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

Newsletter 65 – October 2006

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

Triennal reports from National Liaisons have been edited, collated, and placed on the C46 website (see below).

This newsletter is available at the following websites
http://astronomyeducation.org
http://physics.open.ac.uk/IAU46

CONTENTS

EDITORIAL

Thanks to everyone who has made a contribution to this edition of the Newsletter. For the March 2007 issue the copy date is **Friday 16 March 2007**. If you can include photos or illustrations with any material, please do so. Feel free to approach others to submit material – anything with an astronomy education or development aspect will be considered.

Here is general guidance for the **submission of material for the Newsletter**.

IAU C46 NEWSLETTER – GUIDANCE FOR CONTRIBUTORS

> The editor is happy to accept articles on any aspect of astronomy education and development, including obituaries and other articles on people. 500-2000 words are the approximate upper and lower limits. 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 TIFs up to about 1 Mbyte.
>
> Shorter contributions, up to a few hundred words, such as meeting announcements, meeting reports, and other news items, are also welcome.

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 I like. Only in rare cases is heavier editing necessary.

The Editor of this Newsletter, joining in an observation in Prague with Tycho Brahe and Johannes Kepler (August 2006)

The General Assembly in Prague provided an opportunity for many of us to meet again, or for the first time. It also provided an opportunity for C46 participants to celebrate successes over the past three years, and to set up C46 for the next three years. Two special sessions were devoted to education, and reports on these are in this Newsletter, and also an overview of C46 at the General Assembly.

In Prague a new President was elected, Magda Stavinschi from Romania. And a new Vice-President was appointed unopposed, Rosa Ros of Spain. I wish them well, and urge everyone to support their activities. I was reappointed as Newsletter Editor and as Chair of the National Liaisons Program Group. There were changes in the membership of the other program groups, and the website is being updated to incorporate these changes.

Important – the C46 website

The Open University Department of Physics & Astronomy currently hosts and maintains the C46 website, and has done so for the best part of a decade. However, I have been given notice that this cannot continue beyond 30 September 2007. Therefore, we must find a new institution from that date. **Let me know if your institution would take on the C46 website** – it requires about 10 person days per year to do an adequate job. It was taking more than this, but with this edition of the Newsletter I have reduced the workload by making the Newsletter available via a link to a read only Word file or to a PDF derived from it, rather than the Newsletter being an integral part of the website. I will continue to prepare the Word file, as I have done since the website came to the OU, until the General Assembly in 2009, perhaps beyond.

Barrie W Jones
(for contact details see Officers & Organising Committee of Commission 46)

MESSAGE FROM THE INCOMING PRESIDENT

During the XXVI IAU General Assembly in Prague new officers were elected. The new officers of Commission 46 are: President, Magda Stavinschi (magda@aira.astro.ro); Vice-President, Rosa M Ros (ros@ma4.upc.edu); and Retiring President, Jay Pasachoff (jmp@williams.edu). For the Organizing Committee we have to add the chairs of the program groups, to continue the work so well done by Jay Pasachoff and his team.

I have been honored to be elected President, but at the same time I am aware of the difficult mission I have undertaken. The team of this Commission and I will take into account that the need for astronomical education has unprecedented scope. During the triennium we are now in, we face a big challenge due to the preparations for the International Year of Astronomy (see below).

My experience comes especially from my efforts to restore the role of astronomical education both in school and for the general public. This was the reason I supported the organization of an ISYA in Romania on the occasion of the total solar eclipse of 11 August 1999. I also initiated the IAU Resolution on the Value of Astronomy Education, approved at the XXV General Assembly in Sydney in 2003, and I participated in the organization of Special Sessions on astronomy education during the JENAM meetings at Budapest, 2003, Granada, 2004, Liege, 2005, and Yerevan, 2007, as well as the Special Session SpS2 Innovation in Methods of Teaching and Learning Astronomy, at the IAU General Assembly, Prague 2006.

As I have discussed with Rosa Ros, Vice-President of Commission 46, and Jay Pasachoff, the retiring President, the present program groups will continue, some in a new formula or with new activities. The astronomy olympiads, so welcome for the stimulation of the pupils who love astronomy, will be in the Commission's sights. Taking into account the approach of the International Year of Astronomy and also the value in education of astronomical culture, Commission 46 will cooperate especially with Commission 41 (History of Astronomy) and UNESCO.

UNESCO also has a special Astronomy and World Heritage Initiative. The website http://whc.unesco.org/en/activities/19 states that the objective of this Initiative is to establish a link between science and culture on the basis of research aimed at acknowledging the cultural and

scientific values of issues connected with astronomy. The identification, safeguarding, and promotion of these issues lead to three lines of action for the implementation of this Initiative. These are

- to offer a methodological framework for associated actions
- to open the pathway for cooperation between state parties and academic communities
- to share knowledge.

In the same context there will also be a collaboration with the European Society of Astronomy in Culture (SEAC) which has an Education Committee and an Archaeo-astronomical Heritage Committee.

The International Heliophysical Year will also be a good opportunity for astronomical education.

We have to set up a bank of ideas concerning astronomical education in the world in order to be able to carry out the objectives of our Commission as well as possible.

Last but not least we shall pursue an even closer approach to Commission 55 Communicating Astronomy with the Public, and with IAU Division XII Union-Wide Activities to which we belong.

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

MESSAGE FROM THE OUTGOING PRESIDENT

I'm glad to have a chance to write as, now, Past-President of Commission 46 to thank the people with whom I have worked over the last triennium on our activities. We have some very active projects led by very active people, and I hope that my coordination helped. I hope that setting up a Web link through the easily remembered address of astronomyeducation.org helps accessibility to our activities.

I had a chance to work with Magda Stavinschi, our new President, at the time of the total solar eclipse that my group of colleagues and students observed from Romania in 1999. With pre-eclipse reconnoitering and a conference in addition to the eclipse expedition itself, I got to know Magda fairly well during my several visits to Romania and I am pleased that she has taken on the task of Commission 46.

For the last couple of years, I have worked closely with Rosa Ros, especially in planning our Special Session 2. (Of course, our work continues as we now try to first obtain and then edit the many papers for the forthcoming book.) This summer, I had the opportunity of seeing her organizational capabilities in her European summer school for high school teachers, when I gave one of the closing lectures at their La Palma site when I was *en route* to my own solar observing session up the Roque de los Muchachos. I am glad that she has agreed to join the succession in Commission 46, as Vice-President

In my own program group on public education at the times of eclipses, I was glad that we were able to help and advise in various countries. The spread of 400 000 filters through Nigeria for last March's eclipse was a particular pleasure. I guess I should stop writing this message now, and go and write up that eclipse effort for John Hearnshaw's proceedings of his special session on education in developing countries.

I hope to see you all in Rio de Janeiro in 2009 so we can celebrate the International Year of Astronomy together, by fostering astronomy education around the world.

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

Past presidents of IAU C46. Left to right – Jay Pasachoff, Syuzo Isobe, Julieta Fierro, John Percy, Derek McNally (Prague, August 2006)

INTERNATIONAL HELIOPHYSICAL YEAR 2007-8

In 1957 a program of international research, inspired by the International Polar Years of 1882 and 1932, was organized as the International Geophysical Year (IGY) to study global phenomena of the Earth and geospace in an unprecedented effort. The International Heliophysical Year (IHY) during 2007 and 2008 will celebrate the 50th anniversary of the International Geophysical Year (IGY) and, following its tradition of international research collaboration, will focus on the cross disciplinary studies of universal processes in the heliosphere (http://ihy2007.org/).

"Demonstrate the beauty, relevance and significance of Space and Earth Science to the World" – this IHY basic objective is the focus of the Education and Public Outreach (EPO) Program. IHY presents unique opportunities for expanding the education and awareness of Space and Earth science.

The program aims to inspire the next generation of space and Earth scientists and explorers, and spread the knowledge of our Solar System and the exciting process of scientific exploration to the people of the world. Encouraging young people to pursue careers in science and technology helps secure, and in the case of developing nations build up, human resources, which will improve the technological base and enhance the prospect for further development.

The Program

The main goal of the IHY Education and Outreach (EPO) Program is to create more global access to exemplary resources in space and Earth science education and public outreach by taking advantage of the IHY organization with representatives in every nation, and in the partnership with the United Nations Basic Space Science Initiative (UNBSSI) – http://ihy2007.org/outreach/outreach.shtml

The organizational structure of the IHY EPO Program closely mirrors the overall organization of the IHY program – a central coordinator, an advisory committee, and educators serving as national coordinators for EPO (http://ihy2007.org/outreach/epo_organization.shtml#EPONATCOOR). The EPO national coordinator is appointed by the IHY national coordinator and acts as the liaison between those working on education and public outreach in his/her country and the IHY secretariat, as well as the coordinators of the other nations. The national coordinator for EPO is responsible for promoting local activities and inviting exemplary EPO programs in their country to be a participating program in the IHY.

To foster the partnerships and facilitate the access to exemplary programs, the participating programs are listed in our website (http://ihy2007.org/outreach/epo_programs.shtml) with a link to their resources, which are available to all.

A good example of a participating program is the Space Weather Monitor Project, which is also part of the IHY/UNBBSI Observatory Development (http://solar-center.stanford.edu/SID/). It will bring hands-on science to pre-college students in developing countries. It consists of inexpensive monitors used to track solar and lightning induced changes to the Earth's ionosphere. The project also provides

classroom support materials in the six official languages of the United Nations. For more information, please contact Deborah Scherrer (deborah@sun.stanford.edu).

Students inspecting the interior of a monitor

Determining the need for multi lingual adaptations of educational resources, and facilitating their translation, is an important aspect of accomplishing our goal of globalizing heliophysics outreach. Institutions and individuals are encouraged to help in this effort. Scientists and educators in developing countries play an important role not only in the selection of useful resources, but also in helping with the translation and dissemination of the EPO resources that they believe will improve science literacy in their country. The available multilingual resources are accessible to all at our website (http://ihy2007.org/outreach/epo_multiling.shtml).

As the IHY establishes a greater presence for research in Space and Earth Science in developing countries through the IHY/UNBSSI Observatory Development, it will provide opportunities for undergraduate and graduate students to participate actively in an international cutting edge research project (http://ihy2007.org/observatory/observatory.shtml). In this way, the IHY will foster the development of graduate and undergraduate programs, which, in turn, will encourage young people to become interested in the exciting field of heliophysics. To reinforce education at college level, the IHY has created the IHY Schools Program to develop a series of schools in 2007 with the purpose of educating students in heliophysics (http://ihy2007.org/outreach/ihy_schools.shtml).

IHY and the 2006 total solar eclipse

The IHY sponsored several outreach activities during the total solar eclipse on 29 March 2006. Viewing stations were established along the path of totality of the eclipse where eclipse kits containing eclipse viewing glasses, eclipse posters (http://ihy2007.org/resources/resources.shtml#PRODUCTS), eclipse information, and information on the IHY were distributed. There were viewing stations in: Natal, Brazil, coordinated by Dr Antonio A Sobrinho; Kumasi and Legon in Ghana, coordinated by Dr Victor C K Kakane and Prof Aboagye Menyeh respectively; Ilorin and Ibadan in Nigeria, led by Dr A Babatunde Rabiu; El-Saloum, Egypt, led by Dr A A Hady; the Anatolian Peninsula in Turkey led by Dr Atila Ozguc; Poti, Senaki, Mestia and Zugdidi in Georgia, led by Dr Marina Gigolashvili; and Libya led by Dr Joseph M Davila (IHY Executive Director).

Scientists were available at many of these viewing stations to conduct the observations and answer questions about solar eclipses, the Sun, and space research. A large number of children and adults

attended the event in all participating countries. Live web casts of the total eclipse were also available from many sites in different languages.


Viewing stations in Brazil (left) and Ghana (right)

Conclusions

The International Heliophysical Year in 2007-2008 presents a unique opportunity for expanding education in space and Earth science, and to demonstrate the beauty, relevance and significance of space and Earth Science to the world.

The developing countries have an important role in the IHY, not only in selecting useful resources and helping in the translation/adaptation and dissemination of the resources to the teachers and general public, but also in providing different and innovative approaches and techniques in teaching.

Invitation

If you would like to participate, please contact your IHY EPO national coordinator (http://ihy2007.org/organization/ihy_national.shtml). If your country does not have one, send me an email (csoares@sun.stanford.edu). You can participate in several ways

- providing resources in space and Earth science education
- identifying which types of resources would be beneficial in your region
- translating educational resources
- disseminating educational resources in your region
- promoting local activities related to the IHY from now until 2009.

Please, go to our web page for more information and fill out a form to become a participating program – http://ihy2007.org/outreach/epo_coord.shtml

M C Rabello-Soares
IHY International Coordinator for Education and Public Outreach
csoares@sun.stanford.edu

INTERNATIONAL YEAR OF ASTRONOMY 2009

The International Astronomical Union will be coordinating the International Year of Astronomy in 2009. This initiative is an opportunity for the citizens of Earth to gain a deeper insight into astronomy's role in enriching all human cultures. Moreover, it will serve as a platform for informing the public about the latest astronomy discoveries while emphasizing the essential role of astronomy in science education.

In 1609, Galileo Galilei first turned one of his telescopes to the night sky and made astounding discoveries that changed mankind's conception of the world forever: mountains and craters on the Moon, a plethora of stars invisible to the naked eye and moons around Jupiter. Astronomical observatories around the world now promise to reveal how planets and stars are formed, how galaxies assemble and evolve, and what the structure and shape of our Universe actually are. Today, humans are in the middle of a new age of discovery, one as profound as the one Galileo ushered in when he turned his telescope on those glorious star-filled nights 400 years ago.

Astronomy, the oldest science in history, has played an important role in most, if not all, cultures over the ages. Thanks to advanced telescopes and space probes, astronomy continues to be a trailblazer, enhancing our knowledge by delivering breathtaking discoveries almost on a weekly basis. The International Year of Astronomy 2009 (IYA2009) will be a global celebration of astronomy and its contributions to society and culture, stimulating worldwide interest not only in astronomy, but in science in general, with a particular slant towards young people. The IYA2009 is deemed to mark the monumental leap forward that followed Galileo's first use of the telescope for astronomical observations, and portray astronomy as a peaceful global scientific endeavour that unites astronomers in an international, multicultural family of scientists working together to find answers to some of the most fundamental questions that humankind has ever asked.

The vast majority of IYA2009 activities will span local, regional and national levels. Several countries have already formed National Nodes to work on the planning and preparation of activities for 2009. These committees are collaborations between professional and amateur astronomers, science centres and science communicators. Individual countries will be undertaking their own initiatives as well as assessing their own national needs, while the IAU will be acting as the event's coordinator and catalyst on a global scale. The IAU plans to liaise with, and involve, as many as possible of the ongoing outreach and education efforts throughout the world, including those organized by amateur astronomers.

Despite the IYA2009 being still in its early planning stages, a number of very exciting ideas have already been put forward. One of the core ideas is to bring astronomy closer to all citizens of planet Earth by giving them the opportunity to interact with amateur and professional astronomers, as well as to participate in "sidewalk astronomy" events in planetariums and public observatories where several different activities, such as looking through a telescope and observing our Universe, will be held.

An important objective is to ensure that less well-established organizations from the developing world can become involved with larger organizations and deliver their contributions, linked via a huge global network. Aiming at awakening the public awareness of astronomy and science in the developing countries, the IYA will, based on a resolution adopted by the UNESCO General Conference in 2005, be launching the Universe Awareness (UNAWE) program in 2009. Such a scheme has been designed to broaden the minds of economically disadvantaged young children across the globe, enhance their understanding of the world and demonstrate the power of rational thought.

The IYA2009 is, first and foremost, an activity for the citizens of planet Earth, which will convey the excitement of personal discovery, the pleasure of sharing fundamental knowledge about the Universe and our place in it, and ultimately, the value of the scientific culture.

From Stephen Maran, AAS Press Officer pressofc@aas.org
http://www.iau.org/iau0606_IYA.408.0.html

DVD BY ESA ON THE HUBBLE SPACE TELESCOPE

As part of the 15th anniversary celebrations of the Hubble Space Telescope, the European Space Agency (ESA) has produced an exclusive, 83 minute DVD film, entitled Hubble – 15 Years of Discovery. The documentary covers all aspects of the Hubble Space Telescope project – a journey

through its history, its troubled early life and its ultimate scientific successes, and also mentions the role of the Hubble Space Telescope project in facilitating some of the activities of the United Nations Office for Outer Space Affairs (OOSA). The new DVD film is one of the most widely available science documentaries, with more than 500 000 copies distributed worldwide.

The Hubble Space Telescope, a project of international cooperation between the National Aeronautics and Space Administration (NASA) of the United States and ESA, is one of the biggest scientific projects of all time. In its 15 years of viewing the sky, the Hubble has, among other things, helped astronomers calculate the precise age of the universe, provided sharp views of a comet hitting Jupiter, helped confirm the existence of a strange form of energy called dark energy, and taken more than 700 000 exposures of celestial objects.

Since 1991, OOSA has organized annual workshops on basic space science for the benefit of developing countries, in cooperation with ESA and within the framework of the United Nations Programme on Space Applications. The workshops have supported the operation of small telescope facilities, and have supported the processing of the imagery from the Hubble Space Telescope by developing countries.

OOSA has supported the establishment and operation of the regional centres for space science and technology education, affiliated to the United Nations and located in India, Morocco, Nigeria and Brazil/Mexico. The centres are open to scholars from developing countries in each region and offer long term postgraduate courses in remote sensing, satellite meteorology, satellite communications and space science. As part of the postgraduate courses, scholars of the regional centres have taken advantage of processing the images obtained from the Hubble Space Telescope.

The ESA DVD film can be obtained free of charge by sending an email to OOSA at oosa@unvienna.org

Hans J Haubold
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A UN BASIC SPACE SCIENCE INITIATIVE

Pursuant to recommendations of the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) and deliberations of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), annual UN/European Space Agency workshops on basic space science have been held around the world since 1991. These workshops contributed to the development of astrophysics and space science, particularly in developing nations. Following a process of prioritization, the workshops identified the following elements as particularly important for international cooperation in the field (i) operation of astronomical telescope facilities implementing TRIPOD (ii) virtual observatories (iii) astrophysical data systems (iv) concurrent design capabilities for the development of international space missions (v) theoretical astrophysics such as applications of non extensive statistical mechanics. Beginning in 2005, the workshops focus on preparations for the International Heliophysical Year 2007 (IHY2007). The workshops continue to facilitate the establishment of astronomical telescope facilities as pursued by Japan, and the development of low cost, ground based, world wide instrument arrays as led by the IHY secretariat.

Wamsteker, W, Albrecht, R and Haubold, H J, Developing Basic Space Science World Wide: A Decade of UN/ESA Workshops. Kluwer Academic Publishers, Dordrecht 2004.
http://ihy2007.org
http://www.oosa.unvienna.org/SAP/bss/ihy2007/index.html
http://www.cbpf.br/GrupPesq/StatisticalPhys/biblio.htm

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THIRD EDITION OF RELEA

We are pleased to announce the release of the third issue (pdf) of the Latin-American Journal of Astronomy Education (RELEA), available at the site http://www.iscafaculdades.com.br/relea/

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 submitted to our Journal. In this respect, we also ask you to read, in particular, our reflections and concerns in the editorial of this second issue. Any comments and suggestions may be sent directly to Prof Paulo Bretones at bretones@mpc.com.br or observatorio@iscafaculdades.com.br

Paulo S Bretones, Luiz C Jafelice. Jorge H Horvath

NEWS OF MEETINGS AND OF PEOPLE

REPORT ON C46 AT THE IAU GENERAL ASSEMBLY 2006, CZECH REPUBLIC

Less than two months ago a new triennium of IAU Commission 46 started. During its business meetings in Prague new ideas were presented, as Jay Pasachoff, the Retiring President wrote us, as neither I (new President) nor Rosa Ros (new Vice-President) were able to attend the final meeting.

A new Program Group for planetariums is to be added to the PG for Collaborative Programs. Maybe Martin George, the President of the International Planetarium Society will chair it. A new Program Group for K-12 education was set up – the Program Group for Nonformal Education and Outreach.

A very active group continues to be that of the Worldwide Development of Astronomy (PGWWDA) chaired by John Hearnshaw. We are expecting new travels, projected for Thailand and Laos. Equally active is the WG Teaching Astronomy for Development (TAD}, the grants offered by it helping students to improve their academic work. Larry Marschall and Ed Guinan will be co-chairs of TAD. The very successful International School for Young Astronomers (ISYA) programs, directed until now by Michele Gerbaldi, will have new chairs – Jean-Pierre De Greve (Belgium) and Kam Ching Leung (Nebraska).

An interesting discussion was on the definition of "planet" in terms of the educational implications.

A new European special session devoted to the astronomy will be organized during JENAM 2007 in Yerevan (Armenia) 20-25 August 2007**.**

A very ambitious program of the IAU and of Commission 46 too will be the 2009 International Year of Astronomy (IYA). Kala Perkins asked to be added to the PG Collaborative Programs, to work on it. A special program will be started soon.

Cooperation with IAU Commission 19 (Astrophysics), leading up to the 2009 IYA, will be of benefit to education. Here are their proposals, sent to me by Virginia Trimble.
1 A world wide open house night at observatories and planetariums that have any sort of visitors' program, ideally on a night that is somehow connected with Galileo and falls near the spring or autumn equinox so that the weather might be decent in both hemispheres (his birth/death dates are unfortunately January and February).
2 A correlated "wave of darkness" on the same night, as was eventually proposed to precede the "ring of light" for the World Year of Physics (WYP).
3 Things for teachers
– Materials (which must be paper and correct) for developing countries at about the middle school or early secondary school level
– Recognition for good teachers where they exist – prizes of some kind, which need not be expensive, but would tell them and their head teachers/principals that they are valued.
4 Support for things that are going to happen anyway, especially the UNAWE (Universe Awareness) program for children aged 4-10 (http://www.UniverseAwareness.org) . This already has a number of prestigious institutions and well known scientists and policy leaders behind it. C19 voted its support and this was notified to George Miley, Co-chair of the Steering Committee, who expressed due appreciation.

Plans to be developed for some event in 2007 to commemorate the 1957 launch of Sputnik in Kazhakstan, where the launch took place. Coordinator Emmanuel Vilkoviskis has been told that our support will almost certainly have to be limited to advice and good wishes, not money, but he was pleased nevertheless.
5 Higher level education
– Encourage use of astronomy to teach physics at secondary & college levels.
– Defend astronomy curricula at the university level in places where it is being phased out.

– Try to collect data on the extent to which people who end up in other areas of science were initially attracted by stars, comets, planets etc.

6 Make sure Galileo isn't lost from the program, though because others made and used astronomical telescopes at the same time or even perhaps a bit earlier, and anticipated some of his discoveries, he should not be the exclusive focus (a useful example is Einstein in the WYP, perhaps ended up as too much Einstein and too little physics is a useful).

7 Find out what the professional and amateur (important!) societies in our countries are planning, and try to be useful.

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

REPORT ON SPECIAL SESSION SPS2 AT THE IAU GENERAL ASSEMBLY 2006, CZECH REPUBLIC

During the IAU General Assembly in Prague took place a Special Session (SpS2) on Innovation in Teaching and Learning Astronomy. For two full days astronomers interested in teaching astronomy had the opportunity to exchange their opinions in order to promote teaching astronomy in the world. Last 17-18 August the participants in SpS2 studied the introduction of innovative points of view regarding methods of teaching and learning. Astronomers from all countries – developed or developing – were equally interested.

This session had 400 participants registered on line. IAU members from 5 continents participated. There were 103 papers from 34 countries (Argentina, Armenia, Australia, Brazil, Bulgaria, Canada, Chile, Czech Republic, Egypt, France, Germany, Greece, Honduras, Hungary, India, Italy, Japan, South Korea, Macedonia, Mexico, Netherlands, New Zealand, Nigeria, Serbia and Montenegro, Spain, Poland, Portugal, Romania, Russia, Tanzania, Turkey, Ukraine, United Kingdom, United States). These papers were distributed among 16 invited speakers, 29 oral presentations, and 58 posters.

Regarding the current situation of astronomy …

- astronomy attracts many young people to education in important fields in science and technology
- technology is used in astronomy both for obtaining observations and for teaching
- in many countries, astronomy is not part of the standard curriculum, and teachers do not receive adequate education and support
- many scientific and educational societies and government agencies have produced materials and educational resources in astronomy for all educational levels.

The contributions presented in Prague were distributed among four main themes, as follows.

THEME 1 General strategies for effective teaching Presenting new ideas in order to teach more and better astronomy, connecting astronomy with the environment, presenting classical topics using more simplified methods, using interdisciplinary approach, presentations, mixing with cultural background and/or history of astronomy, and revitalizing astronomy teaching through research on student understanding.

THEME 2 Effective Use of Instruction and Information Technology Modern technology as a tool for current teaching/learning, availability of new technologies in different schools, and information on newly implemented facilities, including remote observing that allows school students to use telescopes in other time zones and in better observing locations.

THEME 3 Connecting Astronomy with the Public Future education and public information projects from astronomical institutions involving schools, introducing new results from astronomy education research and mixing with cultural background and/or the history of astronomy. Role of Public Information Offices of observatories and space missions, planetarium attendance and astronomical content, television and radio media, role of light pollution in liaison with the public, and the 2009 International Year of Astronomy.

THEME 4 Practical issues connected with the implementation of the 2003 IAU Resolution What is the situation in various countries, three years on, for implementing the resolution? New suggestions after three years of experience in order to include astronomy in school curricula, to assist schoolteachers in their training, to inform teachers about available resources, and to contribute to the training of teachers.

The session was chaired by Rosa M Ros and Jay M Pasachoff and supported by Commissions 46 (Astronomy Education and Development), Commission 41(History of Astronomy) and Division XII (Union wide activities)

Scientific Organizing Committee: Rosa M Ros (Spain, Co-chair), Jay M Pasachoff (USA, Co-chair), Michael Bennett (USA), Julieta Fierro (Mexico), Michele Gerbaldi (France), Petr Heinzel (Czech Republic), Bambang Hidayat (Indonesia), Syuzo Isobe (Japan), Edward Kononovich (Russia), Margarita Metaxa (Greece), John R Percy (Canada), Magda Stavinschi (Romania), Richard West (Germany), and Lars Lindberg Christensen (ESO, webmaster)

The proceedings will be published by Cambridge University Press, which will contain the full text of all SpS2 papers.

People attending the C46 sessions at the IAU General Assembly in Prague

Rosa M Ros and Jay M Pasachoff, Co-chairs SOC SpS2
(for contact details see Officers & Organizing Committee of Commission 46)

REPORT ON SPECIAL SESSION SPS5 AT THE IAU GENERAL ASSEMBLY 2006, CZECH REPUBLIC

Special session 5 (SpS5) of the IAU General Assembly took place on Monday August 21 and Tuesday August 22 in Prague, and covered all aspects of astronomy in developing countries. There were 16 invited talks, 25 contributed oral talks and about 20 posters. The presenters came from 37 different countries, and many of these were from developing countries. What is more, 280 people registered their interest in participating in the session, and these came from 61 countries, which represents an impressive global participation and world wide interest in developing astronomy in many countries which are just entering into education and research programs in astronomy.

A highlight of the first session on Monday was the first invited talk by Jayant Narlikar (India), when he outlined his dreams of establishing a Third World Astronomy Institute or Network (TWAI or

TWAN). This would be an institute modelled on the International Centre for Theoretical Physics (ICTP) in Trieste and a place where astronomers from developing countries could go on short visits and enjoy world class facilities for astronomy research, education and conferences. This goal appears to have come a step closer with the agreement to establish such an international centre at IUCAA (the Inter University Centre for Astronomy and Astrophysics in Pune, India), with the support of the director of ICTP. The support of the IAU for this initiative from the incoming president, Catherine Cesarsky, was warmly received.

SpS5 had talks from astronomers in all the major regions of the developing world, including Latin America, the far East, central Asia, Africa, and eastern Europe. It was impressive how many positive accounts of new programs in teaching and research were presented.

One theme was the relation between IAU Commission 46 and other agencies such as the UN Office for Outer Space Affairs, COSPAR, the program for the International Heliophysical Year 2007 and the Japanese ODA program (which donates small telescopes to developing countries). All these collaborative programs were discussed at the session, and hopefully a high degree of coordination between these programs will ensue.

Other international projects such as ADS and various virtual observatory projects in developing countries will have a major impact on astronomy in developing countries in the near future. In fact their influence is already having a big impact.

Although many astronomers in developing countries still struggle to do research and obtain financial support for facilities and international conference travel, the impression left from SpS5 is that much progress is being made. Commission 46 is reaching out to help many astronomers across the globe; a real difference is being made, and there is a feeling amongst many astronomers from developing countries that they are now part of a world wide global community.

It is to be hoped that these trends can continue.

John Hearnshaw, Chair of SOC SpS5, University of Canterbury, New Zealand
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TEACHING SCIENCE IN EUROPE, 22-24 SEPTEMBER 2006, GERMANY

This conference took place at the Science Centre in Wolfsburg, Germany, 22-24 September 2006. From 18 countries, 120 teachers and educationalists participated, with a focus on schools. A summary of the meeting is available at http://www.science-on-stage.de, as is the electronic version of Teaching Science in Europe, which contains teaching materials on the topics

- science in primary school
- interdisciplinary teaching
- the role of the experiment in science teaching
- astronomy in the classroom.

This publication was presented at the conference.

A major outcome of the conference was the creation of three groups, in each of which teachers will have the opportunity to work together over the next two years. The groups are

- science in kindergarten and primary school
- self perception of teachers
- interdisciplinary teaching (scientific and non scientific teaching).

For further information contact Stefanie Zweifel, s.zweifel@science-on-stage.de

Barrie W Jones

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

SCIENCE ON STAGE 2, 2-6APRIL 2007, FRANCE

There will be a science teaching festival, Science on Stage 2, in Grenoble, France, 2-6 April 2007. For further information see http://www.scienceonstage.net/main/default.asp

Barrie W Jones
(for contact details see Officers & Organising Committee of Commission 46)

TEACHING INTRODUCTORY ASTRONOMY TO NON SCIENCE MAJORS, 3-5 AUGUST 2007, USA

Cosmos in the Classroom 2007, a three-day, hands on symposium on teaching astronomy to non science majors, will be held from August 3 - 5, 2007 at Pomona College in Southern California. The meeting is sponsored by the Astronomical Society of the Pacific (ASP), with co-sponsorship by a range of astronomical and educational organizations.

For updated information and to get on the mailing list for the meeting, please go to http://www.astrosociety.org/events/cosmos.html

The non profit ASP has sponsored a Cosmos in the Classroom conference every 2-3 years since 1996. The aim is to bring together those who teach the beginning astronomy course at institutions ranging from high schools and community colleges to research universities.

Participants will exchange ideas, techniques, and materials for improving the course and discuss the challenges of widely differing student preparations and attitudes, shrinking budgets, and unrealistic expectations that instructors of such course face. Much of the meeting will be devoted to hands on, small group sessions where mentor instructors will help participants practice ways to make their courses more effective. Graduate students, postdocs, and instructors new to the introductory course are especially welcome.

Bryan Penprase of Pomona College will head the Local Organizing Committee, and Andrew Fraknoi of Foothill College and the ASP will chair the Program Organizing Committee. Scholarships for the meeting are likely to be available.

Andrew Fraknoi, Chair, Astronomy Program
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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 Officers & Organizing Committee of Commission 46)

INFORMATION TO BE FOUND ON THE IAU C46 WEBSITE

The IAU C46 website http://astronomyeducation.org (or http://physics.open.ac.uk/IAU46) contains the following information.

- Overview (of C46, in English, French, and Spanish)
- Offices and Organising Committee
- Program Groups
- National Liaisons (directory)
- Online Newsletters
- Presidents and Current Vice-President
- Resolution on the Value of Astronomy Education (passed by the IAU General Assembly 2003)
- IAU Working Group on Communicating Astronomy
- External links
- Announcements/News
- Minutes from the 2003 IAU General Assembly
- Commission 46 Terms of Reference, Rules & Guidelines

OFFICERS & ORGANIZING COMMITTEE OF COMMISSION 46

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Retiring President **Jay Pasachoff** jmp@williams.edu
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Newsletter PG Chair **Barrie W Jones** b.w.jones@open.ac.uk
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Officers & Organizing Committee

The officers 2006-2009 are: the President, the Vice-President, and the Retiring President. For details of the Organizing Committee, and for membership of the Program Groups, see the website http://astronomyeducation.org (or http://physics.open.ac.uk/IAU46)

National Liaisons **Barrie W Jones (PG Chair)**

These are listed on the website http://astronomyeducation.org (or http://physics.open.ac.uk/IAU46)