European Astronomical Society

NEWSLETTER

Issue 15. April 1998

Contents

Message from the President

Clouds are gathering over European astronomy! ESO has been threatened recently with a drastic reduction of funding by its French partnership. Fortunately, after intense negotiations, a settlement has been found which limits the budget cut to 3.5 MDM. This reduction represents 2.4 of the total budget; it does not seem a great deal, but it comes after another one last year which, under the pressure of the German delegation, amounted to 4.2 MDM. Most agree that going any further in such budget reductions would have a serious impact on the completion and the instrumentation of the VLT.

It cannot be denied that the cold war provided a strong impetus for scientific competition and that astronomy benefited greatly from the exploration of space. Nowadays our governments have other priorities, such as fighting against unemployement, or improving the environment, and as citizens we can hardly blame them for that. But they indulge also in costly projects which, under the guise of scientific achievement, will contribute little to the progress of science. An example - it must have crossed your mind - is the Space Station.

We must seize any opportunity to explain our authorities that the construction of Europe goes beyond merging our national economies and using the same currency, that it does also imply the development of European cooperation in scientific research, including the Eastern countries. United, we are able to lead the competition, as illustrated by HIPPARCOS, ISO, SOHO, projects which were conceived and managed by ESA. We fare less well in astronomy from the ground, but the VLT will soon triple the optical collecting area of the member states and it will give them unequalled resolving power. Never would they reach this goal if they had not joined their forces within ESO. That is why it would be a serious mistake to weaken the international organisations which constitute our strength.

J-P. Zahn

Editorial

This issue of the Newsletter is dominated by the concern of astronomers on the policy of international cooperation and large facilities.The president's message gives a dramatic warning which should be an important issue during the next JENAM in Prague. F.Praderie in her two articles goes deep into the same subject and I think that contributions from other colleagues on this topic will be most welcome. News from the IAU, Observatories and projects are also important issues whereas the president of the Astronomical Society of Japan is presenting a comprehensive view on the history and role

or towns. Some of them have large telescopes with 100 or even 150 cm apertures. They are open to public people and used for education of school children or students, but also used for scientific observations by expert astronomers.

The total membership of the Society at present is about 3000, more than two thirds of which are amateurs. The membership journals "Tenmon Geppo" (Monthly report of Astronomy) are issued monthly and distributed to all members. Beside this public journal, a professional publication written in English "The Publication of Astronomical Society of Japan" is issued quarterly. This publication is distributed to non-amateurs and also subscribers of world wide. Two annual meetings of the Society are held in March and September every year and about 600 participants are enrolled and about 400 papers are reported either in oral or poster presentations. As is seen, Japanese astronomy has grown very rapidly after the World War II and now become one of the leading country in some fields of astronomy. However, the total number of the professional astronomers is still relatively small compared to many European and American countries; only three national universities have departments of astronomy(no change in the past 70 years!), although several other universities have astronomical groups in physics departments. Most observational works are exclusively undertaken by a single observatory (the National Astronomical Observatory) and a single space institute (the Institute of Space and Astronautical Science). Both are inter-university institutes and open to the utilization by other universities. In the past, we have had many successful projects by international collaborations, but mainly by US and European communities. We hope to extend the collaborations with many other countries including Asian and other areas in the future.

H. Okuda (the President of the Society)

Mykolayiv Astronomical Observatory

Mykolayiv Astronomical Observatory (MAO) is situated in the central part of the city of Mykolayiv (Ukraine) on a hill at 52 meters above the sea-level and about 30 kilometers from the Black Sea. Its geographical coordinates are 31° 58' east longitude and $+46^o$ 58' latitude. An astronomical museum, a scientific library and the adiministration offices, are housed in the main building of MAO. Six domes with different telescopes, several buildings for the scientific departments and an experimental workshop situated near the main building are all included in the area of the scientific campus.

The observatory was founded in 1821 as a naval one with primary aim to train navigators the astronomical methods of orientation and provide the Black Sea fleet with naval maps and exact chronometers. The first director of the MAO was C. Ch. Knorre who served for fifty years. Since its operation the observatory was also engaged in the research and compilation of star maps and catalogues and the determination of comet and planet coordinates.

Since 1912 to 1992 MAO became one of the southern stations of the wellknown Pulkovo Observatory. During this period, its main goal was to expand the Pulkovo absolute star catalogues to the southern sky up to -30° of declination and to observe regularly the Sun and solar system bodies. For this purpose a transit instrument and a vertical circle were installed at MAO. Additionally, the research activities were extended to astrophotography and photometry with the 6" refractor.

In 1931 the high accuracy time service was founded at the observatory site to study time and frequency scale and its applications. Since 1957 the photoelectric transit instrument APM-10 (D=100mm,F=1000mm) was used for the determination of the earth's rotation parameters. For these tasks MAO was equipped with several frequency standards, short and long wavelength radioreceivers and accessories of time synchronisation.

In 1955 the meridian circle (D=150mm,F=2160mm) made by the well-known german firm "Repsold Brothers", was installed for the determination of differential coordinates of stars within the range of declination from $+20^o$ to -30° . During this period some star catalogues, were compiled such as the Bright Star Catalogue, the High Light Catalogue, Zodiac Stars Catalogue etc. In 1957-1969 artificial earth satellites were photographed for the study of their orbits.

Since 1961 regular photographic observations have started by means of a zone astrograph (D=120mm,F=2044mm, plate 5' x 5'). Mars, Jupiter and Saturn with their bright satellites, Uranus, Neptune and minor planets were observed for the determination of their exact coordinates. The collection of the photographic material was arranged in a special photographic plate library. About ten thousand astroplates at different observation epoches have been obtained.

MAO took part in many important international astrometric projects such as AGK3R, South Reference Stars, Catalogue of Faint Stars. The high accuracy of the MAO catalogues was recognised by introduc-

ing its data to the international FK series of fundamental catalogues, whereas others were added into the german catalogue ARIGFH (Astronomisches Rechen-Institut Geschichte des FixsternHimmels. In the last 80 years, about 0.5 million stellar observations were performed from which 30 different catalogues were derived. During the 70s, long term observations of the solar system bodies provided the necessary observational material for the USSR scientists to develop a new relativistic theory of the planets motion.

In 1974 MAO organized a three-year expedition to high geographical latitudes aiming to demonstrate the advantages of astrometrical observation during the polar night. At that location it was possible to observe stars continuously during 24 hours and with insignificant meteorological variations. The polar night observations were organised by MAO on the island West of Spitzbergen (Norway) with latitude of $+78^o$ for determination of accurate absolute coordinates of stars. The main part of the programme was carried out during long-time and non-stop observations from 18 to 155 hours! These observations were similar to the space ones. Many observations were obtained in two culminations for the reliable determination of the absolute orientation of the telescope. Finally, the polar absolute catalogue Nik(Spz)75 was compiled by G.M.Petrov with small systematic errors. Later, this catalogue was used for the improvement of the FK4 fundamental catalogue.

In the 80s MAO focused on the development and design of new automatic telescopes. In cooperation with the Pulkovo and Kazan observatories, developments were been made with the aim of designing two original meridian horizontal telescopes: MAHIS and AMC (Axial Meridian Circle). These instruments were designed to increase the limited accuracy of groundbased telescopes for the determination of star positions. They provided very high level of automation of all observational procedures: operating routines for telescope control, preparing input data, numerous observations of celestial bodies, data sampling and processing etc. Therefore, it was possible to determine the current parameters of the telescope, the anomalous refraction and so on. One of these telescopes C was completed in 1995 and includes the horizontal telescope (D=180mm, F=2480mm) in the prime vertical (fixed alignment) vacuum collimator (D=180mm,F=12360mm). The telescope is connected with a citall pentag objective and can rotate around its optical axis for stellar observations. The AMC is equipped with computer control system and CCD devices. The expected accuracy of the automatic AMC is about 0.02 arcsec considering the systematic errors. A coordinate-measuring machine for the the astrophotographic plates was also developed at MAO. The main purpose of this Programming Automatic Radial-Scanning coordinatometer (PARSeC) is the positional measurement and reduction of the star images photographed on the astroplates taken for the compilation of the astrographic catalogues. At present PARSeC has already been used for measuring different astroplates. More than 500 images can be measured per hour during non-stop operation up to 16 hours, with random error in the position of stars of 1.5 micron.

Since 1992, MAO has become an independent observatory belonging to the Ministry of Science Technology of Ukraine. Together with the ukrainian astronomers MAO continues to make the basic research in astronomy, especially in the field of positional astronomy. The observatory has about 70 employees; among them there are 22 scientists and 20 engineers/ technicians.

Like most observatories of the Former Soviet Union, MAO faces several problems in many fields of the observatory's life, mainly due to the lack of financial support. We try to diminish them by making strong efforts for receiving grants from ISF, ESO, some ukrainian funds , Renaissance etc. The Mykolayiv observatory developed scientific links with many astronomical institutions and organisations such as IAU, EAS, Ukrainian Astronomical Association, Astronomical Society (Moscow) and observatories from Europe, Asia, USA and FSU. This mutual collaboration and assistance is very important and fruitful for MAO.

For the last years the main areas of the MAO investigations are: CCD observations with meridian telescopes for linking the optical/radio reference frames; extention of the optical (Hipparchos) reference frame to faint stars. Since 1996 the observations of nearly 20 thousands stars in the fields around the 250 extragalactic radio sources for declination zone from $+90^o$ to -20° and in the 12-14 magnitude range, have been started with the AMC. The positions of these second reference stars selected from the Guide Star Catalogue are provided to the Hipparchos system. It needs about three years for the compilation of a future catalogue with an accuracy of 0."02.

Furthermore, MAO continues the observations of the solar system bodies, especially the selected minor planets and asteroids with the RMC and the zone astrograph. We plan to reobserve some stars from the Hipparchos, Tycho and Guide Star Catalogues for improving the star coordinates and proper motions.

Finally, the Mykolayiv Astronomical Observatory shows

promising perspectives for the development of modern astrometry.

G. Pinigin (Director of MAO)

Message from the treasurer

From the treasurer's point of view, 1997 was a good year for EAS, thanks to all our members who paid their dues on time. This has resulted in a small surplus in 1997 and a healthy reserve, which gives us the freedom to start taking some new initiatives, like a more attractive Newsletter layout.

Lately, **the EAS Council has decided to announce a number of travel grants for young astronomers to attend the JENAM-98 in Prague in September**. We hope that this will enable some more young astronomers to come to the meeting in Prague and to present their work (see the JENAM-98 second announcement).

Also, we will soon send the new EAS Directory to the printers. The Directory will include addresses of all the EAS members as well as astronomical institutes in European countries, where we have members.

We will soon send out membership renewal invoices for 1998 and hope that they will be paid promptly, as most of you have done for the last couple of years.

I would also like to recall our WWW home page (thanks to Michel Dennefeld) at: http://www.iap.fr/eas/ where information on how to become a member is available. We would welcome an increase in the membership, in particular young people of whom we still have a relatively small representation.

B. Nordstrom

News from the IAU

At the XIIIrd IAU General Assembly in Kyoto in August 1997 (see D. Sugimoto's report in the last EAS Newsletter), new Officers for the period 1997 - 2000 were elected as follows: President: Robert P. Kraft (USA), President-Elect: Franco Pacini (Italy), General Secretary: Johannes Andersen (Denmark), Assistant General Secretary: Hans Rickman (Sweden). New Vice-Presidents elected to the Executive Committee are: Catherine Cesarsky (France), Norio Kaifu (Japan), and Nikolai Kardashev (Russia), while Claudio Anguita (Chile), Bambang Hidayat (Indonesia), and Virginia Trimble (USA) will serve a second term on the EC.

At the Kyoto GA, the IAU welcomed as new Associate Members Bolivia and the Central American Assembly of Astronomers, as representing jointly the astronomers in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. Moreover, the Executive Committee was authorised to approve an application by astronomers of the Macedonian Astronomical Society, when received from an appropriate body. On the negative side, unfortunately, the membership of Morocco had terminated at the end of 1996 by virtue of Article 7 in the IAU Statutes. Finally, an unprecedented 774 new Individual Members were admitted, bringing the total to 8,562 as of August 27, 1997.

The years just before and after a General Assembly are particularly busy for the IAU Secretariat in Paris. As readers who attended the Kyoto GA or read about it in the last Newsletter will know, it featured a very rich scientific programme as well as a large attendance of nearly 2,000 participants. The follow-up work of updating our membership files for nearly 800 new members, sending out individual letters of welcome, and verifying the correctness of the data has taken a large effort. At the same time, the bulk of the papers for the Highlights of Astronomy and Transactions volumes - over 2000 pages in all - was received; we are currently struggling to retrieve the exponential tail of that distribution so the books can be sent to the printer...

The increasing threat to astronomical observations at all wavelengths from activities in space and on the ground has reached a point where a major effort towards achieving some sort of international protective agreement has become necessary: The steadily increasing problems of ground-based light pollution are well known; remedies have been identified, but need to be advertised to the relevant authorities. Threats from space include, in the visible domain, increasing interference from illuminated space debris, and recently - and potentially far more damaging - proposals to place large, luminous, artificial objects in orbit for all sorts of commercial advertising purposes. Similarly, radio astronomers are facing an increasing onslaught on the narrow windows in frequency space allocated to the most important astrophysical spectral lines, primarily from the booming satellite telecommunications industry.

In recognition of the vital importance of these issues, the Kyoto GA passed a resolution (A1) directing the IAU to take steps aiming to ensure the protection of