European Astronomical Society

# NEWSLETTER

Issue 16. October 1998

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## Message from the President

After Liège, Toruń, Edingburgh, Catania, Sevilla and Thessaloniki, our society met this year in Prague, from September 9 to 12, jointly with the Czech Astronomical Society. This 1998 edition of JENAM has been again a successful event, with exciting plenary talks and highly interesting topical sessions. It is clear that we owe this success in great part to our hosts, whom I wish to thank again for all the efforts they spent to welcome us, in particular Jan Palouš and Jiři Grygar who chaired respectively the scientific and the local organising committees.

One of the high moments was the guided tour of astronomical Prague, where we had the privilege to walk in the footprints of Tycho Brahe, Johannes Kepler, Christian Doppler, Ernst Mach, and even of Albert Einstein, who spent there two of his most productive years. The tour was followed by a lovely concert in an ancient hall of Charles University, which celebrates this year its 650th anniversary.

To encourage and to ease the participation of graduate students and junior colleagues, 5000 Swiss francs drawn for the EAS budget were converted by the LOC into as much as 31 grants, to cover registration fees and living expenses, with accommodation in student hostel. We decided to pursue this action and to affect Edith Muller's bequest specifically to such travel grants for young astronomers from Eastern Europe.

The attendance to this JENAM'98 was quite satisfactory. It would have been even more if many Russian colleagues had not been obliged to cancel their participation, due to the financial crisis which hits their country. Even so, there were significantly less participants from the Western countries than from Eastern Europe, a persistent imbalance of which we must analyse the causes in order to remedy them.

What characterises our JENAMs is their pluridisciplinarity: they give us a unique opportunity to learn what is occurring in other branches of astronomy. Some colleagues perceive that as a waste of time, and prefer to go to specialized meetings, of which there are plenty already. Our parallel sessions have a similar goal, and they reach easily the level of such topical meetings, but they are less appealing because they do not publish their proceedings. Perhaps this is something that we should reconsider to render our JENAMs more attractive to all.

Other suggestions to improve or expand the activities of our society came from the floor of the general assembly in Prague. The wish was expressed that astronomers from the Eastern countries, especially the young ones, get access to Western observing facilities. To achieve this, our Web page can help to foster contacts and collaborations, even more so since it gives access to the members' directory. Moreover, Michel Dennefeld announced that we will soon be able to send messages to all members who are connected to Internet; we shall make use of that possibility to tighten our links and to provide better service to the community. The need of better and broader information, on jobs, on fellowships, on lecture courses, etc., was one of the conclusions of the Young People forum, as Mary Kontizas recalled during the general assembly. To satisfy this need must be one of our highest priorities, and I hope that there will be a massive response to the appeal she makes in her editorial.

J-P. Zahn

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## Editorial

It is with great pleasure that I want first to thank our Czeck colleagues for the wonderful meeting they organised and their so warm hospitality during the JENAM 98 in Prague.

Apart from the scientific program we discussed on many issues concerning the Society, the role of European astronomers and the international collaboration matters. You will read some of these Opinions, either presented in Prague or sent as a letter to the editor on a relative article in the previous issue.

As you can see we are changing (slowly I admit) the style of our Newsletter and decided to classify your contributions into specific subjects hoping that this will stimulate some of you to sent relevant articles.

An important question raised also by Jan Palouš in his report on JENAM-98 is the small representation of collegues from south-west parts of Europe. Just by accident? Although it is evident how important our annual gathering is, it is absolutely necessary for all of us to reflect and find ways to develop these meetings to the most important annual forum of European Astronomical matters. It will be extremely important to have your opinion on these issues.

My final paragraph will be again devoted to the campain we started a year ago of approaching the youngest generation of European students and professional astronomers. Last year's forum has given us several imputs as you have already seen in the issue No 15. As it was emphasised the lack of a central bank of information is absolutely necessary and we have already started contacts trying to develop such a long term plan for the creation of a center to help European Young Astronomers with reliable information first and more assistance if possible later on. This time I address an *appeal* to all of you to contact the young people of your Institute and ask them to see the EAS WEB page for the young astronomers. Please persuade them that contacting us our effort will be facilitated to demonstrate to the funding agencies that we are a strong numerous community that needs support for the continuation of the 3000 years of European tradition in astronomical research & achievements.
Contact www.astro.noa.gr/eas-forum/ypf-main.htm or me personaly at mkontiza@atlas.uoa.gr.

M. Kontizas

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## Opinion

**Is European Astronomy facing a crisis?**

In European Astronomy there appears to be a feeling of crisis. Funding is going down, young astronomers have difficulty in finding jobs, student enthusiasm for the physical sciences is waning and the European ideology seems less compelling than before. Is there a real crisis and, if so, what can we do about it?

Let us first look at the overall situation in Western Europe and take as representative that in the four large countries: France, Germany, Italy and the U.K. On average they have some 800 Ph.D. level astronomers each 12 million inhabitants or 0.5% of all researchers, 400 graduate students and produce 75 theses annually (Italy not included in the last two figures because of recent changes). The first problem is immediately evident: in 11 years the new PhD.s could replace all the Ph.D. astronomers, and therefore in a steady state more than 2/3 of these have to find employment other than as research astronomers. In addition to the Ph.D. astronomers there is a comparable number of engineers, technicians and administrative staff working in astronomical institutes.

The spending on astronomy averages 215 M EURO annually in each of these countries (including ESO, ESA, ...., and also taking the planetary sciences as part of Astronomy) which corresponds to 0.02 % of their Gross National Product. The figures are somewhat higher in the USA with astronomy spending estimated to be near 0.035 % of GNP and around 14 Ph.D. level astronomers per million inhabitants. The main cause of the difference is the much smaller space (science) program in Europe.

Until rather recently funding for astronomy tended upwards. From 1982 to 1997 the ESO budget more than doubled, while during several years the ESA science budge increased by up to 5 % per year. Also nationally funding was obtained for a number of expensive new projects. In some countries astronomical personnel continued to increase. Though the number of IAU members is not a very good measure of the total research population (because of the inclusion of retired members and exclusion of very young scientists), it may be noted that over the last 9 years it went up by 24% for all of W. Europe and by 1/3 in Central Europe, which cannot be entirely due to an aging population.

It is rather clear that Society is not going to increase forever the fraction of resources devoted to astronomy, and a leveling off could well have been anticipated. What has contributed to a feeling of crisis is the sudden change from positive to negative growth. Without a period of stability ESAs science budget went from 5%/yr increases to 3%/yr decline. ESOs experience was not very different and national budgets are being severely squeezed in several countries.

Is this unfavorable development just a ripple on a curve that is slowly leveling off or is a real decline to be expected? The answer is uncertain, but increasing expenses for health care and pensions in aging populations combined with the demands of industry in a time of global competition for more science addressed to its immediate needs cannot make us very optimistic. As a consequence, it becomes more urgent to clearly state the case for the importance of astronomical research and to spend our funding with the utmost effectiveness.

## The Case of Astronomy

Why should governments, universities or academies support astronomy ? Of course there is the general cultural aspect: people want to know what kind of world they live in and how it came about. But there is much more. Astronomy informs us about our current and past environment. There are connections between the geosciences, climatology, biological evolution and questions like the evolution and variability of the sun, the accretion of comets, asteroids and dust on earth, and the identification and study of exoplanets. Perhaps an even deeper connection exists between particle physics and astrophysics of the early Universe; also in other areas like nuclear physics or the physics of strong magnetic fields we find interesting extensions of laboratory physics to the astronomical scene. Astronomy also has a role to play in technological development, for example in imaging technology at optical, IR and X-ray wavelengths. It is no accident that the organization that discovered the first galactic X-ray source also brought the first X-ray detector for airport screening on the market.

Astronomy also has its role in education and in particular in attracting the young to the physical sciences in general. This is particularly important now that in some countries the numbers of physics and chemistry students are declining precipitously. For example in Germany the annual production of graduates in physics and chemistry is expected to decline by 60% in the next six years. And, of course, astronomy is an excellent subject to foster scientific literacy in the broader educated public.

It is important to increase the awareness among decision makers of the broad impact of astronomy, that it is not at all a science enclosed in a small corner of the intellectual progress of the age. It is equally important to make our students aware of this, to give them a sufficiently broad interdisciplinary education and to strengthen the connections to other subjects. This is all the more essential since, as we noted before, most astronomy students will not have a career in astronomical research.

## Life on a level plain

If our conclusion is correct that astronomy budgets in the future will at best be flat, a number of consequences follow. First of all, we should establish an optimal balance between the competing demands on the available funds. There should be a balance between spending on personnel and investment and operational spending. The natural temptation to increase the number of jobs for young astronomers can all too easily lead to a situation where not enough funding is available to make them work effectively. Population control is, therefore, required.

Second , we should carefully balance the merits of building new facilities against the continued operation of old facilities. The question is not, as so frequently asked, does this telescope still produce useful data? The question is whether it is the optimal way to spend a certain sum that could also be used to obtain data from a new instrument. If funding remains level, for every new instrument we have to terminate an existing one. Of course, this is easier in space where many soon come to a natural end. However, the case of IUE is an example of the closing down of a functioning instrument in space because the funding could be better used elsewhere.

Equally important, since only some of our graduated can continue in astronomical research, it is clear that the most creative, competent and motivated ones should be selected for employment in our field. To ensure this, it is important to select from the largest possible talent pool which means that we should not specify the jobs too narrowly and that the selection process should be as international as possible. We also should try to have a reasonable balance between theory and observation.

Finally, we should maximize our connections to the surrounding sciences and to the general educated public. The latter cannot be done in an amateurish fashion. One only has to look at HST to see the effort required and the benefits obtained.

The countries of Central Europe

While the countries of W. Europe face some problems, those of Central Europe are still more difficult because of a much more severe funding situation which makes it difficult or impossible to obtain adequate facilities. It would seem that the only way forward is through increased European cooperation and closer association with the European scientific organizations. Such a process would appear to be also very natural. As the European Union is preparing to include several Central European countries, it would be contradictory not to include these in other European entities, and much is to be said in achieving this first. In fact, we are already well on the way. Several countries from Central Europe have joined CERN as well as the European journal Astronomy and Astrophysics. It was announced at the Prague meeting of the EAS that the Czech Republic has signed an agreement with ESA, Poland and Hungary are participating in future ESA missions like Integral or Rosetta, while Poland contributes effectively to Eur opean VLBI with its radio telescope.

The same issue will come up at ESO. Evidently some care is needed in the detailed arrangements. Some astronomers in the ESO countries are concerned about the limited amount of observing time they obtain and are none too happy to slice into even more pieces. The first steps undoubtedly will involve cooperation with scientists from the ESO countries, but ultimately membership on the same conditions and with the same rights as the other countries should be the aim.

The present is a time of great opportunity with much new powerful instrumentation becoming available to astronomers in Europe. Some are worried that there are not enough astronomers to use all that instrumentation. At the same time, much of this instrumentation was funded some time ago and its completion uses the funds that in more prosperous times would have gone into the development of the next generation of instruments. Perhaps both problems may be solved by associating more countries to the present European science organizations.

L. Woltjer

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**Evolving Politics of Scientific Collaboration**
*Letter to the Editor*

Dear Madam Editor

Francoise Praderie's excellent review of the evolving politics of scientific collaboration (Newsletter April 1998) attributes the recent pressure on the international large installations as a desire primarily to serve national interests, or a lack of synergy of the existing organisations with member states' interests. Since the article identifies the UK as one country to associate with this pressure I would like to elaborate our perspective on international collaboration in astronomy.

The UK is some 15% of the European economy, and a comparable fraction of the economy of the USA. It is beyond our means to create alone the large astronomy facilities which all astronomers agree are necessary for the development of our science. Collaboration is absolutely necessary for us. What is more, intellectual leadership in science can come from any country in the world, most from outside the UK, and we are interested in good ideas, whatever their origin.

We are very interested in using the large facilities for their purpose. This means that we want to see the facilities associated with and run for our research community. Astronomers have to live somewhere, ours live in the UK (mostly in our universities in British cities), and we want to see their interests catered for. We expect other countries to want to see the interests of their own communities catered for too. We don't see astronomy as something you buy by giving someone money to do it, we see science as a process that our scientists participate in to the full, so that their brains change and they understand astronomy better.

Our big investments in large facilities will be backed up by our astronomers' participation. We are thus looking to choose to participate in those projects which have the synergy with our scientific programme. We think that the way for the participants to get on well together is to create focussed international collaborations which respect the interests of those who have elected to participate. This includes being flexible about the contributions and the aims of the participants, and delivering according to the desires of each.

The UK is not at all against international facilities for astronomy - you can see that the true position is quite the reverse, since essentially all of our astronomy budget is used in association with them. What we are looking for is the right balance between the international facilities in which we participate and our domestic astronomy programme.

Yours sincerely

Paul Murdin

*Head of Astronomy of the UK Particle Physics and Astronomy Research Council*
*Director of Science at the British National Space Centre*

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## Phenomena of Global Interest

**The last eclipse of the Millenium.**
**In August 11, 1999, the solar eclipse will be visible in Europe and its maximum will be in Romania.**

This eclipse will be an exceptional event, as:

⊙ it is the last total eclipse visible from Europe for the following several decades; The next TSE visible from Romania will be in ... 2236.

⊙ it is the last total eclipse of this millennium;

⊙ the totality band practically bisects Europe, from NW to SE, (the most populated zones);

⊙ it crosses many European countries, namely England, France, Benelux, Germany, Austria, Hungary, Yugoslavia, Romania, and Bulgaria;

⊙ it takes place in midsummer, at suitable hours;

⊙ it also takes place in full tourist season (an incredible affluence of tourists is to be expected).

Some characteristics of the eclipse are:

⊙ the maximum duration (2m 23s, according to NASA Ref. Publ. 1398, 1997);

⊙ the maximum coverage of the Sun (103%);

⊙ the maximum height of the Sun (59 degrees);

⊙ the highest probability of clear sky (at Mangalia the degree of cloudiness is 2.5, and there are 83% chances of good weather);

⊙ the maximum width of the totality band (112 km)

On top of that this event is most interesting for Romania because: (i) it happens in regions of great tourist attraction; (ii) Bucharest is the only European capital situated exactly on the central line of the totality band; (iii) there exist the only professsional astronomical observatory on this line, which has a solar telescope; (iv) there is a second professional astronomical observatory situated inside the totality band, at Timisoara;

Observatories' Projects in Bucharest and Timisoara

The two observatories, belonging to the Astronomical Institute of the Romanian Academy, own very suitable instruments for observing the eclipse. The Bucharest Observatory holds the only stable professional instruments situated just on the central line of the totality band, moreover, very close to the eclipse maximum.

Its main instruments are:

a Zeiss Refractor (13/195 cm) for white light observations of the solar photosphere and a smaller refractor with a Lyot-Ohman H-alpha filter for the chromospheric observations;

a Double Astrograph of Prin-Mertz construction (38/600 cm) with a field of $2 \times 2$ *degrees*, endowed with a photographic camera that uses $24\ cm \times 24\ cm$ plates, and a $7668 \times 512$ *pixels* CCD camera.

The Cassegrain telescope (50/700 cm), the small radiotelescope and the spectrograph could also be very useful. A Cassegrain telescope (30/169 cm) equipped with a photomultiplier of type EMI 9862 Q is owned by the Timisoara Observatory.

Our scientific projects are the following ones:

⊙ White light observations of the corona at Bucharest and Timisoara, during the totality phase;

⊙ Coronal structure observations at the distance of 1-5 solar radii (streamers, helmet, arches);

⊙ Coronal structure evolution;

⊙ Spicule observations;

⊙ Monochromatic coronal observations in green and red lines, as well as in continuum;

⊙ Determination of the contact times C1 and C4 (exterior contacts);

⊙ Einstein effect;

⊙ Infrared coronal observations from space.

All these programs are presented in Theoretical and Observational Problems Related to Solar Eclipses, Eds Z. Mouradian and M. Stavinschi, NATO ASI Series, Series C: Mathematical and Physical Sciences, Vol. 494, Kluwer Academic Publishers, Dordrecht, Boston, London (1997) or in Romanian Astronomical Journal, Vol. 6, Supplement, Ed. G. Maris, Bucharest, 1996. An international panel chaired by Jay M. Pasachoff, Head of the IAU Working Group "Eclipses" is examining the proposals for different programs to be performed with the Romanian astronomical instruments.

Other Programmes

Taking into account the fact that such an event will be very impressive for the public, we have also thought of a program of scientific education. We are also preparing for the eclipse brochures, booklets, books, videotapes, etc.

To cover the extremely wide range of problems raised by this event, as well as to collect the funds necessary for such a large program, we have set up the International Association ECLIPSA '99 (EAS Newsletter, issue 13, July 1996).

Meetings to be held in Romania, all in August '99:

1. a Summer School, at post-doctoral level, "Advances in Solar Research at Eclipses, from Ground and from Space", proposed to NATO by Observatoire de Paris-Meudon (J.-P. Zahn) and the Astronomical Institute of the Romanian Academy (M. Stavinschi);
2. the 24th ISYA (International School for Young Astronomers), organized under the auspices of the IAU/UNESCO (Michele Gerbaldi);
3. the 10th Triennial Assembly of the IUAA (International Union of Amateur Astronomers), European Section (President: Rinaldo Ruggero);
4. the 15th Congress of the Association of Cosmic Space Explorers.

Any other information concerning meteorological conditions, observing sites, touring, etc. can be found by resorting to the homepage of the Astronomical Institute (http://roastro.astro.ro).

Magda Stavinschi, magda@roastro.astro.ro

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## International Collaboration

### Small observatories throughout the world<br>The role of University Consortia and Collaboration

Background

The diminishing availability of small ( 2-m ) telescopes at national facilities and the chronic underfunding for the smaller public and private observatories pose serious threats to the type of research and educational projects that can be undertaken in the 21st century. For example, it has been estimated that the new generation of 8 -m -class telescopes will more than double the number of photons collected per year around the world, but provide dramatically less observing time per astronomer than at present. If current trends continue, the worlds astronomers will have to contend for a relatively small number of increasingly large facilities.

Nowhere are these problems more acute than in the countries of the former Soviet Union and in the developing countries, where national facilities face outright budget crises or do not exist at all, and where smaller private facilities are few in number and/or isolated. If such facilities are to be preserved for the next generation of astronomers and students (and hopefully their number increased) new models for operating them must be developed. Their users, typically students and faculty at small universities and in some cases highly competent amateurs, must achieve an equitable voice in the decisions affecting those facilities which support their education and research. In exchange, they must assume a larger role in the facilities operation, management and funding.

## The Lowell Observatory Workshop: A Beginning

In the U.S., the first few steps have been taken towards preserving small telescopes. Although it remains to be seen successful this effort will be, the First Annual Lowell Observatory Fall Workshop: The Role of Small Telescopes in Modern Astronomy (1996 Oct. 14-15) may have been a watershed. Abstracts and comments from this meeting are summarized at the website:
http://www.noao.edu/aurastma/small_telescopes.html

This meeting led to a special one-day session at the January 1997 meeting of the American Astronomical Society in Toronto, Canada, which focused on the specific issue of how to preserve the remaining small telescopes at the U.S. National Optical Astronomy Observatories (several have recently been closed to budgetary constraints).A summary can be found at:
http://www.aas.org/meetings/aas189/program/index.html

It gradually became clear during the course of these two meetings that the single largest segment of the astronomical community, amateurs, had been largely left out of the discussions. In the U.S. some of the most productive small telescopes contributing to published research belong to private individuals, and clearly some could play a role in dealing with shrinking accessibility of small public telescopes. This omission was corrected in a follow-up meeting Amateurs and Professionals: Collaborators in the New Age of Electronic Astronomy, organized by Larry Marschall (Gettysburg College) and Leif Robinson (Sky & Telescope magazine) at the June 1997 meeting of the American Astronomical Society in Winston -Salem, North Carolina. More information on this discussion can be found at
http://www.aas.org/meetings/aas190/program/index.html

## The role of small telescopes in big astronomy

Before deciding whether to preserve them, one must decide what indispensable functions (if any) small telescopes serve their users that cannot economically be performed by the larger telescopes. To paraphrase a few of the Toronto conclusions:

**Education:** Clearly student access to a small telescope is far more feasible than to a large one. Simply put, small telescopes are the essential training ground for undergraduates, graduate students and even post-docs from most institutions, whether they own major telescopes or not.

**Support:** Research at non-optical wavelengths and from space often need ground-based observational support which frequently does not require a large aperture telescope but does have specific time and/or geographical constraints.

**Special Projects:** Long-term, synoptic and survey projects often require many nights of telescope time, but not large aperture. In addition, new modes of operation, scheduling and testing new instrumentation are best done on smaller telescopes before implementation at larger facilities.

**Gateway:** Especially as the larger 8-m- class international facilities see first light during the next several years, small telescopes will play an increasing role in providing the types of feasibility studies which support proposals for competitively warded access to larger telescopes.

## A central registry for small telescopes

One of the biggest impediments to the full utilization of the world's small telescopes is their relative isolation. Many observational projects could effectively use these instruments, but more often than not scientists with a project are unaware of potential collaborating facilities. One way to alleviate this problem is to provide a widely available observatory registry where astronomers owning and or needing small telescopes can find each other. Perhaps the best present prototype is the North American Small Telescope Cooperative (NASTeC), funded by the late Jason Cardelli and now directed by Heather Preston. NASTeC is a voluntary no-cost, no-obligation website which lists 100 participating facilities, their equipment, capabilities and research interests. This organization, or a new one established by the IAU could be the focus for networking the world's small telescopes.

## University and private consortia

At the present time there exist about a half-dozen small university and privately run consortia in the U.S. which operate or coordinate small observatories. One such consortium, which assumed operation of a 1-m-class telescope at Kitt Peak National Observatory in the U.S., is the Southeastern Association for Research in Astronomy (SARA). SARA, and small consortia like it, are one way to preserve existing telescopes which are threatened with closure due to budgetary constraints at national facilities (i.e.privatization). In countries without national facilities, or with severe economic limitations, they provide a way to create new facilities. In either case, the benefits of consortia, all contribute to long-term stability for the observatory in times of limited economic resources.

Support programs in research and education

Particularly in the developing countries, there is a need for new support programs that either directly utilize small observatories, or allow the interchange of students and astronomers between them. For example, the SARA Research Experiences for Undergraduates (REU)internship program, funded by the U.S. National Science Foundation, attracts over 200 applications from around the U.S. each year. There are about a dozen similar astronomy internship programs in the U.S. there is demand for a dramatic increase in the number of student- oriented programs- doubly so in the developing countries! Programs which offer research opportunities to pre-college students, such as the International Science and Engineering Fair (ISEF) exist but do not specifically target astronomy. Recently Kitt Peak National Observatory has opened the doors of one of its smaller telescopes to advanced amateurs. Programs if emulated in or expanded to the developing countries, provide much needed opportunities for the next generation of astronomers. Moreover, they directly subsidize the diminishing financial resources of small observatories.

The need for communication

The future of small observatories around the world depends most on communication. There is continuing need for popular level periodicals such as Sky & Telescope to play a role in public awareness of the problems facing the smaller observatories throughout the world and the steps being taken to address them. Perhaps less organized, but nonetheless important to the future of the smaller research and educational projects to one another. Many cannot afford the subscription and page charges of the main astronomical journals. Among isolated or economically disadvantaged observatories much reinventing of the wheel occurs as individuals seek their own solutions to the technical or observational problems. At present only a few journals fill this growing niche. For example, the IAPPP Communications has served about 1200 members world-wide; the fastest-growing segment of member/subscribers is among countries of the former Soviet Union.

Preserving small telescopes in the developing countries:

*Recommendations for the IAU*

The IAU can play a key role in preserving and developing the future of small telescopes around the world, particularly those in the developing countries. The relevant IAU Commissions for implementing many of the ideas listed below are already in place.

*Commission Study:* One of the strongest recommendations resulting from the U.S. meetings outlined above has been the need for a national-level study to clearly identify the nature of the problems facing the small observatories and the options for their preservation. The IAU is the appropriate place such discussions at the international level.

*Meetings:* Town forum meetings such as those recently occurring in the U.S. should be expanded to an international venue like the IAU so that the widest segment of the astronomical community can contribute input.

*Networking:* Coordination or outright development of an international equivalent of NASTeC or an Internet list-server /newsletter for the dissemination of small observatory locations, capabilities and technical expertise would be a valuable resource to the developing countries.

*Standardization:* Technical improvements are cheaper than new facilities. The smaller observatories are particularly productive and cost-effective if standard and/or dedicated hardware and software is widely available. The IAU can play a role in identifying, sanctioning, distributing and perhaps funding the development of some standardized resources.

*Opportunities:* More small grant programs for the direct support of equipment purchases and travel for students and faculty from the developing countries are sorely needed. Internship programs for non-U.S. students which utilize small observatories should be more widely available.

*Acknowledgments:* The author gratefully acknowledges partial travel support to the IAU General Assembly in Kyoto, provided by the American Astronomical Society. The SARA Research Experiences for Undergraduates Summer Internships Program is funded by the National Science Foundation. (AST 96-19939).

Terry D. Oswalt

*Note of the editor:* By permission of the author these are extracts from the article in IAAPPPC No 65 p.40

## Reports From Meetings

### JENAM - 98

*Praha, 9 - 12 September 1998*

Nearly 400 astronomers from 36 countries gathered in Prague to attend the Joint European and National Astronomy Meeting (JENAM) for 1998, which was held under the high patronage of Mr. Václav Havel, the President of the Czech Republic. For EAS this was after Liege, Torun, Edinburgh, Catania, Sevilla and Thessaloniki but I can not give the names of the places of all 64 previous Czech Astronomical Society (CAS) meetings, since this was the 65th meeting of the CAS. Most of the conference was hosted by the Faculty of Civil Engineering of the Czech Technical University, but the conference was held also in other places in Prague: the official opening happened at the historical hall in the town center Žofín, the public lecture took place at Planetárium, where also the meeting of the CAS has taken place. At the Aula Magna of the historical building of the Charles University (celebrating 650 years since its foundation), the meeting concert has been performed. I should also mention the reception by Mayor of Prague at his Residence in Municipal Library and last but not least the tour *Praga Astronomica*, which included the visit to many important astronomical places in Prague including the Týn church with the tomb of Tycho Brahe.

The scientific programme has been divided to 13 plenary lectures, 7 parallel sessions and 3 panel discussions. The contributions of Europe to astronomy and astrophysics and its future plans has been highlighted in the plenary lectures. We started with a review on a contribution to science integration in Europe by Francoise Praderie and finished with the lecture by Sir Martin Rees on Gamma-ray bursts. After his lecture Sir Martin has been awarded with the golden medal of the Charles University.
The plenary sessions covered solar physics, small bodies in the solar system, extra-solar planetary systems, astrophysics of interacting binaries, dynamical studies of star clusters and galaxies, high and ultra-high energy astrophysics and relativistic astrophysics. The panel discussions included instrumentation and very large projects, young astronomers, teaching of astronomy and jobs and history of astronomy. An accompanying workshop on the 1999 solar eclipse has been organized the day before the conference started.

Even that the conference has happened shortly after the monetary crisis in Russia several colleagues from the eastern parts of Europe have been able to come. This was possible also due to the financial assistance of the EAS and other sponsors who did contribute to the success of the conference. We only noticed that probably not enough participants came form south-western parts of Europe.

After years in the west-most and south-most parts of Europe the EAS General assembly did the move to the central parts of the continent. This started in Prague, which is also called the heart of Europe. It will continue next year in Toulouse, where the EAS general assembly for 1999 will take place.

Jan Palouš

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### IAU Symposium 190

*"New Views of the Magellanic Clouds"*

The IAU Symposium 190 "New Views of the Magellanic Clouds" was held on the beautiful campus of the University of Victoria, Canada, on July 13–17. 180 astronomers from 23 countries participated. The symposium started with Paul Hodge's overview and ended with Sidney van den Bergh's closing summary. During these five days, 53 talks and 126 posters were presented, covering the latest results from satellite and ground-based observations in all wavelength ranges as well as from theoretical models.

A summary of the highlights from the meeting is given below. As we have available only sketchy notes and imperfect memory, this summary is inevitably subjective and may have inadvertently left out many important results reported in the meeting. We apologize to everyone whose results may not be adequately covered, or presented incorrectly.

<u>*Interstellar Medium (ISM):*</u> New telescopes and instruments made it possible to study the multiple phases of the ISM. High-dispersion UV spectroscopic observations made with IUE, HST GHRS/STIS, and ORFEUS-II in particular provide a great wealth of information on molecular, atomic, and ionized interstellar gases at different temperatures (de Boer, Marx-Zimmer, Richter). Several surveys of the interstellar gas in the Magellanic Clouds (MCs) have been completed or are underway. The UM/CTIO Magellanic Cloud Emission-Line Survey takes images in H$\alpha$, [O III], [S II] lines and green and red continua. This survey will provide not only flux-calibrated catalogs of H II regions and planetary nebulae but also sensitive surveys of supernova remnants (SNRs) and emission-line stars (C.R. Smith). ROSAT X-ray observations have been used to analyze the hot, ionized medium in the MCs; the plasma temperature in

the LMC varies from $\sim 10^{6.6}$ on the west to $\sim 10^{6.9}$ on the east; the plasma density is $N_e \sim 0.002$ cm$^{-3}$. The SMC is not as bright as the LMC in X-rays; large-scale diffuse emission in the SMC is marginally detected only in the 1/4 keV band (Snowden). The ATCA HI survey of the MCs has been completed. A large number of HI shells and holes are detected. The HI of the LMC has a relatively uniform distribution with no concentration along the stellar bar. The HI disk has a scale height of $\sim 300$ pc in the central region and flares out to 400 pc at 4 kpc from the center (Staveley-Smith, Kim, Stanimirovic). Analyses of HI 21-cm emission and absorption lines show that the cool HI in the Clouds is cooler than that in the solar neighborhood, which can be explained by the lower metallicity and dust-to-gas ratios in the Clouds (Dickey). A patchy hot $10^5$ K gas halo of the LMC has been demonstrated by the HST GHRS observations of interstellar CIV absorption lines (Wakker). A high resolution CO survey of the LMC has been completed with the NANTEN 4m telescope. Comparisons between the distributions of clusters and CO clouds indicate that young clusters are formed in CO clouds, but the CO clouds dissipate within a timescale of $< 10^7$ yr (Fukui, Yamaguchi). The CO in the MCs can survive photodissociation only if they are shielded in dense clouds. The conversion factor $N(H_2)/I_{CO}$ varies strongly with physical conditions of individual clouds. The LMC conversion factor is a factor of 3 higher than the Galactic value (Rubio, Pak). The isotopic ratios among CO ($^{13}C^{16}O$, $^{13}C^{18}O$, $^{12}C^{16}O$, $^{12}C^{18}O$) provide critical tests for models of stellar evolution and star formation history (Chin, Heikkilä).

Multiple-wavelength observations of LMC supernova remnants (SNRs) have been analyzed to study their energetics, evolution, and interstellar environmental effects. X-ray observations by ROSAT and ASCA are useful in analyzing the plasma temperatures and abundances, and even the supernova types (Petre, Williams, Hwang, Dickel, Chu, Saito). The youngest SNR is SN1987A, in which supernova ejecta are beginning to impact the rings (Sonneborn). Superbubble structure, evolution, and statistics were comprehensively reviewed by Oey. Palous suggests that the interactions between massive stars and the ISM and the interactions between shells produce the bubble-dominated ISM in the LMC, as seen in the HI maps (Kim, Staveley-Smith). Supergiant shells of kpc sizes have been detected in X-rays, indicating the existence of hot plasma; the supergiant shells LMC2 and LMC4 have been studied in detail (Bomans, Caulet, Points). The 3-D and velocity structure of the ISM near SN1987A has been analyzed, using the light echo and echelle observations (Crotts).

*IMFs:* Massey summarized evidence that despite a metallicity difference of a factor of 10 the upper IMFs of coeval populations (OB associations) in both Clouds and in the Milky Way agree within the errors (slopes of $-1.3$ to $-1.4$). The IMF of young MC clusters is in good agreement with a Salpeter slope (S. Beaulieu, Elson). Evidence for massive star formation in the field comes from, e.g., the presence of O3 stars ($\approx 1$ Myr) which must have formed there (Massey).

In the 30 Dor starburst region a normal Salpeter IMF is found for stars $> 2.8$ $M_\odot$. The numerous most massive stars (O3) appear to have formed last (Hunter). Spectacular NICMOS images show the continued formation of massive, still embedded single and multiple O stars in the vicinity of R 136 (Walborn, Barbá). The IMF of R 136 below 3 $M_\odot$ becomes flatter (Sirianni) and is dominated by pre-main sequence stars of ages from 1 to 10 Myr. A major NICMOS effort aimed at the low-mass IMF is detecting pre-main-sequence stars down to 0.2 $M_\odot$ in 30 Dor region (Zinnecker, Brandner).

*Models:* New evolutionary tracks for rotating stars and binary stars show wider and brighter main sequences with 20%–30% longer main-sequence life times. The new models reproduce the blue-to-red supergiant ratio as a function of metallicity and account for the observed nitrogen abundance variations (Langer).

*Abundances:* Garnett reviewed H II region abundances. He showed that 30 Dor is very homogeneous in abundance, indicating that temperature fluctuations and supernovae have minor effects on abundance determinations. Nebular compositions and stellar abundances agree very well for non-refractory elements except C,N. A metallicity gradient in the LMC is still an open question. V. Smith reviewed the chemical enrichment history of the MCs as evidenced by $\alpha$ and Fe-peak elements as well as s- and r-process species.

The mean abundance of the young SMC population is [Fe/H] = $-0.7$ dex, and $-0.3$ dex for the LMC. Metallicity differences between young clusters and young field stars are small. The mean stellar oxygen and $\alpha$ abundances are $[O/Fe] = -0.18_{SMC}$, $-0.15_{LMC}$, $-0.3_{MW}$, and $[\alpha/Fe] = -0.04_{SMC}$, $-0.15_{LMC}$ (Hill). O abundances in the ISM and B V, B I to K I stars as well as Fe abundances in A I to M I supergiants show remarkable agreement. Both Clouds show little enrichment in C and O but a large range in N abundances (Venn).

*Field populations* Westerlund reviewed the field star populations of the MCs and described a scenario of interaction-triggered bursts of star formation. The on-going large-scale photometric and microlensing surveys will lead to a comprehensive picture of the star formation history (Zaritsky, Harris).

SMC: Ages increase with increasing distance from the center of the SMC. The velocity dispersions of different populations are all very similar, and there is no clear rotational signature. The outer wing shows significantly higher velocity dispersions. The majority of older stars have ages of 6.3 to 9.5 Gyr, while no strong intermediate-age component of 2 – 4 Gyr (as in the LMC) is observed. A significant episode of star formation occurred 8 or 9.5 Gyr ago. The current star formation rate (SFR) is at least a factor of 2 lower. The mean SFR over a Hubble time is 0.09 $M_\odot$ $yr^{-1}$ in the SMC and 0.4 – 0.6 $M_\odot$ $yr^{-1}$ in the LMC (Hatzidimitriou).

LMC: HST color-magnitude diagrams of field star populations across the disk are quite similar and show a non-episodic, roughly constant SFR with an increase by a factor of 3 ≈ 2 Gyr ago as opposed to the age gap seen for intermediate-age clusters. Deep HST data further support a normal IMF in the LMC disk (Gallagher, Holtzman, Cole). The large-scale field star formation history shows evidence for long-lived stationary (≈ 200 Myr) chains of star formation in the LMC disk and migratory patterns along the bar (Grebel).

*Old globular clusters:* Olsen and Johnson demonstrated that there is no distinguishable age difference between the oldest Magellanic and Milky Way halo globulars. The age range is no greater than 1 Gyr. Magellanic globulars are very similar to the outer Galactic halo clusters (Olszewski), although the outermost Galactic globulars beyond the MCs may be up to 2 Gyr younger (Hesser). The oldest LMC globulars appear to be in a disk-like system (Olszewski, Da Costa). The census of old (> 10 Gyr) clusters is fairly complete (Geisler).

*Intermediate-age clusters:* Both MCs show an "abundance gap" between their oldest and intermediate-age clusters. After a rapid initial enrichment (≈ 3 – 4 Gyr) metallicities increased more slowly. Intermediate-age clusters show a wide range of abundances (Da Costa). A good fit to the observed age-abundance data can be obtained with the bursting star formation model by Pagel & Tautvaišienė (Mighell). The discovery of three LMC clusters in the intermediate-age gap reduces the discrepancy between cluster and field age distribution (Sarajedini).

*Young clusters:* The age distribution of young (< 1 Gyr) clusters in both Clouds peaks at 100 – 200 Myr, coincident with predicted close encounters between the Clouds and the Milky Way. Recent field star formation and recent cluster formation trace each other very well. Large surveys triple the number of clusters, contributing mainly to the faint end of the cluster luminosity function (Grebel). The range of core radii increases with age. Tidal truncation does not occur before 1 Gyr (Elson). Young clusters may show evidence for dynamical mass segregation (Fischer). About half of the binary clusters in the Clouds may be physically connected pairs (Dieball).

*Associations:* Stellar systems show hierarchical structure. The smallest units are OB associations (average size: 70 pc), which are embedded in stellar aggregates (≈ 250 pc) and complexes (≈ 600 pc). They show propagating star formation and are 3× more numerous than previously assumed (Kontizas, Maragoudaki). Propagating star formation is also seen in supergiant shell LMC 4 (Efremov).

*Stars* IR surveys strongly increase the census of AGB, M, and C stars (Loup, Cioni, van Loon). 11,000 C stars are now known in the LMC, and 3,600 in the SMC. The number of C stars increases with metallicity. Fainter C stars are found in more metal-poor galaxies (Azzopardi).

SMC PNe are on average more compact than LMC PNe, possibly due to metallicity-related mass-loss. He-burning PNe (20% at end of AGB evolution) tend to be more extended (slower evolution) than H-burning PNe (80%) (Dopita).

The microlensing surveys (EROS, MACHO, OGLE) are completing the variable-star census in the MCs and lead to well-sampled lightcurves for a huge number of stars (Alves, J.-P. Beaulieu, Welch). There are more short-period Cepheids and more s-mode pulsators in the SMC (Marquette) than in the LMC. The metallicity dependence of P-L and P-R relations for Cepheids was discussed by Bono and Marconi.

*Distances:* Highly accurate, direct distance measurements can be obtained with infrared surface brightness fluctuation methods, which are insensitive to metallicity and reddening. These methods allow to study also the tilt of the disk and depth extent. The resulting distance modulus for the LMC is 18.5 (Gieren). The Hipparcos Cepheid distance remains ≈ 0.2 mag larger, while the RR Lyr distance is ≈ 0.2 mag closer (Feast). Age and metallicity dependence of the red clump (Girardi, Cole) need to be thoroughly explored to make it a reliable distance indicator (Feast). The LMC distance based on a new analysis of SN 1987A is ≈ 18.6 (Panagia).

*Dynamics/tidal interactions:* N-body simulations predict the last close encounter between LMC and SMC $\approx 200$ Myr ago, which produced the bridge/tail structure. The previous close encounter plus perigalacticon was 1.5 Gyr ago. The star formation rate in the SMC is enhanced by each tidal interaction. The N-body simulations also nicely reproduce the observed large-scale star formation patterns in the LMC affected by the off-centered bar (Gardiner). An unsolved puzzle are the abundances ($-1.1$ dex, Rolleston) seen in B V stars in the Magellanic bridge, which are much lower than expected from a recent SMC origin. A modified TreeSPH code has been used to simulate the MW-LMC-SMC interaction, and the calculations can easily produce the tidal features, high velocity clouds, the elongated geometry of the SMC, and the spiral pattern in HI gas and the stellar bar in the LMC (Li).

Spectacular data were presented by Putman showing HI tidal tails between the Clouds and the Milky Way including leading arm features. Kinematic data for carbon stars trace SMC stars 4° to 20° from the LMC. A ring of material originating from the SMC is trapped around the LMC as massive perturber (Kunkel, Demers). A second red clump in outlying LMC populations indicates an SMC tidal feature in superposition (Geisler). A large-area survey for red giants around the MCs shows stars at distances expected for tidal debris from the Clouds (Majewski). Radial velocity dispersions for stars along the vertical extension of the red clump indicate that stars of MC origin may now be located between us and the Clouds (Zaritsky), but the extension can also be explained by normal evolutionary effects (J.-P. Beaulieu). Both effects may be at work.

Eva Grebel & You-Hua Chu

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## The EAS Affiliated Societies

### The Czech Astronomical Society

The Czech Astronomical Society (CAS) was founded in Prague on December 8, 1917. At that time the today's Czech Republic was still a part of the Austrian-Hungarian monarchy. Prof. Jaroslav Zdenek (1837-1923) was elected as the first president of the Society. The Society's main goal in the first years was to establish a public observatory in Prague. This became a reality in 1928 when the Stefanik Observatory at the hill Petrin near the centre of Prague was opened for the members of CAS. One year later the observatory was opened also for the general public. The observatory was named for Milan Rastislav Stefanik (1880-1919), a Slovak astronomer who contributed significantly to the establishment of independent Czechoslovakia in 1918 and died tragically in 1919. Today, the Stefanik Observatory is managed by the municipality of Prague.

Since 1920 the Czech Astronomical Society had published a popular astronomical journal Rise hvezd (The Realm of Stars). Since 1921 an astronomical year-book had been published. Both editions exist up to now, though they are not published by the CAS any more. In the period between two wars, CAS had more than thousand members. During the German occupation, CAS supported the national identity and partly substituted for the closed Czech universities.

During the communist era, CAS was forced to be joined with the Academy of Sciences and more strict membership conditions were applied. The number of members decreased. The Society was not allowed to publish the journal Rise hvezd. New state-governed public observatories were established and they took the popularization of the astronomy over. Though astronomy was generally supported by the state in the name of the atheistic ideology, the freedom of the CAS was lost. A purely professional society had little sense in our small country, because most professional astronomers worked in only two institutions. The CAS therefore searched for its identity, and finally survived as a society of both professional and amateur astronomers. An internal bulletin Kosmicke rozhledy (Space Views) was founded and reached good standard. Since 1970's regular panel discussions were held in three-year intervals.

Today, CAS is an independent society with about 400 members not only from the Czech Republic but also from Slovakia and several other countries. The members are professional astronomers, the staff of the public observatories, teachers, amateur astronomers and friends of astronomy. They are organized in local branches and thematic sections. The research projects organized directly by the CAS cover the fields where the amateur observations can be useful: variable stars, comets, meteors, solar activity, stellar occultations. Since 1990, CAS has been affiliated to the newly established European Astronomical Society. Other activities of CAS include granting a Kviz award to young astronomers (named for Zdenek Kviz, 1932-1993, Czech astronomer who lived in Australia after 1968), issuing press-releases, maintaining a WWW page (http://www.astro.cz, mainly in Czech), holding national workshops etc.

Astronomy in the Czech Republic has a long history. Such outstanding scientist as Tycho Brahe, J. Kepler,

E. Mach or A. Einstein spent part of their active life in Prague. Today, most professional astronomers work at the Astronomical Institute of the Academy of Sciences of the Czech Republic with the seat at the Ondrejov Observatory, 40 km southeast from Prague. The institute has about fifty astronomers. Other astronomers work at the Charles University in Prague, Masaryk University in Brno and several other universities and institutions across the country. Important is also the Klet Observatory. The fields studied include solar physics, Sun-Earth relations, dynamics of the Solar system, galaxies and artificial satellites, meteors, minor planets, comets, stellar atmospheres, interacting binary stars, high-energy astrophysics, relativistic astrophysics etc.

Astronomy can be studied at the Charles University or in scope of theoretical physics at the Masaryk University. The work on the PhD thesis can be done either at the universities or in the Academy of Sciences. In the recent years, about five students finish their astronomical studies every year but not all of them continue with the PhD studies. The astronomical research is mostly financed by the state - partly directly, partly through the Grant Agency of the Czech Republic and other grant agencies. Some funds come from abroad through foreign grant agencies or on the basis of mutual agreements, but they are not significant. In general, the financial situation is not very good and the research is restricted to not expensive activities. On the other hand, basic infrastructure including internet connection is well developed. Until now Czech Republic is not a member of ESO or ESA. Nevertheless, both formal and informal collaboration with the institutions abroad is rich and astronomers from foreign countries (Canada, Germany) have worked in the Astronomical Institute.

There are about 30 public observatories and several planetaria in the Czech Republic. These institutions serve as cultural and educational centres and are managed by their home cities. The Czech Astronomical Society covers the activities on various levels, from professional to amateur. There are also several other astronomical societies, either local or highly specialized.

Jiri Borovicka

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## Announcements

### The European VLBI Network

*Support for EU astronomers via the TMR Programme*

Very Long Baseline Interferometry (VLBI) allows the imaging in radio continuum and spectral line emission of astronomical objects on scales of 0.001' (1 millarcsecond) to 1". The European VLBI Network consists of an international Consortium of institutes in Europe and Asia which conducts regular VLBI observations either alone or in conjuction with other arrays: the Very Long Baseline Array (VLBA) in the USA and the MERLIN array located within the UK. Together these arrays form a very sensitive Global VLBI Network. In addition, the EVN conducts observations with the orbiting Japanese Space VLBI satellite, "HALCA", which allows even higher resolution radio images to be obtained.

The EVN encourages use of the Network by astronomers not specialised in the VLBI technique. The Joint Institute for VLBI in Europe (JIVE) can provide support for scheduling, correlation and data analysis of EVN projects, as well as information during proposal preparation.

In particular, proposers affiliated to non-EVN institutes within the European Union may take advantage of the EC's TMR programme "Access to Large-Scale Facilities". This provides travel and other financial support for PIs (and their co-Is) to visit JIVE or the EVN observatories for correlation or data analysis. Interested astronomers should contact Michael Garrett at JIVE (mag@jive.nfra.nl).

Further information about the EVN can be found at:
http://www.nfra.nl/jive/evn/evn.html

Mike Garrett

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### WEBDA

*A Site on Stellar Open Clusters*

WEBDA is a site devoted to observational data on stars in galactic open clusters. It is intended to provide a reliable image of the available data and knowledge on these objects and to offer a wide access to the existing observations. This site should be useful for many colleagues and astronomers interested in star clusters by permitting a larger use of already existing data and fostering new observations.

The present database offers astrometric data in the form of coordinates, rectangular positions, and some proper motions, photometric data in the major system in which star clusters have been observed (UBV, uvby, Geneva, Vilnius, DDO and others), spectroscopic data, like spectral classification, radial velocities, rotational velocities. It contains also miscellanous types of data like membership probabilities, orbital elements of spectroscopic binaries, periods of variability for different kinds of variable stars. List of interesting and peculiar stars have also been compiled. Finally a whole set of bibliographic references allows every one to locate the interesting publications on his or her favorite open clusters easily.

The URL is http://obswww.unige.ch/webda/

Jean-Claude Mermilliod

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**International Space University**
*Summer Session Program*

As a dynamic institution of higher education, the International Space University (ISU) is dedicated to the creation, expansion, exchange and dissemination of knowledge and ideas, and to the development of space-related activities for peaceful purposes. With the support of the world space community, ISU offers interdisciplinary programs in an international and intercultural environment preparing young professionals of all sectors to meet the present and future challenges of international space cooperation.

The Summer Session Program (SSP) is an intensive 10 week program which offers a unique educational experience highly valued by the more than 1100 alumni who have benefited from it. It covers the principal space related fields, both technical and non-technical. These include: space and society, space business and management,space policy and law, space system architecture and mission design, space engineering, space resources, robotics and manufacturing, satellite applications, space physical sciences, space life sciences and informatics.

During these 10 weeks students from around the world follow a series of core lectures, specialized lectures and theme days, and work together on the conceptual design of an international space project. Faculty members also come from around the world from government agencies, industry and academia.

In the field of space physical sciences, members of the ISU Faculty include: Giovanni Fazio (*Harvard-Smithsonian Center for Astrophysics*), Gerhard Haerendel (*Max -Planck Insitut fur extraterrestrische Physik, President of COSPAR*), Mikhail Marov, (*Keldysh Institute of Applied Mathematics*).

SSP'99 will be hosted by the Suranaree University of Technology (SUT) in Khorrat, Thailand from 26 June to 04 September, 1999. Deadline for submission of SSP99 applications is: 15 February, 1999.

Not all students have the private resources to cover the expense of attending the SSP. ISU also seeks sponsorship from industry and government agencies for the support of students who are unable to provide the full amount of the tuition. Those requiring financial assistance are urged to submit their applications as early as possible. For further information contact :

International Space University
Parc d'Innovation
Boul. Gonthier d'Andernach
67400 Illkirch-Graffenstaden FRANCE
Tel: +33 (0)3 88 65 54 30, Fax: +33 (0)3 88 65 54 47
Admissions@isu.isunet.edu, http://www.isunet.edu

Lucy Stojak

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**A New Working Group**

A working group on 'astro-socio-dynamics (ASD)' is being set up. It is gathering together persons interested in the contemporary sociological aspects of our community. These include (but not exclusively) characteristics of organizations, geographical distribution of facilities, recruitment and promotional policies, publishing and communicating procedures, interactions with other communities and the society at large, and so on.

Profile of activities: compilation of recent studies/publications in the field; exchange of expertise and coordination of efforts; electronic newsletter and web site; organization of a colloquium; and so on.

Contact the undersigned.

Andre Heck, heck@astro.u-strasbg.fr

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## Future International Meetings

### Future IAU Meetings

**IAU Symposium No.195: Highly Energetic Physical Processes and Mechanisms for Emission from Astrophysical Plasmas**
6–10 July 1999, Bozeman MT, USA.
Contact: Dr. Sachiko Tsuruta, Physics Department , Montana State University, Bozeman, MT 59717, USA email: uphst@gemini.oscs.montana.edu

**IAU Symposium No.196: Preserving the Astronomical Sky**

12–16 July 1999, Vienna, Austria.
Contact: Prof. W.T. Sullivan, III Dept. of Astronomy Box 351580, Univ. of Washington, Seattle, WA 98195, USA.
email: woody@astro.washington.edu

**IAU Symposium No.197: Astrochemistry: From Molecular Clouds to Planetary Systems**
23–27 August 1999, Sogwipo, South Korea.
Contact: Dr. Y.C. Minh, Korea Astronomy Observatory, Hwaam Yusong, Taejeon 309-348, Republic of Korea.
email: iau197@hanul.issa.re.kr

**IAU Symposium No.198: The Light Elements and their Evolution**
22–26 November 1999, Natal, Brazil.
Contact: Dr. Monique Spite, Observatoire de Paris, Section de Meudon, F-92195 Meudon PPL Cedex, France.
email: Monique.Spite@obspm.fr

**IAU Symposium No.199: The Universe at Low Radio Frequencies**
30 November–4 December 1999, Pune, India.
Contact: Prof. Vijay Kapahi, Natl. Center for Radio Astrophysics, Pune University Campus, Pune 411 007, India.
email: vijay@ncra.tifr.res.in

**IAU Colloquium No.174: Small Galaxy Groups**
13–18 June 1999, Turku,Finland.
Contact: M. Valtonen, Tuorla Observatory, FIN-21500 Piikkio, Finland.
email: Mauri.Valtonen@astro.utu.fi

**IAU Colloquium No.175: The Be Phenomenon in Early–Type Stars**
28 June–2 July 1999, Alicante, Spain.
Contact: M. Smith, 3700 San Martin Dr., Baltimore, MD 21218, USA.
email: msmith@nebula.gsfc.nasa.gov

**IAU Colloquium No.176: The Impact of Large–Scale Surveys on Pulsating Star Research**
8–12 August 1999, Budapest, Hungary.
Contact: G. Kovacs, Konkoly Observatory, 1525 Budapest XII. Box 67, Hungary.
email: kovacs@buda.konkoly.hu

**IAU Colloquium No.177: Pulsar Astronomy–2000 and Beyond**
30 August–3 September 1999, Bonn, Germany.
Contact: R. Wielebinski, MPI fur Radioastronomie, Auf dem Hugel 69, D-53121 Bonn,Germany.
email: rwielebinski@mpifr-bonn.mpg.de

**IAU Colloquium No.178: Polar Motion: Historical and Scientific Problems**
27–30 September 1999, Cagliari, Italy.
Contact: S. Dick, U.S. Naval Observatory, 3450 Massachussets Ave., NW, Washington, D.C. 20392–5420, USA.
email: dick@ariel.usno.navy.mil

**IAU Colloquium No.179: Cyclical Evolution of Solar Magnetic Fields: Advances in Theory and Observations**
13–16 December 1999, Kodaikanal, India.
Contact: P. Venkatakrishnan, Indian Institute of Astrophysics, Bangalore 560034, India.
email: pvk@iiap.ernet.in

Hans Rickman

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## THAPA

*"Treasure-Hunting in Astronomical Plate Archives"*
to be held at Sonneberg Observatory, Dec. 3 - 5, 1998

Topics Technical concepts and solutions, Astrophysics, Astrometry, Data reduction and Databases.

Each session shall embrace one or two invited talks and about three contributed talks. In general there should be plenty of time for discussion. There will be enough space for any posters. The number of participants is limited to about 30. An extended social program is not intended. There will be no registration fee, but also no financial support for local or travel expenses.

Detailed information on registration and accomodation will be made available on the workshop's homepage
http://www.stw.tu-ilmenau.de/~web/workshop/thapa.html
or can be obtained through office@stw.tu-ilmenau.de

SOC: Constanze la Dous, Peter Kroll, Tam Bräuer
LOC: SOC, Angelika Wicklein

Peter Kroll

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## Long and Short Term variability in Sun's history and Global Change

*Session during the Assembly of the International Association of Geomagnetism and Aeronomy (IAGA) at Birmingham (UK), in July 1999*

This conference will adress the posibility of a comprehensive sythesis of science studies across the variability in Sun's history during the last centuries. Topics will include papers from history, archaeology, solar physics, astrophysics, aurora physics, geophysics, meteorology and environmental aspects. It deals with the so-called Minima in Sun's history (Spörer-, Maunder-, LaLande and Wolf Minima) and other variabilities during the centuries. Deadline for abstracts is January 15, 1999. For further details contact the convener, Dr. Wilfried Schröder, Hechelstrasse 8, D-28777 Bremen-

Roennebeck, Germany.

Wilfried Schröder

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OBITUARY

Dr Kashinath Nandy died in Edinburgh on August 18, 1998 after a distinguished career almost entirely spent at the Royal Observatory Edinburgh. A native of Calcutta in 1927, K. Nandy graduated with an M.Sc. in Applied Mathematics at Silchar in Assam in 1951. Soon after graduation, he taught and became Assistant Astronomer in charge of the Presidency College Observatory in Calcutta. As he was mostly interested in astrophysics, he applied for and won in 1959 a research grant of the International Astronomical Union and at the same he was the recipient of a studentship at Edinburgh. He succeeded in obtaining his M. Sc. in astronomy already in 1961.

Under the supervision of Dr V. Reddish, Nandy studied the extinction curve and the properties of interstellar matter for his PhD work thesis. He succeeded to explain the optical properties of ISM by the presence of graphite core and ice mantle tiny particles. Later this type of work was continued and extended towards the infrared in collaboration with Italian astronomers. In 1968, a joint "Liège-Edinburgh ultraviolet sky scanning experiment" was accepted by the European Space Agency aboard their first TD astronomical satellite. Dr Nandy became the leader and principal investigator of the "interstellar absorption" aspects of those new ultraviolet data, being the first author and main contributor of the work outlining the general properties of interstellar absorption in the ultraviolet.

Later he extended his investigations with several colleagues (D.H. Morgan, C. Wickramasinghe)to other galaxies, notably the Magellanic Clouds, and use data from the space-borne International Ultraviolet Explorer telescope. Dr Nandy then broadened his interest to the study of hot stars, especially of the O and late Wolf-Rayet-type stars and their circumstellar environment. He contributed with Prof N.K. Rao (Bangalore) to the understanding of the physical nature of their dust shells. His work won him recognition by various professionnal bodies and organisations. Among others, he was a Foreign Associate of the Société Royale des Sciences de Liège.

All these were discussed in Edinburgh on September 29 and 30, 1986 at the occasion of a symposium marking his formal retirement as Deputy Chief Scientific Officer from the Royal Observatory, published in the Quarterly Journal of the Royal Astronomical Society, volume 28.

Dr Kashinat Nandy will be long remembered for his achievements in the field of interstellar physics. U.K.astronomy has lost a prominent figure and he will be mourned not only by his wife Smirty and his own relatives, but also by the wide family of the numerous friends he had made all around the astronomical world.

Léo Houziaux

*Note of the editor:* I happen to know very closely Kashi Nandy and I share all the views of the former author, adding his special warm human personality and one detail ammong the so many memories from him. I will never forget the advice he gave me when I was just a beginner in Astronomy: "Your current plans must be based on the next decades issues otherwise it will be too late to follow competitive research". It was shocking for me then, but it never came out of my mind.

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European Astronomical Society
P.O. Box 82, CH-1213 Petit-Lancy 2, Switzerland
http://www.iap.fr/eas/index.html

President: J-P. Zahn
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Councillors: P. Heinzel, M. Kontizas,
J. Krautter, M. Longair

Newsletter Editor: M. Kontizas,
Astronomical Institute,
National Observatory of
Athens, P.O. BOX 20048,
118 10 Athens, Greece
mkontiza@atlas.uoa.gr