)

The duration of the course is 4 days. The activities are distributed among
- lectures giving information about special topics in astronomy
- working groups for discussion of the situation of astronomy in the country
- methodology for teaching astronomy
- workshops for practical activities.

The workshops constitute the most important part in the course. Our aim is to promote learning by doing, and workshops are specially designed for this. The idea is that students, helped by their teachers, produce some observations using devices made by themselves or by the use of simple objects and instruments (for instance a photographic camera or a 'remote control') applied to astronomy. The course is also complemented with day and night observations, with and without telescopes, poster sessions in order to give some participants the time to display their expertise, a visit to an astronomical/archeo-astronomical site, and a final evaluation session.

The astronomical visit is to show the participants that astronomy is possible in the middle of a city. In some cases we can visit a building oriented according to astronomical principles, or note the structure of a city oriented in the same way, or visit an old site and to recognise the astronomy of old cultures in

the area. Of course, participants are invited to try to discover astronomical sites in their towns and to study them with their students.

All the activities, except the workshops, are taught to the full group. The workshops are taught to small groups. This is the best method to enable a teacher to understand how to do it. Also we can divide into groups of primary and secondary school teachers in order to approach in a more appropriate way the different methodologies needed.

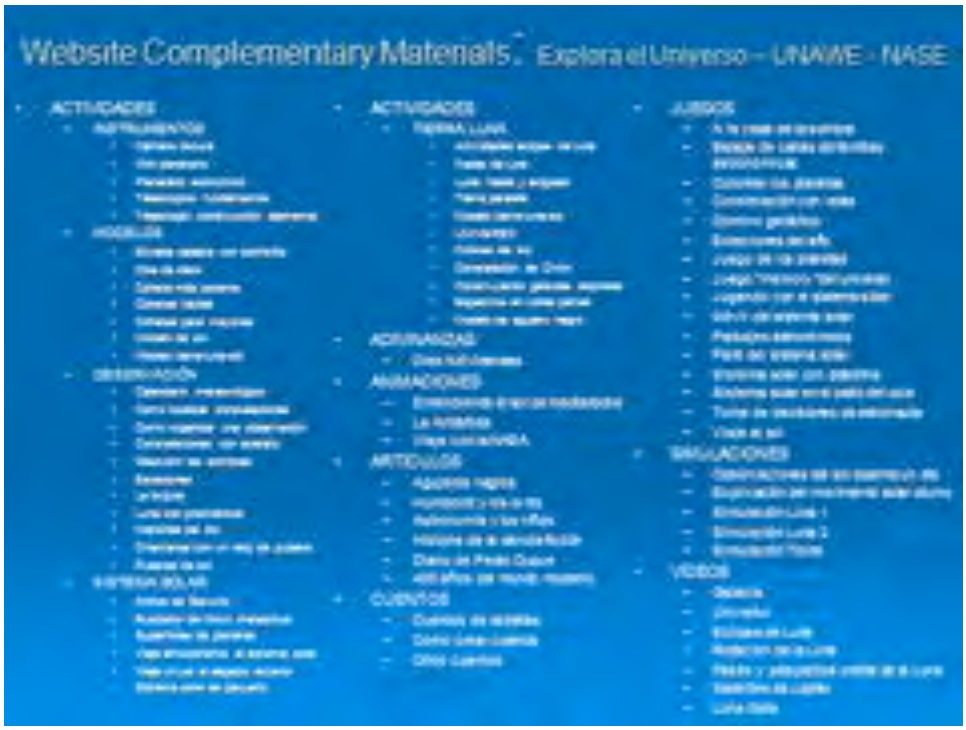
The first time that a workshop is taught to the teaches, the instructor is a member of NASE who visited the country, but with the support of the members of the local NASE group that will be the responsible instructor in the second session. In the second workshop, the NASE visitor is present too, but it is only for support if it is necessary. This method had been used in all the visits this year and it was very useful. Of course the local instructors know that with enough time, a month before, the contents of the activities, they will have enough time to prepare.

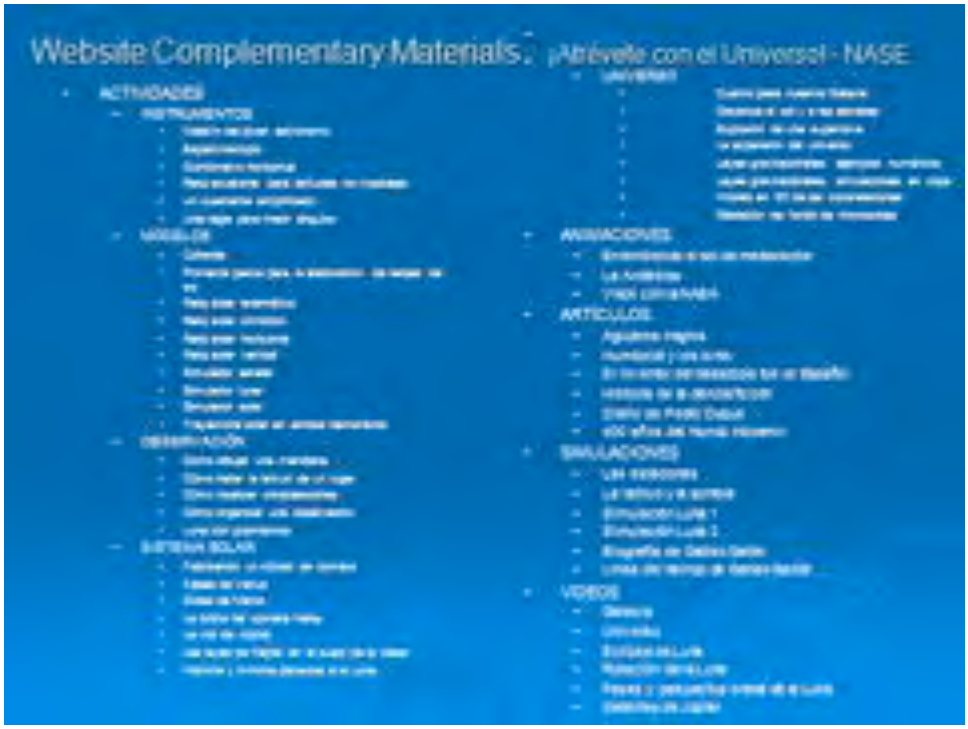
The first year that NASE implemented the basic course, three members of NASE visited the country. In subsequent years the number will decease, and finally the local members will work alone, but they will receive occasional visits from a NASE member in order to reinforce the cooperation.

The materials had been prepared by members of the NASE group and experienced teachers in astronomy. In Table 1 appears the full list. At present the contents are in Spanish and English, but in future we plan to translate into other languages. If it is not possible to translate into the mother tongue, we will translate into a very well-known language accessible to them.

The complementary materials for secondary schools (11-18 years old students)

For our activities in South America, Spanish is an excellent option. We decided to prepare the complementary material in Spanish also. There are more than 150 papers, for secondary and primary schools, including: activities, simulations, interactive projects, games, tales, videos, observations, pictures, articles, etc., all that teachers and students can need. The materials are listed in the two panels below, the first for primary schools (4-10 years old), and the second for secondary schools (11-18 years old). These have been developed in cooperation with the UNAWE Universe Awareness initiative which involves C46 too.





A page with complementary material will be developed in English in a few months, in cooperation with other institutions.

The courses organised in 2010

In 2010, the actuation area has been South America. We organised several courses in July and in October. The members of NASE who visited the countries were Beatriz García, Ricardo Moreno and Rosa M Ros all of them from Spanish speaking countries, and they can teach and exchange opinions with all the participants in this language.

The first course took place in Barranquilla, Colombia, 6-9 July, in cooperation with the Atlantic Department of Education, and the 'Eridano' Astronomy Association. Fifty-one teachers participated, and it created a 'WG NASE Atlántico-Colombia' with seven members. These members participated as instructors in the course together with NASE members.

Students in Columbia making a model showing the relative sizes of the Sun and planets

The second course was in Managua, Nicaragua, 11-15 July, in cooperation with the Universidad Autónoma Nacional de Managua, and the Observatory of Managua. The 'WG NASE Nicaragua' has been created with six members who worked as instructors in the 2010 course, and they will be responsible for organizing courses in future summers. The full number of participants in the course was fifty six from all the different parts of Nicaragua. There were secondary and primary school teachers and professors from education faculties in the university.

Students in Nicaragua performing the Bunsen grease spot experiment to compare the luminosity of two light sources

Then same month, from the 17th to the 20th, the last course took place in Lima, Perú, in cooperation with the Universidad Nacional Mayor de San Marcos, and in particular with the Facultad de Educación and the Facultad de Ciencias Físicas. We created the 'WG NASE Perú' with five members who cooperated with the NASE foreign members, and taught the astronomy course to thirty primary and secondary school teachers.

At an archaeological site near Lima (Perú)

At present we are preparing two courses in Argentina. In this case the courses will be organized in two different cities, one for primary school teachers in Cañada de Gómez, and another for secondary school teachers in Rosario. Both courses will take place 12-17 October 2010.

Every year the lectures, workshops, and observation are the same (of course adapted to the latitude of the place and to the peculiarity of the country). The required materials are on a website in the language of the country. Every participant receives the Proceedings (details of all the activities) in hard copy plus a CD with PowerPoint presentations and the digital material that they need, in the language of the country.

Table 2: Timetable of NASE Basic Course

	1st day	2nd day	3rd day	4th day
0900-1000	Lecture 1	Lecture 2	Lecture 3	Lecture 4
1000-1100	Workshop 1	Working Group 1	Working Group 2	Working Group 3
1100-1130	break	break	break	break
1130-1300	Workshop 2		Workshop 5	Workshop 8
1300-1400	lunch	lunch	lunch	lunch
1400-1530	Workshop 3	Astronomical visit	Workshop 6	Workshop 9
1530-1700	Workshop 4		Workshop 7	Evaluation
	dinner	dinner	dinner	dinner
1830-2030		Observation 1	Observation 2	

The plans for 2011

According to the IAU decanal plan, we are to considerer eight regions.

Region1: North America
Region 2: Latin America
Region 3: Europe
Region 4 Middle East and North Africa
Region 5: Sub-Saharan Africa
Region 6 Central Asia
Region 7: Far East and South-East Asia
Region 8: Oceania (including Australia and New Zealand)

In regions 1, 3 and 8, there are several important associations which organise astronomy courses for teachers. For instance in Europe, the EAAE (European Association for Astronomy Education) organized several courses in cooperation with several IAU C46 members in Madrid, Spain (November 2009), and in Varna, Bulgaria (September 2010). These regions are not in the focus of NASE at present.

The first courses organised by NASE were in region 2 in 2009 as already described. Our plans are to organise courses in 2010 in Africa, regions 4 and 5, in accord with budget constraints. In 2012 we are planning to organise courses in Asia, regions 6 and 7.

We invite Comm. 46 members interested to cooperate with the NASE PG

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

ASTRONOMY EDUCATION REVIEW, VOLUME 9

The Astronomy Education Review (AER), the web-based journal/magazine about astronomy education and outreach, continues to publish significant papers and articles as it moves into the second half of its 9th volume. There is currently no charge for reading or downloading the full articles in the journal and there are no page charges to publish, thanks to the generosity of its publisher, the American Astronomical Society.

A partial table of contents for Volume 9 is below. You can see the entire current issue and all past volumes at: http://aer.aas.org

AER actively solicits interesting papers and articles on all aspects of astronomy and space science education and outreach. All papers are refereed, and a set of guidelines for contributing to AER is available on the website. Thomas Hockey of the University of Northern Iowa is the Editor in Chief and Andrew Fraknoi of Foothill College serves as Senior Editorial Advisor. Judy Johnson of the American Astronomical Society is the Managing Editor. The journal is pleased to announce that it is actively soliciting papers and articles on results from the International Year of Astronomy. Such papers should meet the regular guidelines of the journal's sections, and should, whenever possible, include analysis that goes beyond a single project or single institution.

Papers and articles in the current volume include

Andrew Fraknoi
fraknoiandrew@fhda.edu

LATIN-AMERICAN JOURNAL OF ASTRON. EDUCATION (RELEA)

We are pleased to announce the release of the ninth issue of the Latin-American Journal of Astronomy Education (RELEA), available (as a pdf) at the site
www.relea.ufscar.br

Once again, we acknowledge your collaboration and valuable support.

We would like to request, not only a wide advertising of this issue, but also a personal effort in launching a campaign for articles to be submitted to our Journal. In this aspect, we also ask you to read, in particular, our reflections and concerns in the editorial of this issue.

Any comments and suggestions may be sent directly to Prof. Paulo S. Bretones.

Paulo S Bretones, Luiz C Jafelice, Jorge H Horvath
bretones@mpc.com.br

MEDIA IN EDUCATION NEWSLETTER, MAY 2010

The full PDF is here
http://www.media-in-education.net/files/Media-in-Education_Newsletter_2010-05.pdf
(Sent to the Editor by Magda Stavinschi.)

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

NEWS OF MEETINGS AND OF PEOPLE

TAD SCHOOL INTRODUCCIÓN A LA ASTRONOMÍA, BOLIVIA 05-09 OCTOBER 2009

The International Year of Astronomy was the ideal moment to organize the first university level course on astronomy in Bolivia, in the form of an IAU sponsored TAD School. Before starting we had made contact with the Fundación Simón I. Patiño, an educational foundation with a conference centre in Cochabamba, the third Bolivian city, which was a very good venue because Cochabamba is central, and the conference centre is in a very pleasant park. The Foundation offered, as well as the coffee breaks, some travel funds for the students which augmented the generous funding from the IAU. We also had contact with an active amateur astronomy group in the city, Sigma Octante, who, under their director Germán Morales, gave us very useful logistic support.

The poster for the TAD school in Bolivia

Bolivia has a dozen universities with reasonable standards. There are no formal astronomy courses at degree level, but a physics degree is offered at three universities, (one in La Paz, one in Sucre, and one in Cochabamba), and there are decent courses in engineering fields in most of the universities in the country. Mathematics degrees are offered in half a dozen. We decided to advertise the course as being open to students in physics, mathematics and engineering.

Advertising posters were produced and were sent to all the universities offering degrees in these fields, and an email campaign was directed at individual departments and sent to the Academy of Sciences. The result was that 100 applications were received from all over Bolivia. The limit to the number of students we could accept was set by the size of the lecture theatre in the venue chosen, but in any case we felt that this number, 40, was appropriate as it allowed sufficient personal contact between the individual students and the lecturers. Those who attended agreed that this policy had worked well, but of course we did have pleas - not only from those whom we could not accept, but also from a number of students who had learned of the course too late to apply - either to enlarge it, or to hold further courses in the future.

Nowadays it is increasingly easy to find Latin American experts in all branches of astronomy, but not necessarily so easy to find those who feel that they have the right teaching experience to give this kind of course (of course the situation is not so much different in North America and in Europe!). Also, it was not easy to give very much warning to those who were asked if they would teach. However, the set of lecturers who accepted the invitation turned out to be very well suited indeed to the tasks in hand, probably a positive self-selection effect. There were two from Chile: Paulina Lira of the Universidad de Chile, who gave her course on Normal and Active Galaxies, and Leopoldo Infante of the Universidad Católica de Chile, whose course was on Clusters of Galaxies And Structure in the Universe. There were two lecturers from Mexico: Vladimir Ávila-Reese from the Mexico City Campus of the Universidad National Autónoma de Mexico (UNAM) who lectured on Dark Matter and Dark Energy: Concepts of Modern Cosmology, and Leonel Gutiérrez of the Ensenada Campus of UNAM on The use of the HST and SLOAN Archives in Extragalactic Research. Our Argentinian lecturer, Hugo Levato, of the El Leoncito Astronomy Centre, gave a course on Stellar Photometry and its Applications, while the Brazilian, Ramiro de la Reza, from the National Observatory, Rio de Janeiro, spoke on The Detection of Exoplanets. The Spanish representative, John Beckman, of the Instituto de Astrofísica de Canarias, gave the initial course of the school, on Distance Measurement in Astronomy.

It is of interest (but not a coincidence!) that two of the seven lecturers are in fact Bolivians: Vladimir Avila-Reese is from Tarija, and has given individual courses in previous years in La Paz, while Ramiro de la Reza is from Cochabamba, has family there, and there is even a street named after the family near the centre of the city. We asked another Bolivian astronomer now working in Europe, Rodrigo Ibata, to lecture, but he regretfully could not do so as he had a very demanding previous commitment.

The enthusiasm of the students was obvious from the start, and was maintained through to the end. The course was intensive, with effectively 8 hours of classes per day for the whole week, but this did not stop the students from persisting in engaging the lecturers in eager conversation during all the coffee breaks and in the evenings. It was notable that not one student went missing from the course: all the students were present until the last hour of the final day. This was praiseworthy because many of them had travelled to Cochabamba by bus, from cities more than eight hours away, and were returning home straight after the final lecture. We received emails from many of these students after the course, thanking us for giving it, and with phrases indicating that for many of them it had been one of the most stimulating experiences of any academic kind.

The lecturers were uniformly lively and willing to respond to all kinds of questions. It was clear that they were enjoying the experience. I was certainly grateful for the prior suggestions and help given by Hugo Levato, based on his wide experience of propagating astronomy in Latin America.

In addition to the formal course we also took advantage of the goodwill and the presence of the lecturers to arrange four popular lectures for a wider public, given in a different higher education or cultural institution each night. They were well attended, with audiences of a couple of hundred, and provoked many questions.

On the basis of this experience I would say that there is a great deal of untapped enthusiasm and ability among Bolivian students for astronomical topics. We were asked many questions about possibilities for postgraduate degrees in astronomy and some of us remain in long term contact with several students. Also, two small research projects were initiated based on the course, in the use of the Hubble Space Telescope and the Sloan Digital Sky Survey archive material, one project being for a Master's degree in physics, and the other simply for the interest of the students involved, who were previous physics graduates but are now involved in various professions outside science.

While we did not take this initiative further, it is clear that, as in all parts of the world, there is latent interest in astronomy and astronomically related topics in Bolivia. We learned that in spite of the absence of university level courses, Bolivian students regularly win prizes in the South American

Astronomy Olympiad, in competition with students from countries with far greater depth of experience and with active programmes at university and school levels. These Bolivian students are usually self-taught, sometimes with aid and encouragement from individual academics in neighbouring fields.

Most of the students and some of the staff at the TAD school in Bolivia

In line with the IAU policy of encouraging astronomy for its own sake, and as a tool for all kinds of development projects in the developing world, my view as a result of this experience is that Bolivia would respond well at ground level to an initiative from the IAU to introduce astronomy teaching at all levels within the general curriculum. Whether this would receive an adequate response at government or local authority level is harder to assess, but conversations with university staff in the Physics Department at the UMSS (Cochabamba´s public university) gave me some hope that it would be worth while initiating high level contacts, and I would be prepared to try to follow up on this initiative if given encouragement and the relevant direct support from the IAU.

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EDUCATION AND TRAINING IN OPTICS AND PHOTONICS, TUNIS 08-10 JULY 2011

The Tunisian Society of Optics (Société Tunisienne d'Optique, STO) is organizing the 12th international conference on Education and Training in Optics and Photonics (ETOP).

This international meeting (sponsored by SPIE, OSA, ICO, EOS etc.), will bring together leading scientists and teachers to discuss various issues related to the teaching of optics. It will take place in Tunisia from 8-10 July 2011, at the Ramada Hotel Gammarth, Tunis.

This is the first time a conference like this will have taken place in Africa. It will give opportunity for scientists and educators from many countries to present and share information at an international level about physics education as it pertains to optics and photonics.

As optics & photonics are tools for astronomy, could you please distribute this information and help us to have participants showing the impact of astronomy in science education. Our aim is to have among the participants students presenting their projects in astronomy. STO will arrange accommodation for these students. Such presentations will be very important for our teachers and students.

For details see http://www.esprit-prepa.com/etop/

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INTERNATIONAL SPACE WEATHER INITIATIVE (ISWI), FUTURE WORKSHOPS

Hans J. Haubold (United Nations Office for Outer Space Affairs, Vienna International Centre, Vienna, Austria) has sent me the following information. Is there an opportunity here for C46 involvement?

"The United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), in its fifty-second session in Vienna from 3 to 12 June 2009, noted the importance of continuing to build upon the successes of the International Heliophysical Year 2007 (IHY 2007, http://ihy2007.org/), in particular by deepening the understanding of the function of the Sun and its effects on the Earth's magnetosphere, environment and climate, and noted with satisfaction the agreement reached by the Scientific and Technical Subcommittee at its forty-sixth session to consider, beginning at its forty-seventh session in February 2010, a new agenda item entitled International Space Weather Initiative (ISWI) under a three-year workplan (2010, 2011, 2012) with specific focus on the effects of space weather on the Earth. ISWI will utilize the ground-based world-wide IHY instrument arrays under deployment since 2005.

International ISWI workshops have been tentatively scheduled to be hosted by Egypt (2010; http://iswi.cu.edu.eg/) for Western Asia, Nigeria (2011) for Africa, and Ecuador (2012) for Latin America and the Caribbean. The 2009 UN/ESA/NASA/JAXA Workshop on Basic Space Science, and the IHY 2007, held in the Republic of Korea in 2009, started implementing the ISWI as put forth by UNCOPUOS (http://bssihy.kasi.re.kr/unbssw_newsletter.aspx). Major elements of ISWI will be issuing of an ISWI Newsletter by Bulgaria and an ISWI Website (http://www.iswi-secretariat.org/) by Japan on a continuing basis in the period of time 2010-2012 to assure world-wide delivery of the results of ISWI and its instrument arrays. This will cover all 192 Member States of the United Nations."

Erratum: Website is done by Bulgaria; newsletter is done by Japan.
G.Maeda ISWI Newsletter

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

PROFESSOR RAJESH KOCHHAR VISITS WILLIAMS COLLEGE, USA

Prof Rajesh Kochhar, a C46 member who is at the Indian Institute of Science Education and Research Mohali, encountered Prof Jay Pasachoff, the US National Liaison and a former C46 President, at the meeting on Mathematics and Astronomy, A Long Journey Together, that the current C46 President Rosa Ros organized in Madrid in November 2009. As a result of that encounter, Prof Kochhar paid a visit to Williams College, Pasachoff's home institution, in the United States, in mid-April 2010.

Pasachoff and Kochhar each have deep interests not only in education but also in the history of astronomy. Kochhar is Vice-President of the IAU's Commission 41 on the History of Astronomy and Pasachoff is incoming Vice-Chair of the American Astronomical Society's Historical Astronomy Division.

Jay Pasachoff and Rajesh Kochhar in front of
Williams College's Hopkins Observatory (1836),
the oldest extant astronomical observatory in the United States

Kochhar first spoke to Pasachoff's introductory astronomy class of fifty students about the Indian space program and its lunar studies. India had its Chandrayaan-1 orbiting the Moon in 2008-2009, with a probe crashing into the Moon as part of a search for water in a lunar crater. The spacecraft sent back data for almost a year. A Chandrayaan-2 is planned.

Later, Kochhar spoke to Williams College's International Studies Colloquium, to about 40 faculty and students, on the subject of the Colonial Use of Science and the Native Responses. He discussed how science was used as a tool by the West, in the context of India, and how upper-caste Hindus, lower-caste Hindus, and Muslims responded differently to English education and modern science.

The Indian Institute of Science Education and Research Mohali is an academic institution set up to carry out research in science and to provide science education, including the undergraduate level. Kochhar is also a former director of the National Institute of Science, Technology and Development Studies.

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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

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

- Overviews (of C46, in English, French, and Spanish)
- Guidelines (including Programme Groups)
- Resolutions
- Newsletters (including triennial reports from National Liaisons)
- Organizing committee
- National contacts (liaisons)
- Links
- News

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