
U. R. S. I.

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URSI BULLETIN

On the recommendation of the Finance Committee and the URSI Council at their meetings in Warsaw, reductions will be made in the expenditure on URSI publications during the period 1973-75.

In Circular Letter URSI-M212 dated 19 December 1972, Member Committees were invited to comment on the contents of the *URSI Bulletin*. The replies already received from Committees are being studied. Replies from other Committees and comments from readers in general will be welcome.

It is intended, in future, to reduce the length of articles and notices dealing with more specialised matters. A summary of the subject will be given together with an address from which further information can be obtained by those who are interested in receiving more detailed information.

ELECTROMAGNETIC MEASUREMENTS AND STANDARDS

The following letter was sent out in March 1973 to the Official Members of Commission I whose names and addresses were published in *URSI Information Bulletin* No. 185. The Resolution to which Mr. Bailey refers appeared in *URSI Information Bulletin* No. 184 and has not been reproduced here.

* * *

Ref. NPE 4/012

Division of Electrical Science,
National Physical Laboratory,
Teddington, Middlesex TW11 OLW,
England.

To Official Members of URSI Commission I

Dear Colleague,

At the General Assembly held in Warsaw in August 1972, URSI Commission I resolved to compile a list of national laboratories responsible

for electromagnetic measurements and standards. The full text of the resolution (I.1) is attached to this letter. With the rapid growth of international cooperation in the field of radio-frequency and microwave measurements, it was felt that the production of such a list would be both timely and useful.

I have been asked by Mr. P. O. Lundbom, Chairman of URSI Commission I, to make arrangements to compile the list. A small Working Party met in October 1972 and agreed that, as a first step, I should write to all Official Members of Commission I to ask for their cooperation and assistance.

Would you please write to let me know which organisation in your country is responsible for the provision and maintenance of national standards for electromagnetic measurements? Would you please also tell me which organisation is responsible for providing high-level calibration facilities? In many cases one organisation will doubtless be responsible for both, but I know of some cases where this is not so and must therefore ask the two questions separately.

When I receive this information from you I shall want to send a number of questions to these organisations, either directly or through you, as you wish. In either case I will make sure that you are informed of progress.

The type of information which I shall need from the organisations concerned will include the following, but respondents will be at liberty to add other quantities of interest :

- (a) Basic electrical standards (e.g. Ampere, volt, ohm, AC/DC transfer);
- (b) Other DC and LF quantities as relevant to radio science and technology, including the calibration of ratio devices;
- (c) Time and frequency;
- (d) RF, microwave, millimetric and sub-millimetric quantities, (e.g. power, attenuation, impedance, noise, etc.);
- (e) Laser power and energy.

In each case I shall want to know the frequency range covered, the type of wave guidance (lumped circuit, coaxial line or waveguide, etc.), the range of values of the measured quantity covered, and the uncertainty. It is not intended that exhaustive details of all specific measurements or standards available at the responsible laboratories should be provided, but rather brief summary information giving an overall perspective of the capabilities. In order to ensure that the information supplied by different organisations is compatible, I shall give some guidance on the form in

which it should be presented, while leaving people the maximum freedom in expressing data in the way which suits them best.

On the basis of the replies to these letters, I shall hope to prepare a draft register of standards laboratories and their facilities by the end of 1973. I shall circulate this to give everyone who has contributed to it an opportunity to make any additions or corrections they wish during 1974. I shall then prepare a final register for presentation to Commission I in time for the next General Assembly in 1975.

I am looking to cooperating with you in this project. I am sure that the register will fulfil a very useful purpose.

Best wishes,

Yours sincerely,
A. E. Bailey.

UTC : VELOCITY OF LIGHT

The versions of Recommendations 1.4 and I/VII.1 which appeared in *URSI Information Bulletin* No. 184 (pp. 17 and 18, and pp. 55 and 56) have been replaced by slightly revised texts which appear in *Proceedings of URSI General Assemblies*, Vol. XVI. The definitive English and French texts are reproduced below.

1.4. — UTC

Commission I,

considering

(a) that the General Conference on Weights and Measures (CGPM) and the International Committee on Weights and Measures (CIPM), in accordance with URSI Recommendation 1.4 (Ottawa 1969) and IAU (Commission 31) Resolutions 4 and 5 (Prague 1967), have defined and introduced the International Atomic Time Scale (TAI) based on the International System (SI);

(b) that CCIR has recommended the use of Coordinated Universal Time (UTC), based on TAI, for all standard time-signal emissions;

(c) that it is desirable to introduce, on a world-wide scale, a single coordinated time scale;

(d) that TAI could be made available everywhere if the standard time disseminated in all countries conformed with the UTC System;

recommends that CIPM/CGPM be invited to recommend the adoption of UTC as the basis for the dissemination of standard time in the countries adhering to the Metre Convention.

I/VII.1. — VELOCITY OF LIGHT

Commissions I and VII,

considering

(a) that it is increasingly important to know the velocity of light to an accuracy greater than that with which the unit of length based on the metre can be realised;

(b) that there have been important recent developments in stabilised lasers and in chains of frequency multipliers extending up to frequencies in the optical region;

(c) that these developments may make it possible to attain the following objectives : (i) the definition of the units of length and time on the basis of the same atomic or molecular transition resulting in a fixed value for the velocity of light; (ii) the realisation of a considerably improved standard of length;

recommend

1. that, in order to attain the objectives listed under (c), more attention should be given to the development of such devices as those referred to in (b) and preferably to the extension of their operation up to frequencies in the visible region;

2. that, with the objective of ensuring the continuity of the units of length and time, a world-wide programme be organised for the most accurate measurements of the frequencies and wavelengths corresponding to a number of suitable atomic and molecular transitions.

* * *

1.4. — TEMPS UNIVERSEL COORDONNÉ

La Commission I,

considérant

a) que la Conférence générale des poids et mesures (CGPM) et le Comité international des poids et mesures (CIPM), conformément à la Recommandation 1.4 de l'URSI (Ottawa 1969) et aux Résolutions 4 et 5 de la Commission 31 de l'UAI (Prague 1967), ont défini et introduit l'échelle de Temps Atomique International (TAI), basée sur le Système international d'unités (SI);

b) que le CCIR a recommandé l'utilisation du Temps Universel Coordonné (TUC), basé sur l'échelle TAI, pour toutes les émissions de signaux horaires;

c) qu'il est souhaitable d'introduire, à l'échelle mondiale, une échelle unique de temps coordonné;

d) que l'échelle TAI pourrait être obtenue en tous lieux à condition que les signaux horaires soient diffusés dans tous les pays conformément au système TUC;

recommande d'inviter le CIPM et la CGPM à recommander l'adoption du système TUC comme base pour la diffusion des signaux horaires dans les pays adhérant à la Convention du Mètre.

I/VII.1. — VITESSE DE LA LUMIÈRE

Les Commissions I et VII,

considérant

a) l'importance croissante qu'il y a à connaître la vitesse de la lumière avec une précision dépassant celle qui peut être obtenue avec l'unité de longueur basée sur le mètre;

b) les développements notables intervenus récemment dans le domaine des lasers stabilisés et des chaînes de multiplicateurs de fréquence atteignant les fréquences optiques;

c) la possibilité offerte par ces développements de parvenir aux buts suivants : (i) définition des unités de longueur et de temps à partir d'une même transition atomique ou moléculaire avec, comme résultat, l'obtention d'une valeur fixe pour la vitesse de la lumière, (ii) mise au point d'un meilleur étalon de longueur,

recommandent

1. qu'afin d'atteindre les buts en *c*), une attention accrue soit consacrée au développement des dispositifs cités en *b*) et, en particulier, à la possibilité de leur utilisation aux fréquences dans la région visible;

2. qu'afin d'assurer la continuité des unités de longueur et de temps, un programme mondial soit organisé pour mesurer avec la plus grande précision possible les fréquences et longueurs d'ondes correspondant à un certain nombre de transitions atomiques et moléculaires appropriées.

**REPORT ON COMMISSION III
BUSINESS MEETINGS HELD IN WARSAW
AUGUST 1972**

1. — REVISED STRUCTURE OF COMMISSION III.

The Commission agreed that, in order to fulfil its obligations to the international ionospheric community, a structure comprising active Working Groups (dealing with both scientific and practical aspects of ionospheric physics) was required. Although the relative importance of some radio techniques may be decreasing, coordination of these with other types of experiment is necessary and some newer ionospheric radio techniques such as digital sounding, artificial heating, propagation experiments involving satellites, and incoherent scatter are currently increasing in importance. Satellite communications still require a knowledge of, for example, the total electron content and ionospheric scintillations.

There was currently a general feeling that, unless Commission III of URSI was reorganised, some scientists, particularly those interested in aeronomy and plasma physics, would look to other international bodies for a home. The Commission, therefore, after discussion of the legitimate interests and fields of activity of URSI, recommended the creation of ten Working Groups within the Commission. The scope and Officers of the new Working Groups appear elsewhere in this Bulletin.

2. — METHOD OF OPERATION OF THE NEW WORKING GROUPS AND THE RESPONSIBILITIES OF THEIR CHAIRMEN.

Each Working Group will contain 5-10 members appointed bearing in mind regional and disciplinary balance, but no national representatives.

The Working Groups will meet at least once each year at some convenient scientific meeting, e.g. COSPAR, IAGA or CCIR, and each will produce an annual report describing its activities; these reports will be distributed to all the "correspondents" of the Groups, the correspondents being all the scientists actively working in the fields covered by the respective Groups. The annual reports should be distributed by the Working Group Chairman but, if this proves difficult, the Commission Chairman will arrange for distribution by URSI. Correspondents should be encouraged to provide material for inclusion in the Working Group reports, and the Working Groups may be able to obtain some URSI funds (through the Commission Chairman) to enable them to fulfil their obligations effectively. Open meetings of the Working Groups and their correspondents should be called whenever practicable, and notice of such meetings should be sent to the correspondents in good time. Any liaison between the URSI Working Groups and appropriate committees in other Unions must be arranged through the Commission III Chairman. The mailing list for individual Working Group reports should also include the Officers of all the other Working Groups of the Commission.

3. — RELATIONSHIPS BETWEEN URSI AND IAGA.

The Commission believed that some sort of coordinating committee should be established in order to rationalize the work done by IAGA and URSI Commission III in fields of joint interest. It was strongly felt in the Commission that there was a continuing need for an URSI Commission on the ionosphere, quite distinct from IAGA, but that some inter-Union rationalization was essential.

The URSI Council eventually passed a Resolution and a Recommendation relating to this problem. Resolution C.1 states that "Where consultation or collaboration between URSI and another Union seems to be desirable, the Board of Officers and the Chairmen of Commissions be encouraged to establish the appropriate direct contacts". Recommendation C.7 states that when it appears to be desirable, the Chairmen of Commissions III, IV and VIII should make every effort to organise joint meetings with IAGA and with other ICSU bodies.

4. — RESOLUTIONS AND RECOMMENDATIONS PASSED BY THE COMMISSION.

Resolutions or recommendations dealing with the subjects listed below were passed; the full texts of these will be found in *URSI Information*

Bulletin No. 184 (September 1972) and in *Proceedings of URSI General Assemblies*, Vol. XVI.

- Recommendation* III.1 : An international programme for producing electron density profiles.
- Recommendation* III.2 : The future of the URSI-STP Committee.
- Resolution* III.3 : The procedure for electing the Commission Vice-Chairman in future.
- Recommendation* III.4 : The new URSI Handbook for ionogram interpretation and reduction.
- Recommendation* III.5 : The solar events of August 1972.
- Recommendation* III.6 : Sporadic E.
- Recommendation* III.7 : The 1973 symposia on the lower ionosphere.
- Recommendation* III.8 : Symposium on incoherent scatter.
- Recommendation* III.9 : Ionospheric drift observations.
- Recommendation* III.10 : Large arrays used for fine structure investigations.
- Recommendation* III.11 : Reduction of ionograms.
- Recommendation* III.12 : High-latitude incoherent scatter radars.
- Recommendation* III.13 : The Southern Hemisphere Ionosphere Studies Group.
- Recommendation* III.14 : Absorption measurements.
- Recommendation* III.15 : Regional cooperation in ionospheric research.
- Resolution* III.16 : Observations during magnetic storms.
- Resolution* III.17 : Ionosonde training programme.
- Recommendation* III.18 : The Ionospheric Network Advisory Group.
- Recommendation* III.19 : Digital recording.
- Recommendation* III.20 : Support for ionospheric stations.

5. — THE URSI-STP COMMITTEE.

Professor Beynon reviewed the history of the URSI-STP Committee which was supposed to coordinate the activities of the URSI Commissions concerned with solar-terrestrial physics. The arrangement did not work perfectly in practice, however, because active interest from Commissions II, IV, V and VIII had not really materialized.

Commission III decided, therefore, to recommend the abolition of the URSI-STP Committee in its present form (see Recommendation III.2) and to incorporate into the new Commission III Working Group structure those URSI-STP Working Groups relevant to the Commission.

6. — INCOHERENT SCATTER SYMPOSIUM.

The Commission agreed that a Symposium on incoherent scatter should be organised by the new Working Group 3.8 and that Drs Donahue, Gringauz, King and Mitra should also serve on the programme committee so as to represent interests outside the field of incoherent scatter; the desirability of discussing the use of incoherent scatter for investigating the ionosphere at low latitudes was stressed.

7. — ELECTION OF VICE-CHAIRMAN.

(a) The procedure to be followed in electing the Vice-Chairman in future was specified (see Resolution III.3). It was further agreed that only scientists who were both willing and qualified to serve in this capacity should be nominated in future, and that the names of the proposing countries should be included on the ballot sheets.

(b) It was recommended that Dr. J. W. King (UK) be elected Vice-Chairman in place of Professor Bowhill who would become Chairman after the Assembly.

8. — PROPOSAL FROM NEW ZEALAND TO HOLD A SYMPOSIUM THERE NEAR THE BEGINNING OF THE IMS.

This matter was left to Commission IV for action.

9. — URSI REPRESENTATION ON THE IUCSTP STEERING COMMITTEE FOR MONSEE.

It was recommended that Mr. W. R. Piggott (UK) be nominated as the URSI representative.

10. — SUPPORT FOR STATIONS IN DEVELOPING COUNTRIES.

It was recognized again that the routine operation of ionospheric stations often represented a heavy burden, particularly in developing countries. Where these stations produce results of world-wide, rather than local interest, continued efforts should be made to find adequate and stable solutions (of a special, regional or international character) to the problem of financing them (see Rec. III.20).

11. — VOTE OF THANKS.

A vote of thanks to the retiring Chairman, Professor K. Rawer, was passed with acclamation.

February 1973

J. W. King,
Vice-Chairman.

ADDRESS OF THE OUTGOING CHAIRMAN TO COMMISSION III OF URSI

Commission III has been largely divided on the question of reorganisation since many of its members had been looking forward to a merging of URSI with, or its replacement by, other existing or new Unions. The decision of the Council (to continue URSI) is loyally accepted and it is recognised that this decision is probably right for URSI as a whole.

However, now that this decision has been taken, it should not be interpreted as an invitation to continue as before. As a consequence of the decision, it is felt that drastic changes are needed:

- (i) a change of the internal structure and working style of the Commissions,
- (ii) better outside coordination,
- (iii) a re-engagement of URSI in responsibilities of its own which have not been exercised during the last decade.

The last point refers, in particular, to functions taken over by 'special bodies' which had been created with the intention of forming new organisations. Since this latter possibility is now excluded, and since URSI has decided 'to survive', it must necessarily take back its attributions.

Commission III has taken note of some pessimistic predictions which were expressed during the special meeting on reorganisation in Warsaw. It hopes and feels that the predicted deterioration of the Union can be avoided; this can be achieved provided

- (1) that the internal activity of URSI can be increased and maintained between Assemblies so as to attract a larger number of active scientists who should be allowed to cooperate with Working Groups as 'correspondents';
- (2) that URSI stops the dismantling of its genuine attributions in favour of other bodies; instead URSI should (a) establish better coordination with other Unions and with COSPAR; (b) strongly defend the position that the Unions must not allow those responsibilities that they can themselves carry to be transferred to other bodies.

This policy is proposed to URSI as a whole and, with the cooperation of the incoming Chairman, it has been applied in Commission III

- (i) by devoting about half of the time at the 1969 and 1972 General Assemblies to 'workshop sessions';

- (ii) by creating several Working Groups for the period 1973-1975, each headed by a Chairman and a Vice-Chairman, comprising a limited number of members and an unlimited number of correspondents;
- (iii) by taking over the advisory and instructional functions formerly executed by the URSI-STP Committee (whose efficient activity is gratefully acknowledged);
- (iv) by being prepared to accept responsibilities in present and future coordinated inter-Union programmes.

K. Rawer.

WORKING GROUPS OF URSI COMMISSION III
22 January 1973

3.1. — IONOSPHERIC NETWORK ADVISORY GROUP (INAG) :

Chairman : W. R. Piggott (UK).

Vice-Chairman : J. V. Lincoln (USA).

To assist the ionospheric network stations, and to serve as a means of communication between them and the scientific community.

3.2. — E- AND F- REGION DYNAMICS — OBSERVATIONS AND THEORIES :

Chairman : H. Kohl (FRG).

Vice-Chairman : H. Rishbeth (UK).

To coordinate theoretical and experimental work in the dynamics of the upper ionosphere.

3.2.1. — *Drift Observations* :

Chairman : K. Sprenger (GDR).

To coordinate measurements of horizontal movements in the ionosphere.

3.2.2. — *Travelling Ionosphere Disturbances* :

Chairman : P. Bauer (France).

To coordinate measurements of gravity-wave disturbances produced by ionospheric storms.

3.3. — IONOSPHERE-MESOSPHERE STUDIES INVOLVING ABSORPTION AND OTHER RADIO TECHNIQUES :

Chairman : E. A. Lauter (GDR).

Vice-Chairman : C. F. Sechrist, Jr. (USA).

To coordinate theoretical and experimental studies of the winter anomaly in absorption and other related phenomena.

3.3.1. — *Absorption Measurements* :

Chairman : H. Schwentek (FRG).

To coordinate measurements of ionospheric absorption in Europe and Japan.

3.4. — DATA PROCESSING IN IONOSPHERIC RESEARCH :

Chairman : S. A. Bowhill (USA).

Vice-Chairman : A. Haug (Norway).

To promote exchange of information and international agreement for the optimum processing and exchange of ionospheric data.

3.5. — PRODUCTION AND LOSS OF IONIZATION (INCLUDING FLARE EFFECTS) :

Chairman : L. Thomas (UK).

Vice-Chairman : A. D. Danilov (USSR).

To coordinate theoretical and experimental studies of the neutral and ion chemistry of the ionosphere.

3.6. — MORPHOLOGICAL MODELS OF THE IONOSPHERE :

Chairman : K. Rawer (FRG).

To coordinate the development of numerical and analytical models of electron density and related parameters of the ionosphere.

3.6.1. — *International Reference Ionosphere* :

Chairman : K. Rawer (FRG).

To develop, jointly with COSPAR, reference models of vertical structure of the ionosphere.

3.6.2. — *Complete Electron Density Profiles* :

Chairman : C. G. McCue (Australia).

3.6.3. — *Ionospheric Mapping* :

Chairman : R. Gallet (USA).

3.7. — RADIO EXPERIMENTS CONCERNING IONOSPHERE-MAGNETOSPHERE INTERACTIONS (joint with Commission IV) :

Chairman : J. W. King (UK).

Vice-Chairman : K. I. Gringauz (USSR).

To develop programmes for radio experiments for the IMS, and coordinate these with URSI scientists.

3.8. — INCOHERENT SCATTER :

Chairman : P. Bauer (France).

Vice-Chairman : J. V. Evans (USA).

To exchange experimental and theoretical information, and plan programmes using the technique of incoherent scatter.

3.9. — RADIO WAVE PROPAGATION IN THE IONOSPHERE :

Chairman : H. G. Booker (USA).

Vice-Chairman : C. Altman (Israel).

To coordinate the exchange of information on new scientific aspects of radio propagation in the ionosphere.

3.10. — HIGH-LATITUDE PHENOMENA INVOLVING THE IONOSPHERE (joint with Commission IV) :

Chairman : A. G. McNamara (Canada).

Vice-Chairman : W. H. Campbell (USA).

To promote the exchange of information on experimental and theoretical aspects relating to ionosphere behaviour outside the plasmopause ($L > 4$), and to act as a communication link between URSI and the Upper-Atmosphere Working Group of SCAR.

MOVEMENTS IN THE IONOSPHERE

URSI Recommendation III.9 (*URSI Inf. Bull.* No. 184) referred to the formation of a Sub-group of Working Group III.2 to coordinate measurements of F-region drifts. The Chairman of the Sub-group is Prof. K. Sprenger who has written to Official Members of Commission III and

other interested scientists. The text of Prof. Sprenger's letter (slightly edited) is reproduced below and it should be noted that Prof. Bowhill has since confirmed the membership proposed by Prof. Sprenger.

* * *

Dear Colleague,

It has been proposed that Sub-group 3.2.1 be composed of E. Kazimirovskij (USSR), A. Spizzichino (France), K. Sprenger (GDR) and possibly W. Pfister (USA) who, however, was not present at the Assembly and, therefore, unfortunately could not be contacted there. I have been asked to be the Chairman of this Sub-group and Dr. Spizzichino has agreed to continue acting as a "time coordinator" as he already did during the past three years of our European regional cooperation.

After discussion with some of us, Dr. Spizzichino, in a circular letter of October 6, 1972, proposed the following periods in 1973 and winter 1973/74 to be preferably used for coordinated simultaneous ionospheric drift (or wind) measurements by various radio techniques (spaced antenna, radar meteor, incoherent scatter) :

January 15-27, 1973	(February 12-17)		
March 12-24, 1973	(April 16-21)	(May 14-19)	
June 4-23, 1973	(July 16-21)	(August 13-18)	(September 17-22)
October 15-31, 1973	(November 12-17)	(December 17-22)	
January 14-26, 1974			

The periods given in the left-hand column are the main periods as referred to in item 3 of the Recommendation and have been selected mainly under the aspects of the scientific aims indicated in the preamble of the recommendation, whereas the additional periods put into brackets are facultative ones, proposed to those who wish to have a short recording period once a month. In any case, attention has been paid that the periods include the three Regular World Days of the respective months as defined by the International Geophysical Calendar.

Exchange of observational results for these periods should be arranged individually between the groups concerned, but information on the material available to the individual groups should be sent to my address in order to enable me to compile the information and to circulate it to all participants in our cooperation. Therefore, if you intend to participate and if you are willing to make your results available to other participants,

please inform me about the kind and extent of your observations for a first compilation to be prepared as soon as possible and to be sent to all those who respond to this circular. It seems clear already that there will be active participation of several stations in Europe, as hitherto, and in the Asiatic parts of the USSR. Additional participation of stations in other geographic regions would be particularly welcome, according to item 2 of the Recommendation.

Official Members of URSI Commission III receiving this circular are kindly asked to pass it on to workers in the field of ionospheric drift (or wind) measurements in their country if these are not included in the mailing list.

With best wishes for a good success of our joint efforts and for a happy new year,

Yours sincerely,

12 December 1972

K. Sprenger,
Observatorium für Ionosphärenforschung
DDR — 2565 Kühlungsborn
German Democratic Republic.

INCOHERENT SCATTER

A conference on incoherent scatter is being organised by URSI and will be held in Tromsø, Norway from 12-16 June 1973. Topics will include :

- Incoherent scatter technique.
- D-region, E-region and F-region studies.
- Structure and dynamics of the neutral atmosphere.
- Electric fields.
- Auroral zone phenomena.
- Ionosphere-magnetosphere interactions.

Abstracts (about 200 words or less) should be submitted to the Programme Committee Chairman, Dr. J. V. Evans, Lincoln Laboratory MIT, Lexington, Massachusetts 02173, to arrive not later than 30 March 1973.

AERONOMIC PROCESSES

A Symposium on Aeronomic Processes in the Stratosphere and Mesosphere will be held in Kyoto, Japan, during the IAGA General Assembly

9-21 September 1973. Those wishing to contribute short papers (10 min) are invited to send an abstract to

Prof. H. I. Schiff,
York University,
4700 Keele Street,
Downsview, Ontario M3J 1P3, Canada.

by 15 May.

In addition to a general survey lecture by Prof. M. Nicolet, there will be Sessions on Laboratory Measurements, Atmospheric Measurements and Aeronomic Models at which invited speakers will review particular aspects of the main subject.

IONOGRAM INTERPRETATION AND REDUCTION

The 2nd Edition of the *URSI Handbook of Ionogram Interpretation and Reduction* (Ed. W. R. Piggott and K. Rawer) was published in November 1972. The volume is published by the US Department of Commerce (Reference No. Report UAG-23) at US\$ 2,50, plus postal charges to countries outside the USA. Enquiries should be addressed to

National Climatic Center (Publications),
Federal Building,
Asheville, (NC) 28801, USA.

Important changes in some of the rules have been made since the first edition was published in 1961 and observers are invited to make themselves familiar with the changes so as to ensure uniformity in the procedures for reducing ionograms.

BEACON SATELLITES

Dr. R. Leitinger has distributed a Circular Letter dated 23 February 1973 to the COSPAR Beacon Satellite Group which maintains informal contact with those interested in satellite observations. The subjects treated in the Letter are :

Progress Report on ATS-F;
Status of INTASAT Project;

INTELSAT Satellites with beacons;
Punched card format for exchange of electron content data.

Interested persons who do not receive these Letters should write to

Dr. R. Leitinger,
Institut für Meteorologie und Geophysik,
Halbärthgasse 1, A-8010 Graz, Austria.

URSI BOARD OF OFFICERS

Meeting in Brussels, 29-30 March 1973

The principal questions discussed are summarised below.

POLITICAL NON-DISCRIMINATION

As a result of discussions in the URSI Council in August 1972, the following resolution was adopted :

The URSI Board of Officers,

considering that the objectives of URSI are purely scientific;

expresses the opinion

1. that URSI must observe a policy of political non-discrimination;
2. that, in accordance with the statement made by the 8th General Assembly of ICSU in 1958, scientists in all countries and territories have the right to adhere to or to associate with international scientific activity without regard to their race, religion or political philosophy;
3. that such adherence or association has no implications with respect to the recognition of the government of the country or territory concerned;
and, *acting* in accordance with Art. 16 of the Statutes,

resolves that, when organising Assemblies, Symposia or other meetings, URSI shall take all measures within its power to ensure respect for the fundamental right of participation, without any discrimination, of the representatives of every Member Committee of URSI and of invited observers.

ACADEMIES OF SCIENCE IN CHINA

It was noted that ICSU was anxious to ensure the participation, in the activities of ICSU and the Unions, of scientists associated with the

Academies of Sciences both in Pekin and in Taipei. Pending the completion of formal arrangements, the Board has recommended that ICSU should take steps to make such participation possible in practice as soon as possible.

COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY (CODATA)

Following recent changes in the terms of reference of the ICSU Committee on Data for Science and Technology, the Committee can now deal with geophysical and astronomical data. The Board recommends that the interested Unions and the Services of FAGS should discuss their future rôles in relation to the activities of CODATA.

COMMITTEE ON SCIENCE AND TECHNOLOGY IN DEVELOPING COUNTRIES (COSTED)

URSI has established contact with the reconstituted ICSU Committee on Science and Technology in Developing Countries and it is intended to make enquiries about possible ways in which radio scientists could assist the developing countries.

XVIII GENERAL ASSEMBLY OF URSI 1975

Invitations for this Assembly have been received from Peru (in 1966), Israel (in 1969) and Sweden (in 1972). Member Committees of URSI will be asked to express their preference by postal vote as recommended by the URSI Council in August 1972.

The following recommendations were made regarding the programme for the 1975 Assembly :

1. that the length of the General Assembly should be about the same as in Warsaw;
2. that the scientific sessions should not be restricted to review papers, but that there should be some opportunity for the presentation of the latest developments in radio science;
3. that further consideration should be given to the organisation of specialised symposia before or after the General Assembly;
4. that it is desirable to encourage a greater exchange of ideas between the Commissions and that the Commissions should organise as many joint sessions as possible;
5. that the Chairmen of Commissions V and VII should consult each

other so as to ensure that radioastronomers can attend certain sessions of Commission VII.

PUBLICATIONS

It was noted that some replies from Member Committees had been received to the enquiry about the contents of the *URSI Information Bulletin* (URSI-M212, December 1972). It was expected that other Committees would submit their views and it is intended to examine all the replies received later in the year.

As recommended by the Finance Committee in Warsaw, the cost of the Review of Radio Science 1973-75 will be recovered by an addition to the Registration Fee payable by delegates. The addition will be \$5 and all registered delegates will receive a copy of the Review which is to be edited by Prof. S. A. Bowhill.

INTERNAL REORGANISATION OF URSI

Prof. H. G. Booker (*Vice-President*) has been responsible, since 1972, for making contact with the Chairmen of Commissions III, IV and VIII with the intention of ensuring better coordination of the closely related activities of these Commissions (Rec. C.7 Warsaw 1972). The Board was concerned at the lack of progress made so far, but it expressed the opinion that it was desirable to think in terms of a single broadly-based URSI Commission in which emphasis would be on electromagnetic and hydro-magnetic wave propagation.

Several URSI-IUGG (IAGA) Inter-Union Working Groups are being set up to deal with particular scientific questions of interest to both URSI and IAGA.

Prof. V. V. Migulin (*Vice-President*) has agreed to consult the Chairmen of Commissions I, II, V, VI and VII about future changes in the terms of reference of their Commissions and to preside over a meeting to discuss this question.

The possibility of forming a Commission to deal with the propagation of electromagnetic waves and the transmission of information in biological media is under consideration. Contacts will be established with the biological Unions before any recommendation is made.

Further consideration is being given to the introduction of a scheme for the adhesion to URSI of individual members.

FINANCES

The Board noted that the further devaluation of the dollar in 1973 had invalidated the Budget for 1973-1975 approved by the URSI Assembly in 1972. Income from Member Committees and UNESCO grants will not change, since they are expressed in dollars. However, expenditure, most of which relates to currencies which have not been devalued, will be greater when expressed in dollars. In order to cover the resulting deficit, it is proposed to use part of the URSI reserve funds and to invite Member Committees to make a small additional contribution in 1974-1975 pending a review of the situation at the 1975 Assembly. The President and the Treasurer will write to Member Committees giving more details about this problem.

URSI SECRETARIAT

The Secretary General will not be a candidate for reelection in 1975. The Board has recommended

- (a) that a permanent URSI Secretariat should be retained in Brussels after 1975;
- (b) that, in view of the considerable amount of administrative work in the Secretariat, it is not necessary to appoint a scientist to work full-time as Secretary General;
- (c) that the Secretary General be appointed on a part-time basis in 1975 and that an Executive Secretary be designated to take charge of the Secretariat.

The President, Treasurer and Secretary General will examine these recommendations with the intention of submitting a candidate for election.

SCIENCE TEACHING

It was noted that Prof. Barzilai (Chairman, URSI Working Group on the Teaching of Radio Science) has received about a dozen replies to his letter enquiring about facilities for the training of radio scientists (URSI-R252, November 1972). Prof. Barzilai hopes to receive additional comments from Member Committees and will prepare an interim report for the Board of Officers.

NEXT MEETING

The Board of Officers will meet in Brussels on 28-29 March 1974.

URSI-STP COMMITTEE

Following the decision of the URSI Council in Warsaw (Rec. III/IV/VIII.1), the URSI-STP Committee has been reconstituted.

The Board of Officers has adopted the following terms of reference and membership of the Committee.

1. — TERMS OF REFERENCE

The objectives of the URSI-STP Committee are as follows :

- 1.1 To act as a link between URSI and the Special Committee for Solar-Terrestrial Physics of ICSU;
- 1.2 To maintain effective contact with the URSI Committee for Space Research, especially with respect to the exploitation of space vehicles for research in those branches of solar-terrestrial physics that are of interest to URSI.

2. — MEMBERSHIP

The membership of the URSI-STP Committee shall be as follows :

Chairman : The URSI Representative on the Bureau of the Special Committee for Solar-Terrestrial Physics of ICSU.

Members : The Chairmen of URSI Commissions III, IV and VIII.

The former Working Groups established by the Committee have been attached to the appropriate URSI Commissions.

1973 EUROPEAN MICROWAVE CONFERENCE

Brussels, September 1973

The 1973 E.M.C. will be held at Brussels University from 4 to 7 September 1973. It is organized with the support of Fabrimental, the Belgian Association of Metalworking, Mechanical and Electrical Industries, and with the cooperation of the Institute of Electrical Engineers (UK), the Institution of Electrical and Electronics Engineers (IEEE Region 8, Professional

Groups M. T. T., A. P., E. D.), and the Belgian Committee of URSI. The Conference is the third in a series which already comprises those held in London (1969) and Stockholm (1971). It incorporates the former Microwave-Optical Generation and Amplification Conference (MOGA), which has now joined forces with the E. M. C. There will be some 180 regular papers, arranged in three parallel sessions, and twelve invited papers.

The scope of the Conference is well outlined by quoting the titles of the invited papers, which are : Stability and convergence in analytical and numerical methods (Prof. Mittra, USA); Millimetre and optical waveguides (Prof. Unger, Germany); The tolerance problem in optimal design (Prof. Bandler, Canada); Integrated circuits in microwave receivers (Mr. Oxley, UK); Baritt and Gunn diodes as local oscillators (Dr. Weisglass, Sweden); Microwave tubes in the 1970's (Dr. Bryant, UK); Microwave acoustic components (Mr. Tournois, France); Reflector antennas (Prof. Rusch, USA); Microwave phased arrays (Dr. Stark, USA); Microwaves in non-communicate areas (Dr. Ramachandraiah, India); Propagation above 10 GHz (Dr. Fedi, Italy); Comparison of different microwave communication systems (Messrs. Dupuis and Goloubkoff, France).

Registration forms and the preliminary program can be obtained by writing to

Dr. G. Hoffman, Secretary General,
1973 European Microwave Conference,
St. Pietersnieuwstraat, 41,
B-9000 Gent, Belgium.

ELECTROMAGNETIC WAVE THEORY

London 9-12 July 1974

GENERAL

URSI is sponsoring a Symposium on Electromagnetic Wave Theory in 1974. It will be held in the Imperial College of Science and Technology, London at the invitation of the Royal Society and the Institution of Electrical Engineers.

There will be some residential accommodation for delegates at the Halls of Residence of Imperial College.

SCOPE

The theme of the Symposium will be the effective use of computer methods in electromagnetic wave theory, and at least one full Session will be devoted to this topic. A number of speakers will be invited to present reviews in this area.

The programme will cover, as at previous electromagnetic wave theory symposia, the areas of electromagnetic wave propagation and antennas.

The Organising Committee considers that it is opportune for special attention to be given to the following topics :

- Propagation under the Earth's surface.
- Open resonators.
- Propagation in multi-conductor systems.
- Optical waveguides.
- Phased arrays.

While the programme is devoted to electromagnetic waves, it is also considered appropriate to include acoustic surface wave propagation, because of its similarity to electromagnetic wave propagation.

As on previous occasions, the main emphasis will be on theoretical considerations, but papers with experimental results will be welcomed, particularly if they contribute to a better understanding of theory.

CONTRIBUTIONS

The Organising Committee intends to publish, in advance of the event, a digest of abstracts. Those wishing to offer contributions should submit abstracts of not more than three A4 pages (294×210 mm), including illustrations. This material will be required *not later than 1 December 1973* after which it will be assessed by the Programme Sub-Committee. Authors will be advised subsequently whether their offers have been accepted.

REGISTRATION

Registration Forms and further details about the programme will be available a few months before the event. Intending participants who wish to receive further information are invited to write to

IEE Conference Department,
Savoy Place,
London WC2R 0BL, UK.