



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

Newsletter 53 – October 2000

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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IN THEIR COUNTRIES**

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This newsletter is also available at the following website

<http://physics.open.ac.uk/IAU46>

EDITORIAL

The next three items in this issue give details about the reorganisation of Commission 46, which has resulted in substantial growth of its scope. The new President is Syuzo Isobe, the new Vice-president is Jay Pasachoff, and the outgoing President is Julieta Fierro to whom much thanks for her work as President over the last three years. We wish Syuzo Isobe and the other members of the Organising Committee a productive three years.



Right to left, the new President Syuzo Isobe, the outgoing President Julieta Fierro, and the new Vice-president Jay Pasachoff, at this year's IAU General Assembly

I was pleased to be invited to be Chair of the Newsletter Program Group for 2000-2003, and as you can see I accepted the invitation! I intend to produce an edition each March and October, and I hope that you will consider sending me a contribution. Useful and relevant content would include

- news of forthcoming meetings
- reports on past meetings
- information on various astronomical resources (books, websites, etc)
- discussion of astronomy curriculums
- the need for public understanding
- delivering astronomy to students and to the public
- accounts of interesting visits and places
- ideas for projects and other activities, including those that require little equipment
- training courses, at all levels, including those available over the world-wide-web.

Please send me your comments on this list, adding to it, deleting from it, and suggesting priorities.

Deadlines for items for consideration for the Newsletter are 1 October for the October issue, and 1 March for the March issue.

The role of National Representatives has been modified, and the name changed to National Liaisons – see Section C of the item The Business Meeting of C46 August 2000 for rules and guidelines. NLs, like the NRs of old, are still expected to produce triennial reports on astronomy education in their countries. The next round of triennial reports is due in just under three years, and I would like to collect *all* the reports into a special supplement, rather than have them scattered over several newsletters. There is a precedent for such an attempt. I suggest that this supplement is published just before the 2003 General Assembly and covers the period up to mid 2003.

HERE IS SOME IMPORTANT INFORMATION ABOUT THE DISTRIBUTION OF THE NEWSLETTER. This takes place electronically via the website (see contents page), and via hard copy in two-column format. The cost of colour printing is so high that only the electronic version is in colour. The Organising Committee, the members of the Program Groups, and the National Liaisons, are all notified by email when a new edition is available on the web. There is also a supplementary list of people we inform by email. We will try to make the various lists exclusive, but **DO** let me know if

- you get informed more than once that a new issue has appeared on the web
- you find a new issue on the web but you had not been informed at all!

Hard copies are sent to as few people as possible. If you receive such a copy but do not wish to do so, please let me know. Conversely, if you do NOT receive a hard copy but wish to do so then again let me know.

There have been quite a few changes in the distribution lists, so I expect it will be a while before they are fully updated.

MESSAGE FROM THE PRESIDENT

It is great honour for me to be the President of Commission 46 Astronomy Education and Development with the support of its Organising Committee and the Executive Committee of the IAU. From that sentence you will realise that the commission name is no longer The Teaching of Astronomy. After discussions during the last three years within our OC and with the EC, it was decided it should be reformed. The three groups, the old Commission 46, Commission 38 Exchange of Astronomers, and the Working Group on the Worldwide Development of Astronomy become now the new Commission 46. Therefore, the range of our work expands much as shown in our new Terms of Reference (see below), endorsed by the EC.

Commission 46 is a committee of the EC of the IAU, but not of the division to which commissions usually belong. Our new commission introduces a system of program groups since many different activities are going on, including some additional activities. Fortunately, we have found good chairs for each program group, such as Teaching For Astronomy Development, Worldwide Development of Astronomy, International School for Young Astronomers, and the Newsletter. Each chair is also an OC member.

The IAU has a long history of work on science education, and set up the old Commission 46 several decades ago. Since the IAU is primarily a research union, its educational activities have been limited but were unique compared with the other scientific unions. Fortunately, many other scientific unions started to consider science education. A recent initiative was to explore the possibility of joint programs between astronomy and other branches of space science. Especially in 1999, the IAU, together with COSPAR and the UN Office for Outer Space Affairs, organised a 2.5 day technical workshop during the Third UN Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) in Vienna, Austria, July 20-23. The Workshop was intended to show how basic science and basic science education should become an integral part of how countries build up their scientific capacity to conduct projects in space, and to discuss how the IAU and COSPAR might help facilitating this. Considering the results of this Workshop, our Commission has set up a new program group, Collaborative Programs, to seek effective ways of developing science education with the other unions, and to extend some collaborative activities with the UN, UNESCO, ICSU, COSPAR, IAF, and other international organisations.

The UN has held a meeting, Basic Space Science, to support development mainly for developing countries, every year since 1990, to which some IAU members have voluntarily contributed. The IAF held its first education meeting, Bringing Space into Education, in April 2000, and COSPAR had a meeting, Public Understanding of Space Science, in July 2000. Both organisations will hold a joint education meeting in Texas in 2002, with myself as one of the SOC members. ICSU will hold a meeting, Primary School Science and Mathematics Education, in Beijing, November 2000, which I and Julieta Fierro will attend. As shown by these examples, this program group is active and needs much support from C46 members.

Commission 46 used to have National Representatives plus some active members. However, a proportion of the NRs were not active and did not respond to mail from the OC. As shown above, our activities should inevitably be great, and therefore we need many active members. We must also exchange timely ideas with astronomers and educators in each country. Fortunately, I had an opportunity at the National Representatives meeting of the IAU during the General Assembly in Manchester, August 2000, to request them to assign National Liaisons who will be active. Since then, our vice-president, Jay Pasachoff has worked hard to collect e-mail addresses of National Liaisons, and we are now in good shape to proceed with our important work.

Three years ago, when I was nominated to be a vice-president of Commission 46 during the General Assembly in Kyoto, John Percy told me that the EC would not agree to three consecutive commission presidents from the same continent. The outgoing president was then John Percy from Canada, the incoming president was Julieta Fierro from Mexico, and so I accepted the nomination. I knew our commission has many active members who arrange nicely each commission activity, and so what I would have to do would not be so much.

However, Julieta Fierro and the IAU General Secretary, Johannes Anderson, were so active in reorganising not only Commission 46 but also Commission 38 and WWDA, that this has brought the new Commission 46 many wide activities. This situation is quite different from that at the time when I became the vice-president. I don't know whether I can perform this important role for the next three years, but I hereby declare that I will do my best for the new Commission 46 with a belief that my great predecessor Julieta Fierro and the new vice-president Jay Pasachoff will support me, as well as all the members.

It is said that once a system has settled down it is difficult to refine some weak points, but there is a high possibility to improve a system if one works hard just after its introduction a new system. I hope that Commission 46 will go in a good direction with all of our efforts.

Syuzo Isobe

THE REORGANISATION OF COMMISSION 46

Commission 46, formerly named Teaching of Astronomy, has been replaced by an enlarged Commission 46, Astronomy Education and Development. This new Commission 46 will subsume the work recently done by Commission 38, Exchange of Astronomers, and the Worldwide Group for the Development of Astronomy.

For several decades, the central educational project of the IAU was the series of International Schools for Young Astronomers, aimed to help scientifically isolated astronomical institutions and astronomy students. Research programs were aided by the program Exchange of Astronomers. Active presidents and general secretaries of the IAU have gradually broadened the goals of the IAU to help develop astronomy in the many countries in which a small astronomical nucleus sees the opportunity to expand astronomy, often as part of expanding science education in that country. Supporting projects such as the Working Group on the Worldwide Development of Astronomy and Teaching for Astronomy Development have arisen. Together, these projects now constitute almost 10% of *all* IAU expenditure! The special symposium we sponsored during UNISPACE III in 1999 was to set the stage for integrating IAU goals with those of other international organisations.

All this expanding activity has forced the need to re-organise our education and development activities so that the various parts of our programs interact coherently and benefit from a more consistent oversight. The IAU's resources are very small compared to the potential needs. The following report of the C46 business meeting defines the reorganisation of our activities and expresses the ways in which we believe the IAU resources currently can be used most efficiently.

Further change is desirable. Please, we need collaborators in current projects! We welcome suggestions for new activities in the future! We have the support of the IAU officers and executive committee. Now we also need the active support of more hands-on astronomers. Please contact any of the officers or chairs of program groups (email addresses in Section B of the following report).

Don Wentzel

THE BUSINESS MEETING OF C46 AUGUST 2000

Business Meeting of Commission 46, Astronomy Education and Development
formerly Teaching of Astronomy
IAU General Assembly 2000, Friday, August 11, Session 4

The meeting was conducted by Julieta Fierro, President.

In attendance were, at least, Michele Gerbaldi, France; Syuzo Isobe, Japan; Jay Pasachoff, USA; Peter Martinez, South Africa; Donat Wentzel, USA; Julieta Fierro, Mexico; Jean-Claude Pecker, France; Cecilia Iwaniceska, Poland; Richard Gray, US; Rosa Ros, Spain; Mary Kay Hemenway, US; Mary Crawford, US; Elvira Botez, Romania; Graeme White, Australia; W Bruce McAdam, Australia; Chris Corbally, Vatican; Johannes Feitzinger, Germany; Barrie Jones, UK; Nidia Morell, Argentina; Robert Havlen, US; James (Jay) White, US; Alan Batten, Canada; Case Rijdsdijk, South Africa; John Percy, Canada; Janet Mattei, US; Jayant Narlikar, India; Felicitas Arias, Argentina; Zdenik Pokorny, Czech; Bambang Hidayat, Indonesia; John Baruch, UK; M Asuncion Catala-Poch, Spain; totalling at least 32 in attendance, with a few additional people coming in and out.

SECTION A REPORTS ON C46 ACTIVITIES

1. Michele Gerbaldi discussed International Schools for Young Astronomers (ISYA).
July 26-Aug 14, 1999, Romania, overlapping with the summer solar eclipse; 40 participants (18 foreigners, 8 nationalities, 22 women).

January 3-22, 2001, Thailand, Chiang Mai
www.science.cmu.ac.th/sympol2.html
gerbaldi@iap.fr or boonraks@cmu.chiangmai.ac.th.
future: Argentina, August 2002.

2. Syuzo Isobe discussed Collaborative Programs.
UN, Basic Space Sciences, from 1989
IAFC, Scientific Symposium, Bringing Space into Education, 2000 April;
COSPAR, Special Symposium, Public Understanding of Space Sciences, 2000 July;
ICSU, International Conference on Primary School Science and Mathematics Education, 2000;
The British Council, Global Robotic Telescope project, May 2000, October 2000.

3. Donat Wentzel discussed the Exchange of Astronomers.
Based on a report from Morton Roberts, President of Commission 38, Commission 38 will become one of the program groups within Commission 46. Commission 38 was worrying about being swamped, so we have put the Vice-president and President of Commission 38 into our organising committee. During the last 3 years they made 35 travel grants. For officers and rules for applications, see Sections B and C.

Their website has been at

<http://www.eso.org/iaucom38>

where their Guidelines have been posted. The site will be transferred to the Commission 46 site.

4. Alan Batten discussed the Working Group on Developing Countries. (He has been Chairman since its inception 13 years ago.)

He discussed the Special Session on Astronomy in Developing Countries that was to occur the following week. The duration of its meeting is between an individual session and a symposium. The Proceedings will be published by the Astronomical Society of the Pacific (ASP).

5. Barrie Jones discussed the Newsletter.

He works on the newsletter and then Andy Norton puts it up on the Web. It goes to the Organising Committee, National Representatives (now National Liaisons), and various others. Circulation is approximately 200 electronic and 150 hard copy. It includes messages from the President and from the Editor, news of forthcoming meetings, reports on visits, occasional articles, and the triennial reports submitted by about 40% of the countries affiliated with Commission 46. It is published twice a year: October and March. The present budget is £150 per issue, entirely for postage and photocopying, reimbursed by check from the IAU in Paris. In the future, chairs of each of the program groups might be submitting articles.

6. TAD: Teaching for Astronomy Development, now in its 5th year.

Three main projects:

1) in Vietnam, primary activity: to bring modern astronomy to the 10 pedagogical universities that have been teaching astronomy for the last 50 years. They have a new text in English and Vietnamese with colour pictures, something new for Vietnam. They have had several workshops; the faculty of the last two workshops has included Jay White of ASP. The secondary school course on the Solar System has been approved. We can make suggestions how to develop this course, but there are limits on what we can support, and national training of teachers is not within our purview. We are trying to introduce more variety into the planetarium show. The 16 inch Meade donated five years ago to Hanoi Pedagogical Institute has not been used effectively. Gradually they must be taught how to use it and its CCD, and to have experience in measuring experimental and observational quantities.

2) in Morocco: more like a graduate program within a very interested Department of Physics. The Travelling Telescope has arrived there and is actively used. David Clark went there to make sure everybody knew how to use it and one of their students went to Munich to be trained. The project is in its second year and going well.

3) in Central America, a revision is needed. We thought by increasing our financial and academic support that we got a fairly good regional science meeting going last year but this year they skipped it. There are still problems from Hurricane Mitch. We sent \$7000, mostly from money supplied by the International Council of Scientific Unions (ICSU), to contribute to the repair of the telescope and even the conduit of the high-speed data links. Thus we enabled the observatory in Honduras to be the only institution that has good access to satellite data, helping with national reconstruction. We sponsored two observing courses with their 20 inch telescope. Nobody in Central America has asked for a budget for the current year.

7. John Percy discussed the Travelling Telescope.

As previously discussed the telescope is now in Morocco.

8. Jay Pasachoff discussed the subcommittee on Public Understanding at Eclipses.

They distribute material on request, and partly on the website of the IAU Working Group on Eclipses

www.williams.edu/astronomy/IAU_eclipses

The materials include instructions on how to observe partial eclipses and the partial phases of solar eclipses safely, and to elaborate on the distinction between partial eclipses/phases and totality. The last two eclipses were in the Caribbean (Aruba, Guadeloupe, Curaçao) and northern South America (Venezuela, for example). The next eclipse, June 21, 2001, will be in southern Africa: Angola, Zambia, Zimbabwe, Mozambique, and Madagascar. The following eclipse will also be in southern Africa, including Angola, Zimbabwe, Mozambique, and northernmost South Africa, and will then terminate at sunset in Australia.

We are trying to set up liaisons for support of public education at eclipses – one possibility is with PPARC, the Particle Physics and Astronomy Research Council of Britain. A meeting at the UN, with Hans Haubold and now our member Mazlan Othman, who are both at the UN Vienna Office, is tentatively scheduled for October in New York.

9. John Percy discussed the exchange of books and magazines. He takes over from Darrel Hoff, who remains a member of the Program Group. We are helping the sending of books and magazines to places where we can identify a need and a worthy recipient. S&T, ASP, RASC, etc., are also helping. The IAU provides copies of some of their publications, but those items are often inappropriate to the local needs.

10. New Officers were approved (and subsequently approved at the General Assembly). They are Isobe as President (isobesz@cc.nao.ac.jp), Pasachoff as Vice-president (jay.m.pasachoff@williams.edu), and Fierro as Past-president (fierroju@servidor.unam.mx). See Section B.

Don Wentzel discussed the latest version of the rules and guidelines of Commission 46. The goal of the reorganization is to move all educational and development activities of the IAU into one commission, an idea initiated by General Secretary Andersen. After two brief amendments, the rules and guidelines were approved. See Section C.

Don Wentzel also discussed the membership in the program groups, which was finalised after the meeting as shown in Section B, and the past and future budgets for the activities of Commission 46. The chairs are responsible for requesting the needed funds as part of the budget for Commission 46.

J-C Pecker asked why we do not become a Division of the IAU instead of our current status as a Commission of the Executive; in any case, we will have a member on the Executive Committee or, rather, a member of the Executive Committee on our Organising Committee.

11. Miscellaneous

John Percy made an announcement about the WG on Light Pollution, which has a subgroup working on education and light pollution, headed by Margareta Metaxa, Greece.

John Percy discussed the meeting the next morning (August 12) about how you can start legitimate research activity in an astronomically developing country. He had a position paper to distribute.

Jean-Claude Pecker made an announcement of the International Union of Science Communicators, following a meeting organised by Jayant Narlikar in Pune, India. There will be a union of both organisations and individuals.

Graeme White discussed the astronomy education meeting that they held in Australia last year, even though the IAU could not support it. It was 11-13 July 1999 at University of Western Sydney Nepean. Proceedings are on the Web in electronic form and will be published in the Publications of the Astronomical Society of Australia.

Section A respectfully submitted,
Jay M Pasachoff, Secretary

SECTION B C46 OFFICERS, ORGANISING COMMITTEE, PROGRAM GROUPS, 2000-2003

President Syuzo Isobe, isobesz@cc.nao.ac.jp

Vice-president Jay Pasachoff, jmp@williams.edu

Past-president Julieta Fierro, fierroju@servidor.unam.mx

Representative from IAU Executive Committee (TBA)

The Organising Committee consists of the three officers, the representative from the IAU Executive Committee, the chairs of the Program Groups, and the Vice-chair for Exchange of Astronomers.

PROGRAM GROUPS

* designates individuals neither a member of the IAU nor a consultant member of Commission 46.

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International Schools for Young Astronomers (ISYA)

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Exchange of Astronomers

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National Liaison

Jay Pasachoff (chair), jmp@williams.edu

Newsletter

Barrie Jones (chair), b.w.jones@open.ac.uk
Andy Norton, A.J.Norton@open.ac.uk

Solar eclipses

Jay Pasachoff (chair), jmp@williams.edu
Ralph Chou*, Ralph_Chou@tvo.org
Julieta Fierro, fierroju@servidor.unam.mx

Exchanges of books, journals, etc

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SECTION C C46 TERMS OF REFERENCE, RULES & GUIDELINES

Astronomy Education and Development

Education et Développement de l'Astronomie

Commission 46 is a Committee of the Executive Committee (EC) of the IAU.

OBJECTIVES

The Commission seeks to further the development and improvement of astronomical education at all levels throughout the world, through various projects initiated, maintained, and to be developed by the Commission and by disseminating information concerning astronomy education at all levels.

ORGANISING COMMITTEE (OC)

The OC is charged with the high-level planning and coordination of the activities of the IAU in the broad sphere of astronomy education and development. It is appointed at each IAU General Assembly, subject to the approval of the Executive Committee (IAU By-Laws §20b). The OC has the following composition, members being drawn from all fields of activity (reappointments allowed)

- the present and past President and the Vice-president(s) of Commission 46
- a member of the Executive Committee (EC), appointed by the EC
- the chairs of all active Program Groups
- other members of the Commission up to a total of 12.

The OC reports to the Commission and to the GS (and from there as appropriate to the EC and the General Assembly) through the Commission President. The Commission President may delegate specific duties to the Commission Vice-president(s). If the President of Commission 46 for any reason becomes unable to fulfill his/her duties in a timely manner, the Vice-president(s) is(are) responsible for conducting the business of the OC.

Triennial nominations: At an appropriate time before each General Assembly, the Commission President (or designated Vice-president), in consultation with the OC, shall prepare a slate of officers and members of the OC, and consultant members who will be willing to serve for the next term and present this list to the EC for appointment at the time of the General Assembly.

At the end of a three-year term, the President is normally succeeded by one of the Vice-presidents. An individual may serve up to two consecutive terms as Vice-president. President and Vice-president(s) should be from different countries.

The business of the OC includes the items listed below as well as such others it may deem appropriate. It may conduct its business by correspondence, including electronic correspondence.

Under the responsibility of the Commission President or designated Vice-president, the OC will:

- Prepare an annual Plan of Action, with a five-year Forward Look, for approval by the EC
- Monitor the progress of ongoing activities and make appropriate adjustments if necessary. Termination of a budgeted activity will require prior approval by the GS
- Prepare an annual budget for its activities within the total amount assigned to it, and revise this budget if additional funds become available during the year
- Appoint the Program Groups for the individual activities
- Monitor the progress of ongoing activities and revise their budgets if necessary. Revisions amounting to more than 10% of the total budget assigned to the Commission will require prior approval by the GS
- Submit brief, informal quarterly reports to the GS (email acceptable) and a summary report to the GS before the annual EC meetings on the progress of its activities
- Prepare a summary report on its activities over the triennium for the Reports on Astronomy (Transactions A)
- Provide such reports and budgetary documentation as requested by the GS for the accounts of the IAU and as may be required by any external sponsors.

PROGRAM GROUPS (PGs)

For each identifiable activity, a PG is appointed by the OC to plan and conduct the activity within the programmatic and budgetary terms defined by the OC. Each PG reports to the OC at intervals and in ways defined by the OC. Members of the PG are appointed by the OC for periods of up to three years (renewable) and include a Chair responsible for coordinating the work of the PG, plus a small number of additional members who actively contribute to the work of the PG. The Chair should be a member of the OC of Commission 46 while the others may be either IAU members or consultants. The membership and rotation schemes should be defined as appropriate for the long- or short-term nature of the activity.

Within the terms defined by the OC, the PGs will undertake all actions needed for the successful conduct of their activities. These include the selection of student and faculty participants as appropriate, allocating individual travel or other support within the PG budget, and serving as the primary source of advice or assistance for all involved. Any binding agreements with external institutions or other parties will, however, require the signature or other explicit prior approval of the GS (Working Rules 33). The PGs will provide regular programmatic and financial reports to the OC to enable it to fulfil the obligations listed above. Actual expenditures, if within approved budget levels and so identified, normally will be arranged directly between each PG Chair and the IAU secretariat.

At present, creation of at least the following PGs is foreseen (the first five having their own additional rules and guidelines).

- PG for Advance Development Projects
- PG for Teaching for Astronomy Development
- PG for International Schools for Young Astronomers
- PG for Exchange of Astronomers
- PG for National Liaison on Astronomy Education
- PG for Collaborative Programs; activities co-sponsored by UNESCO, COSPAR, UN, ICSU, etc. and interactions with other international organisations
- PG for Commission Newsletter; an Editor plus perhaps 2 members
- PG for solar eclipses; timely advice for countries that will experience a solar eclipse
- PG for exchanges of books, journals, materials.

REVIEW OF ACTIVITIES

Regular review of ongoing activities is essential. In addition to the ongoing informal, self-reviews through the annual reports, the EC should commission an overall program review every 3-6 years, in consultation with the OC.

COMMISSION MEMBERSHIP

1) *National Education Liaison*: Every country adhering to the IAU should have an educator identified as liaison to Commission 46. The designated Vice-president will identify these liaisons in time for appointment as member of Commission 46 at the General Assembly. A liaison may be an IAU member or a consultant member. The advice of the National Committee or Adhering Body of each country may be sought. The National Committee or Adhering Body will be informed of the appointment. A liaison may also be appointed for a country not adhering to the IAU.

2) *Members of Program Groups*: Members of Program Groups are members of Commission 46 if nominated in time for approval at the General Assembly. Additional members may be co-opted by Program Groups on an informal basis as needed, but these are not necessarily members of Commission 46.

RULES & GUIDELINES FOR PG ADVANCE DEVELOPMENT PROJECTS (formerly WG WWDA)

Many countries wishing to start or significantly enhance astronomy seek guidance how to accomplish such a goal. This PG is established to offer such advice, at the initiative of its members or when requested by an appropriate organisation in a country. The PG is expected to take a proactive role in its activities.

The PG consists of a Chair and a group of advisors, generally IAU members, chosen for their expertise in astronomy development and/or in the appropriate countries. Advice may be given by correspondence or during travel to the country. The PG may institute a short pilot project to ascertain the capabilities for astronomy development in the country. In addition, the PG may disseminate relevant information more generally, e.g. via a newsletter, and it generally sponsors at least one session during General Assemblies at which development issues are to be discussed.

The Chair is responsible for requesting the needed funds as part of the budget for Commission 46 and for timely coordination with the President of Commission 46 as the financial needs develop. The travel budget for the PG should be based on the understanding that any country/institution requesting advice involving travel or a pilot project should be asked to contribute at least a part of the cost.

RULES & GUIDELINES FOR PG TEACHING FOR ASTRONOMY DEVELOPMENT (TAD)

TAD is intended to assist a country with currently little astronomy which wants to enhance its astronomy education significantly. TAD operates on the basis of a proposal from a professional astronomy organisation or on the basis of a contract between the IAU and an academic institution, usually a university. The Chair of the Program Group TAD, with the advice of other members of the PG, helps to negotiate the proposal or contract so that the proposed activities fall within the financial and managing/supervisory capabilities of the IAU and have a good chance of being realised within a few years. An active local leader of the project must be clearly identified. But consideration should be given to supporting all the astronomical institutions in a country so that astronomy may progress on a national basis.

The membership of the PG is to include the Chair, the EC member of the OC, and advisors, including at least one advisor for each participating country. All persons participating in financial decisions must be IAU members.

The capabilities of the TAD program are limited to assistance with university-level activities, such as

- 1) the creation of university-level astronomy/astrophysics courses and the faculty training and equipment associated with the development and first offering of such courses
- 2) a basic, largely educationally oriented research capability for faculty and students
- 3) travel (i.e. transportation) costs of foreign visiting lecturers and of students invited for study at foreign universities, and
- 4) professional preparations needed as a prerequisite for plans to offer astronomy in schools and for the public.

TAD can provide advice about education of school teachers, but not financial support. The training of school teachers and the actual performance of school teaching and public outreach is considered to be part of the national resources.

Progress of each project is to be reviewed regularly, at least annually in connection with preparation of the next year's budget, and evaluated in reference to the annual and long-range plans expressed in the contract or original proposal. After three years, a review of long-range plans is expected that includes an estimate of the time, typically six to ten years after the beginning of the project, when the goals of the project are probably accomplished and support by the IAU TAD program may end. The long-range review should include an outline when or how continuing expenses (for journals, annual professional meetings, etc.) are to be taken over by local institutions.

When it becomes appropriate to consider new proposals from additional countries, this opportunity should be announced not only formally in the Information Bulletin but also by communication with astronomers in non-member countries, particularly those known to the PG for Advance Development Projects.

RULES & GUIDELINES FOR PG INTERNATIONAL SCHOOLS FOR YOUNG ASTRONOMERS (ISYA)

Educational activities are one of the essential tasks of the Union. The International Schools for Young Astronomers are a project within IAU Commission 46, Astronomy Education and Development. The Chair of the Program Group, through the President of Commission 46, should request from the General Secretary a budget for generally two ISYA during any triennium between IAU General Assemblies. The financial support is only for travel, both international and within the host country. The host institution must obtain the funds to cover expenses during the ISYA.

ISYA seeks the participation of young astronomers mainly, but not exclusively, from astronomically developing countries. Participants should generally have finished first degree studies.

ISYA seeks to broaden the participants' perspective on astronomy by lectures from an international faculty on selected topics of astronomy, seminars, practical exercises and observations, and exchange of experiences.

There should be a wide regional (multi-country) representation of both lecturers and students. Participation in ISYA by women is encouraged both as student and as teacher.

For countries with a national astronomy program, part of the school should take place at an observatory site for training in observational techniques and if possible in data reduction.

The ISYA Chair should correspond with the Director of the school so that the proposal follows the working rules and guidelines for the ISYA currently in force. The correspondence should include the duration of ISYA, generally about three weeks, the range of topics to be accommodated in that time, the academic level of the lectures, the importance of faculty who have teaching experience and who can remain for the entire duration of the school, the opportunity of practical exercises including observing and data reduction, the time allotted to individual presentations by participants, the actual dates and location, practical arrangements for room, board, and academic facilities, the associated budget, and the adequacy of the host institution's plans to obtain the needed funding.

The approval of an ISYA proposal, agreed to by the Director of the School and the ISYA Chair, may be done in two steps. First, the ISYA Chair, via the President of Commission 46, seeks approval by the EC of the theme and outline of the scientific program of the ISYA and its venue and dates. Second, the final approval of the ISYA detailed program and lecturers rests with the President of Commission 46. The latter should resolve any disagreements developing during the planning process and, if deemed necessary, may cancel the ISYA.

Approval will depend on the identification of a capable local organiser (not necessarily the Director of the school) who, with the support of the ISYA Chair, can complete all arrangements in time for the ISYA.

The list of recipients of IAU travel grants is worked out jointly by the Director of the school and the ISYA Chair. At least one third of the participants should be foreign.

During the school, the ISYA Chair and/or Vice-chair will act as academic coordinator for the faculty and participants and for the program of lectures.

The ISYA Chair should write two reports.

1) Immediately after the school, generally written with the help of the Director of the School, a first report should summarise the program of the activities, lectures held, the list and addresses of the participants, the list of the speakers and lecturers and the highlights, strengths and weaknesses of the school.

2) Two to four years after the ISYA has been held, a second report should give information on the scientific or educational activities of the ISYA participants together with their new addresses. The ISYA Chair should communicate both reports to the EC for information and to the President of Commission 46 for review at the next GA. A summary report should be published in the IAU Information Bulletin.

RULES & GUIDELINES FOR PG EXCHANGE OF ASTRONOMERS (formerly Commission 38)

The PG makes travel grants to qualified individuals in order to enable them to visit institutions abroad where they may interact with the intellectual life and participate in the research of the host institution. It is the objective of the program that astronomy in the home country be enriched after the applicant returns. The PG publishes, both on the IAU website and in IAU Information Bulletins, all the information needed to apply for a grant under the IAU Exchange of Astronomers program.

The Chair is responsible for requesting the needed funds as part of the budget for Commission 46 and for timely coordination with the President of Commission 46. Normally the Chair serves from one General Assembly to the end of the next General Assembly, and the Vice-chair succeeds the Chair at the end of the latter's three year term. All persons participating in financial recommendations must be IAU members.

RULES & GUIDELINES FOR PG NATIONAL LIAISON ON ASTRONOMY EDUCATION

The exchange of information about astronomy education in different countries is an important project of Commission 46. The exchange of information takes place primarily through the triennial national reports on astronomy education and through conferences organised by Commission 46. The main duty of the National Liaison on Astronomy Education is

1) to write the triennial national report such as to be a valuable resource for countries wishing to enhance their astronomy education, and

2) to transmit to the educators of his/her own country the insights that they might glean from the reports and conferences of Commission 46.

The (one) Vice-president of Commission 46 shall normally be the Chair for the PG for National Liaison on Astronomy Education.

OLD TEXTBOOKS IN ASTRONOMY AVAILABLE NOW

Jay Pasachoff has drawn my attention to the following textbooks. Though not the most recent they are still useful, and if you have great difficulty in obtaining textbooks then please use this opportunity by contacting Elizabeth S Wasiluk, Berkeley County Planetarium, Hedgesville High School, Hedgesville, West Virginia 25427, USA, fax 304 754 7445

(no e-mail address)

Shipping reimbursement would be nice but is not necessary.

15 copies of Jerry D Wilson, College Physics, 1990

33 copies and Teacher's Guide for Jay M Pasachoff, Astronomy: From the Earth to the Universe, 1979

33 copies and Teacher's Guide for Pasachoff, Journey Through the Universe, 1994

2 copies of George Abell, Drama of the Universe, 1978

1 copy of Dinah Moche, Astronomy: A Self Teaching Guide, 1993

2 copies of Pasachoff, Journey Through the Universe, 1994

1 copies of Pasachoff, Contemporary Astronomy 1985

Barrie W Jones

INTRODUCTORY DISCIPLINES OF ASTRONOMY IN UNDERGRADUATE COURSES IN BRAZIL

The aim of this work is to present an overview of specific introductory disciplines with astronomy content, in Brazilian higher education institutions (HEIs).

A study was made on the aspects of Introductory Astronomy, with regard to the types of disciplines, and objectives and syllabuses (Kourganoff, 1980; Mumford & Comins, 1996; Kerton & Attard, 1998). The first step was a descriptive survey aimed at learning about the existence of disciplines in the HEI. The final result was the chart shown in Table 1.

One criterion to find these courses was based on the Brazilian Ministry of Education that defines the curricula of the undergraduate courses in the country (MEC, 1981). Only cartography, land surveying and meteorology courses have astronomy content in their curricula. Another criterion was the assumption that certain courses might lead to teaching astronomy. These were courses in astronomy, science, aeronautics engineering, communications engineering, physics, geophysics, geography, geology and mathematics.

The research was done in 1997 and 1998. A covering letter, questionnaire, and stamped envelope were sent to people responsible for 628 courses throughout Brazil. These courses were identified from publications by the MEC (1994). For each course, the total number of questionnaires sent and answered is shown in Table 1.

Table 1 Courses investigated, number of answers, courses that offer introductory disciplines of astronomy, how many were compulsory, and how many were optional

COURSES	Total	Answers	Astronomy	Compulsories	Optional
Astronomy	1	1	1	1	0
Science	243	85	4	3	1
Aeronautics Eng.	1	0	-	-	-
Cartography	5	4	4	4	0
Land Surveying	9	6	5	5	0
Communications Eng.	1	1	0	-	-
Physics	70	39	22	11	11
Geophysics	1	1	1	1	0
Geography	176	37	13	11	2
Geology	19	7	0	-	-
Mathematics	96	36	0	-	-
Meteorology	6	4	4	4	-
TOTAL	628	221	54	40	14

Sources: MEC, 1994 and Project Introductory Disciplines of Astronomy, 1997-1998.

The HEIs were identified, along with the names of the disciplines offered by them, an indication of which disciplines are compulsory and which are optional, and the number of credit hours of each course. The courses were distributed according to the various geographic regions of the country.

There were 54 courses identified, in a total of 60 disciplines, and distributed among 46 IES. According to the administrative dependency, 67.4% of IES are public (45.6% federal, 19.6% state and 2.2% municipal) and 32.6% are private. By organisation 82.6% are universities and 17.4% are isolated.

Analyses and discussions were done on the contents of the disciplines as outlined in the syllabuses. The disciplines of cartography, land surveying and meteorology courses were examined according to criteria defined by the MEC. This procedure allows verification of the degree to which the various topics are followed, as well as which topics are added.

For the disciplines of astronomy, science, physics, geophysics and geography courses, a classification by topics was done, based on what is more frequent in the answers, the chapters of textbooks in Bakulin et al (1987), Pasachoff (1998) and the programs proposed by Krivov (1995) and Kerton & Attard (1998).

Of the 42 analysed disciplines, the topics and percentage of disciplines within each are as follows.

First Part – History and subject

69.0%, positional astronomy (PA): **78.6%**, instruments: 45.2%, Sun-Earth-Moon system (SEMS): **78.6%**, solar system (SS): **81.0%**, stars (S): **76.2%**, galaxies (G): 69.0%, cosmology (C): 57.1%.

Second Part – Sky and constellations

45.2%, time and calendar: 40.5%, celestial mechanics: 42.9%, astrophysics: 33.3%, and teaching: 7.1%.

Given the highest percentage of the *First Part* the next step was to classify and analyse groups of similar content, yielding the following discipline percentages:

Group A = Breadth: all the topics of First Part → 16.7%

Group B = (PA) + (SEMS or SS) + (S, G or C) and absence of any of the topics → 45.2%

Group C = (PA) + (SEMS or SS) and absence of S, G or C → 7.1%

Group **D** = Absence of PA, (SEMS or SS) + (S, G and C) → 21.4%

Group **E** = Not classified in any before → 9.5%

We concluded that the biggest group (B) is characterised by a large, although not comprehensive, breadth of topics.

The academic staff is mainly male (80.0%). The largest group, 23.6%, is between 36 and 40 years old and 21.8% is between 41 and 45 years old.

Most had a degree in physics (50.8%) followed by geographers (9.8%). As for the graduation, 6.6% have only undergraduate level, 14.7% are specialised, 26.2% have an MSc and 52.5% have a PhD.

Regarding experience in teaching the discipline in the HEI, 63.3% have 5 years and under, and 21.7% have 6 to 10 years.

The teaching materials were classified by: hand-outs (48.8%); videos or films (32.6%); slides (25.6%); star atlases and astronomical ephemerides (18.6%); magazines, papers articles and texts (14.0%); models of the Solar System, eclipses etc (9.3%); transparencies or overhead projector (9.3%); microcomputers, software, CD-ROM and Internet (11.6%); instruments such as sundials, compass and theodolite (4.6%).

Only 40% sent information on practical activities. Of those, 35.0% mentioned observation of the sky by naked eye and by telescopes, photography, determination practices, visits to observatory and planetarium etc. Only 8.3% mentioned other activities such as laboratory classes, concrete materials, construction of models etc.

We also surveyed the cited bibliographies of 165 books – 44.8% edited in Brazil and 55.2% foreign.

The data were greatly dispersed. Most used the textbook *Conceitos de Astronomia* by Boczko (1984) (32.6%). There were no textbooks that influenced the contents of each group of disciplines.

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The contents of this paper are a part of a MSc dissertation with the same title, presented at the DGAE/IG/UNICAMP.

NEWS OF MEETINGS, AND BRIEF ANNOUNCEMENTS

TWO MEETINGS IN BRAZIL IN 1999

Two meetings are reported here (1) XXVth Annual Meeting of the Brazilian Astronomical Society (Sociedade Astronômica Brasileira - SAB, held at Hotel Glória, Caxambu, Minas Gerais, Brazil, on August 1-5) and (2) IVth Brazilian Meeting on Teaching of Astronomy, which was sponsored by the Fundação Planetário da Cidade do Rio de Janeiro (held in the Planetarium of Rio de Janeiro, on December 1-2). On December 3-4 the IVth Meeting of the Brazilian Association of Planetariums (ABP) was also held.

XXVth Annual Meeting of SAB

The main objective of SAB's meetings is to provide a view of the scientific activities in astronomy developed in Brazil, providing an opportunity for the associates to better interact among themselves. There were about 250 participants and the program was especially designed for the celebration of the 25th anniversary of research in Brazil since the foundation of SAB. There were 14 invited talks, 3 debates, 257 poster presentations and 1 exhibition devoted to various astronomical sub-areas, including teaching and history of astronomy. There were 14 posters and 2 debates devoted to the teaching and popularisation of astronomy.

The first debate, *Ethics in science popularisation*, was held on August 2, under the coordination of José Renan De Medeiros (President of SAB/UFRN) and with the participation of José A de Freitas-Pacheco (IAG/USP), Augusto Damineli (IAG/USP), the journalists Ulisses Capozoli (Centro de História da Ciência/USP), Martha S J França (Revista Época), and Dante Grecco Neto (Revista Galileu). The second debate, *Teaching of Astronomy* was coordinated by João B G Canalle (Coordinator of SAB's Teaching Commission - CESAB -/UERJ) on August 4 with the participation of Lilia Arany-Prado (OV/UFRJ), Mariângela de Oliveira-Abans (CESAB's Vice-coordinator/LNA), João Braga (INPE) and Lourdes R B Galliac (SE/Caxambu).

In order to comply with its mission and objectives, CESAB usually organises a series of activities for the local teachers and general public, which are developed simultaneously with the scientific meeting. The *4th Cycle of Activities on Astronomy of CESAB* was coordinated by Mariângela de Oliveira-Abans and consisted of short courses, lectures, night sky observations and planetarium shows for teachers, students, and general public.

The short courses were attended by 11 previously enrolled and selected teachers from the schools of Caxambu and surrounding cities, from August 2 through 5. The program was the following: *Stellar Evolution* (Lilia Arany Prado); *The Solar System* (Cláudia Vilega/INPE); *Contents of Astronomy in School Books* (Ramachrisna Teixeira/IAG/USP); *A Trip by the Cosmos: Discovering our Universe* (Martin Makler/CBPF and Carlos A Wuensche/INPE); *Astronomical Instruments* (Paulo S Bretones); *G: from Gravitation to Galaxies* (Mariângela de Oliveira- Abans), and *Demonstration of a Workshop on Astronomy* (João B G Canalle). There was also the invited lecture *In Search for the Pillars of Creation* (José Renan De Medeiros). There were experiments, distribution of texts and magazines, construction of teaching materials and use of microcomputers.

On August 2 and 3, the Museum of Astronomy and Related Sciences (Museu de Astronomia e Ciências Afins, MAST) set up a portable planetarium in the city's sports gym and received about 550 students from local schools. In order to observe the night sky, a Meade 10 inch telescope was set up by Júlio C Klafke and colleagues (IAG), and a 60-mm refractor by Paulo S Bretones, Mariângela de Oliveira-Abans and João B G Canalle in the yard of the State School Domingos Gonçalves de Melo.

Two public lectures took place at the Municipal Theatre: *Astronomy -- Studying the Universe* by Paulo S Bretones, directed to around 40 people on August 2, and *The Search for Extraterrestrial Intelligence* by Carlos A Wuensche, to around 35 people on August 3.

João B G Canalle organised a meeting of CESAB with other SAB's members who are interested in teaching and outreach to discuss projects, lines of action and future work. An annual report of CESAB's activities is presented during the society's general assembly, and a written report is formally published in the annals.

IVth Brazilian Meeting on Teaching of Astronomy

There were about 130 participants - school and university teachers, students, planetarians and amateurs. The program consisted of 5 lectures, 7 oral communications and 25 poster presentations.

The opening lecture, *Introductory disciplines of Astronomy in Undergraduate Courses in Brazil* was given by Paulo S Bretones. The others lectures were: *The teaching of Astronomy in the Undergraduate course --Formal teaching and Science Initiation* by Lilia Arany-Prado (OV/UFRJ); *A science to read the world* by Rodolpho Caniato; *Astronomy in the primary and secondary teaching* by Rute H Trevisan (CESAB/UEL); *The Popularisation of Astronomy and its relations with teaching* by Waldir T Cardoso (SBEA).

The oral communications were devoted to various themes as follows: *A virtual library of Astronomy* by José Adolfo S de Campos (OV/UFRJ); *The II Brazilian Olympiads of Astronomy* by João B G Canalle (CESAB/UERJ); *Revision of astronomical textbooks* by Walkiria Schultz (INPE); *Teaching materials for Astronomy* by Oscar Matsuura (MAST); *Popularisation: why put journalists and scientists together?* by Dante Grecco Neto (Editora Globo); *Solar telescope and remote telescope* by Fernando A Vieira (Fundação Planetário); *Teaching of Astronomy on the internet - uses at Fundação Planetário* by Paulo C R Pereira (Fundação Planetário)

On the evening of December 1 the book entitled *Astronautics - From Dream to Reality* by Ronaldo R F Mourão (MAST) was released. There was a special planetarium show for the participants of the meeting entitled *The prince without a name*. The Rio de Janeiro Planetarium has a Zeiss Universarium VIII TD projector and a capacity of 277 seats.

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THE RAS/IAU MEETING AT THE IAU GENERAL ASSEMBLY 2000

The development and utilisation of telescopes for educational purposes were prominent on 18 August at a special session of the IAU in Manchester. The session, which was organised by Barrie W Jones & Alan Pickwick of the UK Royal Astronomical Society Education Committee, was entitled Astronomy Research Projects for School & University Students.

The morning session began with a live demonstration by David Smith from Highgate School, London of a robotic telescope for school use. The refurbished 60 cm reflector instrument, which is situated on Mt Wilson in California, is available for remote observers in schools throughout the world to control and take photographs in real time. Mr Smith

used a computer modem and telephone line to link to the telescope in order to demonstrate the ease with which deep sky astronomy may be carried out in the classroom during daylight hours.

Mr Smith returned later to discuss in more detail the Telescopes in Education (TiE) project that has been using the Mt Wilson telescope for about 8 years. In the UK, TiE sessions have been running since 1996, funded by grants from the Particle Physics and Astronomy Research Council. The TiE programme is currently expanding to incorporate a number of 35cm, fully internet-controlled telescopes, leading to an expansion in the resources available to schools for remote astronomical observing.

<http://tie.jpl.nasa.gov/tie/index.html>

Two “home-grown” robotic telescopes were next on the agenda. Professor Mike Bode (Liverpool John Moores University) described the 2 metre Liverpool Robotic Telescope, the largest robotic telescope in the world, which will be installed on La Palma in the Canary Islands in late 2000. 5% of the time on the telescope is earmarked for educational use through schools; through public displays in the Liverpool Planetarium; and through amateur astronomers.

<http://cwis.livjm.ac.uk/astro/>

Robin Catchpole (Royal Observatory, Greenwich) followed with an account of the identical 2 m Faulkes Robotic Telescope, that will be available solely for school use. The telescope will be sited in Hawaii and controlled from the Royal Observatory Greenwich. First light is anticipated in late 2001. By enabling schools to make night time observations during the school day, it is hoped that schools will be able to take part in front-line research projects.

www.rog.nmm.ac.uk

John Baruch (University of Bradford) evaluated the many new opportunities for “inspirational science” offered by combining the World Wide Web, the eight robotic telescopes around the world, and astronomical data bases for undergraduate and school groups. Using the experiences of the Bradford Robotic Telescope as a guide, Dr Baruch discussed the resources necessary to run such programmes and made suggestions as to how they can be implemented. In particular, he emphasised the importance of support for both school students and undergraduates.

<http://www.telescope.org/rti/index.html>

Margarita Metaxa (B Lyceum Tositseio Arsakeio Ekalis, Athens) emphasised the advantages of projects that incorporate astronomy, physics, technology and the environment. She argued that, by using the background theme of environment, students may see the Universe as “our living home”. In particular, through a light pollution project, students can do research on lighting spectra (physics), on the limiting magnitude of stars in constellations (astronomy) and the use of photography and computers (technology) to estimate how much their local environment is polluted by light.

The possible contributions of professional or amateur astronomers and students to studies of variable stars were discussed by Professor John Percy (University of Toronto). Useful measurements made with the eye, binoculars, and/or small telescopes – including robotic telescopes – can make useful contributions to databases, such as that of the American Association of Variable Star Observers (AAVSO), for use by scientists and educators worldwide. Data and software for analysis and interpretation are readily available on the World Wide Web e.g. the AAVSO web site at www.aavso.org. The students are then able to do real science, with real data, while developing and integrating a wide range of science and maths skills. For this purpose, the AAVSO recently developed Hands-On Astrophysics - variable stars in math, science, and computer education.

The Japanese Global Education Programme to detect hazardous asteroids was described by Professor Syuzo Isobe (National Astronomical Observatory of Japan/Japan Spaceguard Association). The Bisei Spaceguard Centre, which is developing two new 0.5 m and 1 m telescopes to detect near-Earth objects, will generate vast amounts of publicly available data that can be used for educational purposes. Software will be distributed so that the data can be analysed and the positions of all the detected asteroids determined.

The afternoon session ended with a presentation on research projects in astronomy education by Mike Simcoe and Andrew Newsam (both from Liverpool John Moores University) and Richard Hammond (BECTA). They described the Schools’ Observatory, an Internet-based resource for schools that is designed to give access to a number of professional robotic telescopes sited around the world (Canary Islands, Hawaii, Japan, Australia, UK). Not only will schools be able to explore the Universe using their own observatory, but they will have a unique resource with which to stimulate the learning process. The Schools’ Observatory will also be an important resource within the National Grid for Learning, (www.ngfl.gov.uk/ngfl/) which aims to support the use of the Internet by providing access to quality learning environments. www.schoolsobservatory.org.uk

In a poster presentation, Jane Gregorio-Hetem and Vera Jatenco-Pereira (Laerte Sodre Jr. Universidade de Sao Paulo, Brazil) described how several astronomers from different Brazilian research centres have started a project to use robotic telescopes in fundamental education. Their efforts to improve educational methods have focused on astronomy because of its multidisciplinary characteristics.

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TRIENNIAL REPORT

BRAZIL

University education There has been real progress during the reported period (to April 2000). Some engineering programs include courses in astronomy, oriented toward geodesy. Several universities offer introductory courses in astronomy, intended for non-science students, and general astronomy, and more specialised courses for physics and science students as well; some physics students fulfil their undergraduate thesis in astronomy and astrophysics. The National Observatory (Universidad Nacional de Colombia) has extended its offering of elective courses as follows:

For non-science students:

Astronomy for everyone
History of astronomy
Constellations, planets and mythology

For science students:

General astronomy
Celestial mechanics
Stellar structure
Stellar statistics

Furthermore, the Observatory has started graduated studies with the following courses:

Theoretical astrophysics

Stellar astronomy

Large scale astronomy

It is expected to have the first Master of Science in Astronomy in a couple of years.

Public education There are four Planetaria in Colombia, at Bogota, Barranquilla, Pereira and Medellin, and one more is planned at Cali; all of them have been very active. In addition The National Observatory in Bogota has implemented the following courses, intended for common people:

Astronomy for adults

Astronomy for young people

Constellations, Planets and Mythology

The Observatory is devoting one day per week to an open house program; those attending can watch the Moon, planets, etc. Moreover, the Observatory performed a program of education in astronomy for high-school teachers, under an agreement with Bogota authorities.

Amateur activities The Universidad del Atlantico (Barranquilla), in cooperation with RAC (Red de Astronomia de Colombia), is preparing the Third RAC Congress to be held in Barranquilla, next December, at the campus of the University. International and Colombian scientists are invited as speakers, and groups of amateur astronomers from all over the country are expected to attend the Congress. Last December, RAC made a call to all amateur astronomers in the country to help secondary schools to form groups of enthusiasts from within the students.

In the program called Adopta un Colegio (Adopt a School) every amateur adopts a school and sponsors the formation of the group, transmitting his own experiences to the young students. The program was received with enthusiasm, and some institutions such as Universidad Bolivariana and Planetary at Medellin are helping the plan in some specific areas. Organisers are expecting to have 100 new groups by the end of this year, just in Medellin.

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Organising 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 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>
