European Astronomical Society

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Editorial

This, the 13th Issue of the EAS newsletter contains some good news about ground–based European astronomy, an article by a distinguished US astronomer, Virginia Trimble, with a view from across the Atlantic on how Euro astronomy is faring, highlighting both its strengths and weaknesses, and a proposed programme on sharing telescope facilities across Europe (NEON). Its new editor has a suggestion on how to improve the speed of dissemination of relevant news items by splitting the newsletter into a hard and a soft part. I hope that readers will provide me with a lot of feedback on all these items!

(continued)

Message from the President

Disaster - the word literally means some negative influence in the stars!

The disaster of Ariane 5 and the destruction of the Cluster space science mission has been a severe negative influence on the magnetospheric community in European astronomy. It could also knock on to other science areas, too, since attempts to recover from the disaster inevitably mean interaction between Cluster and the future ESA science missions - Rosetta, Cobras/Samba, the unspecified M4 ESA Medium mission opportunity. All astronomers together will have carefully to consider - this word literally means to gather the astronomical implications - how best for European astronomy to proceed.

But all is not doom and gloom, I am happy to say. SOHO and ISO are performing beyond expectations. The ISO mission will last 30% longer than its design lifetime, due to the care of the cryogenic design and the skill of its launch preparation. SOHO was so accurately launched that a mission extension into solar maximum in six years seems a near certainty. The science data from the two missions is very impressive.

Elsewhere in this issue of the Newsletter, your Editor reports the splendid inaugurations of Phase II of the Canary Islands observatories - what an impressive array of new installations! I was struck by the power-

ful combination of specialist installations gathering data for a defined community on specific science objectives (HEGRA, the Cosmic Microwave Background experiment, GONG) and the more general telescopes (TNG, THEMIS) which will be used for a range of studies, competitively accessed by a wide cross-section of the respective communities.

What a rich array of intellectual capability and expressions of investigative genius these advances represent - symbols in concrete, glass, aluminium and silicon of the strength of European science! Elsewhere in this issue, my good friend and honorary European Virginia Trimble comments on the difficulties of doing anything in Europe - the barrier for most Europeans in conducting international business in a language not their own, the difficulties in the mechanics of living, the multiplicity of administrative and educational structures. Yes, Virginia, there are these difficulties. I cannot help thinking, though, that these represent the down-side of the diversity and cultural richness which is Europe's strength. Vive les differences!

Paul Murdin

Editorial (cont)

A new initiative comes from Michel Dennefeld: he proposes a Euro–wide collaboration between northern hemisphere observatories.

There is also a short article on the newly inaugurated Dutch Open Telescope (DOT), a fairly radical departure from classical telescope design. The potential improvement in image quality is great

The idea of the newsletter has been to provide a medium to get news items, conference announcements etc. to the European astronomical community in a timely manner. Because of the way it is distributed this is virtually impossible. I suggest that the newsletter be split into two parts: a true newsletter in the form of a regularly maintained WWW site, and a bi–annual printed version that will be mailed the classical way. The latter is especially important for those of us who do not (yet) have access to the net. The web site "EAS News" would cover the time–critical features, such as announcements, updates, and developments of a technological, scientific or political nature relating to astronomy. The advantages are that frequent updates can be made, contribution deadlines effectively cease to exist, and colourful images can be easily used to enhance the publication. It is also cheaper to produce. The printed magazine would concentrate on invited articles such as the one by Trimble in this issue, opinions, science, ideas, all those things that are not too much in a hurry to be seen by the community. A possible name for such a magazine could be "Occasional Notes of the EAS" but suggestions are most welcome.

Hugo E. Schwarz

The next meetings of the EAS.

The EAS and EPS will jointly sponsor a meeting September 9-13 1996 in Sevilla. The EAS/EPS joint astrophysics division will hold symposia on two days on results from ISO and SOHO and review talks on HST and cosmology in plenary session.

The 1997 General meeting will be held in association with the Hellenic Astronomical Society in the summer in Thessaloniki and that of 1998 with the Astronomische Gesellschaft possibly in Muenchen, while the EAS has been invited by Dr.Jan Palous to hold its General Meeting in Prague. This last meeting would be held in 1999.

EAS - Election of Council

Under the Constitution (Article 12) and the Bye-laws (Article IV) of the EAS, the Council has the responsibility to propose a slate of suitable candidates for the vacant posts in Council, paying attention to obtaining a reasonable balance, in geography and scientific expertise. At the Catania meeting, the Council appointed a nominating committee, chaired by Prof P.-O Lindblad, to determine the slate. It is as follows:

Secretary

M. Teresa Lago, University of Porto, Portugal (T Tauri stars)

Councillors

Petr Heinzel, Ondrejov Observatory, Prague, Czech Republic (solar physics)

Joachim Krautter, Landessternwarte, Heidelberg, Germany (star formation, X-ray & far UV astronomy)

Alvio Renzini, University of Bologna, Italy (stellar atmospheres, elliptical galaxies)

Additionally, the Council had earlier appointed a temporary Treasurer, whose appointment under the Constitution had to be ratified by election, and who was therefore also nominated:

Treasurer

Birgitta Nordstrom, Copenhagen University Observatory (stellar evolution, galactic evolution).

All the above are members of the Society and have agreed to serve for the specified 4 year period.

Groups of no fewer than 20 members of the Society and/or Affiliated Societies with no fewer than 50 members of the Society could have, by writing to the President, nominated additional candidates (who signify themselves willing to stand) for election.

A notice was mailed by the Society to the membership at the beginning of April. Since no other nominations had been received by a date two months from then, the above proposed members of Council have been declared duly elected.

Paul Murdin,
President

Good news for European ground-based astronomy!

On the 29th and 30th of June several new installations have been inaugurated on the two Canarian islands of La Palma and Tenerife. On Tenerife at the El Teide Observatory the following:

- **THEMIS** (Télescope Héliographique pour l'Etude du Magnétisme et des Instabilités de l'atmosphère Solaire) a 90cm solar telescope built by the CNRS (F) and the CNR (I).
- **Cosmic Microwave Background Experiment** made up of the Double Antenna Radio Telescope or Radiometers from the University of Manchester (UK) and the IAC (ES); the Interferometer of the IAC (ES) and the University of Manchester (UK); the Teide GEM antenna of LBNL (USA) and IAC (ES).
- **OGS** (Optical Ground Station) a 1m optical telescope for satellite communications by ESA (Europe) and IAC (ES).
- **GONG Fourier tachometer** (Global Oscillation Network Group) a helioseismology telescope of the NSO (USA) and IAC (ES)

On La Palma at the Roque de los Muchachos Observatory site the newly inaugurated telescopes are:

- **TNG** (Telescopio Nazionale Galileo) a 3.5m optical telescope of a similar design as the ESO NTT by the CRA (I) and Padova Observatory (I).
- **DOT** (Dutch Open Telescope) a 45cm optical telescope for day and night use of ASTRON (NL).
- **HEGRA** (High Energy Gamma Ray Array) a γ-ray observatory of the following Universities: Kiel, Wuppertal, Hamburg (all D), Complutense de Madrid (ES), and the MPI Muenchen (D).

All these new or recent observatories have now been officially inaugurated in the presence of "los Reyes" of Spain and other high European authorities and officials during two days of ceremonies.

Hugo E. Schwarz,
Editor

Astronomy in Europe - A Transatlantic View

Prepared for the European Astronomical Society Newsletter

February, 1996

HISTORICAL INTRODUCTION

The difficulties of doing astronomy in Europe are made up of the difficulties of doing astronomy anywhere and the difficulties of doing anything in Europe. This is, of course, neither entirely original nor entirely true. But it was the first thought that came to mind when Hugo Schwarz suggested that I contribute something for his inaugural issue of the EAS Newsletter. The sections that follow explore the background and current condition of European astronomy and astrophysics as I perceive them, accompanied by a few bits of real data and some advice (like all free advice, worth exactly what you paid for it).

Up until nearly the end of the 19th century, astronomy meant, for the most part, European astronomy, whether positional, mathematical, or

spectroscopic, including the beginnings of astrophysics. As late as 1926, about two-thirds of the people indexed in a standard astronomical text (Russell, Dugan, and Stewart 1926) had been born between longitudes 10 degrees west and 70 degrees east (even if you leave out Ptolemy and Ulugh Beigh). The balance began to shift with the construction of large optical telescopes at Mt. Wilson and Mt. Hamilton, sites better than any to be found in Europe (meaning, for the moment, places east of Dingle Bay, west of the Oder, and north of Cape Passero). George Ellery Hale and his skill at picking the pockets of members of nouveaux riches families like his own bear much of the blame, or credit, depending on your point of view.

The shift of power occurred fastest in the newest subfields. The founding membership of Commission 28 (sequentially nebulae, nebulae and star clusters, extragalactic nebulae, and galaxies) of the International Astronomical Union was, in 1922, already half American – V.M. Slipher, Klumpke-Roberts, Solon Bailey, Bigourdan, H.D. Curtis, Dreyer, Ch. Hagen, Horn d'Arturo, Hubble, Knox-Shaw, Reynolds, and Wright), and it was 1964 before the Commission had its first European president (Bertil Lindblad).

Up until 1975, all optical telescopes of 3-meters or larger aperture were owned by public or private American institutions, though the AAT, Calar Alto 3.5 meter, ESO 3.6 meter, and Russian 6-meter put almost exactly half the glass in European hands by 1979.

Europe (especially England and the Netherlands) and Australia were unquestionably first off the mark in radio astronomy in years just after World War II. I have not seen any good inventory of "square meters of chicken wire per radio observer" in various countries, but suspect that the US is currently in the lead by a good deal.

An early European lead toward astronomy above the clouds was similarly lost. Although the first Soviet and American rocket and satellite launches leaned heavily on parts and people from Peenemunde, about 140 launches had followed Sputnik 1 before the first UK/NASA collaborative satellite, Ariel 1, took off on a Delta rocket in April, 1962. Ariel 2 (March 1964) and the first Italian satellite, San Marco 1 (December 1964) went up on Scout vehicles. A French-build Diamant launcher carried their first, A 1, satellite into orbit in November 1965, though the seconds, FR 1, followed the next month on a Scout. And ESRO's first successful satellite, ESRO II (May 1968 to May 1971) came more than a decade and more than 800 assorted US and USSR orbiters after Sputnik (Seaborn 1968; Taylor 1989).

Computing power (broadly interpreted) available for astronomical and other scientific purposes had a similar history, with Babbage and Jacquard giving way to Hollerith and Watson, whose International Business Machines dominated all markets for many years.

Apart from details, one can probably say that the peaks and valleys of the history of European astronomy track the peaks and valleys of European history in general.

DEMOGRAPHICS

Where are we now? The European astronomical community is arguable the largest in the world. At the time of the 1992 General Assembly of the International Astronomical Union, when total membership stood at 7300 (it is about 7600 now), there were 433 members (18.5% women) resident in the 11 countries of the former Soviet Union with official IAU representation; 340 (13.2% women) in the six adhering countries we used to think of as Eastern Europe (Poland, Czechoslovakia, Bulgaria, Yugoslavia, Hungary and Finland); and 2625 (12.5% women) in the 17 adhering countries of Western Europe, stretching from Iceland to (unified) Germany. Thus the "European" contingent, depending on just which countries you count, was anything from 27% to 64% larger than the American one of 2069 members (8.6% women; Bergeron 1992).

IAU membership is clearly a very imperfect guide to the active astronomical community in any country. On the one hand, members are removed from the rolls only at death, and sometimes not even then. On the other hand, just before a General Assembly, no astronomer whose PhD is less than six years old is a member. And, of course, some productive researchers (conspicuously in X-ray astronomy) have simply chosen not to join. Van der Kruit (1994) found that the Dutch community numbered 103 a couple of years ago, fewer than the 161 IAU members at the time. Wilkinson (1990) found a British community about equal to membership (480). And I believe that the US community (including people in planetary science) is probably about 50% larger than the 2061 IAU members, based on the numbers of members of the American Astronomical Society resident in the US and affiliated with the universities, observatories, research laboratories, institutes and so forth

(Trimble 1993a; American Astronomical Society 1992; American Astronomical Society 1993).

The bottom line is that, with considerable uncertainty, the European and American astronomical communities seem to be about the same size. There are undoubtedly significant differences in age distribution, kinds of employment, sub-specialties, and many other parameters that it would be interesting (but quite difficult) to quantify. Net migration was still definitely westward across the Atlantic a few years (Trimble 1988), but the net flow may well now be close to zero, though large numbers of young astronomers cross both ways between postdoctoral appointments.

The communities also bear similar relationships to the total populations of their countries. The ratio of IAU membership to total population was within a factor of 8.10^{-6} for the USA and every adhering western European nation except Portugal and Austria (at about 3.10^{-6}) and Vatican City (at 0.0067!). All Eastern European countries had ratios of astronomers to citizens within a factor two of 3.10^{-6} and the FSU countries had 1.5 IAU members for every million people. By way of comparison, Australia has a ratio near 10^{-4}, most Latin American countries close to 10^{-6} and India and China $2 - 3.10^{-7}$.

I have been treated both very well and somewhat badly in at least 21 countries that adhere to the IAU for reasons that have very little to do with gender. For what it is worth, however, the total 1992 Union membership was 10.5% female. Excluding small delegations for which small number statistics dominate, the major outliers above average in Europe are France, Italy, Belgium, Spain, and Greece. Anomalously low are the United Kingdom, Germany, the Netherlands, Sweden, Switzerland and Ireland. The Vatican City delegation is 100% male, but we are probably not allowed to count this as surprise. Outside of Europe, the Latin American countries have more women members than average, while Japan, the Koreas, and China (ROC) have many fewer. The grouping of former British colonies and mandates, Australia, South Africa, Canada, India, and Israel have only 30 women among 666 members. From this point of view, the US, with 8.6% women members, ranks somewhere between former British colonies and Latin America, which is perhaps not surprising either.

THE DIFFICULTIES OF DOING ASTRONOMY ANYWHERE

Broadly speaking, we all want the same things: secure jobs that pay living wages, ready access to giant computers and photon collectors in our favourite wavelength regimes, lots of gifted younger colleagues coming up through the pipeline, and enough money to see that they too have some job security and living wages. And we would like to know enough about what facilities and funding will exist in the future to be able to plan our work intelligently. Rumors of a long-ago (or even recent) golden age in which most of this was true, at least in northern and western Europe and the USA, are greatly exaggerated. We all know that they are not true now, especially the items that relate to the future. The US is currently producing new astronomy PhDs at a rate of about 120 per year, 2-3 times the availability of traditional (long-term) job openings. Numbers provided informally by colleagues suggest that the mismatch is even larger, a factor of 4-5, in Holland and Britain. Trivially, if the world's population working in astronomy come into a steady state, then each of us is entitled to one PhD student who remains in the research/academic community, just as each biological couple is entitled to two children.

The issue of being able to foresee the future reliably is one about which the American community has often envied the European one. The international treaty structures that underlie ESA, ESO, and so forth appear to provide considerable continuity and stability, so that once a mission or a facility has been chosen as "best of breed" it cannot be arbitrarily derailed or replaced. At one time, I think, ISO and SIRTF were scheduled for launch the same year, but ISO is well into its mission, while SIRTF occupies a horizon currently receding at a rate of about one year per year, despite having been the highest priority space initiative ranked in the "Bahcall Report" (National Research Council 1991). Recent disagreements about who is to pay for how much of which bits of INTEGRAL (as aired in the gossip columns of Nature) seem, however, to be blurring the difference between the systems!

Americans asked to describe the European system of support for research automatically come up with words like "monolithic" and "rigid". The converse, I assume, is "disorganized" and "unpredictable." Neither is entirely good nor entirely bad. Arguments can be and have been made for both central planning and the free market, for both continuity and innovation. I do, however,

perceive as a strength the wide range of sources of money for facilities, salaries, and on-going research expenses that exist in the US, including several federal agencies, the individual states (who support both universities and observatories), some industrial organizations (though many fewer than in the past), and a large number of private, tax-exempt foundations. Of course, there are even more such entities in Europe, but they are divided among very many countries. And the Common Market does not (yet?) seem to extend to allowing Italian astronomers to apply to PPARC or French ones to SRON.

Astronomers are not, in any case, a cheap date. The total from all sources going toward astronomical salaries, facilities, and research programs in the USA fell just short of 10^9 dollars in 1990 (Bahcall report, p. 153-54), distributed among a few thousand astronomers. The real number of people supported, including students, programmers, technicians, and so on must, however, be much larger (a few $*10^4$?).

A wide-spread source of distress, apart from money (or lack of it) per se, is the very long time between deciding that you are interested in astronomy and being able to earn a precarious living at it. The median time from BA to PhD for American astronomy graduate students is now a horrifying 6-7 years (Goldberger et al. 1995). The median time in UK is considerably shorter, and that in many continental countries somewhat longer. And, when you fold in the many years that most new PhDs spend in postdoctoral and other soft-money positions, few people have secure jobs much before age 35, 15 or 20 years after the stars first shone in their eyes.

One might choose many different ways to compare facilities available to different astronomical communities, but what I happen to have available are some numbers for large optical telescopes, so that is what you will get. Table 1 simply lists all the optical and (near) infrared telescopes of aperture 2 meters or larger that were responsible for at least one paper published in a major journal (to be defined shortly) in 1990-91. The nominal diameter of a primary mirror is only a very approximate measure of the photon collecting power, but is is at least readily available, and Table 1 therefore ends with the sums of the squares of the nominal diameters. The AAT has been counted as half European and half "other", and the CFHT as 1/3 each European, American, and "other".

Several of the telescopes, including the ESO New Technology Telescope and the Nordic Optical Telescope were only just coming into operation in 1990. Others, especially the Russian, Crimean, and Bulgarian telescopes, were operating under enormous difficulties. And Mt. Wilson was already closed, with only archival data being published. These and other similar points should be kept in mind as we move on to Table 2.

The final stage of any research project is, of course, publication. The crudest possible measure of productivity is, therefore, shear numbers of journal pages per year (most journals in astronomy now have about the same number of words per page). In 1995, the main European publications were Astronomy and Astrophysics and Monthly Notices of the Royal Astronomical Society, together responsible for about 18,600 pages (excluding Letters and Supplements). You may or may not want to add in 775 (much smaller) pages in Acta Astronomica and about 1680 (slightly smaller) pages in Soviet Astronomy and Letters (now, somewhat unfortunately, called Astronomy Reports and Astronomy Letters in translation). West of the Atlantic, the Astronomical Journal and Astrophysical Journal (again excluding Letters and Supplements) together spewed out a sobering 23,600 pages, with another 1260 in Publications of the Astronomical Society of the Pacific. The numbers are not precise because the last issue or two for 1995 for some of them have no yet reached our library shelves. Various other journals can be added to the sums without much changing the conclusion that American pages outnumber European ones by about 25%.

Even cursory examination of the various journals reveals, however, that papers with European authors in AJ and ApJ considerably outnumber papers by American authors in A&A and MNRAS. The data in Table 2, on productivity of large optical and infrared telescopes throughout the world similarly suggests that the two communities are rather similar in production of journal papers and pages. The data for AJ, ApJ, and PASP come from Trimble (1995). Those for A&A and MNRAS are new here. For all journals, the papers and pages were those published between January 1990 and June 1991, and the citations were those appearing in the 1993 issue of Science Citation Index. Data for all the telescopes shown in Table 1 exist and will (probable) be published elsewhere.

Telescopes of very high productivity clearly exist in both European and American-owned observatories. On the basis of the very small sample of

Table 1: Telescopes Owned and Primarily Used by Various Astronomical Communities

EUROPEAN		**AMERICAN**		**OTHER**	
ESO	3.6	IRTF	3.0	San Pedro Martir	3.5
	2.2	Lick	3.0		2.1
NTT	3.5	MMT	4.5	El Leoncito	2.15
		CTIO	4	Mt Stromlo	3.9
NOT	2.6	KPNO	4		2.3
UKIRT	3.8		2.1	1/2 of AAT	3.9
WHT	4.2	CAT	2.1	1/3 of CFHT	3.6
INT	2.5	McDonald	2.7		
Calar Alto	3.5		2.1		
	2.2	Palomar	5		
Russian	6	Las Campanas	2.5		
Pic du Midi	2	MDM	2.4		
Bulgarian	2	Steward	2.3		
Crimean	2.6	U. Hawaii	2.1		
1/2 of AAT	3.9	McGraw Hill	2.5		
1/3 of CFHT	3.6	Mt Wilson	2.5		
		1/3 of CFHT	3.6		
154.9 m^2		**154.3** m^2		**53.7** m^2	

Table 2: Published Papers, Papers, and Citations thereto, Resulting from Data Collected at Large Optical Telescopes. Note that European papers come from AA and MNRAS; American papers from AJ,ApJ,PASP.

	European		papers	American		papers		Totals	
Telescope	Papers	pp	Cita.	Papers	pp	Cita.	Papers	pp	Cita.
Palomar 5m (US)	3	13	15	62.6	650	222	65.7	680	237
WHT 4.2m (Eur)	29.2	232	84	6	66	25	35.2	298	109
CTIO 4m (US)	4.9	40	18	70.8	822	337	75.7	862	355
KPNO 4m (US)	3.6	43	9	52	564	238	55.6	607	247
AAT 3.9m (mix)	53.3	572	238	37.1	502	184	90.4	1072	422
CFHT 3.6m (Eur)	24	218	35	58.6	559	213	82.6	772	248
ESO 3.6m (Eur)	56.1	505	141	19.1	184	56	75.2	689	197
Calar Alto 3.5 (Eur)	21.7	203	80	5.5	60	19	27.2	263	99
Lick 3.0 (US)	2.3	21	5	45.4	506	197	47.7	527	202
INT 2.5m (Eur)	43.6	448	167	6.5	58	27	50.1	506	194
UKIRT 3.8 (Eur)	33.9	289	98	23.4	157	78	59.3	446	176
IRTF 3.0 (US)	5	35	13	26	191	120	31	226	133

AAT and CFHT, I am slightly tempted to think that some combination of old and new world is best of all. If you add up all the papers from all the telescopes in Table 1, you find roughly 500 "European" ones and 530 "American" ones.

The most conspicuous disparity in Table 2 is the rates at which papers based on data from various telescopes are cited. The same kind of asymmetry appears in other data bases, for instance those on citation rates per paper in various journals (Garfield 1988) and on citation rates per IAU member in various places (Jaschek 1992; van den Kruit 1994; Trimble 1993a,b). The explanation is not quite so simple as a giant, parochial American community riding roughshod over everybody else. All journals over-cite themselves; but all cite more ApJ papers than any other kind (Trimble 1993b, Garfield 1988). You are encouraged to formulate and test explanatory hypotheses, but, in any case, the result leads naturally into the final section.

THE DIFFICULTIES OF DOING ANYTHING IN EUROPE

That most European astronomers (as well as many other scholars) must do a large fraction of their work in a foreign language is surely the single most obvious problem, and one of which Americans are typically almost unaware, because it is generally done so very well. There is a sense in which my opinion on any other aspect of this subject is hardly worth having. My total experience of life in Europe is limited to two, long-ago years in Cambridge and assorted short sojourns in each of 10 other countries, adding up to not more than 30 days in any one (Denmark, France, Germany, Greece, Italy, Netherlands, Poland, Spain, Sweden, and Switzerland, in case anyone is interested). But, above all else, what continues to strike me is the considerable difficulties presented by the everyday mechanics of living in all these places.

That colleagues in Russia and other FSU countries and, to a lesser extent, Eastern Europe, must devote more hours to the basics of shelter, heat, food, and clothing than those of us in richer countries goes without saying. It must surely make scientific research enormously more difficult. This is not, however, what I have in mind.

A former director of the Royal Greenwich Observatory said it clearly when leaving England for the second time and declining to work there again "Until they keep supermarkets open at night." On a recent visit to a northern European country, I lodged by a chance just above one of the town's few grocery stores and saw, mornings at 8:30, afternoons at 5:50, and for a couple of hours on Saturday, large crowds of people of all ages and both gender dash madly in and out again get to jobs, homes, and other chores that had to be done in the same narrow time window. Further south, where loaves of bread, at least, can be bought on Sunday, the entire month of August seems to disappear. The prejudiced trans-Atlantic observer is left uncertain whether to be impressed that anyone can get reasonable amounts of work done under these conditions or to be astounded that the citizens of so many countries choose to organize their lives this way.

Another issue that is likely to become more important in the future concerns the educational structure. Many astronomers have indeed had stars in their eyes since they were 15 or 10 or 5 years old. Others, including some very impressive ones, did not. Heber D. Curtis taught Latin and Greek, Harlow Shapley was a reporter, and Edwin P. Hubble took a law degree before each settled down to astronomy. A significant difference between American and European universities in the past has been the extent to which they welcomed students past traditional undergraduate age, who decided to come back to formal education to earn either a first degree or a second one in a very different subject from their first. I believe the difference still persists (and can identify a dozen or more American astronomers who did not immediately decide to take undergraduate degrees in the physical sciences), although at least one UK institution, the Open University, is now geared toward mature and returning students. As people live longer and jobs with lifetime security become rarer, there will surely be more and more potentially outstanding astronomers (not to mention linguists, doctors, historians, and engineers) who find their real calling after the normal age for normal education is past.

The issues of "mechanics of living" and widening of formal education opportunities both affect who can be an active part of the astronomical community. For researchers already at work, or nearly so, the gradually blurring of boundaries within the Common Market clearly presents many opportunities for greater flexibility. The currently-operating program (Human Capital and Mobility Programme) that provides money for temporary research visits for scholars moving among EC countries is one. I have seen a dozen or more pa-

pers in Astronomy and Astrophysics in the last year specifically thanking that program

I mentioned above that Italian astronomers do not currently apply to PPARC or French ones to SRON for funding but see no absolute reason why that sort of multiplication of opportunities should not be possible in the future. Finally (and at least as "blue sky" as observatories on the moon), one might imagine a unified and liberalized tax structure that would encourage, through credits or deductions, (a) individuals and corporations anywhere in Europe to contribute toward educational, scientific, and cultural organizations anywhere else in Europe and (b) active scientists to put some of their own money into their professional activities. Of course, both these things already happen at some level, but Schedules A and 8106 mean that the average American astronomer really pays only about half as much to belong to AAS as a European astronomer pays for EAS.

In summary, then, Europe (from Lisbon to Samarkand and from Palermo to Tromso) was unquestionably the home of modern astronomy and, it seems to me, now has the opportunity to regain world leadership through efficient use of the people and facilities now available and expected in the future. That I would be slightly sorry to see this happen is quite another issue!

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Virginia Trimble,
University of California, Irvine & University of Maryland, USA.

NEON, Network of European Observatories in the North

The rapid development of astronomy in Europe in the last decades has led to the construction of a large number of ground-based, optical telescopes by each country. Starting first with telescopes in the 1 to 2m class until the late sixties, construction then shifted towards 4m class telescopes from the seventies onwards. The necessity to reach always fainter limiting magnitudes and/or higher spatial and spectral resolutions is now pushing astronomy towards the construction of 8m class telescopes.

The earlier telescopes were placed in sites of various quality, often chosen on national territory for reasons of practicality. While the more recent telescopes were already placed in better but more remote sites, on-going studies have shown in the mean time the importance of various atmospheric parameters, like image quality or water-vapour content to reach the ultimate performance of modern instrumentation, specially with the rapid development of the IR domain.

This leads then to the installation of the 8m class telescopes on only the few, very best sites in the world. It is however clear to everybody (as shown in various recent reports by ESO, NOAO or PPARC) that the science to be done in the 21th century shows a significant need for telescopes of intermediate size (1-4m), operating hand in hand with the 8m ones. Without entering into details, it is worth recalling here that very large telescopes are not adequate to cover all aspects of observations (for instance they are not suited to do large field imaging or spectroscopy); that a large number of scientifically important programmes on brighter objects are conducted more efficiently on intermediate-size telescopes; that the shift of many presently time-consuming programs towards the large telescopes will allow

to conduct on the "smaller" ones long-term programs which could hardly be done until now (the few of which already under way having given very interesting results like the discovery of "machos" or extra-solar planets); and that the growing complexity of instrumentation makes teaching and education of observers always more important, but unlikely to be feasible on the largest telescopes.

There is therefore a constant need to maintain the availability of intermediate-size telescopes, both for specific programs, and as complements to the larger telescopes. They can however only play their role if their instrumentation is kept "state of the art". On the other hand, it is likely also that fewer resources than before will be available for them, with the additional concern that efforts will be dispersed over more sites.

The moment seems therefore opportune to develop coordination in the northern hemisphere at the European level, which could lead in the long term to improved efficiency, foster scientific collaborations and at the same time achieve substantial savings. Analysis, as made at various observatory levels, and also developed in the above mentioned reports, shows that the best way to achieve these improvements, before having to come to the extreme case of closing sites, lies in the specialisation of telescopes, according to the best potential of their instrumentation and location. This can however only be done without damaging the scientific programmes, if the variety of instrumentation needed to achieve these, instead of being built at each of the telescopes, is available globally within the pool of telescopes participating in the collaboration. Observing time is then exchanged among them.

At present, a first step could easily be achieved, irrespective of the time-scale needed to reach the long-term goal, namely making a fraction of the observing time (5 to 10%, depending on the various local conditions) at each of the participating observatories officially available for this coordination. It would lead, through input of new users, with often different scientific interests or even cultural backgrounds, to a global appreciation of the situation at the European level and to the development of new collaborations. It would develop the knowledge of the potential of the various existing sites and instruments. This is an important first step before doing future instrumental developments in cooperation. It should finally lead to a common appreciation of the future instrumental needs and corresponding site requirements for intermediate-size telescopes in the northern hemisphere. Their realisation could then be the long term goal of the proposed collaboration.

At the same time, the opening of the various facilities under consideration would already now provide a globally improved instrumental offer for European astronomers in the northern hemisphere. While basic instrumentation like CCD cameras or low dispersion spectroscopy is available everywhere, more specialised instruments like IR cameras, echelle spectrographs or high-angular resolution imaging facilities are not available on all these sites. It would then be unnecessary to develop all the missing instruments on all sites, as they would become available elsewhere.

The creation of this "Network of European Observatories in the North" (NEON), by opening some observing time to international collaboration, seems therefore to be an interesting first step to achieve the proposed long-term goals, and at the same time to develop the cooperation in astronomy. Although, formally, observing time is distributed presently in most observatories on the basis of scientific merit only, irrespective of the origin of the demand, experience shows that the possibilities are not well known and rarely exploited outside the local communities. The proposed initiative should better advertise the possibilities, ease the exchange of observing time without heavy constraints like night-to-night accountability, or the requirement of special scientific cases, and function under a minimal administrative load, making the best use of the already existing structures.

The park of European telescopes in the 1-4m range could then progressively be considered globally, and optimised for the support and complement of the 8m-class telescopes, which now are or will be under construction soon.

The initiative has received the (informal) encouragement of the European Astronomical Society. It could receive in the future (and will seek) support from the EU.

Many consulted observatories have answered positively. At this stage, the following would participate in further discussions (in alphabetical order):

- France: Haute-Provence Observatory, Pic du Midi Obs. , CFHT (partly)
- Germany: Calar Alto Observatory
- Italy: Asiago Observatory, Galileo Telescope, possibly TIRGO

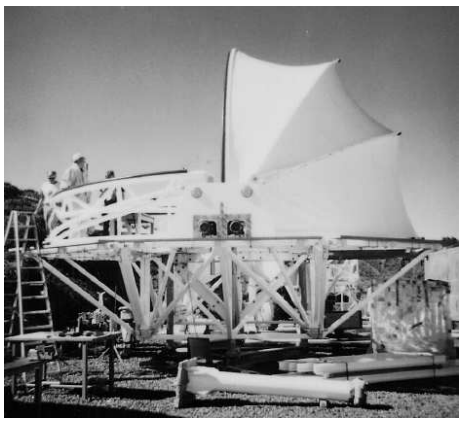
- Nordic Countries: NOT telescope
- Spain (IAC), to be confirmed
- United Kingdom: Isaac Newton Group of telescopes

This list is not exclusive and can be updated following further consultations or offers. It could represent however the basic nucleus of the Network. The practicalities will be discussed and further defined during 1996, which should also see the first meeting of the collaboration.

Michel Dennefeld,
IAP, France.

DOT, Dutch Open Telescope

The Dutch Open Telescope (DOT) is an innovative design aiming at observations with the highest possible image quality for both solar and nighttime observations. It consists of a 15m high framework tower, supporting a telescope also of open construction. New is that the telescope will be completely open and not be protected by an enclosure during observations, allowing the wind to flow freely, ensuring thermal equilibrium at all times. This way the seeing should be the basic (excellent!) site seeing without the usual additional and artificially created disturbances.



View of the upper part of the DOT with one half of the flexible hood closed. This entire assembly will sit on top of the 15m high framework tower.

The price to be paid is that the construction has to be exceedingly stiff against the highly variable wind load. This requirement is met by geometries that are stiff against translational and/or rotational deformations, and stiff drives which guarantee extremely smooth tracking. Moreover, the telescope includes thermal control of all heated elements in the light path in the telescope.

The DOT is being erected on the Canarian island of La Palma at the Roque de los Muchachos observatory, alongside the various existing and well–known telescopes. This is one of the worlds few excellent sites for astronomical observations and the DOT has the potential to make full use of these good conditions.

The DOT will be initially equipped with a 45cm mirror for solar and stellar observations, and to test the open telescope principle. It can be easily upgraded to an 0.8m or 1.2m mirror at a later date. For solar observations a water cooled diaphragm in the primary focus will be used together with extra forced ventilation. The symmetrical optical path makes the DOT especially suitable for polarization measurements, and its field does not rotate due to its equatorial mount.

Looking into the DOT.

The foldable enclosure (shown in the pictures) for storing the telescope during bad weather can be closed even in strong wind, and is designed to withstand wind speeds of up to 70m/s.

Rob Hammerschlag,
Utrecht, Netherlands.

Crimean Astrophysical Observatory– Today!

An overview.

The Crimean Astrophysical Observatory CrAO was the first major observatory of the Former Soviet Union (FSU) to enter the age of astrophysics. The beauty of the observatory site, the telescopes and the instruments together with a rich history and the current scientific and educational activities of the astronomers make the Observatory

quite an attractive place. Many astrophysicists of the FSU have been trained at the CrAO, and today it is one of the major scientific institutes of the Ukraine.

CrAO possesses modern instruments, enabling astrophysical observations over a wide spectral range from gamma–rays to meter radio waves to be made. The main observatory is located in Nauchny (lat=+44:43:36,long= 2h 16m 03sE) at an altitude of 600 meters. The instrument are: the 2.6-m Shajn telescope, two 1.25-m telescopes, the 1.0-m Solar Tower telescope as well as smaller instruments. The Department of Radioastronomy with its 22-m mm-wave telescope is located at the foot of mount Koshka in Katsiveli. On mount Koshka itself is a satellite laser ranging station.

CrAO has 5 departments: Solar Physics, Physics of Stars and Galaxies, Radio Astronomy, Gamma Ray Astronomy, and Experimental Astrophysics. There are optical and mechanical workshops and electronic labs, where astronomical instruments have been manufactured for ground-based and space experiments. CrAO has 420 employees including about 120 scientists (16 senior, and 40 PhDs). The director is Prof. Nikolay V.Steshenko. The main subjects of investigation are: solar activity, helioseismology, structure and chemical composition of stellar atmospheres, stellar and solar magnetic fields, variable stars, extragalactic astronomy, planets and asteroids, geodynamics, laser location of satellites, and the design and building of ground- and space based instrumentation.

Since 1947 CrAO has published 92 volumes of the Bulletin of the Crimean Astrophysical Observatory; since 1977 (Vol.57) it is available in English from Allerton Press.

For detailed information about the scientific and technical work of the CrAO se our EAS WWW pages.

The difficulties CrAO is facing today.

For a long time CrAO was the largest astronomical organisation in the FSU, and fully supported by The Academy of Science.

Today, the observatory depends on the State Committee of Science and Technology of the Ukraine. Its funding is not adequate to support the staff, and to maintain the scientific equipment, buildings and infrastructure at the appropriate level. Debts are accumulating, occasioning the frequent interruption of the basic services and utilities.

The greatest problem, however, is that of communication because of the large distances to other scientific centres (Moscow, Kiev etc.). Transport, post, and telephone are very limited, very expensive, and cause delays in information passing to and from the CrAO. Only e-mail keeps us in contact with the outside world.

The average salary of a scientist at CrAO is equivalent to 50-60 USD per month, but it is paid irregularly and with delays of up to 3 months. Frequent dismissals of scientists occur, without staff replacement. The political and economical situation in the Crimea is such that there is little hope for a rapid improvement of the situation at CrAO. Contact between CrAO astronomers and other scientists is difficult to maintain, as CraO cannot afford travel expenses to meetings in other republics or countries. Given this situation, the support of CrAO scientists by sponsors and the ISF is very important and necessary. The scientists at CraO are willing to participate actively in the competition for receiving grants from the ISF, ESO, and INTAS. We are extremely grateful for the support of some of our projects and we hope this system of grants will continue to help our most active scientists during these hard times.

We are looking forward to more collaborative efforts with scientists from Europe and other countries. Astronomers at CrAO do not wish to loose their scientific potential and are ready to join and participate in more cooperative programmes.

(NP CrAO, in original form May 13, 1996); revised, DA Saclay, June 20, 1996; shortened and edited, HES La Palma, July 12, 1996)

Nina Polosukhina,
CrAO, Ukraine.

TMR Funding to Support International Observing Time at the European Northern Observatory

The International Scientific Committee (CCI) invites international collaborations containing astronomers from at least two EU member or associated countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom) to apply for the 1997 International Time (IT) Programme. This Programme offers 10 days, or 18 nights, on each of 10 telescopes operating at the IAC Canary Islands Observatories

- Roque de los Muchachos and Teide (European Northern Observatory).

Further information and application forms are available from Mr Campbell Warden, CCI Secretary , Instituto de Astrofisica de Canarias, E38200 - La Laguna, Tenerife, Canary Islands (*cci@iac.es* and *http://www.iac.es/cci/lista.html*). The closing date for submission of proposals for the 1997 IT Programme is 31 July, 1996.

The TMR Access to Large-Scale Facilities has awarded the IAC funds to cover the observing expenses (travel and accommodation) of European astronomers using telescopes which are the property of other countries at the European Northern Observatory. Please contact Ms Monica Murphy (*mem@iac.es*) for further information.

Campbell Warden,
IAC Tenerife, Spain.

European VLBI Network - Call for Observing Proposals

The European VLBI Network (EVN) is composed of 14 institutes with 16 radio telescopes in western Europe, Poland, Russia, Ukraine and China. The EVN is often linked to the MERLIN interferometer in the UK (EVN-MERLIN joint sessions) and to the US Very Long Baseline Array to create a "Global" VLBI network.

Observing proposals for the European VLBI Network (EVN) are invited for the wavelengths 0.7, 1.3, 3.6, 3.6/13, 5 (spectral line), 6, 18, 21, 50 and 90cm. Global VLBI proposals may also be submitted for these wavelengths. EVN and Global VLBI Observing sessions are run on the basis of proposal pressure: there is not a fixed cycle of observations at each frequency. The deadline for proposals this year is 1st of June and 1st of October 1996.

The next EVN sessions will be:

Session 3, 16 Oct - 06 Nov 1996 at 1.3, 3.6/13 & 6 cm; Deadline: 1st June

At these wavelengths (1.3, 3.6/13 & 6cm) the resolution of the EVN is 1, 5, 3/11 mas respectively.

The fate of all applications will be communicated to the proposers soon after the EVN Programme Committee meetings. These meetings take place about one month after each deadline and the results are communicated soon after that. Applications not scheduled for the forthcoming run at the requested frequency will remain alive for the next run, or for one year, whichever is longer, unless they are withdrawn by the proposer.

The EVN is moving towards a user-friendly operation, accessible to non-specialist astronomers. Assistance can now be provided with scheduling, correlation, and data analysis if requested, as well as information during proposal preparation. The support scientists of the Joint Institute for VLBI in Europe (JIVE) can provide this assistance. In addition, proposers requiring information on the EVN during preparation of their proposals should contact Richard Schilizzi (e-mail: RTSNFRA.NL) for the name of a support scientist.

Proposal forms and further information can be obtained via:

- WWW: *http://www.nfra.nl/jive*
- E-mail: *jive@nfra.nl*
- anonymous ftp: *ftp.nfra.nl* in directory */jive/proposals_96*

T.Schilizzi,
Dwingeloo, Netherlands.

New publishing policy at Astronomy and Astrophysics - a threat to European astronomy?

New publishing policy at Astronomy and Astrophysics - a threat to European astronomy?

On 4 March 1996 - it must have been after months of preparation, but I am aware of little open interaction with the European astronomical community - A+As Editorial Board decided dramatically to change its publishing policy. As of 1 January 1997, papers will be published in two versions - a short core paper in printed form, and the full version in electronic format only. Private subscriptions will not be available any longer. Papers must be submitted using A+As (LA)Tex templates. Whilst on 7 March, some colleagues were informed directly by A+A about the news, most of us have to follow up on rumours. What is behind these precipitate decisions? Why are the Editors avoiding interaction with the community whom they are meant to serve? Given the current eight months delay between acceptance of a paper and its publication, the decision in March, for all practical purposes, applies to any paper submitted from that moment on. Thinking over the consequences, this seems to be the way to kill A+A and damage European astronomy. While

certainly the future is in electronically available journals, identical paper versions must certainly not be suppressed. A shorter paper version brings about complications in the referencing to different versions. Publishing two versions means extra (costly) time preparing and reading them both. If the paper version is not available, interested astronomers must extract lots of pages from a computer net which is by no means readily available to everybody (certainly those not inside Western Europe and North America). The decision makes it more difficult to publish and to read astronomical papers for those not associated with an astronomical institute (at a time when unemployment is a widespread reality), and works to prevent those from publishing their scientific results who for one reason or another are unable to use the A+A templates. At a time when A+A has the chance to become the most important all-European astronomical journal, it seems to have taken steps to induce astronomers to submit their work to other addresses. In the light of all this, I think it is necessary to bring about an open discussion on A+As publishing policy. There must have been problems which induced the Editors to take this drastic step. We must find solutions which help European astronomy.

C. la Dous is a member of the governing board of the Astronomische Gesellschaft.

C. la Dous,
Sonneberg, Germany.

ECLIPSA 99

The total solar eclipse of 1999 will be the only such event visible from Europe for the next 30 years. The Astronomical Institute of the Romanian Academy, under the directorship of Dr.Magda Stavinschi, has set up the international association ECLIPSA 99 with the aim of maximising the possibilities for studying the 1999 solar eclipse. Any interested person should contact her at:

ROMANIAN ACADEMY, ASTRONOMICAL INSTITUTE
Cutitul de Argint 5, 75212, sector 4, Bucharest, ROMANIA.
Tel.: +401 3356892 FAX: +401 3373389 E-mail: mstavinschi@roimar.imar.ro

M. Stavinschi,
Bucharest, Rumania.

Conferences

- **IAU Symposium No.182: Herbig-Haro Flows and the Birth of Low-Mass Stars**
  20–26 January 1997, Chamonix, France.
  Contact: B.Reipurth, ESO, Casilla 19001, Santiago 19, Chile.
  Tel: +56 2 228 5006; Fax: +56 2 228 5132; email: breipurt@eso.org
- **IAU Symposium No.183: Cosmological Parameters and the Evolution of the Universe**
  18—22 August 1997, Kyoto, Japan.
  Contact: Prof. K.Sato, Dept. of Physics, School of Science, Univ. of Tokyo, Bunkyo–ku, Tokyo 113, Japan.
  Tel: +81 3 5802 3359; Fax: +81 3 5689 0465; email: sato@utaphpl.phys.s.u-tokyo.ac.jp
- **IAU Symposium No.184: The Central Regions of the Galaxy and Galaxies**
  18—22 August 1997, Kyoto, Japan.
  Contact: Dr. Y.Sofue, Inst. of Astronomy, Univ. of Tokyo, Mitaka, Tokyo 181, Japan.
  Tel: +81 422 34 3734; Fax: +81 422 34 3749; email: sofue@mtk.ioa.s.u-tokyo.ac.jp
- **IAU Symposium No.185: New Eyes to See Inside the Sun and Stars: Pushing the limits of Helio- and Asteroseismology with New Observations from the Ground and from Space** 18—22 August 1997, Kyoto, Japan.
  Contact: Dr. F.-L. Deubner, Astr. Inst. der Universitaet Wuerzburg, Am Hubland, D–97074 Wuerzburg, Germany.
  Tel: +49 931 888 5030; Fax: +49 931 888 4603; email: deubner@astro.uni-wuerzburg.de
- **IAU Symposium No.186: Galaxy Interactions at High and Low Redshift**
  26–30 August 1997, Kyoto, Japan.
  Contact: Dr. David B. Sanders, Inst. for Astronomy, Univ. of Hawaii, 2680 Woodlawn Dr., Honolulu, HI 96822, USA.
  Tel: +1 808 956 5055; Fax: +1 808 956 9580; email: sanders@ifa.hawaii.edu
- **IAU Symposium No.187: Cosmic Chemical Evolution**
  26–30 August 1997, Kyoto, Japan.
  Contact: Dr. J.W.Truran, Dept. of Astr. and Astrophysics, Univ. of Chicago, 5640 South Ellis Ave., Chicago, USA.
  Tel: +1 312 702 9584; Fax: +1 312 702 6645; email: truran@nova.chicago.edu

– **IAU Symposium No.188: The Hot Universe**
26–30 August 1997, Kyoto, Japan.
Contact: Dr. K.Koyama, Dept. of Physics, Faculty of Science, Kyoto Univ., Sakyo-ku, Kyoto 606, Japan.
Tel: +81 75 753 3833; Fax: +81 75 701 5377; email: koyama@cr.scphys.kyoto-u.ac.jp

– **IAU Symposium No.189: Fundamental Stellar Properties: The Interaction Between Observation and Theory**
13–17 January 1997, Sydney, Australia.
Contact: Dr. J.Davis, School of Physics A28, Univ. of Sydney, Sydney, NSW 2006, Australia.
Tel: +61 2 9351 3604; Fax: +61 2 660 2903; email: davis@physics.usyd.edu.au

– **IAU Colloquium No.164: Radio Emission from Galactic and Extragalactic Compact Sources**
28 April–2 May 1997, Socorro, New Mexico, USA.
Contact: A.Zensus, NRAO, 520 Edgemont Rd., Charlottesville, VA 22903-2475, USA.
Tel: +1 804 296 0231; Fax: +1 804 296 0278; email: azensus@nrao.edu

– **IAU Colloquium No.166: The Local Bubble and Beyond**
21–25 April 1997, Garching, Germany.
Contact: Dr. D.Breitschwerdt, MPI fuer Extraterrestrische Physik, Giessenbachstr. 1, D–85740, Garching, Germany.
Tel: +49 89 3299 3317; Fax: +49 89 3299 3569; email: breitsch@rosat.mpe-garching.mpg.de

– **IAU Colloquium No.167: New Perspectives on Solar Prominences**
28 April–4 May 1997, Aussois, France.
Contact: Dr. D.M.Rust, The Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Rd., Laurel, MD 20723, USA.
Tel: +1 301 953 5414; Fax: +1 301 953 6670; email: david.rust@jhuapl.edu

– **2nd INTEGRAL Workshop: The Transparent Universe**
St. Malo, France. September 16-10, 1996
C. Winkler, ESTEC, Noordwijk, The Netherlands (integral@astro.estec.esa.nl, http://astro.estec.esa.nl/SA-general/Projects/Integral/integral.html)

– **Actual Problems of Astrophysics**
Niznij Novgorod, Russia. September 1996
N. Bochkarev, Moscow

– **International Conference on Variable Stars**
dedicated to the 90-th anniversary of V.P.Tsessevich (1907-1983)
September 1-5, 1997, Odessa, Ukraine.
Contact address: Prof. Valentin G. Karetnikov, Astronomical Observatory, Odessa State University T.G.Shevchenko Park, Odessa 270014 Ukraine
E-mail: root@astro.odessa.ua

– **International Conference Contemporary Problems of Astronomy**
dedicated to the 125-th anniversary of the Astronomical Observatory of the Odessa State University.
September 2-6, 1996, Odessa, Ukraine.
Contact address: Prof. Valentin G. Karetnikov, Astronomical Observatory, Odessa State University T.G.Shevchenko Park, Odessa 270014 Ukraine
E-mail: root@astro.odessa.ua

– **Role of Ground-based Astrometry in the Post-Hipparcos Period**
this conference will be held in Mykolayiv, from September 9-12, in honour of the 175th anniversary of the Mykolayiv Astronomical Observatory. Contact: Gennady I.Pinigin at pinigin@mao.nikolaev.

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