

U.R.S.I.

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A NOTE ON THE URSI ACCOUNTS FOR 1982

The audited Accounts for 1982 have already been published in the June 1983 issue of the *URSI Information Bulletin*. Numerically, they are of course completely accurate. However, the attribution of expenditure between Scientific Activities and Administration is incorrect. In thousands of dollars, the figures 16.2 and 56.2 are shown for these two items respectively. A more accurate attribution is 32.2 and 40.2. The reason for the incorrect attribution is now understood and steps are being taken to ensure that in future the expenditure in these two areas will be correctly attributed.

A.L. Cullen
Treasurer, URSI.

THE FEDERATION OF ASTRONOMICAL AND GEOPHYSICAL SERVICES (FAGS)

The Services incorporated in the Federation of Astronomical and Geophysical Services are supported financially mainly from national sources. However important contributions are made also by ICSU and the three interested Unions: URSI, IUGG and IAU. Following the recent decreases in the ICSU contributions, the Secretaries General of URSI and IUGG, with the approval of IAU, have jointly written to the President of ICSU inviting him to give serious attention to the need for adequate continued support from ICSU. The following statement was attached to the letter just mentioned.

1. OBJECTIVES: PERIODIC, SECULAR AND IRREGULAR VARIATIONS OF THE EARTH-SUN ENVIRONMENT

Since time immemorial, man has been obliged for purely practical reasons to take an intelligent interest in his environment, and especially in the way in which it changes with time. He soon became familiar with the obvious periodic variations: day and night, and the annually recurring seasons. Later on, he found that these variations could be explained by the fact that the Earth rotates on its axis while, at the same time, it follows an elliptic orbit round the Sun.

However, men must have realised very early that their environment was not controlled exclusively by these simple periodic, and hence predictable, changes; the harvest could be drastically reduced by unusually bad weather or by unexpected floods, and towns could be destroyed by earthquakes, which occurred without obvious warning, or by volcanic eruptions. As progress was made in improving the accuracy of scientific observations of the environment, it became clear that many of the apparently simple periodic phenomena were often disturbed by the incidence of irregularities; navigators discovered that the Earth's magnetic field was subject to sudden and, for them, potentially dangerous fluctuations, and astronomers found that the Sun itself underwent unexpected changes, some of which had a direct effect on the terrestrial environment. In recent times, the fact that the Earth does not rotate uniformly around its axis has aroused considerable interest.

Thanks to the availability of *long series of scientific observations*, some of which have been continued without interruption for many decades, it has now become clear that, besides the periodic and the irregular changes just mentioned, there exist also slow, and hence less easily detected, *long-term variations* in many parameters. The potential importance of these *secular changes* is now believed to be much greater than was at first thought, and scientists are becoming more and more interested in them and in the implications they may have for mankind; to mention only a few: *the future economic consequences of climatic changes, the possibility that slow tectonic movements and tides may play a rôle in triggering earthquakes, and the long-term consequences of changes in the level of the sea and in the growth and decay of glaciers on climate.*

However important the geographical variations in geographical parameters may be, it is equally important to remember that many of them also vary with time; these temporal changes,

and especially the slow secular changes, must receive as much attention as the geographical variations in any programme for the collection and analysis of geophysical and astronomical data.

2. FIELDS: APPLICATIONS OF OBSERVATIONAL DATA

Astronomical and geophysical data find applications in many different fields, but it will suffice to refer to only a few examples.

2.1 Terrestrial and Space Navigation

Whereas geomagnetic and astronomical data are hardly sufficient for the needs of navigators in modern ships and in aircraft, the navigation of a spacecraft requires a knowledge of the Earth rotation parameters and of the detailed characteristics of the Earth's gravitational field, including the effects of local irregularities attributable to the inhomogeneous structure of the Earth.

2.2 Climatic Changes

In any attempt to understand long-term changes in climate, it will be necessary to take account of many factors other than those associated with the traditional types of meteorological observation; these include the hydrological budget, and changes in sea-level and in the rate of growth and decay of glaciers. Although it is known that changes in solar activity affect the upper levels of the atmosphere, much more information is needed about how solar energy penetrates down to the lower levels and how it affects the weather.

2.3 Precursors to Earthquakes

The difficulties associated with the search for the trigger that initiates an earthquake are numerous, but the rewards for future success would be great. In this search, it is not possible to ignore such factors as local variations in the gravitational field, or the stresses and strains imposed on the Earth's lithosphere by ocean and earth tides, as well as by slow movements of the tectonic plates. It is suspected also that the observed fluctuations in the parameters that describe the rotation of the Earth may provide clues relating to internal movements in the Earth's core closely connected to the geomagnetic field variations.

2.4 Radiocommunications

The reliable exploitation of radiocommunication systems, including those that make use of satellite relays, depends on the effective use of information about the physical characteristics of the ionosphere and the troposphere, and also about the unwanted effects caused by magnetic disturbances and by unusual solar activity.

3. METHODS: COLLECTION AND ANALYSIS OF DATA

All types of geophysical data must be studied in four dimensions since their variations depend on time and on the geographical location, the altitude being also an important element; the characteristics of the atmosphere, neutral and ionized, and of the gravitational and magnetic fields fall into this category.

From what has been said, it will be readily appreciated that the analysis of data that vary in three-dimensional space as well as with time is a task which presents difficulties resulting from *the enormous mass of raw observational measurements*. In order to reduce this information to a volume and a form that can be more easily assimilated, it is necessary to define various *refined and composite parameters* which represent, for example, certain trends or other special characteristics of the original data.

Where appropriate, the most modern statistical techniques and computers are being employed in this task. *The high-quality reduced parameters that result from the careful analysis of many types of data constitute the foundation on which it will be possible to construct improved models designed to improve our knowledge of the terrestrial environment and of the dynamics of the Earth itself.* An example of such an investigation is the revision of the nutation of the axis of rotation of the Earth; in this work, use is being made of very large numbers of observations collected by three different Services: the Bureau International de l'Heure, the Polar Motion Service, and the Centre for Earth Tides.

4. WORLD-WIDE DISTRIBUTION OF OBSERVATORIES

Approximately 1,500 observatories are engaged in making basic scientific measurements of many kinds and in forwarding these for processing to the Services. The *Developing Countries* can play an important rôle in making observations, since only by siting instruments in them is it possible to achieve the

world-wide coverage that is essential in many types of investigation.

5. COMMON FEATURES OF THE SERVICES

In spite of the great variety in the types of observation treated, the different Services have certain common features. It is important to emphasise that the Services are not engaged simply with the routine handling and storing of data: their common objective is *to find improved ways of processing* the information they receive and of increasing the accuracy of the calibrations. The experience thereby gained means that the Services are often in a position to provide valuable advice on instrumentation, the acquisition of data and subsequent numerical procedures.

Several Services have a mutual interest in the adoption of new principles and modern methods applicable to the *re-processing of long series of observations*, and the availability of modern computers is an important factor in this work. The Services that have been particularly active in this field are those concerned with time (BIH), polar motion (IPMS), Earth tides (ICET) and mean sea-level (PSMSL).

In all the Services there is an increasing awareness of the interconnections between various solar and terrestrial phenomena, and of the need to understand the underlying causes of these; in consequence, it is natural to find that there is a growing interest in *interdisciplinary studies*, and in the extension of observational programmes to cover new types of parameter.

Most of the Services are concerned with work that has actual or potential value for the Developing Countries; for example, the diffusion of accurate time (BIH), the preparation of the gravity map of Africa (BGI), the construction of the trans-world tidal gravity profiles (ICET) and the analysis of changes in the level of the sea (PSMSL).

Where appropriate, the Services can often provide scientific information when requested; for example, when data on the amplitude of earth tides are required for making corrections in laser ranging experiments (ICET), or where accurate values of the gravity 'g' are needed (BGI and ICET). In a completely different field the Ursigram Service can provide information and forecasts relating to current conditions in space; *these have been used by astronauts, and also in the*

execution of certain scientific experiments in space.

6. HIGH SCIENTIFIC STANDARDS

There is widespread recognition of the *high scientific standard of the activities of the Services* and of the information that they provide. A few examples of this can be quoted by way of illustration.

The BIH carries the responsibility for two distinct, but related, timescales: a) International Atomic Time, which is used not only in astronomy and geodesy, but also in physics laboratories and in the navigation of space vehicles; b) Universal Time, which is used for monitoring the rotation of the Earth, and which provides the basis for time signals. In addition, under the terms of a contract, NASA requested the BIH to undertake a special campaign designed to monitor the rotation of the Earth during the flight of the Mariner satellite.

The completion of the trans-world tidal gravity profiles across Africa, Asia and the South Pacific was carried out with the active support of the authorities in Australia, Belgium, Indonesia, Thailand, P.E. China and the USA. The construction of the Africa gravity map is being supported by a contract with UNESCO.

When reporting on the provision of data that had been requested, the Director of the Mean Sea-level Service made a comment which could without doubt be applied to all the Services: *"the enthusiasm with which the material has been received gives confirmation that the Service is fulfilling a strategic need, and must continue"*.

7. FUTURE ACTIVITIES

It will be important to ensure that the well-established activities of the Services are permanently maintained, and especially *to avoid the interruption of long series of observations* the value of which can not yet be fully assessed. However, this does not preclude the initiation of new types of measurement and the reevaluation of existing series.

Comparatively new fields in which interest is growing include attempts to *identify precursors of earthquakes*, and to determine the factors that influence *climatic changes*. The major efforts that have been made in recent decades to observe

the astronomical and geophysical parameters that are characteristic of interplanetary space represent the logical consequence of man's recognition that, for him, the space environment may, in future, be of comparable importance to the terrestrial environment with which he has been familiar for many centuries.

The increasing interest in the study of long-term trends is fairly recent, and it can be justified by the present expectations that *secular trends may throw light on precursors of important changes in our planet.*

There is a need for a more uniform geographical distribution of the observatories that provide certain types of data. The filling of the gaps in the world network inevitably implies *cooperation with both the smaller and the developing countries*, and the participation of their scientists in the collection and dissemination of observational material.

8. FINANCING THE SERVICES

It is sometimes wrongly suggested that the activities of the Services are routine in character, and that financial support ought to be given preferably to new research projects that seem likely to yield early or spectacular results. There is a natural tendency to be overenthusiastic and overoptimistic about the results expected from new projects. However, experience shows that there is also a tendency to undervalue the *importance of long-term programmes* and of ensuring the continuation of series of observations such as those in which the Services are interested. Some of these series are only beginning to yield new and sometimes unexpected results, thanks not only to the adoption of modern analytical methods, but also to the efforts made by earlier generations of scientists to maintain the continuity of the observations in question. A decision to interrupt such series now must be avoided since it would be likely to result in irreparable damage and would compromise the use of these series by future generations.

The immediate victims of the termination of the activities of FAGS Services would be the developing and the smaller countries which rely on the present international arrangements. The big countries would, most likely, feel obliged to initiate similar activities at national level, but they would tend to concentrate on their own requirements to the exclusion of aspects of little interest to them.

The resulting duplication of effort in a few big countries would be regrettable and difficult to justify. In addition it is not certain that the present international network of observatories would be prepared to continue to provide data for use by nationally oriented organisations. Assuming that two or three national data-processing organisations were formed, the result would be that the smaller and the developing countries would become completely dependent on a few large countries for the supply of certain types of scientific information. This can only be regarded as a most undesirable prospect, and it must surely conflict with ICSU's policy which encourage genuinely international cooperation in science.

It is important to remember that, in most cases, much of the financial and logistical support for the Services is provided by the national laboratories and institutes that house them. This support would not necessarily continue to be available if the Services did not enjoy their present international status and prestige. It is the grant provided by ICSU that constitutes the *label of quality* of a Service and of its scientific activities.

It is unfortunate that the continuing reduction in the amounts of the ICSU grants to FAGS, combined with the effects of cost inflation, has seriously eroded the real value of the support given by ICSU. If this erosion continues, there is a risk that the national bodies concerned may conclude that ICSU no longer seriously wishes to support the Services. In such circumstances, the present international supervision of the work of the Services by the appropriate Scientific Unions might have to give way to national control tending to favour parochial objectives.

9. ALTERNATIVE FINANCING

The suggestion that the ultimate users of the output of the Services should carry the responsibility for providing the necessary finances has been made from time to time; this idea is based on a naive or ill-informed conception of the way in which astronomical and geophysical data are collected, treated and disseminated. It must not be forgotten that there is a two-way flow of data; in one direction, very large numbers of basic observational data are transmitted from individual observatories to the relevant Services, but the data from any one observatory have limited value when considered in isolation. In the opposite direction, there is a flow of refined data

and various parameters and indices from the Services to the organisations which provided the original raw data. Since the original data are provided free of charge to the Services, it would be unrealistic to ask those who supplied them to pay for the refined data and related information.

In any case, the circulation of the publications containing the highly specialised information provided by the Services does not exceed a few hundred copies. It would be uneconomical to market such small numbers of publications and, in any case, the Services do not have staff who could undertake the administrative work associated with the unavoidable ordering, invoicing and accounting procedures.

10. ICSU SUPPORT FOR THE SERVICES

The question whether ICSU does, or does not, carry a responsibility for providing adequate financial support for the Services has been posed from time to time. There are several reasons why the response to this question should be in the affirmative.

10.1 Although the Services were originally created by the Scientific Unions, the importance of their combined activities was recognised by ICSU, and this led to the establishment, in 1954, of the present Federation.

10.2 There is no reason to believe that the present task of the Services is any less important than it was 30 years ago; there are still many outstanding problems in astronomy and geophysics the solution of which seems likely to be found in the analysis of long series of observations.

10.3 The very high scientific standards that govern the treatment of the data, handled by the Services are universally recognised; these guarantee the quality of the output of the Services and justify the utilisation of the information provided in scientific research.

10.4 Administrative expenditure and travel expenses in the Services are covered by national support, and hence *the ICSU contribution is spent entirely on scientific activities.*

10.5 If the withdrawal of ICSU support for the Services led to the interruption of existing long-standing series of observations, irreparable damage would be done. If this support were transferred to a new and untried project, it might be argued that the damage done would be compensated by the

hoped-for, but not guaranteed, benefits coming from the new project. It is difficult to believe that ICSU would agree to indulge in a scientific gamble of kind.

10.6 *It is worth recalling that a UNESCO Working Group recognized the need, in geophysics, for long-continued series of systematically reduced observations, particularly those of global significance, and urged that adequate support be made available for such work.*

11 July 1983

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS XVII MEETING OF THE GENERAL COMMITTEE

The XVII Meeting of the General Committee of ICSU was held in Warsaw, Poland on 4 and 5 August 1983. Some of the Resolutions adopted by the General Committee are reproduced below.

ICSU Abstracting Board

The General Committee

recommends to the XX General Assembly that the status of the ICSU Abstracting Board as a Permanent Service of ICSU be terminated and further *recommends* that the appropriate modes of cooperation between the Abstracting Board and the ICSU family be determined after the Abstracting Board has established its new structure and objectives.

Global Change

The General Committee

resolves to establish an Ad hoc Committee to carry out a study of those aspects of Global Change which are not yet adequately covered, to prepare an inventory of existing programmes and their inter-relations, and to make recommendations to the XX General Assembly for further planning in fields that are interdisciplinary and require international cooperation.

Effects of Nuclear War

The General Committee,

recalling the Resolution of the XIX General Assembly to make an assessment of the biological, medical and physical effects of the large-scale use of nuclear weapons,

noting the action already taken by the Executive Board to set up a special committee for this assessment,

urges all ICSU adhering bodies to send appropriate proposals to the special committee,

and *noting* with satisfaction that, at the request of the Executive Board, SCOPE is undertaking a study on the Environmental Consequences of Nuclear War,

urges the Executive Board and the ICSU adhering bodies to give their full approval and support to this undertaking and to make appropriate additional inputs.

NEWS FROM MEMBER COMMITTEES

EGYPT: NATIONAL RADIO SCIENCE SYMPOSIUM 1984

The Second National Radio Science Symposium will be held in Cairo at the Military Technical College from 10 to 12 March 1984.

The scientific programme will include the subjects covered by all the URSI Commissions. The Chairman of the Programme Committee is Prof. Dr. Abd El-Samie Mostafa.

FRANCE: 2e COLLOQUE NATIONAL SUR LA COMPATIBILITE ELECTRO-MAGNETIQUE

Le 2ème Colloque National sur la Compatibilité Electro-magnétique a eu lieu à Trégastel du 1er au 3 juin 1983. Les Actes de ce Colloque peuvent être obtenus, au prix de 170 FF, en s'adressant à

Mme Trambly
Actes CEM
CNET-BP 40
F-22301 Lannion Cedex, France.

USA: NATIONAL RADIO SCIENCE MEETING, 11-14 January 1984

This open scientific meeting, which will be held at the University of Colorado, Boulder, CO 80309, is sponsored by the US Member Committee of the International Union of Radio Science. It is being held in cooperation with the IEEE Antennas and Propagation Society, IEEE Circuits and Systems Society, IEEE Electromagnetic Compatibility Society, IEEE Geoscience Electronics Society, IEEE Microwave Theory and Techniques Society, IEEE Information Theory Group, IEEE Instrumentation and Measurement Society, IEEE Nuclear Plasma Sciences Society, and the IEEE Wave Propagation Standards Committee.

The following USNC/URSI Commissions will take part: A (Electromagnetic Metrology), B (Fields and Waves), C (Signals and Systems), D (Electronics and Optical Devices and Applications), E (Electromagnetic Noise and Interference), F (Remote Sensing and Wave Propagation - Neutral Atmosphere, Oceans, Land, Ice), G (Ionospheric Radio and Propagation), H (Waves in Plasmas) and J (Radio Astronomy).

Papers on any topic of interest to a Commission are welcome, but in addition certain topics will be emphasized as indicated in the later Call for Papers. The deadline for the receipt of abstracts is 1 October 1983.

For further information, contact the Steering Committee Chairman:

Prof. S.W. Maley,
Department of Electrical Engineering,
University of Colorado,
Boulder, CO 80309, USA.

4TH INTERNATIONAL CONFERENCE ON INTEGRATED
OPTICS AND OPTICAL FIBER COMMUNICATION

This International Conference, which was held in Tokyo, Japan from 27 to 30 June 1983, was the fourth in a series which started in 1977 (Tokyo), and was continued in 1979 (Amsterdam) and 1981 (San Francisco). It was organized by the Institute of Electronics and Communication Engineers of Japan and the Institute of Electrical Engineers of Japan, in cooperation with other Japanese, American and Western European Electronics Societies. The 5th Conference will be held in

Venice in October 1985. The Tokyo Conference was co-sponsored by URSI. The Chairman of the Programme Committee was Professor Yasuharu Suematsu of the Tokyo Institute of Technology.

The Conference was a major scientific event, mainly in the field of optical fiber technology and communication. It was attended by nearly 1,000 participants at the Keio Plaza Hotel with its very convenient technical and social arrangements.

The keynote address "Information Network Systems and the Rôle of Optical Technology" was presented by Dr. Y. Kitihara, Vice-President of the Nippon Telephone and Telegraph Public Corporation.

The programme of the Conference included three groups of sessions:

I. Fiber manufacturing; Fiber mode coupling; Fiber measurements; Single mode fiber transmission; Fiber polarization; Guided wave components; Grating components; Fiber cables and joints; Undersea systems and cables; New fiber materials.

II. Diode lasers; Monolithic integration; Single longitudinal mode lasers; Light source reliability; Laser characteristics; Avalanche photodiodes; Functional laser devices; Modulators and their applications; Acousto-optic devices and Spectrum analyzers.

III. Systems and equipment; Fiber sensors; Fiber transmission systems; Fiber transmission and applications; Local area networks; Passive and active components; Switches and modulators; Subscriber systems; Components and their performance; Coherent transmission.

A total of 250 papers were presented, including 40 invited and 20 post deadline papers. Four-page summaries are contained in two Technical Digests which are available from the Business Centre for Academic Societies of Japan (20-6 Mukagaoka 1-chome, Bunkyo-ku, Tokyo 113, Japan).

During the Conference, an exhibition of the Japanese industry was organized presenting the progress in the technology of fibers, optoelectronic devices and measuring equipment.

The 4th International Conference on Integrated Optics and Optical Fiber Communication showed the present state-of-the-art in this field and the future perspectives of this exciting technology.

COMMISSION F SYMPOSIUM ON WAVE PROPAGATION AND REMOTE SENSING

This Symposium, which has been very successful, was held at Louvain-la-Neuve, Belgium from 9 to 15 June 1983. There were 101 participants coming from 20 countries. The presence of delegates from several developing countries was highly appreciated.

The programme included six review papers, namely

- D. Gjessing: Common grounds to propagation and remote sensing.
- R. Bolgiano: Wave propagation: turbulence in clear air.
- P. Delogne: Wave propagation through precipitations
- Ph. Waldteufel: Physico-chemistry of the atmosphere: less-known phenomena and their importance for electromagnetic wave propagation.
- K.J. Button: Millimeter waves: new potentialities and technological developments.
- E. Lueneburg: Wave scattering by random surfaces and application to natural surfaces.

The scientific level of the some sixty regular papers was very good. Very significant results were presented on some topics as water vapour absorption, turbulence and atmospheric refractivity, propagation aspects related with radiometry and communications, geotomography. A workshop was held on the influence of multipath effects on communication systems.

The Symposium was continued by a two-day meeting of the CCIR IWP 5/3 "Influence of the non-ionized regions of the atmosphere on wave propagation", chaired by Dr. F. Fedi.

URSI INTERNATIONAL SYMPOSIUM ON ELECTROMAGNETIC THEORY

This triennial event, held regularly since the middle of the fifties, represents one of the major URSI efforts between General Assemblies. It was held in Santiago de Compostella, Spain, from 23 to 26 August 1983, under the chairmanship of Prof. M. Rodriguez Vidal, President of the URSI Committee in Spain. Prof. Rodriguez Vidal was ably assisted by Dr. Sebastian, a 7-man strong Organizing Committee, and a Technical Programme Committee consisting of a group of 17 experts representing several nationalities. Some 210 participants from 26 countries attended the Symposium and its well-balanced programme. Financial assistance was provided for 10 Young Scientists.

The scientific activities started with a most interesting lecture on Solitons, given by P.L. Christiansen. A total of 27 sessions were organized, subdivided into three parallel groups of nine and embodying some 175 papers. The titles of the papers and sessions faithfully followed the present trends in electromagnetic research. The Symposium had the advantage of being held in a delightful medieval city, the smallness of which favoured extensive after-meeting contacts between participants. These contacts were made even easier by the three receptions generously offered by our Spanish hosts, a most memorable banquet held in the superb medieval Franciscan convent and, last but not least, the great cordiality and good spirits of our Spanish colleagues.

The Proceedings of the Symposium may be obtained from:

Prof. J.L. Sebastian,
Departamento de Electricidad y Electronica,
Facultad de Ciencias Fisicas,
Universidad Complutense de Madrid,
Ciudad Universitaria,
Madrid 3, Spain

or from

Prof. J. Rivas Rey,
Departamento de Electricidad y Magnetismo,
Facultad de Ciencias,
Universidad de Santiago,
Santiago de Compostella, Spain

at the price of US\$40 per copy, plus \$3.75 for postage.

12 September 1983

J. Van Bladel

ANNOUNCEMENTS OF MEETINGS AND SYMPOSIA

9th European Conference on Optical Communication, ECOC 83

As already announced in the December 1982 issue of the *URSI Information Bulletin*, this Conference will be held from 23 to 26 October 1983 in Geneva, Switzerland.

The titles of the sessions are as follows:

Fibre technology; Fibre splicing and coupling; Long wavelength diode lasers; Diode lasers and LED's; Diode laser noise; Photo-detectors and optical receivers; Fibre measurement techniques; Fibre cables; Integrated optics; Fibre and waveguide properties; Long distance fibre transmission systems; Fibre optical communication; Fibre components and sensors; Fibre broadband and subscriber networks.

After the conference, the Proceedings (including all post deadline papers) will be available from:

North-Holland Publishing Company,
Book Order Department,
P.O.Box 211,
1000 BZ Amsterdam, The Netherlands.

XXV Plenary Meeting of COSPAR

The XXV Meeting of COSPAR and Associated Activities will be held in Graz, Austria, from 25 June to 7 July 1984.

Below is a list of the scientific events scheduled for this Meeting:

Symposia:

1. Achievements of the IMS (SCOSTEP/COSPAR)
2. Solar Maximum Analysis (SCOSTEP/COSPAR/IAU)
3. Planetology of Venus, Mars, and Satellites of Outer Planets (COSPAR/IAU/IAGA/IAMAP)
4. Space Observations for Climate Studies (COSPAR/WMO/IAMAP/UNEP/SCOR/URSI/SCAR)
5. First Achievements of MAP (COSPAR/SCOSTEP)

6. Nucleosynthesis and Acceleration of Cosmic Rays (COSPAR/IAU/IUPAP/SCOSTEP)
7. Advances in Ballooning Science and Technology (COSPAR)
8. Shocks and Acceleration Processes in Collisionless Plasmas (COSPAR/IAGA/SCOSTEP)
9. The Physics of the Magnetosphere-Ionosphere Connection (COSPAR/SCOSTEP/IAGA/URSI)

Workshops:

- I. Satellite Remote Sensing of Interest to Developing Countries (COSPAR/IUGS/UN/UNESCO/COSTED/AGID)
- II. Recent and Proposed Sensor Systems (COSPAR)
- III. Venus Atmosphere (including Venus Reference Atmosphere) (COSPAR/IAGA/IAU/IAMAP)
- IV. Space Debris (COSPAR)
- V. Promotion of Space Research in Developing Countries - Formulation of Plans for Future Activity (COSPAR/COSTED/UNESCO/UN)
- VI. Balloon Technology and Related Problems (COSPAR)
- VII. Planetary Protection (COSPAR)
- VIII. International Reference Ionosphere (COSPAR/URSI)
- IX. Advances in the Applications of Space Sciences to Hydrological Investigations (COSPAR/IAHS/WMO)
- X. Proposed New CIRA and Related Models and Data (COSPAR/IAGA/SCOSTEP/IAMAP)
- XI. Gravitational Biology - The g-Scale Factor (COSPAR)

Topical Meetings

- A.1 Inter-comparison of Stratospheric/Mesospheric Data
- A.2 Data Processing Techniques
- A.3 Analysis of Deforestation and Desertification Processes
- B.1 Dust-Magnetosphere Interactions
- B.2 Halley Up-Date
- B.3 Asteroid Missions
- B.4 Studies of Collected Samples of Interplanetary Dust (possibly to be included in an IAU Colloquium)
- B.5 Physical Properties and Distribution of Interplanetary Dust (possibly to be included in an IAU Colloquium)
- D.1 Plasma Circulation in the Magnetosphere
- E.1 Space Observations of Fine Structure related to Solar Magnetic Fields
- E.2 Space Observations of Solar Global Properties: Output Variabilities and the Solar Interior
- E.3 Infrared Astronomy from Space
- E.4 X-Ray Astronomy

- E.5 Science and the Space Telescope
- F.1 Long-Term Effects of Weightlessness
- F.2 Cancelled
- F.3 Cosmic Chemistry, Chemical and Biochemical Evolution
- F.4 Space-Flight Results
- F.5 Rôle of Radiation (ionizing and UV) in Prebiotic Formation of "Biological" Molecules
- F.6 Life Support Systems in Space Travel
- F.7 Prebiotic Evolution during the First 10⁹ Years of the Earth's History
- F.8 Radiation Standards for Space Flight
- F.9 Perspectives of Global Biogeochemical Cycles: Towards a Science of the Biosphere
- G.1 Scientific Results and Developments of Materials Sciences in Space
- P.1 Satellite Orbit Determination.

In addition, an Evening Session on "What is Life?" will be organized by COSPAR Commission F.

The First Circular on the XXV COSPAR Meeting has been circulated in June 1983. The Second Circular will be sent out in September/October 1983. Copies of these Circulars may be obtained from:

COSPAR Secretariat,
51 boulevard de Montmorency,
F-75016 Paris, France.
Telephone: 525 0679.

Solar Terrestrial Prediction Workshop 1984

This Workshop will be organized from 18 to 22 June 1984 at the Observatoire de Meudon, France, by the International Ursigram and World Days Service (IUWDS). It is cosponsored by URSI and several other Scientific Unions. It will be held in the week preceding the Graz COSPAR meeting.

In two relevant fields, respectively the Magnetosphere and the Solar Activity, international study programmes have recently been carried out under the auspices of SCOSTEP and

of the relevant Scientific Unions. Such programmes should supply the forecasting techniques with new views which need to be discussed among the forecasters, the prediction users and the scientists.

This Workshop is a kind of follow up to the Solar Terrestrial Prediction Workshop held in 1979 at Boulder, USA.

The following topics have already been suggested:

- Long term (years) solar prediction
- Medium term (months) solar prediction
- Short term (days) solar prediction
- Geomagnetic activity and aurora forecast
- Ionospheric prediction
- General topics.

The Chairman of the Organizing Committee is Dr. P. Simon, and the members are H. Coffey, Th. Dambolt, G. Heckman, A.P. Mitra, T. Ogawa, B.M. Reddy, K. Stasiewicz, E.A. Tandberg-Hanssen, R. Thompson and P. Triska.

For further information, apply to:

Dr. P. Simon,
DASOP,
Observatoire,
F - 92195 Meudon Principal Cedex,
France.

9th International Conference on
Infrared and Millimeter Waves

This International Conference will be held from 22 to 26 October 1984 at Osaka, Japan. It is being co-sponsored by URSI.

The programme will cover progress in all aspects of infrared and millimeter waves, with special emphasis on new fields of research. A non-limitative list of main subjects includes the following topics:

- 1) Sources
- 2) Detectors, receivers, mixers, and amplifiers

- 3) Guided propagation and components
- 4) Spectroscopic techniques
- 5) Spectroscopy of solids, liquids and gases
- 6) Astronomy and aeronomy
- 7) Applications in biology and medicine
- 8) Plasma interactions and diagnostics
- 9) Technical and industrial applications
- 10) Related areas of basic science and novel applications.

Further information available from:

Prof. Akiyoshi Mitsuishi,
Conference Secretary,
Department of Applied Physics
Osaka University,
Yamado-Oka, Suita, Osaka 565, Japan.

International MAP Symposium 1984

This Symposium will be held from 26 to 30 November 1984 in Kyoto, Japan. It will be organized by the MAP Committee in Japan, acting with the approval of the International MAP Steering Committee. It is being co-sponsored by SCOSTEP, URSI, IAGA, IAMAP and COSPAR.

The general aim of the Symposium is to provide a review and to discuss the scientific achievements that have taken place so far during the period of MAP (1 Jan 1982 - 31 Dec 1985) and to aid in establishing closer and more fruitful cooperation in the latter phases of this global enterprise.

The scientific programme will have the following five topical sessions:

- 1) Climatology of the Middle Atmosphere
- 2) Large-scale Wave Dynamics
- 3) Gravity Waves and Turbulence
- 4) Transport Processes of Trace Species and Aerosols
- 5) MAP in the Antarctica.

Each session will be composed of invited keynote talks and contributed papers.

A second circular, including the Call for papers, will be sent out in December 1983. The deadline for the submission of papers will be April 1984. The acceptance of contributed papers will be announced by the end of May 1984. A third circular giving the details of session schedules, accommodation and other information will be sent in June 1984.

All correspondence and enquiries should be sent to:

Prof. Susumu Kato,
Chairman of the Organizing Committee of the
International MAP Symposium Kyoto 1984,
Radio Atmospheric Science Centre,
Kyoto University,
Gokanosho, Uji, Kyoto 611, Japan.

