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EXHIBITION AT THE KYOTO GENERAL ASSEMBLY

The Japanese Organizing Committee is planning a medium scale exhibition during the General Assembly. The exhibition will be held for three days : August 30, 31 and September 1, at the Event Hall of the Kyoto International Conference Hall, connected with the main building through a 80-meter long all-weather type passageway. On the first day of the exhibition, a large unified Poster Session will also be held in the same Event Hall. (The posters will be left for the following two days, but without attendants.)

Number of, and fee for the booths.

In the present plan 65 booths, 1.8m x 1.8m each, will be prepared. This number, however, could be increased if applications overflow. The fee to be paid by exhibitors will be 300,000 yen for a booth. Some booths (approximately ten) will be open to nonprofit organizations (universities, etc.) with reduced fee or without fee. The deadline for applications is 1 February, 1993.

The URSI Community, through its extensive contacts with Universities and organizations such as NASA, ESA, etc., is an important source of support for the planned Exhibition, which is the first one to be held in conjunction with a General Assembly. The Exhibition is intended to display equipment and documentation of high scientific value, and will therefore efficiently contribute to the attractiveness of the General Assembly. The readers of the Bulletin are therefore urged to encourage potential exhibitors to contact Dr. Furuhama.

Address : Dr. Yoji Furuhama
Chairperson of the Exhibition Committee
ATR Optical and Radio Communications Res. Labs
Seika-cho, Soraku-gun
Kyoto, 619-02 Japan
Tel. : +81-77490-5-1511
Fax : +81-7749-5-1509

NETWORK OF CORRESPONDENTS

The Members of URSI are the Committees established a territory by the Academy of Sciences or the Research Council, or by a similar institution or association of institutions (art. 3 of the Statutes). In an effort to increase contacts with individual scientists involved in URSI work, the Council approved the following resolution at the 1990 Prague General Assembly :
Network of Correspondents

The URSI Council,
noting the recommendations made by the URSI Standing Committee on Membership;
resolves that a Network of Correspondents be created within URSI according to the following scheme :

(i) any scientist attending a General Assembly will have an opportunity to register as a correspondent for a three-year period by paying a special fee when registering for the Assembly;
(ii) individual scientists not able to attend a General Assembly will be given the possibility of being included in the Network of Correspondents by applying direct to the URSI Secretariat and by paying the special fee;
(iii) scientists from developing countries will be included in the Network without any charge according to a mechanism still to be devised;
(iv) correspondents participating in the Network will be kept informed about the activities of the Union;
(v) they will have no voting rights, but will be allowed to express their views in the Commissions on matters of a scientific nature.

The URSI Board felt that it would be desirable to start the Network ahead of Kyoto, in order to have an idea of how the system might work before the General Assembly, where the main decisions must be made. The Network was therefore launched on the basis of the following membership :

(1) the President and Secretary of each Member Committee, plus the Official Members of the ten Commissions (i.e. a maximum of 12 per Member Committee). We added to these a few officials, such as our Honorary Presidents, and the Presidents of some Committees, bringing the total to about 420. These correspondents receive the "Bulletin" and "Radioscientist" individually, by KLM air service.

(2) for each Member Committee, a number of Correspondents which is a function of the Category chosen by the Committee. The numbers are : 12 for Category 1, 22 for Category 2, 32 for Category 3, 52 for Category 4, 92 for Category 5, 132 for Category 5A, and 172 for Category 6. The names appearing in (1) are included in these totals. The additional names receive the "Bulletin" individually, by KLM air service, provided their mailing addresses have been communicated to the Secretariat. Data have been received from the Committees in Australia, Belgium, Canada, China (SRS, Taipei), Denmark, Egypt, Finland, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Poland, Russia, South Africa, Sweden, the U.K. We now have a total of about 430 in that group, in addition to the 420 in (1).

(3) the subscribers to the "Radioscientist", some 130 of them, are automatically part of the Network.

When adding these figures, it becomes clear that about 1000 people form the Network at the present time, but their numbers will increase if more Member Committees send in their list. One of the present benefits of the Correspondent status is a reduced subscription rate for "Radio Science", a periodical published by the American Geophysical Union.

The present situation is of a transient nature, and the problem of an individual association with URSI (in the form of Correspondent, affiliate member, or some other title) is one of the main items on the agenda of the Kyoto General Assembly. The readers of the Bulletin are strongly urged to express their ideas on individual membership by writing to the Chairman of the Membership Committee :

Professor T.B.A. Senior
Radiation Laboratory
Electrical Engineering and Computer Science Department
The University of Michigan
Ann Arbor, MI 48109, USA
Tel. : (1) 313-764 3317
Fax : (1) 313-936 3492
Telex : 4320815 UOFM UI

NEWS FROM THE MEMBER COMMITTEES

FINLAND

The URSI Finnish Member Committee, the IEEE MTT/AP Finland Chapter and the Electromagnetics Laboratory of the Helsinki University of Technology will organise a Workshop on the theory and applications of novel microwave and millimetre wave materials. Among these media one may classify chiral media, as well as magnetic and bi-isotropic materials. The workshop will be held 1-4 February 1993 at the Electrical Engineering Department of the Helsinki University of Technology, Espoo, Finland. It will consist of invited reviews of representatives from different groups in the morning, and discussions and planning of joint research in the afternoon. There will be no registration fee. Special efforts will be made to invite Russian and Belarussian experts in the field of optical activity to the workshop. Excellent research has been performed by these colleagues, but their results have been mostly published in Russian, which makes hem less accessible to Western scientists. Academician Fedor Fedorov from the Belarussian Academy of Sciences in Minsk has promised to participate as a special guest.

The URSI community is invited to take part in the workshop. Review presentations and specific papers about the research on new materials in microwaves are welcome.

Contact : Workshop Organiser, Ari Sihvola
Helsinki University of Technology
Electromagnetics Laboratory
SF-02150 Espoo, Finland
Tel. (358-)0-4512261, Fax (358-)0-4512267
E-mail ari.sihvola@hut.fi

SPAIN

The Member Committee in Spain, chaired by Prof. J. L. Sebastian, has established (since 1980) the tradition of holding an annual meeting. This meeting is either organized by Commission B, or by the Member Committee as a whole. The last one was held on 23-25 September 1992

in Torremolinos, Malaga, and was organized by the Departamento de Ingenieria de Comunicacions of the Universidad de Malaga. The Organizing Committee was headed by Prof. Carlos Camacho Penalosa, Director of the Escuela Tecnica Superior de Ingenieros de Telecomunicacion of the Universidad de Malaga. The invited lecture on "Integral equation techniques for three dimensional microstrip structures" was given by Prof. Juan R. Mosig from the Laboratoire d'Electromagnetisme et d'Acoustique, Ecole Polytechnique Fédérale de Lausanne. There were 275 selected papers, presented in seven parallel sessions. The Symposium covered all URSI Commissions. The main areas of interest were : Antennas, Wave Propagation, Radiation and Scattering, Data Transmission, Satellite Communications, Optical Communications, Signals and Systems, Electromagnetic Metrology, Analytical and Numerical Methods, Signal and Image Processing, Electronic Devices, Teaching Electromagnetics and Computers in Microwave Laboratories. A special effort was made to invite a large number of postgraduate students to the meeting. The Proceedings of the Symposium have been published, in Spanish, in two volumes totalling 1210 pages.

The annual meeting of our Spanish colleagues is open to the international community. The 1993 edition will be held at the University of Valencia, probably in the last week of September. Those who wish to participate and receiver further information should contact Prof. Elias de los Reyes or Prof. M. Ferrande Batalle. Their address is :

Departamento de Comunicaciones
Escuala Tecnica Superior de Telecomunicaciones
Universidad Politecnica de Valencia, Valencia, Spain.

SWEDEN

The URSI Committee in Sweden organizes, every third year, an important Conference devoted to the various disciplines of our Union. The last one was held in 1990 at the Chalmers University of Technology, Gothenburg. Professor Rönnäng and Dr. B. Lindberg (Space Observatory of Onsala) were responsible for the organization. Some 150 technical papers were read, and the Conference was attended by 350 participants. The next Conference is scheduled for 5-8 April, 1993, in Lund.

The Swedish Committee celebrated its 60th anniversary on 20th of March 1991 by organizing a one-day meeting, held at several venues : Televerket Radio in Haninge, the Royal Academy of Sciences, and Ericsson Radio Systems in Kista. Several URSI personalities, such as Folke Eklund, P.O. Lundbom and H. Sterky, actively participated in the meeting. Dr. Sterky was Vice-President of URSI from 1946 to 1950.

UNITED KINGDOM

The 10th National Radio Science Colloquium of the UK Panel for URSI will be held in the Department of Electronic and Electrical Engineering, the University of Leeds, on Monday and Tuesday, 5-6 April 1993. Overnight accommodation will be at Devonshire Hall. The Colloquium comes right after the URSI co-sponsored "International Conference on Antennas and Propagation", which is held from 30 March to 2 April, 1993, in Edinburgh (see Bulletin of June 1992).

Abstracts of papers, not exceeding one A4 page, are invited on topics falling within any of the URSI Commission subject areas, viz.

A. Electromagnetic Metrology
B. Fields and Waves
C. Signals and Systems
D. Electronics and Photonics
E. Electromagnetic Noise and Interference
F. Wave Propagation and Remote Sensing
G. Ionospheric Radio and Propagation
H. Waves in Plasma
J. Radio Astronomy
K. Electromagnetics in Biology and Medicine

Abstracts must be submitted by 1st March 1993.

For further information, contact

Dr. H.J. Strangeways
Dept. of Electronic and Electrical Engineering
The University of Leeds
Leeds, LS2 9JT, UK
Fax (44) 532 332032

NEWS FROM THE COMMISSIONS

COMMISSION B

Commission B recently organized its most important meeting of the triennium, the Electromagnetic Theory Symposium, held in Sydney from 17 to 20 August, 1992. A scientific report on this meeting appears elsewhere in this Bulletin. Two Business Sessions of the Commissions were held during the Conference. Professor Gardiol reports on them as follows :

" Commission B delegates met on 18 and 19 August during the Electromagnetic Theory Symposium held in Sydney, Australia. The first session was devoted to informations, the second one to discussion and decisions.
The main item, as in previous events, was the determination of the next venue for the Symposium, in 1995. Two proposals were received :

- St. Petersburg, Russia. The invitation was made by Prof. V. Buldyrev and V. Babich, and presented orally by Dr. M. Ljalinov. A detailed document was distributed to the delegates.
- Newark, Delaware, USA. Professor Ralph Kleinman proposed to host the 1995 Symposium at the University of Delaware, and presented the details of the available facilities.

On 19 August, the delegates voted with a large majority in favour of the Russian proposal : the next Symposium will therefore be held in St. Petersburg in 1995. The proposed dates, 3-6 June, were found to be unsuitable for the US delegates, and it was requested thoroughly to investigate the possibility of holding the Symposium during the last week of May.
It was noted that, in many places, facilities must be booked long before the event, and that a 3-years lead time many not be sufficient.
It was therefore proposed, and accepted by the delegates, to select the venue for the 1998 Symposium during the 1993 General Assembly in Kyoto. Delegates were kindly invited to submit proposals to the Chairman of Commission B.

Special Issue of Radio Science

Professor A. Ishimaru reminded the audience that a special issue of the journal Radio Science will be devoted to the Sydney Symposium on EM

Theory. Delegates, technical programme committee members and session chairpersons were invited to indicate which authors should be invited to submit a paper for the special issue, based on their presentation in Sydney.

Individual "Membership" in URSI

URSI consists of about 40 Member Committees throughout the world. While some of them are in close contact with radio scientists in their countries, many others are not. As a result, too many radio-scientists do not feel any personal involvement with URSI. To correct this most unfortunate situation, it is proposed to introduce some kind of "personal membership" in URSI. Precautions should be taken to avoid confusion between different types of membership, and another term might be preferable (maybe correspondents?). Professor Tom Senior, past Chair of Commission B, and presently Chair of the URSI Membership Committee, outlined the proposal, at this time at a very preliminary stage, and asked for the general feeling of the audience. There was no opposition to have this proposal further developed : about 80% of the attendees were in favour of the proposal, while the remainder abstained.

1993 General Assembly, Kyoto, August-September 1993

Professor J. Bach Andersen, Scientific Programme Coordinator, presented the general lines of the organization of the General Assembly. Contributions are to be sent to the Japanese secretary, who will forward them to the relevant Commission Chairs, who in turn distribute them to the conveners. A green booklet "First Announcement" was recently sent to all Commission delegates.

Review of Radio Science 1990-1992

Professor Staffan Ström, Commission B editor, briefly reviewed the situation. Four articles were written by specialists and are undergoing the usual reviewing process. A good number of delegates already sent technical references from their country for the diskettes, and he expects to find the remaining one on his return to Sweden. Editors were appointed for the 8 sub-sections.

Vote of thanks

The audience manifested, by loudly applauding, its appreciation for the tremendous work carried out by Dr. Graeme James. Thanks to him, the Sydney Symposium on Electromagnetic Theory will remain in all the participants' memories as a particularly well organized 'no-problem' event. "

F. GARDIOL

Prof. F. Gardiol mailed the fifth Newsletter of the Commission in October 1992. In addition to details on the Sydney meeting, which appear elsewhere in this Bulletin, we note a report by E.V. Jull on the "Day on Diffraction :St.-Petersburg, Russia, June 1992". Of particular interest are data on the forthcoming Symposium on EM Theory, to be held in St.-Petersburg in 1995. Our Russian colleagues write :

" The proposed meeting will give an opportunity to improve the contacts between scientists of Eastern Europe and the whole world. Saint-Petersburg is one of the most beautiful cities in Europe. It has a population of more than five million. It is situated near the Finnish Gulf in the North West of Russia. St.-Petersburg is the second largest industrial, cultural and scientific centre of the former Soviet Union. More than forty museums and famous architectural buildings are waiting for visitors from all over the world.

Venue

It is proposed to hold the symposium in one of the largest hotels in the city, "Saint-Petersburg", which is in the old historical centre of the city on the Neva embankment. It has one large conference hall (700 seats) equipped with sound system. Two halls (100 seats) and one hall (50-70 seats) provide usual facilities to hold sessions. A large foyer can be used for registrations and information tasks. A poster session can be arranged in the foyer area. Thus, four sessions can be held in parallel, if required, and the fifth additional room will be available for committee meetings. The alternative variant is available in the Palace of Youth. This hotel has similar conveniences, and can also be arranged to hold the symposium. "St.-Petersburg" hotel is situated in the heart of the city and everything is essentially within walking distance. The other places of interest out of the centre can be reached by underground.

Accommodation

There are presently available more than 400 rooms in the "St.-Petersburg" hotel. There are other hotels in the central part not far from "St.-Petersburg" hotel with a daily rate ranging from $US 50- to $US 200+. We suppose that significant reductions can be expected for block bookings.

Travelling to St.-Petersburg

St.-Petersburg has an international airport connected with the largest cities of the world. It can also be reached from Moscow and Helsinki by train (8 hour journey) and by plane.

Proposed dates

It is planned to hold the symposium on 3-6 June 1995. At that time of the year, one can expect good warm weather, with the daytime temperature around 20°C. From the tourist's point of view, it can be one of the best times to visit St.-Petersburg. It should be noted that the Commission B meeting, in Sydney, requested to advance the dates by about one week, to the last week in May 1995.

Cost

We are definitely able to obtain financial support to conduct this event. We propose to set a registration fee of around $US 200. The fee would include a symposium digest for each delegate, morning and afternoon teas for each day, and one lunch for the first day. We hope that the other lunches will be paid for by the participants.

Organization

We have been responsible for organizing annual "Days on Diffraction", which are the all-union seminars. For the URSI Symposium, we can count on the active support of Drs. M.A. Ljalinov, I.V. Andronov, S. Yu. Slavyanov, V.V. Veremey, Yu. A. Tuchkin, and readily co-opt others as required. We are confident that we can organize the symposium to the high degree of competence and professionalism expected by delegates. We hope to get different kinds of support from the city Council, as well as from the Government.

Tourist Attractions

St.-Petersburg is famous for its museums, including the largest museum of art, "The Hermitage". We hope the visitors will enjoy its architectural buildings and beautiful views. The famous ballet school of St. Petersburg will show them the best performances. The city of St.-Petersburg is waiting for you.

For further details please contact :

Prof. V.S. Buldyrev
Institute of Physics
University of St.-Petersburg
Uljanovskaja 1-1
St.-Petersburg-Petrodvorec 198904
Russia

COMMISSION G

Dr. A.W. Wernik, Chair of the Commission, circulated an interesting questionnaire within his Commission entitled "Future of Ionospheric Studies". This questionnaire runs as follows

"Ionospheric studies are unimportant and obsolete. Scientists should switch to more important fields of science and engineering'

Statements like this are frequently heard from funding agencies and on conferences.

1. Do you share this view ?
2. If not, please
   a. substantiate your view
   b. specify the topics and open questions which you regard important for the future of ionospheric studies.

In particular we would like to have your views on the future trends in the following areas of interest to Commission G : ionospheric structure and physics, techniques and propagation.

Your answer would be very valuable for the future work of URSI's Commission G. It will also help our colleagues from the developing countries concentrate their studies on the most fruitful directions and to use their limited resources in the most effective way.

We plan to compile the answers and issue a report which will be distributed during the Kyoto General Assembly and possibly discussed at a special meeting in Kyoto. Names of all the contributors will be mentioned in this report.

Since we would like to have a broad response from people who care about the future of ionospheric studies please feel free to distribute copies of this questionnaire among your colleagues. "

Since the whole URSI Community is concerned with the future of our Union's Commissions, the readers of the Bulletin are welcome to let their views known to the Commission Officials.

Dr. A. W. Wernik (Chair) or
Polish Academy of Sciences
Space Research Center
Ul. Bartycka 18a
00-716 Warsaw
Poland
Fax (48) 39 121 273
E-mail : CBKPAN@PLEARN.BITNET

Dr. K. Schlegel (Vice-Chair)
Max-Planck-Institut für Aeronomie
Postfach 20
3411 Katlenburg-Lindau
Germany
Fax (49) 5556-401-240
E-mail : ECD1::LINMPI::SCHLEGEL

On 8 September 1992 Dr. Wernik mailed a Newsletter to his Commission, in which he discussed several items, viz.

1. the Commission's programme at the Kyoto General Assembly
2. A special session of Commission G in Kyoto
3. Election of the Vice-Chairman of the Commission
4. Reminder of deadlines for the Review of Radio science
5. The Commission G Questionnaire

On the "Special session on latest results". Dr. Wernik wrote :
"The flow of abstracts is different from what we have had in the past :

Author -> Organizing Committee -> Commission Chairman ->

-> Convener -> Commission Chairman -> Organizing Committee
-> Author

Since this flow is long the deadline for submission has been shifted to January 15, 1993. To allow for the presentation of important latest results our Commission allocated one time slot, 3 hours long, to the "Open Session and Latest Results" Symposium. Abstracts of papers submitted to this session will not be published. The deadline for this special session is May 15, 1993, and abstracts should be sent directly to the conveners, Dr. K. Schlegel (address given above), or to

Dr. A.P. Mitra
National Physical Laboratory
Dr. K.S. Krishnan Road
New Delhi 110012, India
telex 3177099 NPL IN

COMMISSION K

Professor M.A. Stuchly gives the following information on the Commission's Scientific Programme in Kyoto

"Preparations are well underway for the scientific programme in the area of Commission K "Electromagnetics in Biology and Medicine". The sessions are likely to be scheduled in the second part of the Assembly to facilitate attendance of those scientists who are only interested in the area of Commission K, as well as those mostly interested in other Commissions who are expected to be then able to find time to satisfy their interest in the new Commission.

A tutorial overview of research in bioelectromagnetics will be given by Dr. Ross Adey from the U.S., who at the last General Assembly in Prague presented a general lecture that drew a lot of interest. Professor Adey will talk about interactions of electromagnetic fields with living systems as well as medical applications. Two joint sessions are organized with other Commissions. A session on "Exposure Assessment and Measurements in Complex Environments" is convened by Dr. Lars-Eric Paulsson from Sweden (Commission K) and Dr. Moto Kanda from the United States (Commission A). Some of the topics covered are : exposure assessment for epidemiologic studies at power line frequencies, exposure from mobile communication, transient field measurements, contact currents. A joint session with Commission B is devoted to "Computational Electromagnetics in Biology and Medicine" is convened by Professor James Lin of the U.S. (Commission K) and Dr. S.N. Hornsleth of Denmark (Commission B). Analytical solutions and numerical techniques in evaluation of energy deposition in tissue at low and high frequencies from various environmental, occupational and medical exposures will be discussed.

The following sessions are organized by Commission K :

- "Interaction Mechanisms", convener Dr. Thomas Tenforde (USA). The topics are : extremely low frequency interactions, counter ions, resonant phenomena, cellular communication, interactions of pulsed microwaves, interactions with drugs and other chemical agents.
- "Health Effects", conveners Dr. Richard Saunders (U.K.) and Dr. D.L. Szabo (Hungary). The topics are : epidemiological studies, animal studies, cellular investigations, cancer related studies.
- "Electromagnetic Fields in Medical Diagnosis", convener Professor Masao Saito (Japan). The topics are : impedance and microwave imaging, MRI/MRS, electromagnetic nerve stimulation, microwave radiometry, psychological function monitoring and telemetry.
- "Therapeutic Applications of Electromagnetic Fields", convener : Dr. Bernard Veyret (France). The topics are : hyperthermia for cancer and other disease treatment, bone repair, soft tissue healing, nerve regeneration, osteoporosis treatment, in vivo electroporation, functional stimulation.

All sessions will consist of three to four invited overview presentations, and contributed platform poster presentations. There will be no competing sessions scheduled during the poster session.

As during the previous General Assemblies the Bioelectromagnetics Society (BEMS) has been co-operating in preparation of the scientific programme. Dr. James Lin, who is the U.S. Official Member of

Commission K, is the BEMS representative. Commission K is actively seeking future co-operation with other international as well as regional and national scientific organizations in the area of the Commission. Interested organizations are invited to contact the Commission Chair. "

M.A. STUCHLY
CHAIR COMMISSION K

Professor J.C. Lin, Official Member in the USA, reports on an URSI-organized meeting, at which there were contributions from Commission K :

"At the URSI Radio Science Meeting held on July 18-25 in Chicago, Illinois, the U.S. Commission K, under the leadership of Professor James C. Lin, organized and sponsored two technical sessions : one on **Electromagnetics in Biology and Medicine** and another on **Measurements for Biomedical Applications**. A standing-room-only crowd were presented with 15 papers which began with two invited reviews on biological effects and physical mechanisms of interaction between weak low frequency electric and magnetic fields with biological systems. The balance of the papers addressed radio frequency bioeffects and beneficial medical applications of electromagnetic fields and waves. Speakers for this first Commission K sponsored and organized session were from Europe, Asia and North America."

REPORTS ON URSI-SPONSORED MEETINGS

CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS

9-12 June 1992, Paris, France

En 1992, la Conférence sur les Mesures Electromagnétiques de Précision (CPEM'92) s'est réunie à Paris, du 9 au 12 Juin, dans le centre de conférences du CNIT (Centre des Nouvelles Industries et Technologies).
En général, les objectifs principaux de la conférence sont les suivants :

a) disséminer l'information concernant les principes et les techniques des mesures électromagnétiques de précision;
b) permettre aux scientifiques et aux ingénieurs concernés, par la recherche fondamentale relative aux étalons et aux mesures, d'une part, et par l'application de nouvelles techniques aux problèmes pratiques de mesure, d'autre part, de se rencontrer
c) d'encourager la coopération internationale et l'intercompa-raison de diverses réalisations de quantités d'intérêt physique et
d) d'accroître les contacts entre l'industrie et les laboratoires de métrologie, afin de contribuer au développement de l'activité économique.

La conférence se réunit tout les deux ans. Elle est organisée par les Laboratoires Nationaux de Métrologie. La conférence porte son nom actuel depuis la réunion de 1958 à Boulder (USA). Depuis 1974, elle est devenue itinérante. L'acceptation, par le Comité Exécutif de CPEM, de l'invitation du Bureau National de Métrologie a permis à la conférence de se réunier à Paris pour la première fois.

La conférence est placée sous le parrainage de l'IEEE Instrumentation and Measurement Society, l'Union RadioScientifique Internationale et le National Institue of Standards and Technology des USA.

L'organisation pratique de la conférence a été assurée conjointement par le Bureau National de Métrologie (BNM) et la Société des Electriciens et des Electroniciens (SEE), sous les impulsions respectives de M.J. Blouet et de Melle G. Bonami.

L'esprit de la conférence de 1992 a été similaire à celui des conférences précédentes. En résumé, les présentations ont eu pour sujet : la réalisation des unités, leur conservation, la mesure de constantes fondamentales, la métrologie Temps-Fréquence, la métrologie électrique et l'instrumen-tation associée.

Au total, 322 communications ont été proposées, ce qui constitue un record pour CPEM. 227 communications (représentant 27 pays) ont été acceptées, 110 pour présentations orales et 117 sous forme de posters. Le Comité des Programmes, présidé par P. Giacomo, ancien Directeur du BIPM, a retenu les propositions qui étaient les plus conformes avec les principaux sujets d'intérêt de la conférence et qui présentaient les progrès les plus significatifs obtenus durant les deux années passées.

Le nombre des inscrits s'est élevé à 325. Ce nombre est inférieur à celui qui était espéré, si l'on se réfère à l'afflux de communications proposées. A cet égard, nous regrettons qu'un certain nombre d'auteurs étrangers n'étaient pas été en mesure de venir présenter leurs communications, par manque de crédits de mission. La conférence favorise la venue de jeunes scientifiques : elle a pris en charge les frais de déplacement de 14 d'entre eux.

L'allocation d'introduction a été prononcée par le Dr. C. Audoin, Président de CPEM'92. Puis, M. J.Y. Yolin a souhaité la bienvenue aux participants au nom du Prof. H. Curien, Ministre de la Recherce et de l'Espace. Ensuite, le Prof. P. Aigrain, membre de l'Académie des Sciences, ancien Ministre de la Recherche et Conseiller scientifique du Président du groupe Thomson, a mis en évidence les relations étroites entre la métrologie et la haute technologie. Le Dr. P. Clapham, Directeur du NPL, a présenté une communication documentée et convaincante sur l'impact économique de la métrologie. D'autres exposés invités ont été présentés pendant la conférence. Le Dr. M. Devoret a décrit la conception et la physique des écluses et des pompes aux électrons qui sont capables de transférer des électrons un à un. Le Dr. T. Witt a décrit les activités de la Section Electricité du BIPM. Le Prof. B. Cagnac a passé en revue les progrès récents sur les mesures spectroscopiques portant sur l'atome d'hydrogène et conduisant à une connaissance de la valeur de la constante de Rydberg au niveau de 10^{-11}. Le Dr. F. Mignard a présenté les objectifs et les premiers résultats de la mission Hipparcos d'astrométrie spatiale. La conférence a été honorée par la présence du Prof. K. von Klitznig, prix Nobel 1985 pour sa découverte de l'effet Hall quantique. Il a présidé la première session scientifique, où plusieurs des exposés invités ont été présentés.

Pendant le diner de la conférence, la médaille SUN-AMCO a été remise au Dr. B. Kibble, du NPL, pour sa contribution éminente à la métrologie électrique.

Les présentations scientifiques ont mis en évidence les tendances actuelles suivantes. Les recherces distinées à améliorer les étalons de fréquence atomiques ou moléculaires, dans les domaines micro-onde et optique, se poursuivent très activement. L'application aux étalons de fréquence du refroidissement laser des atomes semble très prometteuse. De nouvelles mesures très précises de la fréquence de raies laser dans le visible ont été décrites. L'emploi d'atomes d'hydrogène comme support de fréquences de référence jusque dans l'ultra-violet est envisagé. La métrologie électrique a été considérablement modifiée par la mise en pratique, depuis le début de 1990, de l'effet Josephson et de l'effet Hall quantique pour conserver le volt et l'ohm, respectivement. Il apparaît clairement que ce changement tend à rendre uniforme les mesures électriques concernées au niveau de 10^{-11}. L'évènement remarquable de CPEM'92 a certainement été la présentation des résultats qui montrent qu'il est possible de commander le déplacement d'électrons un par un, dans un dispositif sub-micronique, qui est semblable à un circuit intégré. Cette découverte ouvre des perspectives entièrement nouvelles dans le domaine de la métrologie électrique, entre autres. D'autres tendances intéressantes concernent l'extension de la métrologie électrique aux longuers d'onde millimétriques et le développement de la métrologie des fibres optiques.

Pendant la session finale, le Dr. D. Sullivan a annoncé que CPEM'94 serait organisée par le NIST, et qu'elle se tiendrait à Boulder (USA).

CLAUDE AUDOIN
Président CPEM'92

CLIMATIC FACTORS IN THE PREDICTION OF RADIOWAVE PROPAGATION CHARACTERISTICS

11 June 1992, Ravenscar, UK

The objective of this Commission F Workshop was expressed as being to examine the extent to which radiometeorological parameters needed for world-wide methods of predicting radiowave propagation characteristics in non-ionised media can be characterised on a climatic basis.

Some 42 people participated, from 23 organisations in 15 countries and discussion was focussed on the following two areas :

1. Rain effects - attenuation and scatter (under the leadership of Dr. J.E. Allnutt and Mr. J.W.F. Goddard), and
2. Clear-air effects - ducting and multipath (under the leadership of Dr. B. Segal and Dr. K. H. Craig).

The radio-science community around the world has shown much energy, ingenuity and expertise in developing methods for prediction of various characteristics of the propagation of radiowaves in non-ionised media. However, the extent to which these characteristics may be expected to vary from one climatic region of the world to another is still far from clear.

Progress and understanding in the examination of effects of Climatic Factors is most advanced in relation to attenuation due to rain at frequencies above 10 GHz. For terrestrial paths, most prediction methods start from the rainfall rate at a point for the given time percentage and the effective proportion of the path length over which that rainfall rate may be assumed to apply. For earth-space paths, an additional factor has been used to give the effective height over which the rainfall rate may be assumed to exist. Characteristics of cumulative distributions of rainfall rates may be mapped on a worldwide basis, but characteristics of raincell width, separation, and heights are less well known. Due to the serious lack of sufficient measured rainfall and path attenuation data from various areas of the world from which model improvements might be made, the methods have generally not been able to take numerical account of a priori differences between climates (e.g. prevalance of monsoons or cyclonic rain). However, a number of new measurements in low-latitude regions are now beginning to produce results, and these were the basis for an URSI Commission F Special Open Symposium on "Regional Factors in Predicting Radiowave Attenuation due to Rain" which was held in Rio de Janeiro in December 1990 (see M.P.M. Hall, URSI Bulletin, pp. 23-26, June 1991).

Similar considerations are now becoming apparent in the prediction of signal levels likely to cause transhorizon co-channel interference, with a reappraisal of data and prediction methods, and world mapping of radio refractive index parameters is giving a means of steering prediction methods for interference in clear-air conditions in terms of Climatic Factors. In addition, both within URSI and CCIR there are those interested in collaborating on Climatic Factors in relation to other refractive index effects (notably multipath), but it is still difficult to see what will be the radiometeorological steering parameters. Obvious ones

are surface refractivity (which may largely be an indication of high humidity), probability of occurrence of refractive index lapse-rates in excess of 100N/km in the first 100m height (which may need to be remapped with new and improved data from around the world) and refractive index lapse-rates in the first kilometre.

All these considerations of the influence of Climatic Factors are at an early stage, but exploration of the potential for such factors was the basis of a Workshop held immediately following on the Commission F Triennial Symposium at Ravenscar in the UK in June 1992. Particular emphasis was on those areas outlined in the second paragraph. Consideration was given to (1) the primary radiometeorological parameters that are needed to produce improved prediction methods, and (2) what data exist and what studies might be made that would enable "characteristic values", or values taken from model maps, or coefficients for a climatic region, to be formulated and incorporated into an extension of existing methods. It was recognised that only an initial examination of the situation could be made at this short Workshop meeting.

During the discussion at Ravenscar, it emerged that there was concern that the term "Regional Factors" might be considered as "fudge factors" to take account of any differences from a model that could not otherwise be accounted for ! By contrast, there was general agreement that mapping of radiometeorological parameters necessary for prediction was entirely appropriate. "Climatic factors" are perhaps what are needed.

In the matter of attenuation due to rain, particularly for earth-space paths, the view was expressed that climatic variations in the vertical and horizontal distributions of rainfall rate were probably masked by the dominating influence of radio frequency, deviation angle and rainfall rate distribution. Better worldwide mapping of the last of these was essential. On earth-space paths, the effects of elevation angle in intercepting one or more raincells was felt to be of major importance. A considerable difficulty was in getting stable data for comparison between regions ; the time and spatial variabilities (and possibly microclimate effects) being large. This problem is less severe when, for instance, investigating effects of rainfall rates using concurrent data. Lack of data to test prediction methods, together with uncertainty of rain cell sizes, was a major bar to developing Climatic Factors for hydrometeor scatter. Many such Factors were thought to be important.

It was felt that, although direct statistical measurements of hydrometeor scatter in tropical and other regions are necessary to test existing models that have been developed primarily from a study of European

measurements, a more productive approach would be the use of judiciously located (monostatic) radar systems. These could provide information on raincell structure in both horizontal and vertical dimensions, which would be of use to modelling of both attenuation and rain scatter, but could additionally be used to simulate rain scatter interference for a variety of system geometrics from a single database.

Climatic Factors certainly strongly influence the magnitude and occurrence of clear-air effects, but there is a marked scarcity of data. For modelling of both transhorizon ducting and line-of-sight multipath effects, use was made of the percentage of time that refractive index gradients in the first 100m height were more negative than 100N/km, but it seemed likely that the height of the duct should also be a strong influence. The nature of this influence was unclear, as was the means of determining or even specifying the height. (Again there might be some difficulty with variabilities due to microclimate).

As was to be expected, the problems presented to the workshop were demanding of new data and new directions of study. Some of the latter were developed during the workshop, but it is a field that may require a decade or so to develop satisfactorily.

MARTIN P.M. HALL
Workshop chairman and coordinator

SEMINAR ON SPECTRUM MANAGEMENT FOR RADIO AND TV BROADCASTING IN DEVELOPING COUNTRIES

15-26 June 1992, Tucuman, Argentina

Introduction

Spectrum management for radio and TV broadcasting is one of the areas of radiopropagation studies and applications where the need for updating of knowledge in developing countries has been found more urgent. Such need was discussed during the 2nd College on Radiopropagation held at the International Centre for Theoretical Physics (ICTP), Trieste, Italy, January 1991, and at the 3rd Bi-regional African-Latin-American Conference on Radiopropagation held in Foz do Iguaçu, Brazil, in September 1991, both activities organized and supported by the ICTP

and the International Union of Radio Science (URSI). The ICTP Bi-regional African-Latin-American Network of Radiopropagation Groups and the URSI decided to organize and partially finance the Seminar on Spectrum Management for Radio and TV broadcasting that was carried out in Tucuman, Argentina, 15-26 June, 1992. The International Telecommunications Union (ITU) has contributed technically and financially by supporting the participation as lecturers of international experts of the International Frequency Registration Board (IFRB) and the International Consultative Committee on Radiocommunications (CCIR), and by granting fellowships for participants designated by Telecommunication Administrations of Latin-American countries. The Argentine National Programme of Radiopropagation (PRONARP) of the National Council of Scientific and Technical Research of Argentina and the National University of Tucuman, Argentina, have contributed with financial and institutional support.

The seminar was oriented towards the updating of a limited number of radiopropagation scientists and engineers from developing countries in the field of spectrum management for broadcasting, covering the AM, HF and FM radio and VHF-UHF TV bands. A total of 29 participants from Argentina, Bolivia, Brazil, Nigeria, Paraguay, the People's Republic of China and Peru attended the Seminar, which was held at the Cultural Centre of the National University of Tucuman in Tucuman, Argentina. The ionospheric Laboratory of the Institute of Physics (LIIF) of the Faculty of Sciences and Technology of the University, and the (PRONARP) were in charge of the local organization. The Local Organizing Committee consisted of Professor J.R. Manzano (LIIF, Chairman), Ing. A. Garbini (PRONARP), Professor N. Ortiz de Adler (LIIF), and Professor A. Giraldez (Naval Research and Development Service - PRONARP). The Seminar International Committee consisted of Professor S.M. Radicella (PRONARP and ICTP, Chairman), Mr. M. Harbi (IFRB-ITU), and Professor R. Struzak (CCIR-ITU).

The Programme

The Seminar was organized on the basis of three types of sessions. Lectures, Workshops, and Open Discussions.

Lectures were given on the following general topics :

- National and International Issues in Radio Spectrum (Mr. M. Harbi, IFRB-ITU)
- Radio Spectrum Engineering (Professor R. Struzak, CCIR-ITU)
- CCIR Recommendations relevant to Spectrum Management (Professor R. Struzak and Professor A. Giraldez, Naval Research and Development Service - PRONARP, Argentina)

- FM Radio and TV Broadcasting Services Planning (Professor A. Giraldez, Professor R. Struzak and Lic. P. Marco, Naval Research and Development Service - PRONARP, Argentina)
- MF and HF Radio Broadcasting Services Planning (Dr. P. Bradley, Rutherford-Appleton Laboratory, United Kingdom, and Lic. M. Peres, Naval Research and Development Service - PRONARP, Argentina)
- Electromagnetic Compatibility and Interference problems in Radio and TV Broadcasting (Professor R. Struzak and Professor A. Giraldez)
- Radiopropagation Research efforts and Broadcasting Services (Professor S.M. Radicella, PRONARP and ICTP).

A large number of Workshop Sessions were organized where computer software needed in the planning of Radio and TV services have been demonstrated by the lecturers and made available to the participants. For this purpose adequate computer facilities were used in the Seminar Computer Room. During the Workshop Sessions some of the participants presented reports on the work being carried out in their own countries on topics related to the Seminar subject.

Particularly useful were the Open Discussion sessions. Questions raised by the participants have been analysed by the international experts lecturing at the Seminar and discussed together with the participants.

The questions analysed during the Open Discussion Sessions were centred on the topics indicated below (in italics). The main conclusions of the discussions are mentioned after the topics.

1. The role of developing countries administrations in the national and international traffic control in Low Orbiting Satellite Communication Systems. The need for a compromise between the convenience of the low cost and good instant communications that can be provided by this new technology now being proposed and the potential loss of national administration control over the communications provided by such a system, was underlined.
2. The role of developing countries in the new radiocommunication technology trend. The importance of international telecommunication enterprises involving important capitals in the present and future scenario have been stressed. Such companies are those that will tend to impose the new technological trends. The importance of supporting the ITU role as a global forum and administrative council in order to limit the technological isolation of developing and small developed countries was stressed.

3. The future of HF communications. The decrease of HF communications traffic appears to be the international trend but it is doubtful that HF will be abandoned, because HF equipments are usually less costly, and technological improvements like the use of automatic adaptive systems and SSB spread spectrum have enhanced the performance of HF communications. The use of Digital HF is the main new development, and is becoming a good alternative for some services, particularly for developing countries, due to the low cost and the easy to use technology involved. The project being developed in this line by the PRONARP of Argentina and the ICTP was mentioned.
4. The need for Digital terrain mapping acquisition. This technique appears to be very useful, in cases where rough terrain is involved, for the FM and TV services planning as well as for direction and the preliminary results obtained by them have been discussed. The convenience of a joint pilot project involving both countries has been stressed as a starting point for a wider effort. Also Nigeria could be interested in such a technique, and could be integrated in a second step in the pilot project.
5. Market approach and Spectrum use and management. The economic importance of Spectrum Management in the new telecommunications scenario has been stressed. The relation between the market pressure and new frequency allocations becomes obvious. The importance of international agreements under the ITU to avoid severe future problems appears essential.
6. Training on Spectrum Engineering. The need of permanent actualization schemes in the area of Spectrum Engineering, due to the rapid technological evolution in the field, has been emphasized. The renewed interest of the telecommunications administrations on this subject has been underlined. The possibility given by the IFRB regular seminar organized in Geneva every two years (the next one will take place in Geneva from 5 to 9 October, 1992) and the IFRB/BDT (Telecommunications Development Bureau of ITU), regional seminars have been reviewed and the collaboration among ICTP, URSI and ITU on the training of developing countries scientists and engineers in the field has also been mentioned. The present Seminar is an example of this collaboration.

S.M. RADICELLA
Chairman, Committee on Developing Countries

SUB – ARCSECOND RADIO ASTRONOMY

19–25 July 1992, Manchester, England

A conference on Sub Arcsecond Radio Astronomy - and the interaction between radio and optical observations at high resolution - was held at the conference centre of the University of Manchester in July 1992. This meeting follows in the tradition of previous VLBI conferences which have been sponsored by URSI, the last occurring in Cambridge Massachusetts in 1987. Our meeting concentrated on astronomical results rather than techniques, though summaries of the current status of various instruments were given. As indicated by the title the meeting was not restricted to VLBI results, but included high resolution observations from MERLIN, the VLA and optical telescopes such as the Hubble Space Telescope.

The meeting was organised into eighteen sessions covering stellar and galactic astronomy, celestial masers, astrometry, gravitational lenses, active galactic nuclei, jet models and finally cosmological implications of high resolution observations. Two hundred and forty astronomers from every continent of the globe took part in the conference, and nineteen review talks, fifty seven oral contributions and one hundred and twenty posters were presented.

In addition to URSI, sponsorship was obtained from the University of Manchester, the Royal Astronomical Society, Cambridge University Press, Interferometres Inc., MAN GmbH and Penny and Giles Ltd. A special users meeting of the European VLBI Network was held on Saturday 25 July attended by one hundred people and sponsored by the European Community.

Thanks to the sponsors we were able to assist the travel and accommodation costs of twenty four visitors from Eastern Europe, Asia and developing nations, including eleven from the former Soviet Union. An additional six students and visitors were funded for local costs.

Reports were given on the good progress being made in astrometric techniques and advances in our understanding of superluminal and other compact radio sources. Particular highlights include a discussion by Felix Mirabel of the hard X-ray annhilator source in the galactic centre, now known to possess a double sided radio jet, the exciting discovery of new compact gravitational lens candidates by Alok Patnaik illustrated by the beautiful images now made with the MERLIN array, the remarkable

similarity between the radio and HST images of the jet in M87 presented by Colin Norman, and the intriguing possibility presented by Ken Kellermann that the angular size vs redshift relation for compact radio sources may lead to a value for the cosmological deceleration parameter q_0 of 0.5.

The conference was considered a great success, perhaps helped by the barbecue at Jodrell Band on Wednesday, and the dinner in the Victorian splendour of Manchester Town hall on Thursday. The attendees look forward to the next meeting in a few years time.

R.E. SPENCER

INTERNATIONAL MEETING FOR WAVE PROPAGATION IN RANDOM MEDIA

3 - 7 August 1992
University of Washington, Seattle, Washington, USA

The International Meeting for Wave Propagation in Random Media (Scintillation Meeting for short) was convened on the beautiful campus of the University of Washington under the Conference Chairs V.I. Tatarskii and A. Ishimaru. In a meeting lasting for four and one-half days 170 papers were presented. Early on in the preparation of this meeting it was realized that the statistical approach to wave behaviour permeates into many disciplines. To bring these multi-disciplinary investigators into one room there was some need for mutual education. In an attempt to cover as many disciplines as possible the organizers therefore decided to have all invited reviews presented as posters. The invited reviews were organized into five sessions : scintillation phenomena, statistical description of scintillation, imaging through turbulence, theory, and remote sensing using scintillation. These five topics also set the theme for the poster papers. In reading the Meeting Digest one could not help but notice the diversity of random media. Included were the atmosphere, ocean, ionosphere, interstellar medium, planetary atmospheres, solar wind, comet tails, etc. It was quite amazing to note that the fluctuations in all these media had a power-law spectrum.

In the Chairs' Welcome printed on the first page of Meeting Digest, we read : "The purpose of the meeting is to foster communication and

exchange of ideas relating to problems of wave propagation in continuous random media. We seek to promote a multi-disciplinary approach to research in scintillation by bringing together the optical, radio, and acoustical communities in this endeavour." In the opinion of this writer, this purpose was completely fulfilled. It is through the hard work of the two Chairs, the Executive Secretary, Rod Frehlich, and many other peoplé that this "first" meeting became a grand success, as represented by two hundred attendees coming from thirteen countries. For those who could not come to Seattle, the readers of the Bulletin will be happy to know that plans are going forth to print the reviews as a book, and the posters as papers in a special issue. URSI should be proud to have played a part in this international scientific exchange as one of the sponsors of this meeting.

K.C. YEH

COMMISSION B ELECTROMAGNETIC THEORY SYMPOSIUM

17-20 August 1992, Sydney, Australia

Commission B's triennial Symposium on Electromagnetic Theory was held in the Southern Hemisphere for the first time in 1992. The series started in 1953 and this year's event was the fourteenth. Every three years a group active in electromagnetic theory organises the symposium on behalf of Commission B. This year the organiser in Sydney was the CSIRO (Commonwealth Scientific and Industrial Research Organisation). CSIRO has achieved international recognition for its work covering many aspects of radio science. The local chairman was Dr Graeme James, who had devoted considerable effort to ensuring the success of the symposium.

Most of the participants had travelled a long distance to reach Australia and managed to combine the Symposium with a vacation to see some of the varied and beautiful aspects of that large and relatively uninhabited continent. They had left the northern summer and entered the southern hemisphere expecting winter but were pleasantly surprised to discover that winter in Sydney can have very reasonable temperatures with clear blue skies. The Symposium was held in the Convention Centre in Sydney which has a near ideal layout for these events, with four lecture rooms adjacent to each other, and good circulation space for individual interaction.

Among the over 250 participants were 17 Young Scientists, 16 of whom had received awards from URSI to enable them to travel to Sydney and attend the Symposium. Seven of these came from Russia or the Ukraine, where there has been extensive work on electromagnetic theory, which has not obtained much exposure until recently. Commission B regards the Young Scientist Programme as an important aspect of the Symposium, which encourages more participation in URSI activities.

As the name implies, the Electromagnetic Theory Symposium emphasises the theoretical aspects of fields and waves, thus nicely complementing the national institutional conferences, which tend to highlight practical applications. The international technical programme committee had selected 186 contributions from 28 countries for presentation. These covered all aspects of electromagnetic theory. Some subjects were traditional Commission B topics, such as electromagnetic scattering and antennas. Others were newer areas, such as chiral media and superconductivity. Yet others emphasised the growing interdependence of radio science with topics on bio-electromagnetic and mobile communications. Both computation and analysis are now seen as equally important aspects of electromagnetic theory, and the symposium had a healthy number of papers describing new analytical and computational techniques.

The standard of presentation was generally very high, and the problem of no-shows had been largely avoided by requiring authors to register when they submitted their full papers. These are all printed in the Proceedings, copies of which can be purchased at a cost of Australian $160 (including postage) from Australian Convention and Travel Services Pty Ltd, GPO Box 2200, Canberra, ACT, Australia 2601 (fax: +61 6 257 3256).

The symposium opened with an address of welcome by the chief executive of CSIRO (Dr Stocker) and a fascinating historical survey of the Commission B activities in Australia by Professor Skellern, Chairman of the Australian Member Committee for Radio Science. Each day started with two invited review papers, which set the scene for sessions later in the day. The invited papers were Chiral electrodynamics and complex materials (Engheta - USA), Non-linear guided waves (Arnold - UK), Trends and directions in computational electromagnetic (Miller - USA), Electromagnetic fields and health (Joyner - Australia), Spacecraft antenna design and applications (Crone - Netherlands), Antenna applications of phase retrieval (Poulton - Australia).

A final keynote address, which looked ahead under the title "Electromagnetic - Where is it going?", kept most of the participants present till the end of the Symposium. The address was delivered by Professor Ed Jull, President of URSI, himself an eminent electromagnetic theorist. He noted the danger of predicting the future but offered suggestions for a wide range of subjects which could be studied to advantage. These ranged from a re-examination of the methods of stating Maxwell's equations, to environmental electromagnetics for remote sensing. The growing power of the computer will enable problems to be tackled which are as yet insoluble. His message was an optimistic one, and left the departing participants with the warm feeling that there will be plenty to study in the years ahead. The next opportunity to find out what has developed will be at the fifteenth symposium in 1995, which was chosen to be held at St. Petersburg in Russia.

A.D. OLVER

WORLD SPACE CONGRESS

28 August-5 September 1992, Washington D.C., USA

The World Space Congress, the major event of the International Space year, was organized in Washington DC (USA) in order to celebrate 35 years of space activity since Spoutnik I, and the 500th anniversary of the journey of Christopher Columbus to America.

The World Space Congress, the first to date, was conceived as the combination of the General Assemblies of COSPAR (Committee On Space Research) and of IAF (International Astronautical Federation). More than 4000 registrated participants attended the congress, which covered all areas of space science and technology, from space medicine to remote sensing of the earth surface and atmosphere, astronomy, space exploration systems, mobile communication systems and space debris.

URSI sponsored three COSPAR Symposia : Active experiments in space plasmas, Phenomena and processes of thermosphere/ionosphere coupling, Verification and new development of the International Reference Ionosphere.

URSI, one of the 12 International Scientific Unions represented in the Executive Council of COSPAR, was involved in the voting process leading to the change of the statutes and by-laws of COSPAR. The new

statutes and by-laws, now submitted to ICSU, should permit a more flexible operation of COSPAR and a wider opening to the scientific community. Furthermore, they are characterized by the disappearence of the explicit political reference to the two super-space-powers which used, each, to nominate one Vice-president. This move of COSPAR brings it into the usual frame of reference of the ICSU committees, a development which can be considered as timely.

One resolution adopted by COSPAR mentions explicitely the necessary coordination of COSPAR with URSI and IAU (International Astronomical Union) in order to review and report on potentially environmentally detrimental activities in space.

P. BAUER
URSI Vice-President
Representative of URSI at COSPAR

DEUXIÈME SYMPOSIUM INTERNATIONAL SUR LES SIGNAUX, LES SYSTÈMES ET L'ELECTRONIQUE (ISSSE'92)

1-4 Septembre 1992
Conservatoire des Arts et Métiers, Paris, France

La conférence était placée sous la responsabilité scientifique des commissions C (président . Prof. Peter Matthews) et D (président : Dr. Jeannine Hénaff) de l'URSI. La commission A a apporté son concours pour une session sur les lasers ultrastables, utilisés en communications et en métrologie, avec la participation effective de son président Jacques Vanier. Le Professeur E.V. Jull, président de l'ursi, a honoré le symposium de sa présence.

Le comité français de l'URSI, le CNFRS, (secrétaire général : Jean-Claude Bic), a assuré l'organisation de la manifestation et l'accueil des participants. Le symposium avait reçu le parrainage du CNRS (Centre National de la Recherche Scientifique) et du CNET (Centre National d'Etudes des Télécommunications), ainsi que le co-parrainage du chapitre MTT de l'IEEE et du club Télécom de la SEE.

Lors de la session inaugurale, Michel-Yves Bernard, professeur au Conservatoire des Arts et Métiers, donna quelques "coups de projecteur" sur les évènements intervenus dans les locaux historiques où les

participants étaient réunis. Puis, le Président de l'URSI, dans son discours d'introduction, a retracé l'évolution de l'Union et sa volonté d'une intense implication dans le domaine des télécommunications.

Le programme scientifique comprenait 3 conférences plénières, 26 contributions invitées, 160 contributions orales et 50 affichées. La liste des conférences plénières et invitées qui figure en annexe résume les thèmes principaux qui ont été abordés. Les points les plus marquants ont été : les communications avec les mobiles, les communications à spectre étalé, le codage d'images, l'optique cohérente, les réseaux de communication à haut débit, les circuits de télécommunication. Le comité scientifique international avait reçu 325 propositions de communications, en provenance de 38 pays, et 33 pays sont représentés dans le programme final. Quelques présentations sélectionnées ont été annulées par leurs auteurs (5 à l'oral, 10 en affiches).

En dehors des 3 conférences plénières qui réunissaient l'ensemble des participants, les 31 sessions composant le symposium étaient organisées en parallèle dans 3 salles. De plus, une session affichée s'est tenue le 2 et 3 septembre. La formule d'ISSSE 89 d'Erlangen avait été reprise à Paris en ramenant à trois le nombre de sessions proposées simultanément. Néanmois, certains participants ont regretté le principe de cette simultanéité des sessions, qui impose parfois des choix difficiles. Les conférences invitées ont été appréciées et ont fait l'objet de commentaires flatteurs.

Le symposium a réuni 320 participants, ce qui peut être considéré comme satisfaisant étant donné la mauvaise conjoncture économique. Parmi eux, 52 jeunes chercheurs ont profité d'une inscription à tarif réduit. Par ailleurs, 25 subventions ont été accordées pour favoriser la venue d'orateurs dont les institutions doivent faire face à de grandes difficultés matérielles.

Les actes du symposium rassemblent les contributions en 2 tomes comportant 977 pages. Quelques exemplaires sont encore disponibles, et peuvent être demandés à

Jean-Claude BIC
CNFRS, 38 rue du Général Leclerc
F-92131 Issy les Moulineaux (France)
Fax : + 33 1 45 29 60 52

Des discussions sont en cours concernant le site de la prochaîne réunion. ISSSE 95 pourrait quitter l'Europe pour l'Amérique : les comités d'outre-Atlantique examinent diverses possibilités.

SECOND INTERNATIONAL SYMPOSIUM ON SIGNALS, SYSTEMS AND ELECTRONICS (ISSSE'92)

1-4 September 1992, Conservatoire des Arts et Métiers, Paris, France

The Conference involved the joint scientific responsibility of Commission C on Signals and Systems (Chair : Prof. P. Matthews) and Commission D on Electronics and Photonics (Chair : Dr. J. Hénaff). URSI Commission A on Electromagnetic Metrology joined with Commissions C and D by organizing a session on ultrastable lasers in telecommunications and metrology, and its chair, Dr. J. Vanier, was personally present. Professor E.V. Jull, President of URSI, honoured the Symposium with his presence.

The local arrangements were in the hands of the French URSI Committee, i.e. the Comité National Français de Radioélectricité Scientifique, (CNFRS Secretary : J.C. Bic). The Symposium was sponsored by the Centre National de la Recherche Scientifique (CNRS) and the Centre National d'Etudes des Télécommunications (CNET), and was co-sponsored by IEEE/MTT and SEE.

At the inaugural session, the participants were welcomed to the Conservatoire by Prof. M.Y. Bernard, who described some interesting features of the history of the venue. The President of URSI then delivered the introductory talk, and recalled the main stages in the development of the Union. He stressed the strong wish of URSI to put increasing emphasis on the field of telecommunications.

The scientific programme included 3 plenary-session lectures, 26 tutorials, 160 contributed papers and 50 posters. The list of plenary-session lectures and tutorials given in the annex provides an overview of the main topics covered by the Symposium. The outstanding points were : mobile communications, spread spectrum communications, image coding, coherent optical communications, broadband communication networks, circuits for telecommunications. A total of 325 abstracts had been submitted to the International Scientific Committee by authors in 38 countries ; 33 countries were present in the final programme. Some of the selected papers (5 oral and 10 posters) were cancelled by the authors.

For ISSSE'92, the Steering Committee retained the scheme applied by the organizers of the Erlangen 1989 Symposium, but reduced to 3 the number of simultaneous sessions. The plenary-session lectures, delivered

by world renowned experts, were attended by all participants and the 31 sessions of the Symposium were run in parallel in 3 lecture halls. Poster sessions were held on 2 and 3 September. In general, the tutorials as well as the contributed papers were of high quality and were appreciated by the audience. However, some criticisms were made regarding the organization of parallel sessions, a system which sometimes gives rise to difficult choices.

The Symposium was attended by 320 participants. The number seems to be fairly reasonable taking into account the present world economic situation. In accordance with the general policy of URSI and its Young Scientists Programme, grants were offered to 25 speakers, who would have been otherwise unable to participate. In addition, 52 young scientists were allowed to pay substantially reduced registration fees.

The 2-volume Proceedings, totalling 977 pages, were distributed to all registered participants. A limited number of copies are available from

Jean-Claude BIC
CNFRS, 38 rue du général Leclerc
F-92131 Issy les Moulineaux (France)
Fax : + 33 1 45 29 60 52

Discussions are under way regarding the location of the next ISSSE. There is a possibility for the Symposium to cross the Atlantic Ocean in 1995.

ANNEXE/ANNEX

Conférences plénières/Plenary Lectures

J. Körner :	Zero-error information theory	Hungary
J. Midwinter :	Optics in switching and all optical networks	UK
A. Barthelemy :	Soliton and other stable solutions to Instability Problems of Nonlinear & Laser Optical Processing	France

Conférences invitées/Tutorial Lectures

Microelectronics for Dynamic Neural Network	S. Prange	Germany
Introduction to CDMA	Barton	UK
Modeling of Millimeter Wave Structures	T. Itoch	USA
Emerging Electronic Applications of High Temperature Superconductors	R. Withers	USA
Evaluating Error Probabilities of Multi-Level Modulation Codes	Biglieri	Italy
Recent and Prospective Decorrelation Techniques for Image Processing	S. Comes	Belgium
Microwave Applications of Optoelectronics	Seeds	UK
Analog Blocks in Telecommunications Systems	Castello	Italy
The Future of Quantum Wells	Weisbush	France
Chaos	Hasler	Switzerland
VLSI Architecture for Digital Processing of Speech Signals	LeScan	France
Integrable Devices for Wavelength Multiplexing Optical Comm. Syst.	Baets	Belgium
Recent Progress on Optical Fibre Amplifiers	Horiguchi	Japan
General Principles of ATM	Coudreuse	France
Techniques of Device Modelling	Ladbrooke	UK
Optical FDM Based Lightwave Networks	Nosu	Japan
Active Antenna Syst. and Active Radiator Features and Related Problems	Martin Pascual	Spain
Optimal and ad hoc Adaptation Mechanisms	Ljung	Sweden
The Evolution of Land Mobile Communications	P. Giusto	Italy
Review of CAD methods	Sobhy	UK
Microwave Power Amplifiers for Space Systems	Gatti	Netherlands
Stable Lasers : a Review	Cerez	France
Models for Digital Magnetic Recording Systems and their implications to Signal Detection	Wolf	USA
The Evolution and Development of HDTV	Green	UK
Miniature High Perform. SAW Filters used in Mobile Radio Handy Phones	Hikita	Japan

THE ELEVENTH INTERNATIONAL WROCLAW SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY.

2–4 September 1992, Wroclaw, Poland

The Symposium was organized by the Association of Polish Engineers, the Institute of Polish Electrical Engineers, the Institute of Telecommunications and the Wroclaw Technical University. It was cosponsored by the URSI.CCIR,CCITT and other international and national organisations gave support. The Symposium Council was chaired by Prof. Majewski, and the Scientific Programme Committee by Prof. Stumpers. The co-chairmen of the Symposium were Prof. Bem and Mr. Rutkowski, and the organizing committee was chaired by Mr. Moron.

The symposium was held from September 2 to September 4. In the evening of September 1 a meeting on Activities of the Technical Committee for Telecommunications of the European Cooperation in the field of Scientific and Technical Research (COST) was organized. Its chairmen, Mr. Dwyer and dr. Hall gave a general survey and a survey of propagation studies, respectively.

During the official opening session the participants were greeted by the chairmen Prof. BEM and by the PTT vice-minister Mr. Szuder. Mr. Kirby received the gold Distinction of the Order of Merit of the Republic of Poland for his contribution to Polish telecommunications and to EMC. He and twelve others received a citation on parchment for their contributions to the success of the Symposium. During the first Plenary Session Prof. Stumpers surveyed the program of this symposium and Mr. Vrolijk discussed "Changing Environments". Invited sessions were :

- EMC and EMP Environments in Power Plant Transmission and Distribution - Organizer J.S. Chang, Canada ;
- EMC in Amateur Radio Service - Organizer H. Chicon (IARU) ;
- EM Coupling to Shielded Cables - Organizer Prof. E. Degauque for URSI Comm. E;
- Cochannel Interference Propagation Losses at Frequencies above 1 GHz - Organizer Dr. M.P.M. Hall for URSI Comm. F ;
- Terrestrial EM Noise - Organizer Prof. Hayakawa for URSI Comm. E ;
- Technical Capabilities to Promote International Harmony of Standards - Organizer dr. M. Kanda (USA), in his absence chaired by Prof. Trzaska (Poland) ;

- Noise, Fluctuation and Chaos - Organizer Prof. Kikuchi for URSI Comm. E ;
- EMC in Wire Communication - Organizer Mr. H. Lorke for CCITT.SG.5 ;
- Spectrum Management : New Approaches - Organizer Prof. Parlow for USRI Comm. E ;
- Spectrum Management and Sharing Problems - Organizer dr. A. Pavliouk for URSI Comm. E ;
- Alternatives for Emission Measurements - Organizer dr. P. Wilson, Switzerland ;
- Seismogenic Emissions - Organizer Prof. Yoshino for URSI Commission E.

Other session titles :
- Antennas and Propagation, EMC Aspects ;
- Biological Effects of EM Radiation ;
- EMC Measurement and Instrumentation ;
- EMC in Power Engineering ;
- EMC Prediction and Analysis. ESD, Lightning, EMP ;
- Immunity of Electronic Systems and Devices ;
- Regulations and Standards in EMC.

A Round Table Discussion on "Spectrum Management in the Future : Impact of WARC'92, Advanced Technology and Simplification of the Radio Regulations" attracted great interest. It was chaired by Mr. Mayher (USA), and key speakers were Mr. T. Boe (Norway), Mr. R.C. Kirby (CCIR), Mr. Klupczyk (Poland), Prof. Parlow (USA) and dr. Pavliouk (Russia).

Three Workshops accompanied the Symposium:
- Automatic EMC Measurement on Sound and Television Broadcast Receivers. (Rhode und Schwarz, Germany).
- Low Cost Spectrum Analyzer in EM Tests (Tektronik, Austria)
- Techniques for Measuring Narrowband and Broadband EM Signals, using Spectrum Analysers (Hewlett Packard, Austria).

Nine companies participated in a technical exhibition.

In a Literature Exhibition publications of URSI, IFRB, CCIR, CCITT, ETSI, EBU, CENELEC and IEC (CISPR and TC 77) and books form Artech House (UK) and Wiley (UK) were displayed.

A joint meeting of the Symposium Council, the Scientific Programme Committee and the Organising Committee was held on the last day,

chaired by Prof. Majewski and Prof. Stumpers. All chairmen evaluated their sessions and suggested improvements.

Apart from the technical sessions, there were a cocktail party, a picnic, a visit to the Panorama, reception at the Townhall, and dinner. In general, the 225 participants from 31 countries were quite satisfied. Due to financial problems, the delegation of the former Soviet Union was rather small (21), but its chairman, dr. Yu. B. Zubarev, hoped that in 1994 his delegation would be up again to its usual number.

The Young Scientist Programme, supported by URSI, helped four scientists from China, Ukraine and Russia to participate.
The Symposium Proceedings were distributed to all participants (two volumes) and are still available form EMC Symposium, Box 2141, 51645 Wroclaw 12, Poland, fax 4871 483248, tlx 712118 ilw pl.
The 12th Symposium on EMC is planned for September 1994, in Wroclaw.

F.L.H.M. STUMPERS

INTERNATIONAL SYMPOSIUM ON ANTENNAS AND PROPAGATION

22-25 September 1992, Sapporo, Japan

Professor Brussaard, Chairman of Commission F, gave the following congratulatory address at the meeting, on behalf of URSI :

"Mr. Chairman, ladies and gentlemen,

I feel very honoured to be here at the 92 International Symposium on Antennas and Propagation and to speak to you on behalf of URSI, the International Union for Radio Science.

Japan has a very active radio science community, in particular in the area of propagation research, one of the two focal points of this conference. The ISAP conferences, together with their European counterpart, the ICAP series, are the reflection of the importance of the work that is carried out in a field that is constantly changing its focus in order to

serve the demands of new applications. As chairman of URSI Commission F, responsible for the coordination of research in Propagation and Remote Sensing, and in particular for the timely reporting of results to the international community, I am happy to see such an international gathering taking place regularly and to see it so well attended.

The application of our research is the development of new telecommunications and teleobservation services. A glance through the busy conference program makes it very clear that the direction of research is influenced by new demands in this respect. For example the explosive growth of mobile communication services is giving strong impulses for renewed research in diffraction theory with applications to the modelling of urban radio channels and to the design of compact and miniature antennas. It is interesting to note here a new illustration of the close relation that exists between the fields of antennas and of propagation, and a proof (if at all needed) of the wisdom of regularly holding international conferences combining the two.

URSI has always adhered to a policy of efficient transfer of knowledge to the user community. It recently established the Scientific Committee on Telecommunications, charged with the liaison between URSI and user organisations such as CCIR, the International Radio Consultative Committee of the ITU.

Japan has always had a very strong representation in Study Group 5 of CCIR, which is responsible for advise to users in propagation questions. As such it has contributed much in making results of research applicable to the design of new systems. Not surprisingly it has many researchers that are active both in CCIR and URSI. As chairman also of a Working Party of the newly transformed CCIR, I find myself therefore among many friends and have already tasted the Japanese hospitality in the previous days.

In the other area of responsibility of URSI Commission F, the area of Remote Sensing, Japan has placed itself also in the floodlight of international attention by hosting the 1993 International Conference on Geophysics and Remote Sensing, IGARSS 93. Here, in my view, the Japanese URSI Committee has an important task to support the exchange of information between radio researchers and the community of users of remote sensing information. The international Geosphere/Biosphere Program is coordinating worldwide the efforts of geophysicists, oceanographers and biologists to study the evolution of the Earth and the changes that man introduces in the delicate balance of the ecosystem.

Radio Remote Sensing is contributing much to this effort. It is of great importance that also in this area users find an opportunity to interface effectively with radio scientists, who are sometimes better aware of the potential and the limitations of radio systems. Holding IGARSS 93 in Japan next year may be an excellent opportunity to help to improve this interface to bring it to the level of efficiency that has been reached already in the area of propagation research.

The culmination of Japan's efforts to support the international radio research community will be the General Assembly of URSI, next year in Kyoto. The entire world community of radio scientists is looking forward to this event !

On behalf of URSI, mr. chairman, I wish the Japanese radio science community every success in the very busy conference year that has now started. This week in particular, I wish all of us a very successful ISAP 92.

Thank you for your attention."

ANNOUNCEMENTS OF URSI-SPONSORED MEETINGS

SYMPOSIUM ON THE AIR-SEA INTERFACE

Radio and Acoustic Sensing, Turbulence and Wave Dynamics
24-30 June 1993, Marseilles, France.

The causes and evolution of climatic change are among the principal scientific issues today. The interaction between oceans and atmosphere is a vital link in the dynamics of climatic variation. From the very small scales of near-surface boundary layers, to the global variation of ocean surface properties, to wind and wave distributions, there is much to be explored via theory and observations. Today the advanced development of radio and acoustic remote sensing techniques complements the more traditional in situ methods, and greatly increases the excitement of and possibilities for learning more about the boundary layers that join atmosphere and ocean, and that are vital in the regulation of our weather and climate.

This symposium - sponsored by URSI - is the third in a series dealing with the mechanisms of the boundary layers on both sides of the air-sea interface, and with the application of remote sensing techniques in this field. The previous symposia were directed primarily at wave dynamics and the upper-ocean mixed layer and the related use of electromagnetic remote sensing methods. This symposium widens the scope to acknowledge the coupling of air and water boundary layers and the increasing prominence of acoustic methods for observing the interface and probing the boundary layers from above and below.

The Chair of the Scientific Committee is Dr. M.A. Donelan, and the Local Organizing Committee has two co-chairs : Dr. A. Ramamonjiarisoa and Prof. K.B. Katsaros. For additional details, contact

Dr. Michael SKAFEL
NWRI, CCIW, Box 5050
Burlington, Ontario
L7R 4A6, Canada
Fax (1-416) 336-4989

SIXTH WORKSHOP ON TECHNICAL AND SCIENTIFIC ASPECTS OF MST/ST RADAR

17-20 August 1993, Chung-Li, Taiwan

The 6th workshop on technical and scientific aspects of MST/ST radar will be held at the National Central University, Chung-Li. The workshop is sponsored by SCOSTEP, URSI and the National Science Council. The co-conveners are Professor C.H. Liu and Dr. Jurgen Rottger. The following session topics are planned :

(1) Meteorological Applications
(2) Interpretation of Scattering Mechanisms
(3) Structure of the Lower and Middle Atmosphere
(4) Dynamics of the Lower and Middle Atmosphere
(5) Coordination of Ground-based, In-situ, and Space-borne Observations
(6) Radar Interferometry in the Frequency and Spatial Domains
(7) Hardware and Software Developments for MST/ST Radar and Wind Profilers
(8) Progress in Existing and Planned MST and ST Radars
(9) Inclusion of MST Radar Observations in International Programs
(10) Diversified Techniques : Lidar, RASS, BLR, Meteor and Ionosphere Radar, etc.

Further Information on the workshop, such as submission of abstract, registration and housing, can be obtained from

Professor Shin-Yi Su
Chairman, Local Committee
NSC Chung-Li Instrument Center
National Central University
Chung-Li, Taiwan, R.O.C.
Tel : (886) -3-4227151 Ext. 5750
Fax : (886) 3-4255535
and (886) 3-4224394

INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM (IGARSS)

18-21 August 1993, Tokyo, Japan

This Symposium, the first IGARSS to be held in Asia, is co-sponsored by URSI under Mode C. It will provide extensive concurrent forums for technical presentations on instrumentation, theory and experimentation. The theme of IGARSS '93 emphasizes the capability of remote sensing to understand global environment for human survival and to manage natural resources. Specially organized sessions are planned to focus on the techniques and methods for observing global change phenomena, and to discuss present and near-future international and national remote sensing programs related to environmental issues.

The technical sessions will be coordinated to provide a comprehensive and well-balanced program of submitted and invited papers. Authors are encouraged to submit papers on all topics of interest to either the Geoscience and Remote Sensing Society or to URSI. The topics on which the URSI part will focus are :

(1) Electromagnetic Techniques : Theoretical Models and Prediction
(2) Inverse Scattering
(3) Modeling and Measurement of Propagation Effects
(4) Optical Sensing of Atmospheric Parameters
(5) Propagation Through Random Media
(6) Radio Meteorology : Precipitation, Attenuation and Depolarization
(7) Rough Surface and Volume Scattering
(8) Radio Oceanography
(9) SAR Ocean Backscatter Modeling
(10) Scattering from Land and Vegetation
(11) Subsurface Sensing and Inversion
(12) Telecommunication Studies
(13) Tropospheric Effects on Propagation

Instructions for Abstracts :

URSI summaries should be in English, and limited to two pages including figures. The text should be typed single-spaced on white A4 or 8-1/2 x 11 inch paper. The text width should be 13.5 cm (5.3 inches). The title should be centered in the text in capital letters 2.5 cm (1 inch) form the top of the page. The author's name and affiliation should be two lines below the text three lines below this. Left margins should be 3.8 cm

(1-1/2 inches). Right margins are adjusted by the text width and are different with A4 or 8-1/2 inch x 11 inch papers. A 2.5 cm (1 inch) margin should be left at the top of all pages. The bottom margin should be 2.5 cm for A4 size papers and 0.3 inches for 8-1/2 x 11 inch papers. Double space between paragraphs. Do not include tables, footnotes or lists of references ; a few open literature references may be included parenthetically, for example (A.B. Smith, J. Radiophys, 32, 348-353, 1978). The original and four copies of the summary must be received by the URSI Technical Program Chairman by **January 31, 1993**. Address summaries to :

URSI Technical Program Chairman
Dr. Yoji Furuhama
ATR Optical and Radio Communications Research Laboratories
2-2 Hikaridai, Seiko-cho,
Soraku-gun, Kyoto 619-02, Japan
Tel : +81-7749-5-1511 Fax : +81-7749-5-1508

It should be noted that URSI awards are offered partially to pay the travel expenses of a few participants from developing countries and countries with non-convertible currencies who qualify for neither a Student Travel Stipend nor the GRSS IGARSS '93 Travel Support Program. They must be less than 35 years old at the time of the IGARSS meeting, and they must have a paper of which they are principal author accepted for their presentation at IGARSS '93.

Requests should be directed to Dr. Furuhama

21ST INTERNATIONAL CONFERENCE ON PHENOMENA IN IONIZED GASES (ICPIG XXI)

19-25 September 1993, Bochum, Germany

The Conference is organized by the Arbeitsgemeinschaft Plasmaphysik (APP), which is a joint venture of the Ruhr-University Bochum, the Heinrich-Heine-University Düsseldorf, the University-GH-Essen and the Forschungszentrum Jülich. The venue for the conference is the Ruhr-University - founded about thirty years ago - which has developed into one of the largest and most successful universities in Germany. It is situated within the Ruhr valley on the north rim of the Bergische Land, with short connections to the political center of Nordrhein-Westfalen and to some of the important cultural and shopping towns of Germany, like

Düsseldorf and Essen. The environment is a center of German industry, with a high population density, and large areas of quiet country (with old castles and historical monuments) in the neighbourhood.

The organizers will foster the attendance of students by offering them a reduced registration fee. They will also give financial assistance to some invited speakers and a few participants with limited resources. A full day (September 19, 1993) will be devoted to lectures of particular industrial relevance, in order to promote the interest of the surrounding industrial establishment for plasma-technological methods.

Topics covered in the Conference :

(1) Kinetics, thermodynamics and transport phenomena
(2) Waves and instabilities, including shock waves
(3) Non-linear phenomena and self-organization process
(4) Particle and laser beam interaction with plasmas
(5) Ionospheric, magnetospheric and astrophysical plasmas
(6) Physical aspects of plasma chemistry, plasma processing of surfaces and plasma-wall interaction
(7) Non-ideal plasmas, Clusters and dusty plasmas
(8) Elementary processes
(9) Ionization growth and transition to breakdown
(10) Low pressure glows
(11) Coronas, sparks, surface discharges and high pressure glows
(12) Arcs
(13) Electrode and surface effects
(14) Radio frequency, high frequency and micro-wave discharges
(15) Laser-induced and optically controlled discharges
(16) Discharges for generation of laser radiation
(17) Generation and dynamics of plasma flows.
(18) Numerical modelling
(19) Plasma spectroscopy (including laser-induced fluorescence, optogalvanic and optovoltaic effects)
(20) Diagnostic methods
(21) Plasmas for environmental issues.

The Chairmen of the Scientific and Local Organizing Committee, are resp. A.H. Guenther and G. Ecker.

Abstracts of about 200 to 300 words should be submitted by 15 January 1993.

For additional details, contact :

Dr. Udo Arendt, Secretary ICPIG XXI
Arbeitsgemeinschaft Plasmaphysik
Ruhr-Universität Bochum
Universitätsstrasse 150, Postfach 10 21 48
W-4630 Bochum 1, Germany
Tel. (49) 234-700 3757 or 49-234-700 6709
Fax (49) 234-709 4178, Telex 17-234-356
E-mail: icpig@tp4.ruhr-uni-bochum.de

4TH INTERNATIONAL SYMPOSIUM ON RECENT ADVANCES IN MICROWAVE TECHNOLOGY (ISRAMT '93)

15-18 December 1993, New Delhi/Agra, India

The 4th International Symposium on Recent Advances in Microwave Technology will feature contributed as well as invited papers on any area of microwave technology and its applications. However, the topics on Components and Solid State Devices, Antenna and Radar Technology, MICs and mm-ICs, Remote Sensing, Biological Effects and applications, Communication Systems, CAD Techniques, Propagation and Measurements, Electro-Optics, Microwave/mm-wave Optical Technology, Microwave Superconductivity and Microwave Education are especially proposed.

Authors are invited to submit one original and 3 copies of the 4 page manuscript (in English only), prepared according to the instructions given below. Poster Sessions are also being organized. The authors should indicate whether the paper is for poster session or main sessions.

Deadlines

4-Page Paper Submission	March 15, 1993
Acceptance Notification	April 30, 1993
Preregistration	September 10, 1993

Contributions and inquiries should be addressed to

(USA, Canada and Europe)
Dr. Banmali Rawat,
Technical Program Co-Chair
Department of Electrical Engineering
University of Nevada, Reno
Reno, NV 89557-0153 USA
Tel : (702) 784-1457
Fax : (702) 784-6627

(Asia, Pacific Region, Africa)
Dr. Bharathi Bhat,
Technical Program Co-Chair
Center for Applied Res. in Electronics
Indian Institute of Technology
Hauz, Khas, New Delhi, 110016
INDIA
Tel : 91-11-665674
Telex : 31-73087 I.I.T. IN

Exhibits of Industrial Products & Workshop are also planned.

CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS (CPEM)

27 June - 1 July 1994, Boulder, Colorado, USA

The purpose of the biennial meetings of CPEM is to exchange information on a wide range of topics on precise electromagnetic measurements. These topics include :

(1) Advanced instrumentation including new sensors and measurement methods
(2) Automated measurement methods
(3) Dielectric and antenna measurements
(4) Direct current and low-frequency measurements
(5) Fundamental constants and special standards
(6) Laser, optical fiber, and optical electronic measurements
(7) RF, microwave, and millimeter-wave measurements
(8) Superconducting and other low-temperature measurements
(9) Time and frequency measurements

CPEM '94 will be extended to five days to provide for added special sessions on the fundamental constants. The CODATA Task Group On Fundamental Constants plans to carry out the next-squares adjustment of the fundamental constants in 1995, with a cutoff date for input data that

is shortly after CPEM '94. Thus, CPEM '94 provides a particularly timely forum for discussion of results important to the 1995 adjustment.

The conference language will be English. Authors are requested to submit an abstract and a summary by January 18, 1994. If the paper is accepted, the author will be notified and encouraged to prepare a full paper for the IEEE Transactions on Instrumentation and Measurement. The Conference Chair is Donald B. Sullivan, and the Technical Programme Committee is chaired by A.C. Newell. For further information, please contact :

Gwen E. Bennett, Conference Secretary
Natl. Inst. of Standards & Techn.
325 Broadway
Boulder, Colorado, 80303 USA
Telephone : (01) 303-497-3295
Telefax : (01) 303-497-6461
Telex : 910 940 5906

INTERNATIONAL SEMINAR ON MATHEMATICAL METHODS IN ELECTROMAGNETIC THEORY (MMET)

7-10 September 1994, Kharkov, Ukraine

This Seminar, the fifth MMET, is sponsored and organized by the Institute of Radiophysics and Electronics of the Ukrainian Academy of Sciences, and is sponsored by Test-Radio Ltd. The Seminar is held in cooperation with the International Union of Radio Science (URSI). Suggested topics :

Scattering and Diffraction :
- Numerical Methods
- Asymptotic Methods
- Inverse Scattering
- Diffraction Gratings and Periodic Structures
- Canonical Problems
- Frequency Selective Surfaces

Antennae :
- Theory and Design
- Reflector Antennae
- MM Waves Antennae

Waveguides :
- Theory and Design
- Open Waveguides

Deadlines :

Submission of summaries	30 November 1993
Notification of accepted papers	20 January 1994
Submission of completed papers	30 March 1994

Working language : English

Typed summaries of original papers related to one of suggested topics must be sent in three copies by 30 November 1993 to :

MMET-94
Institute of Radiophysics and Electronics
Ukrainian Academy of Sciences
12, ac.Proskura, st., Kharkov, 310085, Ukraine

OTHER MEETINGS WHICH HAVE BEEN BROUGHT TO OUR ATTENTION

- 1993 Symposium on VLSI Technology, 17-19 May 1993, Kyoto, Japan
  Contact : Eiji Takeda, 3rd Dept., Central Res. Lab.
  Hitachi Ltd., 1-280 Higashi-Koigakubo
  Kobubunji-shi, Tokyo 185, Japan
  Tel : (81) 423 23 1111, Fax : (81) 423 27 7732

- European Hybrid Microelectronics Conference, 2-4 June 1993, Nice, France
  Contact : ISHM, c/o Edigraphic, 16 rue Guillaume Tell
  75017 Paris, France

- 8th International Symposium on Solar Terrestrial Physics (Dedicated to STEP, the Solar Terrestrial Energy Program), 5-10 June, 1994, Sendai, Japan
  For information, contact :
  Dr. A. Morioka, Department of Astronomy and Geophysics, Tohoku University, Aramaki, Aoba, Sendai 980, Japan
  Fax : (81) 22-262-6332
  E mail : THKSTP(40.799)::Morioka (NSI/DEC)
  Morioka@st.pp.geophys.tokohu.ac.jp (Internet)

- IEEE MTT-S International Microwave Symposium, 14-18 June, 1993, Atlanta, Georgia, USA
  Contact : MTT-Symposium 1993, c/o LRW Associates
  1218 Balfour Drive, Arnold, Maryland 21012, USA

- IEEE International Symposium on Electromagnetic Compatibility, 9-13 August, 1993, Dallas, Texas, USA
  Contact : Dr. Frederich M. Tesche
  c/o International Compliance Corporation, 1911 E. Jeter Rd., Argyle, Telex 76226-94101
  Tel : (81) 7-491-3696, Fax : (81) 7-491-3699

- European Conference on Circuit Theory and Design, 30 August - 3 September, 1993, Davos, Switzerland.
  Contact : Prof. J. Neirynck or Mrs. Renate Agotai
  Tel : (41) 1 256 51 93, Fax : (41) 1 262 08 23
  E mail : ecctd93 @ isi.ethz.ch).

LIST OF URSI-SPONSORED SYMPOSIA AND MEETINGS IN 1993

Details have been received concerning the following Conferences :

Very High Angular Resolution Imaging
11-15 January, Sydney, Australia
Contact address : Dr. W.J. TANGO
School of Physics A28, University of Sydney
Sydney, NSW 2006, Australia
E-mail : tango@astron.physics.su.oz.au

Spatio-temporal Analysis for Resolving Plasma Turbulence
31 January - 5 February, Aussois, France
Contact address : Dr. A. ROUX, CNET/CPRE, 92131 Issy-les-Moulineaux-Cédex, France
Tel. : (33) 1 45 29 44 15, Fax : (33) 1 45 29 60 52
Telex : 200570 cnetion, span crpeis::roux
Bitnet : roux@frcrpe51.Bitnet
Internet : roux@crpeis.decnet.cnet-pab.Fr

10th Zurich Symposium on Electromagnetic Compatibility
9-11 March, Zurich, Switzerland

Contact address : Dr. G. MEYER
ETH-Zentrum - IKT, 8092 Zurich, Switzerland
Tel. : (41) 1-256-2790, Fax : (41) 1-262-0943
Telex : 817379

8th International Conference on Antennas and Propagation
30 March - 2 April, Edinburgh, UK
Contact address : IEE Conference Department
Savoy Place, London WC2R OBL, UK
Tel. : (44) 71-240.18.71, Fax : (44) 71-497.36.33

ICC'93, International Conference on Communications
23-26 May, Geneva, Switzerland
Contact address : Dr. Thomas MITTELHOLZER
ICC'93 TPC Secretary, ISI ETF F103
ETH-Zentrum ,CH-8092 Zurich, Switzerland

Air-sea Interface Symposium
29-30 June, Marseilles, France
Contact address : Mark A. DONELAN
Chairman, Air-Sea Interface Symposium
National Water Research Institute
Burlington, Ontario, Canada
Tel. : (416) 336-4879, Fax : (416) 336-4989
Telex : 061-8296, Telemail : m.donelan/omnet

URSI Radio Science Meeting and IEE AP-S Symposium
27 June - 2 July, Ann Arbor, Michigan, USA
Contact address : Prof. T.B.A. SENIOR
Radiation Laboratory, Electrical & Computer Eng. Dept., The University of Michigan, ANN ARBOR, MI 48109, USA
Tel. : (1-313) 764-0500, Fax : (1-313) 747-2106
E-mail : Senior@um.cc.umich.edu.

International Microwave Conference
2-5 August, Sao Paulo, Brazil
Contact address : Paulina CARDOSO
IMT-Escola de Engenharia Maus
Estrada das Lagrimas, 2035
09580 S. Caetano do Sul - SP, Brazil

International Geoscience and Remote Sensing Symposium (IGARSS 93)
18-21 August, Tokyo, Japan

Contact address : Professor Mikio TAKAGI
Institute of Industrial Science, University of Tokyo
7-22-1 Roppongi, Minato-Ku, Tokyo 106, Japan
Tel. : (81) 3-3402-6231
Fax : (81) 33-402-6226

International Symposium on Radio Propagation (ISRP'93)
18-21 August, Beijing, P.R. China
Contact address : Prof. Zong SHA
China Research Institute of Radiowave Propagation
P.O. Box 138/93, Xinxiang, Henan 453003, China

XXIV General Assembly of URSI
25 August - 2 September, Kyoto, Japan
Contact address : Prof. I. KIMURA
c/o Osaka Office, Business Center for Academic Societies Japan, 10th Tabuchi Bldg., 6-3 Matsugae-cho, Kita-ku, Osaka 530, Japan
Tel. : (81) 6-356-6041, Fax : (81) 6-356-6190

Third International Symposium on Antennas and EM Theory (ISAE'93)
6-9 September, Nanjing, P.R. China
Contact address : Prof. Wen Xun ZHANG
Chairman of TPC, ISAE'93, Southeast University
Nanjing 210018, P.R. China
Fax : (86) 25-713 019

Space VLBI Conference
6-10 September, Kyoto, Japan
Contact address : Dr. M. MORIMOTO
Tokyo Astronomical Observatory
Osawa Mitaka, Tokyo 181, Japan

19th European Conference on Optical Communication (ECOC'93)
12-16 September, Montreux, Switzerland
Contact address : Prof. Réné P. SALATHE
EPFL Ecublens CAL, CH-1015 Lausanne, Switzerland
Tel. : (41) 21 693 33 38
Fax : (41) 21 693 49 16

21st International Conference on Phenomena in Ionized Gases (ICPIG XXI)
19-25 September, Bochum, Germany

Contact address : Dr. Udo ARENDT
Arbeitsgemeinschaft Plasmaphysik, Ruhr-Universität Bochum, Universitätsstraße 150,
Postfach 10 21 48, W-4630 Bochum 1, Germany
Tel. : (49) 234-700 3757 or (49) 234-700 6709
Fax : (49) 234-709 4178, Telex : 17-234-356
E-mail : icpig@tp4.ruhr-uni-bochum.de

Microwaves in Medicine 1993
11-14 October, Rome, Italy
Contact address : Prof. Guglielmo D'INZEO
Dept. of Electronic Engineering
University "La Sapienza" of Rome
Via Eudossiana 18, I-00184 Rome, Italy
Fax : (39) 6-474 2647

Second International Conference on Signal Processing
26-30 October, Bejing, P.R. China
Contact address : Prof. Yan BAOZONG
Institute of Information Science
Northern Jiaotong University
Beijing 100044, China

4th International Symposium on Recent Advances in Microwave Technology 15-18 December, New Delhi-Agra, India
Contact addresses :

For USA, Canada , Europe :

Banmali RAWAT
Co-chair Technical Programme Committee ISRAMT-93
Department of Electrical Engineering
University of Nevada, Reno
Reno, NV 89557-0153 USA

Tel. : (1-702) 784-1457
Fax : (1-702) 784-6627

For Asia, Pacific Region,Africa :

Dr. Bharathi BHAT
Co-chair Technical Programme Committee ISRAMT-93
Center for Applied Res. in Electronics
Indian Institute of Technology
Hauz, Khas, New Delhi, 110016
India
Tel. : (91) 11-665674
Telex : 31-73087 I.I.T. IN

NEWS FROM THE CCIR

Mr. R.C. Kirby, Director of the CCIR, and Professor R.G. Struzak presented a paper at the 1992 Wroclaw Symposium on Electromagnetic Compatibility. The authors have kindly agreed to let the Bulletin reprint the following excerpts from that article : Evolution of Radio-Communications and Future ITU.

"1. Changing environment

At the turn of the century, only a few radio stations existed in the world. Today, the Master International Frequency Register contains more than one million assignments (ITU Report, 1990). The IFRB has recorded more entries in the Register in the past decade than during the whole previous history of radio. More than 60 million cellular and cordless phones are working around the world (Calendar, 1991). There are some 600 million television receivers, and the number of radio receivers is even greater (Waters, 1991). More than 120 million industrial, scientific, medical and domestic appliances use radio waves for non-communication purposes (Struzak, 1985). Since the first Sputnik appeared in the sky in 1957, thousands of artificial earth-satellites have been put in space, of which about 10% on the geostationary orbit, about 36,000 km above the Earth. Their number increases, and about 500 new satellite networks are expected by the end of 1993."

2. Radio Regulations

The ITU Plenipotentiary Conference, Nice 1989, created a Voluntary Group of Experts, VGE, to re-examine alternatives to the way in which the radio frequency spectrum is presently allocated, with a view to maximizing its efficient use and to cover multi-functional radio systems, and to simplify the Radio Regulations. The studies are under way, and more than 30 countries and six international organizations participate. The Final VGE Report is scheduled for September 1993, with the draft circulated for comments by October 1992. The text of new Radio Regulations is planned to be ready by September 1995, for consideration by a competent Radio Conference.

The VGE adopted four basic guidelines :

- The simplified Radio Regulations must be in conformity with the ITU Convention;

- Only the fundamental and minimum necessary provisions requiring treaty force should be retained ; non-binding and informative texts would be removed from the Regulations. They would be considered as the primary document, with support being provided in secondary documentation.
- The new Radio Regulations would contain only the material that relates to the rights and obligations of Governments bound by the treaty ; all other material would either be transferred elsewhere or cancelled
- For the material to be transferred, the Technical Standards and Rules of Procedures of the IFRB, or the Recommendations of the CCIR might be an appropriate place; Additionally, transfer to either ICAO or IMO; or other inter-governmental organizations might be considered.

The work of VGE would facilitate the utilization of the spectrum through making the frequency allocations more flexible and through balancing the increased allocation freedom given to administrations with their increased responsibility to recognize the rights of other administrations. A possible merging of some existing radio communication services, for the allocation purposes, is under consideration. Five to seven families of services might be achieved progressively, with appropriate transitional arrangements, according to VGE. The possible merger of the present three ITU Regions is also being studied. Of the present concept of Primary, Secondary and Permitted Services in the Table of Allocations, the last one will probably not be used. The number of footnotes to the Table would also be reduced.

3. Future ITU : the HLC (High Level Committee) vision

There has been a feeling among the ITU Member Countries that the functioning of the ITU can be improved to respond more effectively to the challenges of the changing telecommunication environment. The Nice Plenipotentiary Conference decided that a special study should be undertaken for that purpose by a High Level Committee, HLC. In 1989, the ITU Administrative Council set out the detailed tasks and selected 21 Member States to designate representatives to serve on the Committee. The HLC task resulted in a draft new text of the ITU Convention and Constitution to be considered by the Extraordinary Plenipotentiary Conference in December 1992. In its Report (HLC, 1991), the HLC proposes that the ITU should not seek to broaden or change its overall mandate. The ITU should act as a catalyst and coordinator of international telecommunications, including industry, with emphasis on the policy and strategy issues. The ITU should recognize the growing

role of regional bodies and their complementary activities. The HLC recommendations seek to encourage greater participation by all those who have interests in ITU activities, not only the Administrators. The ITU is an intergovernmental organization with Administrations as Members, but it exists to meet a wide range of interests : to facilitate the provision of services to end users by operators, service providers and equipment manufacturers ; and to assure effective use of the radio-frequency spectrum by all users. Non-Member participants make a great contribution to its work, and their even greater participation should be encouraged, according to HLC.

The supreme body would remain the Plenipotentiary Conference, meeting every four years. It would be supported by the Administrative Council (to be renamed ITU Council), playing a more strategic role. The substantive work of ITU would be organized in three Sectors : Development, Standardization and Radiocommunication. The Standardization Sector would include the current work of the International Telegraph and Telephone Consultative Committee (CCITT) and some standardization work currently done by the International Radio Consultative Committee (CCIR). The Radiocommunication Sector would include most of the current CCIR work and that of the International Frequency Registration Board (IFRB) and its specialized secretariat. The Development Sector would encompass the current work of the Telecommunications Development Bureau (BDT). For each Sector, the supreme body would be a World Conference, supported by Study/Working Groups. For each Sector, elected Directors would head Bureaus at ITU headquarters. They would also chair Advisory bodies which, according to the needs of the Sector, would review its strategies, priorities and activities and help ensure coordination of work and adaptation between conferences to the changing needs and circumstances. Each Sector would have its own budget. The Secretary General would continue as the chief officer of ITU, with a key role in strategic planning, management and coordination. The HLC also recommends a greater participation of the private sector, which should be encouraged to play a more active role.

The Radiocommunication World Conferences would be held between Plenipotentiary conferences, in a regular cycle, which would enable the frequency allocations and Radio Regulations to be modified at the same rate. This creates a new situation for each user of the spectrum, who must now continuously analyze the impact of spectrum-related activities and be able to react faster than previously. The HLC do not propose radical changes in the CCIR Study Group mechanism, but recommends the transfer to all standard-related studies to the Standardization Sector. The

IFRB secretariat would be under the Director of the Sector and not under the Board. The current full-time five-member IFRB is proposed to be replaced by a part-time nine-member Radio Regulations Board. The HLC considers that, over the years, the Board has established rules of procedure and technical criteria which allow most notices from Administrations to be treated in a routine manner. This has also enabled the increase implementation of automation. As a result, the HLC considers that the Board routinely approves the vast majority of findings produced by the secretariat staff with the help of the computer. In addition, it expect that the results of the work of the VGE on a simplification of the Radio Regulations will facilitate further the activities of the Board. The new part-time Board would meet on a quarterly basis or less frequently, the meetings would be prepared by the Director and his staff. The HLC is convinced that such an expanded part-time Board "would better understand the needs of all Administrations and, in particular, those of developing countries". Its task would be to approve the technical standards and rules of procedure to be used in the application of the Radio Regulations by the Director and the Bureau, and interpret the provisions of the Radio Regulations in this respect. The findings would be issued on behalf of the Board by the Director, based upon these approved standards and procedures. A review of a finding which is requested by an Administration, and which cannot be resolved by the established criteria, would be considered by the part-time Board.

The Director will not only direct the work of the new Radio-Communication Bureau (including the present secretariats of the CCIR and IFRB), but also serve as Executive Secretary of the part-time Board, according to the proposals. The Director will prepare draft revisions of the technical standards and rules of procedure for consideration by the Board. He will also coordinate the technical and regulatory preparations for the Radiocommunication Conferences, ensuring that the work of the Study groups and the work of the Bureau are properly integrated. The Director will communicate to Administrations the results of this preparatory work, collect their comments and then submit a consolidated report to the Conference. The Director will maintain the Master International Frequency register and the other service documents referred to in the Radio regulations, as well as continue the assistance to Administrations as specified in the Regulations, says HLC.

Tables 1 and 2 show the existing and proposed units involved in the world-wide management of the radio spectrum.

Table 1. Existing ITU Organs dealing with radio

General Secretariat
WARCs and RARCs
CCIR Plenary Assembly
CCIR Study Groups
Ad-hoc Advisory Group
CCIR Director & Specialized Secretariat
IFRB & Specialized Secretariat

Table 2. Proposed ITU Radiocommunication Sector

General Secretariat
Radiocommunication Sector
Biannual Radiocommunication Conference
Study Groups
Advisory Committee
Radio Regulation Board (Part-time)
Director & Bureau

4. Concluding remarks

The current review of the structure and functioning of the ITU by the High Level Committee confirmed that the ITU framework is an indispensable element for further development of telecommunications on national, regional and global scales. The Committee concluded :

"The ITU remains unique and irreplaceable as an intergovernmental organization, both in its leading role in the global information economy and society and in the manner in which it addresses the needs of developing countries and engages the private sector in its work as part of the wider ITU family."

The Members of the ITU will consider the HLC proposals at the Additional Plenipotentiary Conference planned for December 1992 in Geneva and take appropriate decisions ; the future will show to what degree the proposed changes will serve well the international community."

INTERNATIONAL GEOPHYSICAL CALENDAR 1993

This Calendar continues the series begun for the IGY years 1957-1958, and is issued annually to recommend dates for solar and geophysical observations which cannot be carried out continuously. Thus, the amount of observational data in existence tends to be larger on Calendar days. The recommendations on data reduction and especially the flow of data to World Data Centres (WDCs) in many instances emphasize Calendar days. The Calendar is prepared by the International Ursigram and World Days Service (IUWDS) with the advice of spokesmen for the various scientific disciplines.

The Solar Eclipses are :

a) 21 May 1993 (partial) visible in N. America northwest of line that passes from mid-Baja, CA, through Buffalo, NY ; in Europe northeast of line crossing from England-Scotland border through southern Poland ; and in northeast Asia. Maximum magnitude is 0.74.
b) 13 November 1993 (partial) visible near sunrise in all of Australia and New Zealand except for northern rims ; near sunset in S. America south of middle of Chile and Argentina ; in Antarctica where maximum magnitude is 0.93. (Description by Dr. Jay Pasachoff)

Meteor Showers (selected by R. Hawkes, Canada) include important visual showers and also unusual showers observable mainly by radio and radar techniques. These can be studied for their own geophysical effects or may be "geophysical noise" to other experiments. The dates are given in Note 1 under the Calendar.

Definitions :

Time = Universial Time (UT);
Regular Geophysical Days (RGD) = each Wednesday;
Regular World Days (RWD) = Tuesday, Wednesday and Thursday near the middle of the month (see calendar);
Priority Regular World Days (PRWD) = the Wednesday RWD;
Quarterly World Days (QWD) = PRWD in the WGI;
World Geophysical Intervals (WGI) = 14 consecutive days each season (see calendar);
ALERTS = occurence of unusual solar or geophysical conditions, broadcast once daily soon after 0400 UT;
STRATWARM = intervals selected by MONSEE for study.

For more detailed information of the definitions, please see one of the following, or contact H. Coffey (address below) : IUWDS Synoptic Codes for Solar and Geophysical Data; Solar-Geophysical Data, November issue ; URSI Information Bulletin, December 1991 issue ; COSPAR Information Bulletin ; IAGA News ; IUGG Chronicle ; WMO Bulletin ; IAU Information Bulletin ; Journal of the Radio Research Laboratories (Japan), Geomagnetism and Aeronomy (Russia) ; Journal of Atmospheric and Terrestrial Physics (U.K.) ; EOS Magazine (AGU/USA).

Priority recommended Programmes for measurements not made continuously (in addition to unusual ALERT periods) :

Aurora and Airglow - Observation periods are New Moon periods, especially the 7 day intervals on the calendar ;

Atmospheric Electricity - Observation periods are the RGD each Wednesday, beginning on 6 January 1993 at 0000 UT, 13 January at 0600 UT, 20 January at 1200 UT, 27 January at 1800 UT, etc. Minimum programme is PRWDs.

Geomagnetic Phenomena - At minimum, need observation periods and data reduction on RWDs and during MAGSTORM Alerts.

Ionospheric Phenomena - Quarter-hourly ionograms ; more frequently on RWDs, particularly at high latitude sites ; f-plots on RWDs ; hourly ionograms to WDCs on QWDs ; continuous observations on solar eclipse in the eclipse zones. See Airglow and Aurora.

Incoherent Scatter - Observations on Incoherent Scatter Coordinated Days, and intensive series on WGIs or Airglow and Aurora Periods. Special programmes : Dr. J. Holt, M.I.T. Haystack Observatory, Route 40, Westford, MA 01886 USA, URSI Working Group G.5. Phone (617) 981-5625, e-mail address AMES: "jmh@chaos. haystack.edu".

Ionospheric Drifts - During weeks with RWDs.

Travelling Ionosphere Disturbances - special periods, probably PRWD or RWDs.

Ionospheric Absorption - Half-hourly observations on RWDs ; continuous on solar eclipse days for stations in eclipse zone and conjugate area. Daily measurements during Absorption Winter Anomaly at temperate latitude stations (October-March Northern Hemisphere; April-September Southern Hemisphere).

Backscatter and Forward scatter - RWDs at least.

Mesospheric D region electron densities - RGD around noon.

ELF Noise Measurements of earth-ionosphere cavity resonances - WGIs.

All programmes - Appropriate intensive observations during unusual meteor activity.

Meteorology - Especially on RGDs. On WGIs and STRATWARM Alert Intervals, please monitor on Mondays and Fridays, as well as on Wednesdays.

GAW (Clobal Atmospheric Watch) -- WMO programme to integrate monitoring of atmospheric composition. Early warning system of changes in atmospheric concentrations of greenhouse gases, ozone, and pollutants (acid rain and dust particles). WMO, 41 avenue Giuseppe-Motta, P.O. Box 2300, CH-1211 Geneva 2, Switzerland.
Solar Phenomena - Solar eclipse days, RWDs and during PROTON/FLARE ALERTS.
FLARES22 (FLAre RESearch at the maximum of solar cyccle 22) - observations of basic physical processes of transient solar activity and its coupling with the solar-terrestrial environment, including times of the various solar ALERTS. Coordinate satellite and ground-based observations. Contact Dr. M. Machado, Department of Physics, University of Alabama, Huntsville, AL 35899, USA. Phone (1-205) 895-6676, Fax (1-205) 895-6790, SPAN SSL::MACHADO
SOLTIP (SOlar connection with Transient Interplanetary Processes). 1990-1995 observations and analyses of solar-generated phenomena propagating throughout heliosphere, including times following the various solar ALERTS. Includes Interplanetary Scintillation observations of radio galaxies and telemetry signals to/from interplanetary spacecraft; Also coordination of spacecraft IMP-8, ICE, Giotto, Sakigake, Voyager 1/2, Pioneer 10/11, Ulysses, Relict, Wind, SOHO, Galileo, and ACE. Contact Dr. M. Dryer, NOAA R/E/SE, 325 Broadway, Boulder, CO 80303, USA. Phone (1-303) 497-3978, Fax (1-303) 497-3645, SPAN E-mail address SELVAX::MDRYER.
Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy - QWDs, RWDs, and Airglow and Aurora Periods.

The International Ursigram and World Days Service (IUWDS) is a permanent scientific service of the International Union of Radio Science (URSI), with the participation of the International Astronomical Union (IAU) and the International Union of Geodesy and Geophysics (IUGG). IUWDS adheres to the Federation of Astronomical and Geophysical Data Analysis Services (FAGS) of the International Council of Scientific Unions (ICSU). The IUWDS coordinates the international aspects of the world days programme and rapid data interchange.

This Calendar for 1993 has been drawn up by H.E. Coffey, of the IUWDS Steering Committee, in association with spokesmen for the various scientific disciplines in SCOSTEP, IAGA and URSI and other ICSU organizations. Similar Calendars are issued annually beginning with the IGY, 1957-58, and are published in various widely available scientific publications.

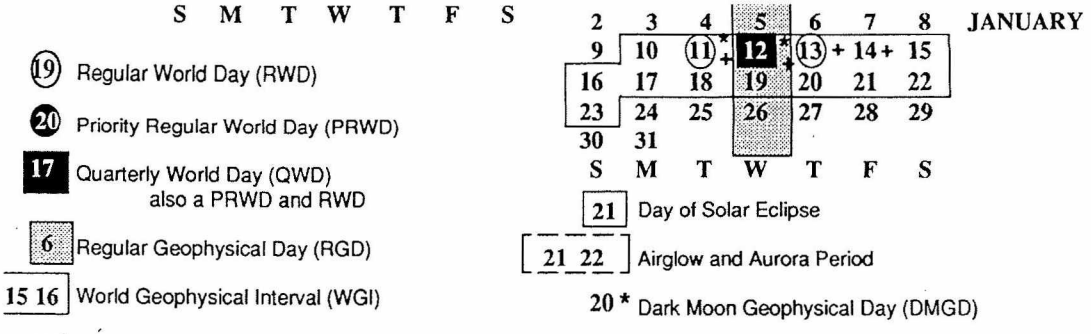
International Geophysical Calendar
1993

(See other side for information on use of this Calendar)

	S	M	T	W	T	F	S
						1	2
	3	4	5	6	7	8	9
JANUARY	10	11	12	13	14	15	16
	17	18	(19)	(20) * +	(21) * +	22 +	23 +
	24 +	25 +	26 +	27 +	28 +	29 +	30 +
	31	1	2	3	4	5	6
FEBRUARY	7	8	9	10	11	12	13
	14	15	(16)	17 *	(18) *	19	20
	21	22	23	24	25	26	27
	28	1	2	3	4	5	6
MARCH	7	8	9	10	11	12	13
	14	15	(16)	(17) * +	(18) * +	19	20
	21	22	23	24	25	26	27
	28	29	30	31	1	2	3
	4	5	6	7	8	9	10
APRIL	11	12	13	14	15	16	17
	18	19	(20)	(21) *	(22) *	23	24
	25	26	27	28	29	30	1
	2	3	4	5	6	7	8
MAY	9	10	11	12	13	14	15
	16	17	(18) +	(19) * +	(20) *	21	22
	23	24	25	26	27	28	29
	30	31	1	2	3	4	5
JUNE	6	7	8	9	10	11	12
	13	14	(15) +	(16) * +	(17) *	18	19
	20	21	22	23	24	25	26
	27	28	29	30			

	S	M	T	W	T	F	S
					1	2	3
	4	5	6	7	8	9	10
JULY	11	12	13	14	15	16	17
	18	19	(20) * +	(21) * +	(22)	23	24
	25	26	27	28	29	30	31
	1	2	3	4	5	6	7
AUGUST	8	9	10	11	12	13	14
	15	16	(17) *	18 *	(19)	20	21
	22	23	24	25	26	27	28
	29	30	31	1	2	3	4
SEPTEMBER	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	(21) *	(22) *	(23)	24	25
	26	27	28	29	30	1	2
	3	4	5	6	7	8	9
OCTOBER	10	11	12	13	14	15	16
	17	18 +	(19) ‡ *	(20) *	(21)	22	23
	24	25	26	27	28	29	30
	31	1	2	3	4	5	6
NOVEMBER	7	8	9 +	10 +	11	12	13
	14	15	(16) *	17 *	(18)	19	20
	21	22	23	24	25	26	27
	28	29	30	1	2	3	4
DECEMBER	5	6	7 +	8 +	9	10	11
	12	13	(14) *	(15) *	(16)	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	1

1994



NOTES on other dates and programs of interest:

1. Days with unusual meteor shower activity are: Northern Hemisphere Jan 3; Apr 21-23; May 4-5; Jun 4-12, 26-29; Aug 10-15; Oct 20-23; Nov 16-18; Dec 12-14, 22-23, 1993; Jan 3-4, 1994. Southern Hemisphere Apr 23; May 4-5; Jun 4-12, 26-29; Jul 28-29; Oct 21-23; Nov 16-18; Dec 12-14, 1993.

2. SOLTIP (Solar connection with Transient Interplanetary Processes). Observing Program 1990-1995: solar-generated phenomena and their propagation throughout the heliosphere. (See Explanations.)

3. FLARES22 (FLAre RESearch at solar cycle 22 max). Observing Program 1990-1995: basic physical processes of transient solar activity and its coupling with solar-terrestrial environment. (See Explanations.)

4. GAW (Global Atmosphere Watch). WMO program to measure atmospheric composition -- early warning system to detect changes in atmospheric concentrations of greenhouse gases, ozone, and pollutants (acid rain and dust particles).

5. Day intervals that IMP 8 satellite is in the solar wind (begin and end days are generally partial days): 28 Dec 1992-5 Jan 1993; 9-17 Jan; 21-30 Jan; 3-12 Feb; 16-24 Feb; 1-9 Mar; 14-21 Mar; 26 Mar-3 Apr; 8-15 Apr; 20-27 Apr; 2-10 May; 15-22 May; 28 May-4 Jun; 9-17 Jun; 22-29 Jun; 4-12 Jul; 17-24 Jul; 30 Jul-5 Aug; 12-18 Aug; 24-30 Aug; 6-12 Sep; 18-25 Sep; 1-7 Oct; 14-20 Oct; 26 Oct-1 Nov; 8-14 Nov; 20-27 Nov; 2-10 Dec; 15-22 Dec; 27 Dec 1993-4 Jan 1994. Note that there will not necessarily be total IMP 8 data monitoring coverage during these intervals. (Information kindly provided by the WDC-A for Rockets and Satellites, NASA GSFC, Greenbelt, MD 20771 U.S.A.).

6. + Incoherent Scatter Coordinated Observations Days (see Explanations) starting at 1600 UT on the first day of the intervals indicated, and ending at 1600 UT on the last day of the intervals: 20-30 Jan 1993 CADITS/MLTCS; 17-18 Mar; 18-19 May; 15-16 Jun SUNDIAL; 20-21 Jul; 18-19 Oct; 9-10 Nov GISMOS; 7-8 Dec; 11-14 Jan 1994 GISMOS

where CADITS= Coupling and Dynamics of the Ionosphere-Thermosphere System;
GISMOS= Global Ionospheric Simultaneous Measurements of Substorms;
MLTCS= Mesosphere, Lower-Thermosphere Coupling Study;
SUNDIAL= Coordinated study of the ionosphere/magnetosphere.

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Additional copies are available upon request from the following persons: the IUWDS Chairman : Dr. R. Thompson, IPS Radio and Space Services, Department of Administrative Services, P.O. Box 5606, West Chatswood, NSW 2057, Australia, Fax (61) 2-414 8331, E-mail richard@ipso.ips.oz.au, or the IUWDS Secretary for World Days : Miss H.E. Coffey, WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder, Colorado 80303, USA, Fax (1-303) 497-6513, E-mail 34367::hcoffey.

INFORMATION ON UTC-TAI

No positive leap second will be introduced at the end of December 1992.
The difference between UTC and the International Atomic Time TAI is :
from 1992 July 1, 0h UTC, until further notice : UTC-TAI = -27s.
Leap seconds can be introduced in UTC at the end of the months of December or June, depending on the evolution of UT1-TAI. Bulletin C mailed every six months, either to announce a time step in UTC, or to confirm that there will be no time step at the next possible date.

MARTINE FEISSEL
Director Central Bureau of IERS

PUBLICATIONS BY MEMBERS OF THE URSI COMMUNITY

Methods for Electromagnetic Field Analysis
by Ismo V. Lindell
Helsinki University of Technology

304 pages, 26 line drawings. £ 40.00 Hardback.
Published in July 1992 by Clarendon Press, Oxford.

0-19-856239-X

This monograph discusses mathematical and conceptual methods applicable in the analysis of electromagnetic fields and waves. Dyadic algebra is reviewed, and armed with new identities it is applied throughout the book. The power of dyadic operations is seen when working with boundary, sheet and interface conditions, medium equations, field transformations, Green functions, plane wave problems, vector circuit theory, multipole and image sources. The main emphasis of the monograph is not on specific results but methods of analysis.
Contents : Complex vectors, Dyadics, Field equations, Field transformations, Electromagnetic field solutions, Source equivalence, Exact image theory, A collection of dyadic identities.

Electromagnetic Compatibility
Edited by Pierre Degauque and Joël Hamelin

600 pages, 20 halftones, 120 line drawings. £ 50.00 Hardback.
Published in September 1992 by Oxford University Press.

0-19-856375-2

This is the English version of "Compatibilité électromagnétique", published by Dunod in 1990 (see the URSI Bulletin of March 1991).

The issue of electromagnetic compatibility is becoming more important as a consequence of the widespread use of electronics in functions requiring very high degrees of reliability. Examples range from fly-by-wire aircraft to ignition, fuel injection, and braking systems of modern cars. These electronic systems have to be proof against both natural

disturbances (e.g. lightning) and man-made disturbances (power transmission lines, TV masts, etc.).
This book describes interference sources and determines interference fields radiated ; considers modes of coupling between the disturbance and the system in question on qualitative and quantitative levels ; outlines simulation and test procedures necessary to develop protective techniques. This is essentially an informative and practical book rather than theoretical.
Contents : P. Degauque & J. Hamelin : The domain of electromagnetic compatibility; J. Hamelin : Sources of natural noise; A. Azouly : Industrial Noise; M. Gaurrand : Noise sources of nuclear origin; J. Piponnier : Administration of the frequency spectrum and regulation of radio communications; B. Demoulin : Characterization of screened cables; P. Degauque : Coupling in lines and cables in proximity to the earth or an earth plane; F. Molinet : Coupling of a plane wave with wire antennas; Y. Le Guillou : Penetration into three-dimensional structures and coupling; B. Besnault : Measurements of electromagnetic compatibility; M. Blanchet : Means of stimulation and analysis of systems subjected to the effects of pulsed electromagnetic interference.

Radioengineering

This is a new periodical, published jointly by the Czech and Slovak Technical Universities and the URSI Member Committee in Czechoslovakia. The first issue, which came out in May 1992, contains data on URSI and on various University Departments in Czechoslovakia. It also features six technical articles written by Czechoslovakian colleagues. For details and subscriptions, contact

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RADIOENGINEERING

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CZECHOSLOVAKIA

FROM THE ARCHIVES OF URSI

CHRONOLOGICAL LIST OF OFFICERS OF THE BOARD

In January 1993 the Member Committees will receive a letter inviting nominations for the offices of President and Vice-President of URSI. The nominations should be in by the end of March 1993. It is perhaps useful to give the list of former URSI officers, as found in our Archives (more specifically in the URSI Bulletin, the Proceedings of the General Assembly, and the Golden Jubilee Memorial) :

Presidents :

1919-32 : G. Ferrié (France)
1932 : L.W. Austin (USA)
1932-34 : A.E. Kennelly (USA)
1934-52 : E.V. Appleton (U.K.)
1952-57 : P. Lejay (France)
1957-60 : L.V. Berkner (USA)
1960-63 : R.L. Smith-Rose (U.K.)
1963-66 : I. Koga (Japan)
1966-69 : S. Silver (USA)
1969-72 : W. Dieminger (Germany)
1972-75 : W.J.G. Beynon (U.K.)
1975-78 : J. Voge (France)
1978-81 : W.N. Christiansen (Australia)
1981-84 : W.E. Gordon (USA)
1984-87 : A.P. Mitra (India)
1987-90 : A.L. Cullen (U.K.)
1990- : E.V. Jull (Canada)

W. Duddle (U.K.) was President of the International Commission of Scientific Wireless Telegraphy, the precursor of URSI, which was founded in Brussels in 1914. The Vice-President of the Commission was M. Wien (Germany).

Vice-Presidents :

For the period before World War II we only mention that J.H. Dellinger (USA), R. Mesny (France), H. Nagaoka (Japan) and B. van der Pol (Netherlands) were Vice-President from 1934 up to the start of the war. After the war, we note the following names :

1946-48 : J.H. Dellinger (USA), R. Jouaust (France), H. Sterky (Sweden), B. Van Der Pol (Netherlands)

1948-50 : J.H. Dellinger (USA), A. Dorsimont (Belgium), P. Lejay (France), J. Lugeon (Switzerland), H. Sterky (Sweden), B. Van Der Pol (Netherlands)

1950-52 : J.H. Dellinger (USA), P. Lejay (France), D.F. Martyn (Australia)

1952-54 : C.R. Burrows (USA), D.F. Martyn (Australia), B.D.H. Tellegen (Netherlands)

1954-57 : L.V. Berkner (USA), C.R. Burrows (USA), R.L. Smith-Rose (U.K.), B.D.H. Tellegen (Netherlands)

1957-60 : I. Koga (Japan), R.L. Smith-Rose (U.K.), G.A. Woonton (Canada)

1960-63 : B. Decaux (France), I. Koga (Japan), A. Prokhorov (USSR), G.A. Woonton (Canada)

1963-66 : B. Decaux (France), W. Dieminger (Germany), A. Prokhorov (USSR), S. Silver (USA)

1966-69 : W.J.G. Beynon (U.K.), M. Boella (Italy), W. Dieminger (Germany), J. Groszkowski (Poland)

Professor C. Manneback (Belgium) was Treasurer of URSI from 1946 to 1969. From 1969 on, the function of Treasurer has been discharged by one of the Vice-Presidents.

1969-72 : W.J.G. Beynon (U.K.), H.G. Booker (USA), J. Groszkowski (Poland), J. Voge (France : Treasurer)

1972-75 : H.G. Booker (USA), W.N. Christiansen (Australia), V.V. Migulin (USSR), J. Voge (France : Treasurer)

1975-78 : W.N. Christiansen (Australia), W.E. Gordon (USA : Treasurer), V.V. Migulin (USSR), F.L.H.M. Stumpers (Netherlands)

1978-81 : W.E. Gordon (USA : Treasurer), A.P. Mitra (India), A. Smolinski (Poland), F.L.H.M. Stumpers (Netherlands),

1981-84 : A.L. Cullen (U.K. : Treasurer), A.P. Mitra (India), S. Okamura (Japan), A. Smolinski (Poland)

1984-87 : H.J. Albrecht (Germany : Treasurer), A.L. Cullen (U.K.), S. Okamura (Japan), V. Zima (Czechoslovakia)

1987-90 : H.J. Albrecht (Germany : Treasurer), R.L. Dowden (New Zealand), E.V. Jull (Canada), V. Zima (Czechoslovakia)

1990-- : J.B. Andersen (Denmark), P. Bauer (France : Treasurer), R.L. Dowden (New Zealand), T. Okoshi (Japan)

Secretaries General :

1919-35 : R. Goldschmidt (Belgium), 1935-38 : M. Philippson (Belgium), 1946-48 : A. Dorsimont (Belgium), 1948-67 : E. Herbays (Belgium), 1967-78 : C.M. Minnis (U.K.), 1978-79 : P. Hontoy (Belgium), 1979-- : J. Van Bladel (Belgium)

Assistant Secretaries-General

1984-90 : P. Delogne (Belgium), 1990-- : P. Lagasse (Belgium)

Chairs of Commissions

Chairs and vice-chairs of Commissions for 1993-6 will be elected in Kyoto next year. Present vice-chairs are automatically candidates for the chairmanship, unless they decide not to be considered, or if special circumstances develop. Before the end of 1992 the Official Members of Commissions will receive, from their respective Chairs, a letter requesting nominations for the Vice-chairs. It is with these nominations in mind that we give the chronological list appearing below. It should be remembered that number, name and terms of reference of Commissions have evolved over the years. Our present Commission A, for example, has been known as Commission I on "Radio measurements and standards" in the past. Commission B used to be Commission VI, but the latter also covered Information Theory, which is now part of Commission C. Since the purpose of the list is to motivate members of the URSI community to suggest names of candidates to the Official Members, historical niceties have been ignored and we have lumped the available information under the present Commission titles.

Commission A : Electromagnetic metrology

1922-27 : H. Abraham (France), 1927-32 : D.W. Dye (UK),
1934-46 : E.H. Rayner (UK), 1946-52 : J.H. Dellinger (USA),
1952-54 : R.L. Smith-Rose (UK), 1954-60 : B. Decaux (France),
1960-63 : U. Adelsberger (Germany), 1963-69 : L. Essen (UK),
1969-72 : M.E. Zhabotinskij (Russia), 1972-75 : P.O. Lundbom (Sweden),
1975-78 : H.M. Altschuler (USA), 1978-81 : S. Okamura (Japan),
1981-84 : V. Kose (Germany), 1984-87 : S. Hahn (Poland),
1987-90 : S. Leschiutta (Italy), 1990- : J. Vanier (Canada),
Vice-chair 1990- : B.I. Somlo (Australia)

Commission B : Fields and Waves

1948-52 : B. van der Pol (Netherlands), 1952-53: L.C. Van Atta (USA),
1953-60 : S. Silver (USA), 1960-63 : J. Loeb (France),
1963-69 : F.L. Stumpers (Netherlands), 1969-72 : H.M. Barlow (UK),
1972-75 : K.M. Siegel (USA), 1975-78 : J. Van Bladel (Belgium),
1978-81 : L. Felsen (USA), 1981-84 : H. Unger (Germany),
1984-87 : J.B. Andersen (Denmark), 1987-90 : T.B.A. Senior (USA),
1990- : F. Gardiol (Switzerland),
Vice-chair 1990- : D. Olver (UK)

Commission C : Signals and Systems

1975-78 : B. Picinbono (France), 1978-81 : V. Zima (Czechoslovakia),
1981-84 : J.K. Wolf (USA), 1984-87 : K. Geher (Hungary),
1987-90 : R. Saal (Germany), 1990- : P.A. Matthews (UK),
Vice-chair 1990- : A.D. Wyner (USA)

Commission D : Electronics and Photonics

1928-48 : B. van der Pol (Netherlands), 1948-52 : G. Lehmann (France),
1952-57 : G.A. Woonton (Canada), 1957-63 : W.G. Shepherd (USA),
1963-69 : P. Grivet (France), 1969-72 : M. Chodorow (USA),
1972-75 : A.C. Cullen (UK), 1975-78 : A. Smolinksi (Poland),
1978-81 : W.G. Farnell (Canada), 1981-84 : J. Le Mezec (France),
1984-87 : W.A. Gambling (UK), 1987-90 : T. Okoshi (Japan),
1990- : J. Hénaff (France),
Vice-chair 1990- : T. Itoh (USA)

Commission E : Electromagnetic Noise and Interference

1922-28 : E.V. Eccles (UK), 1928-46 : E.V. Appleton (UK),
1946-48 : R. Bureau (France), 1948-52 : H. Norinder (Sweden),
1952-57 : J.A. Ratcliffe (UK), 1957-63 : R.A. Helliwell (USA),
1966-69 : F. Horner (UK), 1969-72 : R. Rivault (France),
1972-75 : N.O. Clarence (S. Africa), 1975-78 : Y. Likhter (USSR),

1978-81 : G.H. Hagn (USA), 1981-84 : S. Lundquist (Sweden),
1984-87 : F.L. Stumpers (Netherlands), 1987-90 : H. Kikuchi (Japan),
1990- : J. Hamelin (France),
Vice-chair 1990- : V. Scuka (Sweden)

Commission F : Wave Propagation and Remote Sensing

1922-33 : L.W. Austin (USA), 1934-46 : J.H. Dellinger (USA),
1946-48 : E.V. Appleton (UK), 1948-54 : C. Burrows (USA),
1954-60 : R.L. Smith-Rose (UK), 1960-66: J. Voge (France),
1966-69 : J.A. Saxton (UK), 1969-72 : W.E. Gordon (USA),
1972-75 : P. Misme (France), 1975-78 : F. Eklund (Sweden),
1978-81 : A.T. Waterman (USA), 1981-84 : D. Gjessing (Norway),
1984-87 : F. Fedi (Italy), 1987-90 : R.K. Crane (UK),
1990- : G. Brussaard (Netherlands),
Vice-chair 1990- : R.K. Moore (USA)

Commission G : Ionospheric Radio and Propagation

1946-48 : R. Bureau (France), 1948-54 : E.V. Appleton (UK),
1954-60 : D.F. Martyn (Australia), 1960-66 : J.A. Ratcliffe (UK),
1966-69 : C.O. Hines (USA), 1969-72 : K. Rawer (Germany),
1972-75 : S.A. Bowhill (USA), 1975-78 : J.W. King (UK),
1978-81 : B. Hultquist (Sweden), 1981-84 : P. Bauer (France),
1984-87 : J. Aarons (USA), 1987-90 : H. Rishbeth (UK),
1990- : A.W. Wernik (Poland),
Vice-chair 1990- : K. Schlegel (Germany)

Commission H : Waves in Plasmas

1963-69 : H.G. Booker (USA), 1969-72 : J.W. Dungey (UK),
1972-75 : F.L. Scarf (USA), 1975-78 : R. Gendrin (France),
1978-81 : F.W. Crawford (UK), 1981-84 : M. Petit (France),
1984-87 : R.L. Dowden (N. Z.), 1987-90 : H. Matsumoto (Japan),
1990- : R.F. Benson (USA),
Vice-chair 1990- : F. Lefeuvre (France)

Commission J : Radio Astronomy

1948-52 :	D.F. Martyn (Australia),	1952-57 :	M. Laffineur (France),
1957-63 :	A.C.B. Lovell (UK),	1963-66 :	W.N. Christiansen (Australia),
1966-69 :	E.J. Blum (France),	1969-72 :	C.A. Muller (Netherlands),
1972-75 :	J.L. Locke (Canada),	1975-78 :	G. Westerhout (USA),
1978-81 :	H. Tanaka (Japan),	1981-84 :	V. Radhakrishnan (India),
1984-87 :	R. Wielebinski (Germany),	1987-90 :	R.H. Frater (Australia),

1990- : R. Ekers (Australia),

Vice-chair 1990- : Y.N. Parijskij (Russia)

Commission K : Electromagnetics in Biology and Medicine

1990- : M.A. Stuchly (Canada),

Vice-chair 1990- : P. Bernardi (Italy)

EXCERPTS FROM PREVIOUS URSI BULLETINS

Bulletin of January - February 1953

This Bulletin contained, in addition to routine matters,
- extensive data and tables on the world-wide distribution of ionospheric stations
- data for the codes of European Ursigrams

Bulletins of November 1962 to February 1963

In the November-December 1962 issue appeared a thorough description of the ionosphere programme for the IQSY (International Year of the Quiet Sun) (see also Bulletins of March and September 1992). The main headings were :
- Vertical incidence sounding
- Absorption observations
- Drift observations
- Invest. of atmosphere noise
- Whistlers and VLF ionospheric noise
- Radar aurora
- Forward scatter
- Oblique incidence and back-scatter experiments

The January - February 1963 issue starts with an obituary of Dr. J.H. Dellinger, who passed away on 28 December 1962. Dr. Dellinger was active in URSI for many years, having been Chairman of two of our Commissions, Vice-president of the Union from 1934 to 1952, and Honorary President from 1952 to his death. The Dellinger Gold Medal has been established by the Member Committee in the US to honour this distinguished scientist's career.

The same issue contains a detailed report on the first meeting of the I.U.W.D.S. Steering Committee, born of the merger of the Central Committee on Ursigrams and the Steering Committee of the International World Days Service (see Bulletin of March and June 1992). The main headings of the report were : Aims of the IUWDS, Membership of the Steering Committee, Publications, Finances, Functioning of the Ursigram Service, Fructioning of the World Days Service. Mr. A.H. Shapley was elected as first chairman of the Committee.

Bulletin of December 1972

This issue reports on the first meeting of a working party charged with establishing a Register of National Standards Laboratories active in the field of electromagnetic measurements. As some of our readers might remember, a first draft was presented at the General Assembly in Lima in 1975, and a revised version followed in 1978. A second revision came out in 1984, at the General Assembly in Florence. The latest version dates from 1990, and was published by Adam Hilger - IOP. These various volumes were produced under the very able editionship of Dr. A.E. Bailey.

The December 1972 issue also contains a substantial article on FAGS, the Federation of Astronomical and Geological Services, and a survey of the highlights of recent activities in the field of Commission VI, the precursor of our present Commission B (and parts of Commission C). The main headings were :

- Wave propagation	H. Bremmer
- Guided waves and periodic structures	A.L. Cullen
- Diffraction Scattering	L.P. Felsen
- Computer simulation of EM field problems	R.F. Harrington
- Antennas and Arrays	G. Sinclair
- Stochastic effects in Radio Physics	B.J. Uscinski

Bulletin of December 1982

The issue starts with the obituary of A.H. Waynick, founder of the Ionosphere Research Laboratory at the Pennsylvania State University, and former chairman of the URSI Member Committee in the United States (USNC). We also note a most interesting article by C.M. Minnis on Gustave Ferrié, first President of URSI (1919-1932). The paper was written in commemoration of the 50th anniversary of the death of General Ferrié. The article gives, at the same time, an excellent survey of the first years of URSI, form which we learn , for example, that representatives from Belgium, France, Italy, Norway, the UK and the USA were present at the first General Assembly of URSI, held in Brussels in 1922.

URSI OFFICERS AND OFFICERS OF MEMBER COMMITTEES

Note : An alphabetical index of names, with addresses and page references, is given at the back of this Bulletin.

HONORARY PRESIDENTS

Sir Granville Beynon (U.K.)
Prof. W.N. Christiansen (Australia)
Prof. W. Dieminger (Germany)
Prof. W.E. Gordon (USA)
Prof. F.L.H.M. Stumpers (Netherlands)

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Past President :	Prof. A.L. Cullen (U.K.)
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	Dr. P. Bauer (France) (Treasurer)
	Prof. R.L. Dowden (New Zealand)
	Prof. T. Okoshi (Japan)
Secretary General :	Prof. J. Van Bladel (Belgium)

URSI SECRETARIAT

Secretary General :	Prof. J. Van Bladel
Assistant Secretary General :	Prof. P. Lagasse
Administrative Secretary :	Mrs. I. Heleu

URSI STANDING COMMITTEES

Standing Finance Committee

Chairperson :	Prof. K. Géher (Hungary)
Members :	Prof. C.M. Butler (USA)
	Prof. F. Gardiol (Switzerland)
	Prof. J.G. Lucas (Australia)
	Prof. S.M. Radicella (Argentina)
	Prof. F.W. Sluijter (Netherlands)
	Prof. S.S. Swords (Ireland)

Standing Publications Committee

Chairperson :	Prof. P.J.B. Clarricoats (U.K.)
Members :	Prof. S.A. Bowhill (USA)
	Prof. P. Delogne (Belgium)
	Prof. R.L. Dowden (New Zealand)
	Prof. K. Géher (Hungary)
	Dr. G. Hyde (USA)
	Dr. R. Stone (USA)

Standing Committee on URSI Membership

Chairperson :	Prof. T.B.A. Senior (USA)
Members :	Prof. S. Okamura (Japan)
	Dr. M. Petit (France)
	Prof. J. Shapira (Israel)
	Dr. V. Shevchenko (Russia)
	Mr. Yu-Kai Chen (China, SRS)

Standing Committee on Developing Countries

Chairperson :	Prof. S. Radicella (Argentina)
Members :	Dr. G.O. Ajayi (Nigeria)
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	Prof. J.O. Oyinloye (Nigeria)
	Dr. B.M. Reddy (India)
	M.J. Voge (France)

Standing Committee on Future General Assemblies

Chairperson :	Prof. T. Okoshi (Japan)
Members :	Prof. J.W. Klein (Germany)
	Prof. I.A. Salem (Egypt)
	Prof. A.M. Scheggi (Italy)
	Pro. E.M. Zhabotinskij (Russia)
	Prof. V. Zima (Czechoslovakia)

Standing Committee on Young Scientists

Chairperson :	Prof. E.V. Jull (Canada)
Members :	Prof. Feng Shizhang (China, CIE)
	Prof. D. Gjessing (Norway)
	Dr. A.P. Mitra (India)
	Prof. T. Okoshi (Japan)
	Dr. G. Pillet (France)
	Dr. R. Sagalyn (USA)
	Mr. S. Tumsaroch (Thailand)
	Prof. L. Zombory (Hungary)

Committee on the Future of URSI (Long Range Planning Committee)

Chairperson :	Prof. E.V. Jull (Canada)
Members :	Dr. P. Bauer (France)
	Prof. A.L. Cullen (UK)
	Prof. W.E. Gordon (USA)
	Prof. J.G. Lucas (Australia)
	Prof. K. Serafimov (Bulgaria)
	Prof. J. Shapira (Israel)
Secretary :	Prof. P. Lagasse (Belgium)

Committee on the International Geosphere/Biosphere Programme

Chairperson :	Prof. R.K. Moore (USA)
Members :	Prof. W.E. Gordon (USA)
	Prof. A. Guissard (Belgium)
	Dr. J.F.R. Gower (Canada)
	Prof. H. Hallikainen (Finland)
	Dr. N. Matuura (Japan)
	Dr. M. Petit (France)
	Prof. S.M. Radicella (Argentina)
	Prof. H. Rishbeth (UK)
	Prof. Serafimov (Bulgaria)
	Dr. P.A. Watson (UK)
	Dr. A. Wernik (Poland)

ad hoc Group on Environmental Consequences of Nuclear War

Chairperson :	Mr. M. Wik (Sweden)
Members :	Dr. W. Graf (USA)
	Dr. D. Hansen (Switzerland)
	Dr. J. Shiloh (Israel)

Scientific Programme for XXIV URSI General Assembly

Coordinator :	Prof. J. B. Andersen (Denmark)
Ass. Coordinator :	Prof. H. Matsumoto (Japan)

Scientific Committee on Telecommunications

Chairperson :	Dr. L.W. Barclay (U.K.)
Vice-Chairperson :	Prof. P. Delogne (Belgium)

URSI COMMISSIONS AND WORKING GROUPS

Commission A : Electromagnetic Metrology

Chairperson : Dr. J. Vanier (Canada)
Vice-Chairperson : Dr. P.I. Somlo (Australia)
Official Members :

Argentina : Ing. H.F. Mazza
Australia : Dr. P.I. Somlo
Austria : Hofrat Dipl. Ing. W. Dewam
Belgium : Prof. P. Paquet
Brazil : Eng. Paulo Mourilhe da Silva
Bulgaria : Dr. B. Balabanov
Canada : Dr. G. Missout
China CIE (Beijing) : Dr. X. Yang
China SRS (Taipei) : Mr. Yuan-Cheng Teng
Czechoslovakia : Dr. O. Buzek
Denmark : Dr. T. Guldbrandsen
Egypt : Prof. A.L. Elsayed
Finland : Ass. Prof. P. Wallin
France : M. J.J. Gagnepain
Germany : Dr. K. Dorenwendt
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Hungary : Dr. M. Kenderessy
India : Dr. B.S. Mathur
Iraq : Dr. A. Naoom
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Israel : Dr. J. Politch
Italy : Prof. S. Leschiutta
Japan : Dr. S. Shimada
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Nigeria : Mr. S.U.B. Ezekpo
Norway : Mr. K. Birkeland
Poland : Dr. K. Radecki
Portugal : Mr. A.C. M. Caetano
Russia : Prof. P.M. Herouni
Saudi Arabia :
South Africa : Dr. F. Hengstberger
Spain : Prof. J.L. Sebastian
Sweden : Dr. D.L.-E. Paulsson
Switzerland : Dr. O. Piller
Thailand :
United Kingdom : Mr. R.W. Yell
USA : Dr. M. Kanda

Commission B : Fields and Waves

Chairperson : Prof. F. Gardiol (Switzerland)
Vice-Chairperson : Prof. D. Olver (U.K.)
Official Members :

Argentina : Prof. V. Trainotti
Australia : Prof. J.G. Lucas
Austria : Prof. B. Schnizer
Belgium : Prof. A. Van de Capelle
Brazil : Prof. J.T. Senise
Bulgaria : Prof. I. Geliazkov
Canada : Dr. Y.M.M. Antar
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China SRS (Taipei) : Prof. Chung-Hsiung Chen
Czechoslovakia : Prof. J. Vokurka
Denmark :
Egypt : Prof. I.A. Salem
Finland : Prof. I.V. Lindell
France : M. A. Papiernik
Germany : Prof. Dr. P. Edenhofer
Greece : Prof. E. Kriezis
Hungary : Dr. Gy. Veszely
India : Prof. B. Bhatt
Iraq : Dr. Ali Al-Mashat
Ireland : Prof. B.K.P. Scaife
Israel : Dr. E. Heyman
Italy : Dr. G. Gerosa
Japan : Dr. T. Teshirogi
Netherlands : Prof. P. Van den Berg
New Zealand : Prof. A.G. Williamson
Nigeria : Dr. A.G. Kolawole
Norway : Prof. A. Tonning
Poland : Prof. D.J. Bem
Portugal : Prof. Dr. A.M. S. Barbosa
Russia : Prof. L.D. Bakhrakh
Saudi Arabia :
South Africa : Prof. J.H. Cloete
Spain : Prof. J.L. Sebastian
Sweden : Prof. S. Ström
Switzerland : Prof. F. Gardiol
Thailand :
United Kingdom : Dr. J.M. Arnold
USA : Prof. R.E. Kleinman

Commission C : Signals and Systems

Chairperson : Prof. P.A. Matthews (U.K.)
Vice-Chairperson : Dr. A.D. Wyner (USA)
Official Members :

Argentina : Prof. A. Quijano
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Austria :
Belgium : Prof. P. Delogne
Brazil : Dr. M. H.M. Costa
Bulgaria : Prof. B. Shishkov
Canada : Dr. I.F. Blake
China CIE (Beijing) : Dr. Wu Youshou
China SRS (Taipei) : Prof. Lin-Shan Lee
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Denmark : Mr. E. Mortensen
Egypt : Prof. N. Saleh
Finland : Mr. J. Aurinsalo
France : M.G. Battail
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Hungary : Prof. K. Géher
India : Prof. B.S. Sonde
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Saudi Arabia :
South Africa : Prof. D.C. Baker
Spain : Prof. J.L. Sebastian
Sweden : Dr. H. Schefte
Switzerland : Dr. G. Meyer
Thailand :
United Kingdom : Prof. B.G. Evans
USA : Dr. R. Pickholtz

Commission D : Electronics and Photonics

Chairperson : Dr. J. Hénaff (France)
Vice-Chairperson : Prof. T. Itoh (USA)
Official Members :

Argentina : Dr. M. Garavaglia
Australia : Dr. D.J. Skellern
Austria :
Belgium : Prof. J.L. Van Eck
Brazil : Dr. R.D.P.K.C. Ranvaud
Bulgaria : Prof. J. Slavova
Canada : Dr. C.A.T. Salama
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China SRS (Taipei) : Prof. Tien-Shou Wu
Czechoslovakia : Dr. M. Karasek
Denmark : Dr. K.Stubkjær
Egypt : Prof. E.A.F. Abdellah
Finland : Prof. T. Tuomi
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Greece :
Hungary : Prof. L. Zombory
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Iraq : Dr. Amer Naoom
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Israel : Prof. A. Friesem
Italy : Prof. P.U. Calzolari
Japan : Prof. K. Tada
Netherlands : Dr. Th. G. van de Roer
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Norway : Prof. K. Bløtekjaer
Poland : Prof. B. Mroziewicz
Portugal : Prof. Dr. F. de Oliveira Restivo
Russia : Prof. M.E. Zhabotinskij
Saudi Arabia :
South Africa : Prof. J.S. Vermaak
Spain : Prof. J.L. Sebastian
Sweden : Mr. S. Rudner
Switzerland : Prof. Dr. W. Bächtold
Thailand :
United Kingdom : Dr. A.J. Seeds
USA : Dr. J.W. Mink

Commission E : Electromagnetic Noise and Interference

Chairperson : Dr. J. Hamelin (France)
Vice-Chairperson : Dr. V. Scuka (Sweden)
Official Members :

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Australia : Prof. D.J. Skellern
Austria :
Belgium : Prof. Vloeberghs
Brazil : Prof. J.J. Angerami
Bulgaria : Mr. N. Kombakov
Canada : Prof. T.J.F. Pavlasek
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China SRS (Taipei) : Prof. Chi-Fu Den
Czechoslovakia : Dr. T. Cesky
Denmark : Mr. O. Hansen
Egypt : Prof. M.M. Ibrahim
Finland : Dr. R. Pirjola
France : Prof. P. Degauque
Germany : Dr. R. Sturm
Greece : Prof. J. Sahalos
Hungary : Dr. P. Szemerédi
India : Dr. M.K. Rao
Iraq : Mr. J.L. Jarella
Ireland : Prof. J.O. Scanlan
Israel : Mr. O. Hartal
Italy : Prof. E. Nano
Japan : Prof. M. Hayakawa
Netherlands : Ir. A. Mawira
New Zealand : Dr. R. Barr
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ADACHI, Prof. S., Dep. of Electrical Engineering, Tohoko University, Aramaki, Aoba-ku, Sendai-shi, MIYAGI 980, JAPAN, Tel. : (81) 22-222-1800 ext. 4234, Fax : (81) 22-261-7470 (90)

AJAYI, Prof. G.O., Dep. of Electronic & Electrical Engineering, Obafemi Awolowo University, ILE-IFE, NIGERIA, Tel. : (234) 36-230290, Fax : (234) 1-637043 (74, 79, 80, 90)

AL-ATHEL, Dr. S., President, KACST, P.O. Box 6086, RIYADH 11442, SAUDI ARABIA, Fax : (966) 1-488 3756 (90)

AL-KHATEEB, Dr. T.R., Research Center, Bab-Muadam, P.O. Box 14080, BAGHDAD, IRAQ, Fax : (9641) 5383635 (89)

AL-MASHAT, Dr. A., Director General, Space Research Centre, P.O. Box 2441, BAGHDAD, IRAQ (77)

ALBRECHT, Dr. H.J., Postfach 21 01 43, W-5300 BONN 2, GERMANY, Tel. : (49) 228-852 223 (89)

AMIR, Mr. A.A.A., Iraqi Telecom & Post Establishment, Transmission, BAGHDAD, IRAQ (78)

ANANTHAKRISHNAN, Dr. S., GMRT Project, Tata Institute of Fundamental Research, Poona University Campus, Ganeshkhind, PUNE-411007, INDIA, Tel. : (91) 57 107, CABLE : UNIPUNA (85)

ANDERSEN, Prof. J.Bach, Aalborg University Centre, Institute of Electronic Systems, Fr. Bajersvej 7, DK-9220 AALBORG EAST, DENMARK, Tel. : (45) 9815 8522, Fax : (45) 9815 6740, Telex : 69790 aub dk, e-mail address : jba@kom.auc.dk (73,75)

ANDERSON, Dr. D., Geopohysics Laboratory, HANSCOM AFB, MA 01731-5000, USA (83)

ANDREWS, Dr. M.K., Industrial Research Limited, P.O. Box 31310, LOWER HUTT, NEW ZEALAND, Tel. : (64) 4-569-0223, Fax : (64) 4-569-0117 (79)

ANGERAMI, Prof. J.J., Escola Politecnica, Universidad de Sao Paulo, 5503 SAO PAULO - SP, BRAZIL (80)

ANTAR, Dr. Y.M.M., Dept. of Electrical & Computer Eng., Royal Military College of Canada, KINGSTON, ON K7L 2W3, CANADA, Tel. : (1-613) 541-6403, Fax : (1-613) 547-3053 (77)

ARENGA, Mr. J.R., Avenida Defensores de Chaves 79-B, Instituto de Serviço Ocupacional, P-1000 LISBOA, PORTUGAL (86)

ARMAND, Dr. N.A., Institute of Radioeng. & Electronics (FIRE), Russian Academy of Sciences, Vvedenskogo pl. 1, 141120 FRYAZINO (MOSCOW REGION), RUSSIA, Tel. : (7095) 203-6078, Fax : (7095) 203-8414, Telex : 411429 ire sc (82)

ARNOLD, Dr. J.M., Department of Electronic & Electrical Engineering University of Glasgow, GLASGOW, G12 8QQ, UNITED KINGDOM, Tel. : (44) 41-330 4901, Fax : (44) 41-330 4907, e-mail address : gnea54@cms.gla.ac.uk (77)

ASSIS, Prof. M.S., EMBRATEL - DDH, Rua da Assembléia, 10 - Sala 2201, 20011 RIO DE JANEIRO - R.J., BRAZIL (74, 81)

AURINSALO, Mr. J., Technical Research Centre of Finland, Telecommunications Laboratory, Otakaari 7B, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-456-5606, Fax : (358) 0-455-0115, e-mail address : jouko.aurinsalo@vtt.fi (78)

AZIZ, Prof. M.E.A., 17 Shagaret-El-Dor St., ZAMALEK-CAIRO, EGYPT (84)

BÄCHTOLD, Prof. W., ETHZ-IFH, ETH-Zentrum, CH-8092 ZÜRICH, SWITZERLAND, Tel. : (41) 1-256 4171, Fax : (41) 1-261 1026 (79)

BAGGALEY, Prof. W.J., Department of Physics and Astronomy, University of Canterbury, Private Bag, CHRISTCHURCH 1, NEW ZEALAND, Tel. : (64) 3-366-7001, Fax : (64) 3-364-2469, e-mail address : phys051@canterbury.ac.nz (85)

BAGHOUZ, Dr. B.B., National Institute of Astronomical, and Geophysical Research, HALWAN-CAIRO, EGYPT (85)

BAKER, Prof. D.C., Dept. of Electronics & Computer Eng., University of Pretoria, PRETORIA 2, SOUTH AFRICA, Tel. : (27) 12-420 2775, Fax : (27) 12-43-2185, e-mail address : duncanbaker@ee.up.ac.za (78)

BAKHRAKH, Prof. L.D., NPO VEGA M, Kutuzovsky Prospekt 34, MOSCOW 121170, RUSSIA (77)

BAKOS, Prof. J., KFKI (Central Physical Research Institute), Konkoly Thege u. 29-33, H-1121 BUDAPEST, HUNGARY, Tel. : (36) 1-169-6721, Fax : (36) 1-169-6567, Telex : 224722kfki h (84)

BALABANOV, Dr. B.H., ISR in Telecommunications, Hajdushka Poliana 8, SOFIA 1612, BULGARIA (76)

BANERJEE, Dr. P., Assistant Director, Time & Frequency Section, National Physical Laboratory, Dr. K.S. Krishnan Road, NEW DELHI 110 012, INDIA, Tel. : (91) 5718310/586168, Telex : 031-77384 rsd in (89)

BARBOSA, Prof. S.A.M., Instituto Superior Técnico de Lisboa, Avenida Rovisco Pais, LISBOA CODEX 1096, PORTUGAL (77)

BARCLAY, Dr. L.W., Dept. of Trade and Industry, Waterloo Bridge House, DRT Room 515, Waterloo Road, LONDON SE1 8UA, UNITED KINGDOM, Fax : (44) 71-401 8681 (75)

BARR, Dr. R., Atmospheric Division, National Institute of Water, and Atmospheric Research, P.O. Box 31-311, LOWER HUTT, NEW ZEALAND, Tel. : (64) 4-569-0268, Fax : (64) 4-566-6166, e-mail address : srgprxb@grace.cri.nz (80)

BASU, Dr. Sa., Geophysics Laboratory, HANSCOM AFB MA 01731, USA (87)

BATTAIL, Mr. M.G., Ecole Supérieure Nationale des Télécommunications, 46 rue Barrault, F-75634 PARIS CEDEX 13, FRANCE (78)

BAUDRY, Mr. A., Observatoire de Bordeaux, B.P. 21, F-33270 FLOIRAC, FRANCE, Tel. : (33) 5686 4330, Fax : (33) 5640 4251 (85)

BAUER, Dr. P., CNRS, Service d'Aéronomie, B.P. N° 3, F-91371 VERRIERES-LE-BUISSON CEDEX, FRANCE, Tel. : (33) 1-6447 4320 (6920.0183), Fax : (33) 1-6920 2999, Telex : 602 400 (73, 75, 87, 89)

BAUER, Prof. S.J., Institut für Meteorologie und Geophysik, Universität Graz, Halbärthgasse 1, A-8010 GRAZ, AUSTRIA (84, 88)

BAUM, Dr. C.E., Phillips Laboratory, WSR Kirtland Air Force Base, KIRTLAND AFB NM 87117-6008, USA, Tel. : (1) 505-846 0879, Fax : (1) 505-846 9900 (81)

BAVA, Prof. E., Dip. di elettronica e dell informazione, Politecnico di Milano, Piazza Leonardo da Vinci 32, I-20133 MILANO, ITALY, Tel. : (39) 2-2399 3609/3799, Fax : (39) 2-2399 3413/3561, Telex : 333467 polimi i (89)

BEM, Prof. D.J., ul. Bacciarellego 24, m. 12, 51-649 WROCLAW, POLAND (77)

BENCZE, Dr. P., Geophysical Research Institute, MTA (Hungarian Academy of Sciences), Muzeum u. 6, H-9400 SOPRON, HUNGARY, Tel. : (36) 99-14290 ext. 36, Telex : 249125 (83)

BENSON, Dr. R.F., NASA - Code 692, Goddard Space Flight Center, GREENBELT MD 20771, USA, Tel. : (1) 301-286-4037, Fax : (1) 301-286-3271, Telex : 89675 (84)

BERNARDI, Prof. P., Department of Electronics, Università "La Sapienza", via Eudossiana 18, I-00184 ROMA, ITALY, Tel. : (39) 6-4458 5855, Fax : (39) 6-474 2647 (86)

BERNHARDT, Dr. P., Naval Research Laboratory, Code 4780, WASHINGTON, DC 20375-5000, USA (87)

BEYNON, Sir Granville, Dept. of Physics, University College of Wales, Penglais, ABERYSTWYTH SY23 3BZ, UNITED KINGDOM (73)

BHATT, Prof. B., Centre for Applied Research in Electronics, Indian Institute of Technology, Hauz Khas, NEW DELHI-110 016, INDIA, Tel. : (91) 665 674 (77)

BIC, Mr. J.-C., CNET/PAB/RPE, 38 rue du Général Leclerc, F-92131 ISSY-LES-MOULINEAUX, FRANCE, Tel. : (33-1) 4529 4870, Fax : (33-1) 4529 6052 (89)

BIRKELAND, Mr. K., Justervesenet, Nordahl Bruns g 18, N-0165 OSLO, NORWAY, Tel. : (47) 2-20.02.26 (76)

BITTENCOURT, Dr. J.A., INPE, S.P. 515, 12200 SAO JOSE DOS CAMPOS - S.P, BRAZIL (84)

BLAHAK, Dr. F., Geophysical Institute, Czechoslovak Academy of Sciences, Bocní II-1401, 141 31 PRAHA 4, CZECHOSLOVAKIA, Tel. : (42) 2-762 548, Fax : (42) 2-762 528, Telex : 121546 ionpc, e-mail address : frbl@cspgig 11.earn/bitnet (82)

BLAKE, Dr. I.F., Department of Electrical Engineering, University of Waterloo, WATERLOO, ON N2L 3G1, CANADA, Tel. : (1) 519-885 1211 ext. 2840, Fax : (1) 519-888 4521, e-mail address : ifblake@ watmath.uwaterloo.ca (78)

BLOMQUIST, Mr. A., Gripgatan 4, S-582 43 LINKÖPING, SWEDEN (82)

BLØTEKJAER, Prof. K., Institutt for fysikalsk elektronikk, Universitetet i Trondheim, N-7034 TRONDHEIM NTH, NORWAY, Tel. : (47) 7-59 44 08, Fax : (47) 6-80 72 12 (79)

BODGER, Dr. P.S., Electrical and Electronic Eng. Dept., University of Canterbury, Private Bag 4800, CHRISTCHURCH 1, NEW ZEALAND, Tel. : (64) 3-366 7001 ext. 7241, Fax : (64) 3-364-2761 (86)

BOOTH, Dr. R., Chalmers Unversity of Technology, Onsala Space Observatory, S-439 00 ONSALA, SWEDEN (86)

BOSSY, Prof. L., Université Catholique de Louvain, 174 avenue Winston Churchill, B-1180 BRUSSELS, BELGIUM, Tel. : (32) 2-373.03.81 (Priv. 343.43.86) (82, 84)

BOWHILL, Prof. S.A., Dept. of Electrical Eng., University of Lowell, 1 University Avenue, LOWELL, MA 01854, USA, Tel. : (1) 508-934-3345, Fax : (1) 508-452-1445 (74)

BOZSOKI, Dr. I., BME (Technical University of Budapest), Dept of Microwave Telecommunications, Göldmann Gy. tér 3, H-1111 BUDAPEST, HUNGARY, Tel. : (36) 1-181 2968, Fax : (36) 1-181 2968, Telex : 225931muegy h, e-mail address : t-bozsoki@nov.mht.bme.hu (81)

BRAZIL, Dr. T., Dept. of Electrical & Electronic Eng., University College, Belfield, DUBLIN 4, IRELAND, Tel. : (351) 1-7061 929, Fax : (351) 1-2830 921 (82)

BREKKE, Prof. A., Nordlysobservatoriet, Universitetet i Tromsø, Postboks 953, N-9000 TROMSØ, NORWAY, Tel. : (47) 83-44094/45167 (83)

BRINCA, Prof. A.L.E., Instituto Superior Técnico de Lisboa, Avenida Rovisco Pais, 1096 LISBOA CODEX, PORTUGAL (82)

BRUSSAARD, Prof. G., Eindhoven University of Technology, Faculty of Electrical Eng., EH 12.33, P.O. Box 513, NL-5600 MB EINDHOVEN, NETHERLANDS, Tel. : (31) 40-47 38 90, Fax : (31) 40-44 83 75, Telex : 51163 (81)

BRUSTAD, Prof. T., Biofysisk avdeling, Det Norske Radiumhospital, Montebello, N-0310 OSLO, NORWAY, Tel. : (47) 2-50 60 50, Fax : (47) 2-52 55 59 (86)

BUTLER, Prof. C.M., Dept of Electrical and Computer Eng, Clemson University, 201 Riggs Hall, CLEMSON, SC 29634-0915, USA, Tel. : (1) 803-656 5922 (and 2650), Fax : (1) 803-656 2698, e-mail address : CBUTLER@ENG.CLEMSON.EDU (73, 90)

BUZEK, Dr. O., Institute of Radioeng. and Electronics, Czechoslovak Academy of Sciences, Chaberská 57, 182 51 PRAHA 8, CZECHOSLOVAKIA, Tel. : (42) 2-843 741, Fax : (42) 2-840 609, e-mail address : ure 68@cspgcs 11 (76)

CAETANO, Mr. A.C.M., Observatório Astronómico de Lisboa, Tapada da Ajuda, P-1300 LISBOA, PORTUGAL (76)

CALZOLARI, Prof. P.U., Dip. di Elettronica Informatica e Sistemistica, Università degli studi, Viale Risorgimento 2, I-40136 BOLOGNA, ITALY, Tel. : (39) 51-644 3001, Fax : (39) 51-644 3073, Telex : 520620 ingbo (79)

CESKY, Dr. T., Research Institute of Posts, and Telecommunications, Hvozdanská 3, 149 50 PRAHA 4, CZECHOSLOVAKIA, Tel. : (42) 2-799 2152, Fax : (42) 2-799 2318 (80)

CHEN, Prof. C.-H., Dept. of Electrical Engineering, National Taiwan University, No. 1 Sec 4 Roosevelt Rd., TAIPEI, TAIWAN, Tel. : (886) 2-363-0231, Fax : (886) 2-363-8247 (77)

CHEN, Mr. Y.-K., No 29-3, Jen-Ai Rd., Sec. 1, TAIPEI 100, TAIWAN, Telex : 31202 TELTRANS (74)

CHONG, Dr. C., China Research Institute of Wave Propagation, P.O. Box 138, 453003 XINXIANG, HENAN PROVINCE, CHINA, Tel. : (86) 373-353912 (82)

CHRISSOULIDIS, Dr. D.P., Dept. of Electrical Engineering, University of Thessaloniki, CH- 54006 THESSALONIKI, GREECE (81)

CHRISTIANSEN, Prof. W.N., Bingera RMB 436, Mac's Reef Road, VIA BUNGENDORE, NSW 2621, AUSTRALIA (73)

CHUGUNOV, Dr. Yu.V., Institute of Applied Physics, Russian Academy of Sciences, Ulianova ul. 46, 603600 NIZNIJ NOVGOROD, RUSSIA (84)

CIZEK, Dr. V., Institute of Radioeng. & Electronics, Czechoslovak Academy of Sciences, Chaberská 57, 182 51 PRAHA 8, CZECHOSLOVAKIA, Tel. : (42) 2-843 741, Fax : (42) 2-840 609 (89)

CLARK, Mr. R.F., National Research Council of Canada, Building M-36, Room 109, Montreal Road, OTTAWA, ON K1A 0R6, CANADA, Tel. : (1) 613-993 7714, Fax : (1) 613-952 1394, e-mail address : clark@nrcphy.nrc.ca (89)

CLARRICOATS, Prof. P.J.B., Dept. of Electronic Engineering, Queen Mary & Westfield College, Mile End Road, LONDON E1 4NS, UNITED KINGDOM, Tel. : (44) 71-980 4811, Fax : (44) 81-981 0259 (74, 90)

CLOETE, Prof. J.H., Dept. of Electrical & Electronic Eng., University of Stellenbosch, STELLENBOSCH 7600, SOUTH AFRICA, Tel. : (27) 2231-77-4337, Fax : (27) 2231-77-4499, e-mail address : jhcloete@firga.sun.ac.za (77)

COHEN, Dr. R.J., Nuffield Radio Astronomy Laboratories, Jodrell Bank, Macclesfield, CHESHIRE, SK11 9LD, UNITED KINGDOM, Tel. : (44) 477-71321, Fax : (44) 477-71618, e-mail address : rcb@star.jb.man.ac.uk (85)

COLOMB, Dr. F., Instituto Argentino de Radioastronomia, CC. 5, 1894 VILLA ELISA, B.A., ARGENTINA, Tel. : (54) 21-870 230, Fax : (54) 21-254 909 (85)

CONKRIGHT, Mr. R., WDC-A/STP, 325 Broadway, BOULDER, CO 80303, USA (83)

CORNEY, Mr. A.C., Industrial Research Limited, P.O. Box 31-310, LOWER HUTT, NEW ZEALAND, Tel. : (64) 4-566-6919, Fax : (64) 4-569-0515 (76)

COSTA, Dr. M.A.C., INPE, C.P. 515, 12200 SAO JOSE DOS CAMPOS, S.P., BRAZIL (78)

CULLEN, Prof. A.L., Felden Drive 3, HEMEL HEMPSTEAD HERTS HP3 0BD, UNITED KINGDOM, Tel. : (44) 71-387 7050 x3189, Fax (44) 71-387 4350, Telex : 296273 UCLENG G (73, 75)

D'AURIA, Prof. G., Dip. di Elettronica, Università "La Sapienza", Via Eudossiana 18, I-00184 ROMA, ITALY, Tel. : (39) 6-4458 5847, Fax : (39) 6-4742 647, Telex : 620021 univrm (82)

DAMBOLDT, Dr. Th., FI 34, Forschungsinstitut der DBP beim FTZ , Postfach 5000, W-6100 DARMSTADT, GERMANY, Tel. : (49) 6165-83 25 48 (89)

DANILKIN, Prof. N.P., Nemanskij Proezd, I, Korpus I, fl. 283, MOSCOW 123181, RUSSIA, Fax : (7095) 288-9502, Telex : 411914 zemla su, e-mail address : geophysi (83)

DE VREEDE, Dr. J., Van Swinden Laboratorium, Postbus 654, NL-2600 AR DELFT, NETHERLANDS (76)

DE WAGTER, Dr. C., Kliniek voor Radiotherapie en Kerngeneeskunde, Universitair ziekenhuis, De Pintelaan 185, B-9000 GENT, BELGIUM, Tel. : (32) 91-40.30.14, Fax : (32) 91-40.49.91, e-mail address : dewagter@NMR.RUG.AC.BE (86)

DEGAUQUE, Prof. P., Université des Sciences et Techniques de Lille 1, Département Electronique Bât. P3, F-59655 VILLENEUVE D'ASCQ CEDEX, FRANCE, Tel. : (33) 2043 4849, Fax : (33) 2043 6523 (80, 81)

DELOGNE, Prof. P., Laboratoire de Télécommunications et Télédétection, Bâtiment Maxwell, Place du Levant, 3, B-1348 LOUVAIN-LA-NEUVE, BELGIUM, Tel. : (32) 10-472 307, Fax : (32) 10-452 272, Telex : 59315 telhy b, e-mail address : elhy@elhy.ucl.ac.be (74, 75, 78, 88)

DEMOULIN, Dr. B., Lille University, Electronic Dept. Bat. P3, F-59655 VILLENEUVE D'ASCQ, FRANCE, Tel. : (33) 2043 4856, Fax : (33) 2043 6523 (81)

DEN, Prof. C.-F., Dept. of Communication Engineering, National Chiao Tung University, Ta, Hsueh Rd. No. 1001, HSIN-CHU, TAIWAN, Tel. : (886) 35-718-083, Fax : (886) 35-721-500 (80)

DEWAM, Mr. W., Bundesamt für Eich- und Vermessungswesen, Abt E3, Arltgasse 35, A-1160 WIEN, AUSTRIA (76)

DIEMINGER, Prof. W., Berlinerstraße 14, W-3411 NÖRTEN-HARDENBERG, GERMANY (73)

DOMINICI, Prof. P., Dipartimento di Fisica, Università "La Sapienza", Piazzale Aldo Moro 5, I-00185 ROMA, ITALY, Tel. : (39) 6-4991 3979/6898 5142, Fax : (39) 6-4429 1070/6898 5112, Telex : 623620 italen i (83)

DORENWENDT, Dr. K., Physikalisch-Technische Bundesanstalt, Bundesallee 100, W-3300 BRAUNSCHWEIG, GERMANY, Tel. : (49) 531-592 1210 (76, 86)

DOWDEN, Prof. R.L., Physics Department - P.O. Box 56, University of Otago, DUNEDIN, NEW ZEALAND, Tel. : (64) 3 479 7752, Fax : (64) 3 479 0964, e-mail address : dowden@otago.ac.nz (73, 74, 84)

DRANE, Prof. C., Electrical Engineering, University of Technology, P.O. Box 123, BROADWAY NSW 2007, AUSTRALIA, Tel. : (61) 2-330-2390, Fax : (61) 2-330-2435, e-mail address : cdrane@ee.uts.edu.au (78)

EDENHOFER, Prof. P., Ruhr-Universität Bochum, Fakultät für Elektrotechnik, Postfach 10 21 48, W-4630 BOCHUM 1, GERMANY, Tel. : (49) 234-700.2901 or 2842 (77)

EL-DEEB, Prof. N.A., P.O. Box 62, MAADI-CAIRO, EGYPT (86)

EL-SAYED, Prof. L., 18 Merghany St., HELIOPOLIS-CAIRO, EGYPT (76)

ELGARØY, Prof. Ø., Astrofysisk Institutt, Universitetet i Oslo, Postboks 1029 Blindern, N-0315 OSLO 3, NORWAY, Tel. : (47) 2-85 65 04 (85)

ELKHAMY, Prof. S., Faculty of Engineering, Alexandria University, Abou-Keer St., ALEXANDRIA, EGYPT (81)

EVANS, Prof. B.G., Dept. of Electronic & Electrical Eng., Surrey University, GUILDFORD, SURREY, GU2 5XH, UNITED KINGDOM, Tel. : (44) 483-509 131, Fax : (44) 483-300 803 (78)

EVIATAR, Prof. A., Faculty of Exact Sciences, Dept. of Geophysics & Planetary Sciences, Tel-Aviv University, Ramat Aviv, 69978 TEL AVIV, ISRAEL, Tel. : (972) 3-413505 and 03-5450633, Telex : 342171 (84)

EZEKPO, Mr. S.U.B., Obafemi Awolowo University, P.O. Box 1027, ILE-IFE, NIGERIA, Tel. : (234) 36-230290 (76, 90)

FÄLTHAMMAR, Prof. C.G., Royal Institute of Technology, S-100 44 STOCKHOLM 70, SWEDEN (84)

FENG SHIZHANG, Prof., Chief Engineer, China Academy of Electronic Technology, P.O. Box 134, 100039 BEIJING, CHINA (74, 87, 89)

FERENCZ, Prof. Cs., ELTE - University of Sciences Lóránd Eötvös, Department of Geophysics, Ludovika tér 3., H-1083 BUDAPEST, HUNGARY, Tel. : (36) 1-134-3953 (80, 85)

FIALA, Dr. V., Geophysical Institute, Czechoslovak Academy of Sciences, Bocni II-1401, 141 31, PRAHA 4 CZECHOSLOVAKIA, Tel. : (42) 2-762 548, Fax : (42) 2-762 528, Telex : 121546 ionpc, e-mail address : frbl@cspgig 11.bitnet (84)

FIKIORIS, Dr. J.G., Dept. of Electrical Eng., National Technical University of Athens, 42 Patission Str., GR-106 82 ATHENS, GREECE, Tel. : (30) 3616-934 or 3691-360 (89)

FORSSELL, Prof. B., Institutt for teleteknikk, Navigasjonssystemer, Universitetet i Trondheim, N-7034 TRONDHEIM - NTH, NORWAY, Tel. : (47) 759-2653, Fax : (47) 794-4475 (78)

FRIESEM, Prof. A., Dept. of Electronics, Weizmann Institute, REHOVOT, ISRAEL, Tel. : (972) 8-482580,08-482614 (79)

FURUHAMA, Dr. Y., ATR Optical and Radio Communication, Research Laboratories, 2-2 Hikaridai,Seika-cho, Soraku-gun, KYOTO 619-02, JAPAN, Tel. : (81) 7749-5-1511, Fax : (81) 7749-5-1508 (82)

GAGLIARDINI, Dr. D.A., Julian Alvarez 1218, 1414 BUENOS AIRES, ARGENTINA, Tel. : (54) 1-772-1471, Fax : (54) 1-776 0410, e-mail address : postmast@caerce.edu.ar (81)

GAGNEPAIN, Mr. J.J., Laboratoire de Physique et de, Métrologie des Oscillateurs, 32 avenue de l'Observatoire, F-25000 BESANÇON, FRANCE, Tel. : (33) 8166 6999, Fax : (33) 8166 6998 (76)

GALLAGHER, Prof. T.G., Dept. of Electronic & Electrical Eng., University College, Belfield, DUBLIN 4, IRELAND, Tel. : (353-1) 706 1844, Fax : (353-1) 283 0921, e-mail address : TOMGALLA@ IRLEARN.0 (86)

GAO, Prof. Y.-G., Beijing Institute of Posts, and Telecommunications, BEIJING, CHINA (80)

GARAVAGLIA, Dr. M., Centro de Invest. Opticas (CIOP), CC. 124, 1900 LA PLATA, B.A., ARGENTINA, Tel. : (54) 21-840 280/842 957, Fax : (54) 21-530 107, Telex : 31216 cesla.ar, e-mail address : postmast@caerce.edu.ar (79)

GARBINI, Mr. A., Julian Alvarez 1218, 1414 BUENOS AIRES, ARGENTINA, Tel. : (54) 1-772-1471, Fax : (54) 1-776 0410, e-mail address : postmast@caerce.edu.ar (88)

GARDIOL, Prof. F., LEMA, Ecole Polytechnique Fédérale, ELB-Ecublens, CH-1015 LAUSANNE, SWITZERLAND, Tel. : (41) 21-693 2670, Fax : (41) 21-693 2673, Telex : 454062 EPFUDCH, e-mail address : gardiol@lemahp1.epfl.ch (73, 77, 90)

GARDNER, Dr. A.D., Mission Research Corporation, 1720 Randolph Road, S.E., ALBUQUERQUE NM 87106, USA, Tel. : (1-505) 768 7600, Fax : (1-505) 768 7601 (81)

GEHER, Prof. K., Dept. of Telecommunication and Telematics, BME - Technical University of Budapest, Stoczek u. 2, H-1111 BUDAPEST, HUNGARY, Tel. : (36-1) 181-3500, Fax : (36-1) 181-2302, Telex : 225931muegy h, e-mail address : h3683geh@ella.hu (73, 74, 78, 89)

GELIAZKOV, Prof. I., Faculty of Physics, Sofia University, Bul. Anton Ivanov 5, 1126 SOFIA, BULGARIA (77)

GENTIL, Mr. P., CIME-INPG, 46 av. Félix Viallet, F-38031 GRENOBLE, FRANCE, Tel. : (33) 7657 4682, Fax : (33) 7646 8824 (79)

GEROSA, Prof. G., Dip. di Elettronica, Università "La Sapienza", Via Eudossiana 18, I-00184 ROMA, ITALY, Tel. : (39) 6-4458 5854, Fax : (39) 6-4742 647, Telex : 620021 univrm (77)

GHATAK, Prof. A.K., Department of Physics, Indian Institute of Technology, NEW DELHI-110 016, INDIA, Tel. : (91) 666 979 ext. 246, Telex : 31-73087 (79)

GIRALDEZ, Prof. A., LIARA, avda. del Libertador 327, 1638 VICENTE LOPEZ, B.A., ARGENTINA, Tel. (54) 1-791-5001, Fax (54) 1-776-0410, e-mail address : secyt!atina!senid.mil.ar@postmast (84)

GJESSING, Prof. D.T., PFM, (Program for Miljøovervakingsteknikk), P.O. Box 89, N-2001 LILLESTRÖM, NORWAY, Tel. : (47) 6-892660 (<15/4/93 : 63-), Fax : (47) 6-892670 (<15/4/93 : 63-) (74, 90)

GONZE, Prof. R., Service de Radioastronomie, Observatoire Royal de Belgique, 3, avenue Circulaire, B-1180 BRUSSELS, BELGIUM, Tel. : (32) 2-375 24 84 (85, 88)

GORDON, Prof. W.E., Distinguished Professor Emeritus, Space Physics Dept., Rice University, P.O. Box 1892, HOUSTON, TX 77251-1892, USA, Tel. : (1) 713-527 6020, Fax : (1) 713-285 5143 (73, 75, 88,)

GORGOLEWSKI, Prof. S., Katedra Radioastronomii, Uniwersytet M. Kopernika, ul. Gagarina 11, 87-100 TORUN, POLAND (85)

GOUGH, Dr. P.T., Dept. of Electrical Engineering, University of Canterbury, Private Bag, CHRISTCHURCH 1, NEW ZEALAND, Tel. : (64) 366-7001 ext. 7273, Fax : (64) 364-2761, e-mail address : gough@elec.canterbury.ac.nz (78)

GOWER, Dr. J.F.R., Department of Fisheries and Oceans, Institute of Ocean Sciences/Patricia Bay, P.O. Box 6000, SIDNEY, BC V8L 4B2, CANADA, Tel. : (1) 604-356 6558, Fax : (1) 604-356 6479, e-mail address : IOS.BC/OCEAN (telemail) (75, 81)

GRAF, Dr. W., Electromagnetic Sciences Laboratory, SRI International, MENLO PARK, CA 94025, USA (75)

GRAHL, Dr. B.H., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, W-5300 BONN 1, GERMANY (88)

GUBANKOV, Prof. V.N., Institute of Radioeng. & Electronics, Russian Academy of Sciences, Mokhovaja St. 11, 103907 MOSCOW, RUSSIA, Fax : (7095) 203 8414, Telex : 411429 iresc, e-mail address : obukh@ ire.msk.su (90)

GUDMANDSEN, Prof. P., Electromagnetics Institute - Bldg 348, Technical University of Denmark, DK-2800 LYNGBY, DENMARK, Tel. : (45) 4288 1444, Fax : (45) 4593 1634, e-mail address : omnet@ p.gudmandsen (81)

GUISSARD, Prof. A., Laboratoire des Télécommunications et Télédétection, Bâtiment Maxwell, Place du Levant 3, B-1348 LOUVAIN-LA-NEUVE, BELGIUM (75, 81)

GULDBRANDSEN, Dr. T., Physics Lab. III - Building 309, Technical University of Denmark, DK-2800 LYNGBY, DENMARK, Tel. : (45) 4288 1611, Fax : (45) 4288 2239 (76)

HAHN, Prof. S., Warsaw University of Technology, Institute of Radio-electronics, ul. Nowowiejska 15/19, 00-665 WARSAW, POLAND (90)

HALL, Mr. M.P.M., Rutherford Appleton Laboratory, CHILTON, DIDCOT, OXON, OX11 0QX, UNITED KINGDOM, Tel. (44) 235 44 6650, Fax (44) 235 44 6140/5753, e-mail address BYT@ib.rl.ac.uk (82)

HALLIKAINEN, Prof. M., E.E. Department, Laboratory of Space Technology, Helsinki University of Technology, Otakaari 5A, SF-02150 ESPOO, FINLAND, Tel. : (348) 0451 2371, Fax : (358) 0460 224, e-mail address : hallikainen@ava.hut.fi (75, 81)

HAMELIN, Dr. J., Ministère de la Recherche et de l'Espace, 1, rue Descartes, F-75231 PARIS CEDEX 05, FRANCE, Tel. : (33-1) 46 34 31 77, Fax : (33-1) 46 34 30 88 (80)

HANBABA, Mr. R., CNET/LAC/MER/SPI, Route de Trégastel, F-22301 LANNION CEDEX, FRANCE, Tel. : (33) 9605 2677, Fax : (33) 9605 3256 (82)

HANSEN, Mr. O., Telelaboratory, Radio/EMC, Telecom A/S, Telegade 2, DK-2630 TAASTRUP, DENMARK, Tel. : (45) 4252 5577 ext. 5510, or (45) 4252 9111, Fax : (45) 4252 9331 (80)

HANSEN, Dr. D., EMI Control Centre, ASEA Brown-Boveri Ltd., Corporate Res. Crbe 4, CH-5405 BADEN, SWITZERLAND (75)

HARTAL, Mr. O., TECHNION, P.O. Box 2250, 31021 HAIFA, ISRAEL, Tel. : (972) 4-792930 (80)

HAYAKAWA, Prof. M., Faculty of Electro-Communications, University of Electro-Communications, 1-5-1 Chofugaoka, Chofu-shi, TOKYO 182, JAPAN, Tel. : (81) 424-83-2161 ext. 3354, Fax : (81) 424-89-5861 (80, 81)

HELEU, Mrs. I., URSI Secretariat, University of Ghent, c/o LEA, St.-Pietersnieuwstraat 41, B-9000 GENT, BELGIUM, Tel. (32) 91-64.33.20, Fax : (32) 91-64.35.93, e-mail address : heleu@lea.rug.ac.be (73)

HENAFF, Dr. J., CNET/DIT/ASC, 38 rue du Général Leclerc, F-92131 ISSY-LES-MOULINEAUX, FRANCE, Tel. : (33) 1-4529 4871, Fax : (33) 1-4736 8924, Telex : 250317 F (79)

HENGSTBERGER, Dr. F., Division of Production Technology, CSIR, P.O. Box 395, PRETORIA 1, SOUTH AFRICA, Tel. : (27) 12-841-4352, Fax : (27) 12-841-2832 (76)

HEROUNI, Prof. P.M., Radiophysics Measurements Institute, 49/4 Komitas av., 375014 YEREVAN, ARMENIE (76)

HEYMAN, Dr. E., Faculty of Engineering, Tel Aviv University, Ramat Aviv, 69978 TEL AVIV, ISRAEL, Tel. : (972) 3-420147, Telex : 342171 (77)

HILOU, Dr. H.W., Research Centre, Bab Almuadam, P.O. Box 14080, BAGHDAD, IRAQ 84)

HJELMSTAD, Dr. J.Fr., PFM, P.O. Box 89, N-2001 LILLESTRÖM, NORWAY, Tel. : (47) 6-892663 (<15/4/93 : 63-), Fax : (47) 6-892670 (<15/4/93 : 63-) (82)

HØEG, Dr. P., Dept. of Geophysics, Danish Meteorogical Institute, Lyngbyvej 100, DK-2100 KØBENHAVN Ø, DENMARK, Tel. : (45) 3129 2100, Fax : (45) 3118 4261, e-mail address : metohoeg@uts.uni-c.dk (82)

HOEGGER, Dr. B., Route des Charbonnières 13, CH-1723 MARLY, SWITZERLAND, Tel. : (41) 37-626111, Fax : (41) 37-611194 (83, 84)

HOLT, Dr. J.M., MIT Haystack Observatory, Route 40, WESTFORD, MA 01886, USA (83)

HOUMINER, Dr. Z., Asher Space Research Institute, Technion, Israel Institute of Technology, 32000 HAIFA, ISRAEL, Tel. : (972) 4-293512, Fax : (972) 4-230956, Telex : 46406 tecon il, e-mail address : ASZWIH@vmsa.technion.ac.il (83, 85)

HU, Mr. D.-Z., Qing-Dao Research Centre, China Research Inst of Radio Propagation, 18A Qi-dong Road, QUINGDO, CHINA (81)

HUANG, Prof. K.-T., National Sun Yat-Sen University, KAO-HSIUNG 80424, TAIWAN, Tel. : (886) 7-385-8828, Fax : (886) 7-381-6133 (84)

HUANG, Dr. Y.-N., Dept. of Posts and Telecommunications, Ministry of Transportation/Communication, 2, Sec. 1, Changsha St., TAIPEI, TAIWAN, Tel. : (886) 2-344-3980, Fax : (886) 2-381-4684 (82, 89)

HULTQVIST, Dr. B., President SCOSTEP, Swedish Institute of Space Physics, P.O. Box 812, S-981 28 KIRUNA, SWEDEN, Tel. : (46) 980-12240 or 79060, Fax : (46) 980-15465 (79050), Telex : 8754 IRF S (83)

HYDE, Dr. G., COMSAT Laboratories, 22300 Comsat Drive, CLARKSBURG, MD 20871-9475, USA, Tel. : (1) 301-428 4494, Fax : (1) 301-428 7747/4280, Telex : 44-0696 (74)

IANOZ, Dr. M., Ecole Polytechnique Fédérale de Lausanne, LRE/DE, ECUBLENS, CH-1015 LAUSANNE, SWITZERLAND, Tel. : (41) 21-693 2664, Fax : (41) 21-693 4660 (81)

IBIYEMI, Dr. T.S., Dept. of Electrical Engineering, University of Ilorin, ILORIN, NIGERIA (86)

IBRAHIM, Prof. M.M., Faculty of Engineering, Ain Shams University, 1 Elsaryat St., 11517 ABASIA-CAIRO, EGYPT (80)

IDEMEN, Prof. M., Electromagnetics Research Group, Istanbul Technical University, Electrical and Electronic Eng. Faculty, Maslak 80626 ISTANBUL, TURKEY, Tel. : (90) 1-176-3622, Fax : (90) 1-176-1734, Telex : 28186 (90)

INAN, Dr. U., Stanford University, Star-Lab, Durand 321, STANFORD, CA 94305, USA (87)

IRELAND, Mr. W., Physics & Engineering Laboratory, Department of Scientific & Industrial Research, Private Bag, LOWER HUTT, NEW ZEALAND (90)

ISHIGURO, Prof. M., Nobeyama Radio Observatory, Nobeyama Minamimaki-mura, Minamisaku-gun, NAGANO 384-13, JAPAN, Tel. : (81) 267-63-4396, Fax : (81) 267-98-2884 (85)

ITOH, Prof. T., Electrical Eng. Dept., School of Eng.&Applied Science, 66-147 A ENG IV, 405 Hilgard Avenue, LOS ANGELES, CA 90024-1594, USA, Tel. : (1) 310-206-4820, Fax : (1) 310-206-4819 (79)

JARELLA, Mr. J.L., Research Centre, Bab Almuadam, P.O. Box 14080, BAGHDAD, IRAQ (80)

JESKE, Prof. H., Meteorilogisch Institut, Universität Hamburg, Von Melle Park 6, W-2000 HAMBURG 13, GERMANY, Tel. : (49) 40-4123 5878 (81)

JONES, Dr. D.L., Department of Physics, King's College, Strand, LONDON, WC2R 2LS, UNITED KINGDOM, Tel. : (44) 71-836 5454, Fax : (44) 71-872 0201 (80)

JONES, Prof. T.B., Department of Physics, University of Leicester, University Road, LEICESTER, LE1 7RH, UNITED KINGDOM, Tel. : (44) 533-523 561, Fax : (44) 533-523 555 (83)

JOYNER, Dr. K.H., Telecom Research Laboratories, 770 Blackburn Road, P.O. Box 249, CLAYTON NTH, VIC 3168, AUSTRALIA, Tel. : (61) 3-253-6315, Fax : (61) 3-253-6365, e-mail address : k.joyner@trl.oz.au (86)

JULL, Prof. E.V., Dept. of Electrical Engineering, University of British Columbia, 2356 Main Mall, VANCOUVER, BC V6T 1Z4, CANADA, Tel. : (1) 604-822 3282, Fax : (1) 604-822 5949 (73, 74, 75, 88)

KAHLMANN, Mr. H.C., Radiosterrenwacht Westerbork, Schattenberg 1, NL-9433 TA ZWIGGELTE, NETHERLANDS, Tel. : (31) 5939-2421, Fax : (31) 5939-2486 (85, 88, 90)

KAMP, Dr. L.P.J., TU Eindhoven, Afdeling Technische Natuurkunde, Postbus 513, NL-5600 MB EINDHOVEN, NETHERLANDS (84)

KANDA, Dr. M., Electromagnetic Fields Division, National Inst. of Standards & Tech., 325 Broadway, BOULDER, CO 80303-3328, USA, Tel. : (1-303) 497-5320, Fax : (1-303) 497-6665 (76)

KANGAS, Prof. J., University of Oulu, Deparment of Physics, Linnanmaa, SF-90570 OULU, FINLAND, Tel. : (358) 81-553-1369, Fax : (358) 81-553-1287 (84)

KANTOR, Dr. I.J., INPE, C.P. 515, 12200 SOA JOSE DOS CAMPOS - S.P., BRAZIL (82)

KARASEK, Dr. M., Institute of Radio Engineering and Electronics, Czechoslovak Academy of Sciences, Chaberska 57, 182 51 PRAHA 8, CZECHOSLOVAKIA, Tel. : (42) 2-843741, Fax : (42) 2-840609, e-mail address : ure 44@cspg cs 11 (79)

KARTASCHOFF, Dr. P., La Pistoule 28, CH-2036 CORMONDRECHE, SWITZERLAND, Tel. : (41) 31-624 380, Fax : (41) 31-625 174 (90)

KATILA, Prof. T., Laboratory of Biomedical Eng., Faculty of Information Sciences, Helsinki University of Technology, Rakentajanaukio 2 C, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-451-3173, Fax : (358) 0-451-3182, e-mail address : lkt-tk@finhut.hut.fi (86)

KATO, Prof. S., Japan - Indonesia Forum, Rokko Building No. 2, 1-3-7 Shinkawa, Chuo-ku, TOKYO 104, JAPAN, Tel. : (81)3-3552-7986, Fax : (81) 3-3552-7302 (88)

KAUFMANN, Prof. P., Universidade de Sao Paulo, Escola Politecnica, PTR, C.P. 61548, 5508 SAO PAULO - S.P., BRAZIL (85, 89)

KENDERESSY, Dr. M., TKI - Research Institute for Telecommunication, Gábor A.u.65., H-1026 BUDAPEST, HUNGARY, Tel. : (36) 1-135 3762, Fax : (36) 1-135 5560, Telex : 224338taki h (76)

KHOKLE, Dr. W.S., Director, Central Electronics Eng. Res. Institute, PILANI-333 031, INDIA, Tel. : (91) 15951-2111 (86)

KIKUCHI, Prof. H., College of Science & Technology, Nihon University, 8-14, Kanda Surugadai, 1-chome, Chiyoda-ku, TOKYO 101, JAPAN, Tel. : (81) 33-293 3251 ext. 370, Fax : (81) 33-5275 8310, Telex : J 29496 NICHIDAI (81)

KLEIN, Prof. J.W., Ruhruniversität Bochum, Postfach 102148, W-4630 BOCHUM, GERMANY, Tel. : (49) 234-700 3137/4507 (74, 79)

KLEINMAN, Prof. R.E., Dept. of Mathematics, University of Delaware, NEWARK, DE 19716, USA, Tel. : (1-302) 451-2266, Fax : (1-302) 451-8000, e-mail address : BITNET: KLEINMAN@MATH.UDEL.EDU(77)

KLOBUCHAR, Dr. J.A., Research Engineer, Air Force Geophysics Lab, Ionospheric Physics - Lis, HANSCOM AFB, BEDFORD, MA 01731, USA (83)

KNUDE, Dr. J., Copenhagen University Observatory, Øster Voldgade 3, DK-1350 COPENHAGEN, DENMARK, Tel. : (45) 3314 1790, Fax : (45) 3315 4338, e-mail address : indus@astro.ku.dk (85)

KOLAWOLE, Prof. L.B., Department of Physics, Federal University of Technology, AKURE, NIGERIA (77, 84)

KOMBAKOV, Mr. N., Institute of Communications, Haidushka Poliana St. 8, 1612 SOFIA, BULGARIA (80)

KORNIEWICZ, Dr. H., Centralny Instytut Ochrony Pracy, Zaklad Zagrozen Fizycznych, Pl. Konstytucji 2, 00-552 WARSZAWA, POLAND, Tel. : (48) 2-221.14.38, Fax : (48) 2-227.96.12 (86)

KORNSTEIN, Prof. R., Sackler Medical School, Tel-Aviv University, TEL AVIV, ISRAEL (86)

KOSILO, Dr. T., Warsaw University of Technology, Institute of Radio-electronics, ul. Nowowiejska 15/19, 00-665 WARSAW, POLAND (90)

KOURIS, Prof. S., University of Thessaloniki, Dept. of Electrical Engineering, GR-54006 THESSALONIKI, GREECE (82)

KRIEZIS, Prof. E.E., Dept of Electrical Engineering, University of Thessaloniki, GR-540 06 THESSALONIKI, GREECE, Tel. : (30) 31 996 311, Fax : (30) 31 274 868 (77)

KUSTER, Dr. N., Institute for Field Theory and Highest Frequency, Techniques, ETH Zurich, Gloriastraße 35 CH-8092, ZURICH, SWITZERLAND, Tel. : (41) 1-256 2810, Fax : (41) 1-261 1026 (87)

KUTIEV, Dr. I., Institute of Geophysics, Ac. G. Bontchev St., bl. 3, 1113 SOFIA, BULGARIA (84)

LAGASSE, Prof. P., Laboratorium voor Elektromagnetisme & Acustica, St.-Pietersnieuwstraat 41, B-9000 GENT, BELGIUM, Tel. : (32) 91-643315, Fax : (32) 91-643593 (73, 75)

LALOUX, Prof. A., Laboratoire de Télécommunications, Bâtiment Maxwell, Place du Levant 3, B-1348 LOUVAIN-LA-NEUVE, BELGIUM (88)

LANDECKER, Dr. T.L., Dominion Radio Astrophysical Observatory, P.O. Box 248, PENTICTON, B.C. V2A 6K3, CANADA, Tel. : (1) 604-493 2277, Fax : (1) 604-493-7767 (85)

LEE, Prof. L.-S., Dept. of Information Engineering, National Taiwan University, No. 1 Sec. 4 Roosevelt Rd., TAIPEI, TAIWAN, Tel. : (886) 2-788-8799 ext. 2202, Fax : (886) 2-782-4814 (78)

LEE, Mr. P.-Y., National Committee for URSI, c/o Telecommunication Training Institute, 168, Min-Chu Road, Pan-Chiao, TAIPEI HSIEN, TAIWAN (89)

LEFEUVRE, Dr. F., LPCE/CNRS, av. de la Recherche Scientifique 3A, F-45071 ORLEANS CEDEX 2, FRANCE, Tel. (33) 38-630086 (84, 87)

LEITAO, Prof. J.N., Instituto Superior Técnico de Lisboa, Avenida Rovisco Pais, P-1096 LISBOA CODEX, PORTUGAL (78)

LEITINGER, Dr. F., Karl-Franzens-Universität Graz, Institut für Meteorologie & Geophysik, Albärthgasse 1, A-8010 GRAZ, AUSTRIA (83)

LESCHIUTTA, Prof. S., Dipartimento di Elettronica, Politecnico di Torino, Corso Duca degli Abruzzi 24, I-10129 TORINO, ITALY, Tel. (39) 11-564 4035, Fax (39) 11-564 4099, Telex : 220646 POLITO (76)

LIGTHART, Prof. L.P., Technische Universiteit Delft, Afdeling Elektrotechniek, Postbus 5031, NL-2600 GA DELFT, NETHERLANDS (82)

LIN, Dr. J.C., Dept. of Bioengineering, University of Illinois at Chicago, Box 4348, CHICAGO, IL 60680, USA, Tel. : (1-312) 996-2331, Fax : (1-312) 996-5921 (87)

LINDELL, Prof. I.V., Helsinki University of Technology, Electromagnetics Laboratory, Otakaari 5A, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-451-2266, Fax : (358) 0-451-2267, e-mail address : ismo.lindell@hut.fi (77, 89)

LIU, Prof. C.-H., National Central University, CHUNG-LI 32054, TAIWAN, Tel. : (886) 3-425-4822, Fax : (886) 3-425-4842 (81)

LUCAS, Prof. J.G., Electrical Eng. - School of Science & Technology, University of Western Sydney (Nepean), P.O. Box 10, KINGSWOOD, NSW 2747, AUSTRALIA, Tel. : (61) 47-360-828, Fax : (61) 47-360-833, e-mail address : g.lucas@nepean.uws.edu.au (73, 75, 77)

MAGALHAES, Mr. A.A.S., Observatório Astronómico Manuel de Barros, Monte da Virgem, P-4400 VILA NOVA DE GAIA, PORTUGAL (85)

MAGUN, Dr. A., Halen 66, CH-3037 HERRENSCHWANDEN, SWITZERLAND, Tel. (41) 31-658 903, Fax (41) 31-653 765 (82, 85)

MANILHA, Mr. T.M.E., National Institute of Meteorology, & Geophysics, Aeroporto Rua C., P-1000 LISBOA, PORTUGAL (80)

MASS, Dr. J., Radio Observatory, Hagalil St. 111, 32683 HAIFA, ISRAEL, Tel. : (972) 4-234383 (82)

MATHUR, Dr. B.S., Deputy Director, National Physical Laboratory, Dr. Krishnan Road,, NEW DELHI 110 012, INDIA, Tel. : (91) 5718310, Telex : 31-62454 & 31-5451 (76)

MATSUMOTO, Prof. H., Radio Atmospheric Science Centre, Kyoto University, Gokasyo, Uji-shi, KYOTO 611, JAPAN, Tel. : (81) 774-33 2532, Fax : (81) 774-31 8463, e-mail address : matsumot@kurasc.kyoto-u.ac.jp (75, 84, 87)

MATSUURA, Prof. N., Solar-Terrestrial Environment Laboratory, Nagoya University, Furo-cho, Chigusa-ku, Nagoya-shi, AICHI 464-01, JAPAN, Tel. : (81) 52-783-3543, Fax : (81) 52-783-3542 (83)

MÄTZLER, Dr. Ch., Staffelweg 30, CH-3302 MOOSSEEDORF, SWITZERLAND, Tel. : (41) 31-654 589, Fax : (41) 31-653 765 (80)

MAWIRA, Mr. A., Dr. Neher Laboratorium / PTT, Postbus 421, NL-2260 AK LEIDSCHENDAM, NETHERLANDS (80)

MAY, Prof. J., Departamento de Astronomia, Facultad de Ciencias Fisicas y Matematicas, Universidad de Chile, Casilla 36-D, SANTIAGO DE CHILE, CHILE, Fax : (56) 2-6712799 (90)

MAZANEK, Dr. M., Dept. of Electromagnetic Field, Faculty of Electrical Engineering, Czech Technical Uniersity, Technická 2, 166 27 PRAHA 6, CZECHOSLOVAKIA, Tel. : (42) 2-3322 282, Fax : (42) 2-3111 786, e-mail address : mmazánek@cspunt 12 (81)

MAZZA, Mr. H.F., INTI, CC. 157, 1650 SAN MARTIN, B.A., ARGENTINA, Tel. : (54) 1-753 4064, Fax : (54) 1-755 2102, Telex : 27128 INTI.AR (76)

McKENNA-LAWLOR, Prof. S., Dept. of Experimental Physics, St. Patrick's College, Maynooth, CO., KILDARE, IRELAND, Tel. : (351) 1-6285 222 ext. 209, Fax : (351) 1-6289 277 (85)

MEYER, Dr. G., ETHZ-IKT, ETH-Zentrum, CH-8092 ZÜRICH, SWITZERLAND, Tel. : (41) 1-2562 793, Fax : (41) 1-2690 943 (78)

MICHALEV, Mr. M., Institute of Electronics, Bul. Lenina 72, 1748 SOFIA, BULGARIA (81)

MIGULIN, Prof. V.V., Russian URSI Committee, Russian Academy of Sciences, Mokhovaja St. 11, 103907 MOSCOW, RUSSIA, Fax : (7095) 203-8414, Telex 411429 iresc, e-mail address : obukh@ire.msk.su (90)

MINK, Dr. J.W., U.S. Army Research Office, Box 12211, 43000 S. Miami Blvd., RESEARCH TRIANGLE PARK, NC 27709, USA, Tel. : (1-919) 549-0641, Fax : (1-919) 549-4310 (79)

MISSOUT, Dr. G., IREQ, 1800 Montée Ste. Julie, VARENNES, PQ J3X 1S1, CANADA, Tel. : (1-514) 652-8084, Fax : (1-514) 652-8435, e-mail address : Missout@ireq.hydro.qc.ca (76)

MITRA, Dr. A.P., Bhatnagar Fellow, National Physical Laboratory, Hillside Road, NEW DELHI 110 012, INDIA, Tel. : (91) 11-574 5298, Fax : (91) 11-575 2678, Telex : 31-77384 RSD IN (74, 88)

MIYAUSHI, Prof. K., Dept. of Electrical Eng., Faculty of Engineering, Science University of Tokyo, 1-3 Kagurazaka, Shinjuku-ku, TOKYO 162, JAPAN, Tel. : (81) 3-3260 4271 ext. 3394, Fax : (81) 3-3260 4294 (78)

MON, Mr. J.-P., CNET/PAB/CRPE, 38, rue du Général Leclerc, F-92131 ISSY-LES-MOULINEAUX, FRANCE, Tel. : (33) 1-4529 5019, Fax : (33) 1-4529 6052, Telex : 200570 CNETION (81)

MOORE, Prof. R.K., Radar Systems & Remote Sensing Lab., Center for Research/Univ. of Kansas, 2291 Irving Hill Road, LAWRENCE, KS 66045-2969, USA, Tel. : (1) 913-864-4835, Fax : (1) 913-864-7789, Telex : 706352, e-mail address : EREMOTE@UKANVAX.bitnet & 7418::moore (75, 81, 88)

MORAN, Dr. J.M., Smithsonian Astrophysics Observatory, 60 Garden Street, CAMBRIDGE, MA 02138, USA, Tel. : (1-617) 495-7477, Fax : (1-617) 495-7345, e-mail address : BITNET : MORAN@CFA (85)

MOREIRA, Prof. A.R.A., Instituto Superior Técnico, Avenida Rovisco Pais, P-1096 LISBOA CODEX, PORTUGAL (83)

MORTENSEN, Mr. E., Inst of Telecommunications / Building 343, Technical University of Denmark, DK-2800 LYNGBY, DENMARK, Tel. : (45) 4288 1566, Fax : (45) 4288 2239, e-mail address : em@it.dth.dk (78)

MOUALA, Dr. K., Space Research Centre, P.O. Box 2441, JADIRYA / BAGHDAD, IRAQ (83, 85)

MOURILHE DA SILVA, Mr. P., Observatorio Nacional, R. Gal Bruce 586, 20921 SAO CRISTOVAO, RIO DE JANEIRO, BRAZIL, Fax : (55)21-5806071 or (55)21-5800332, Telex : 2139159 or 2121288 (76)

MROZIEWICZ, Prof. B., Instytut Technologii Elektronowej, Al. Lotnikow 32/46, 02-668 WARSZAWA, POLAND (79)

MUSIL, Dr. J., National Institute of Public Health, Strobárova 48, 100 42 PRAHA 10, CZECHOSLOVAKIA, Tel. : (42) 2-730851, Fax : (42) 2-736904, Telex : 122662 c (86)

NANO, Prof. E., Dept. di Elettronica, Politecnico di Torino, 24 Corso Duca degli Abruzzi, I-10129 TORINO, ITALY, Tel. : (39) 11-564 4051, Fax : (39) 11-564 4099, Telex : 220646 POLITO (80)

NAOOM, Dr. A., Space Research Centre, P.O. Box 2441, JADIRYA / BAGHDAD, IRAQ (76, 79)

NESTOROV, Dr. G., Institute of Geophysics, Ac. G. Bontchev St. - bl. No 3, 1113 SOFIA, BULGARIA (85)

NEVES, Prof. C.J.S., Universidade de Aveiro, P-3800 AVEIRO, PORTUGAL (82)

NICOLSON, Dr. G.D., Hartebeesthoek RA Observatory, FRD, P.O. Box 443, 1740 KRUGERSDORP, SOUTH AFRICA, Tel. : (27) 11-642-4692, Fax : (27) 11-642-2424, e-mail address : george@bootes.hartrao.ac.za (85)

NORRIS, Dr. R., Australia Telescope National Facility, CSIRO, P.O. Box 76, EPPING, NSW 2121, AUSTRALIA, Tel. : (61) 2-868-0222, Fax : (61) 2-868-0310, e-mail address : rnorris@atnf.csiro.au (85)

NUNN, Dr. D., Dept. of Electronics, University of Southampton, SOUTHAMPTON SO9 5NH, UNITED KINGDOM, Tel. (44) 703-595 000, Fax (44) 703-592 865, e-mail address: eli002@ibm.soton.ac.uk (84)

ÖHMAN, Mr. B., Telia Research AB/TTr, Swedish Telecom, S-136 80, HANINGE, SWEDEN (90)

OKAMURA, Prof. S., 4-12-15 Numabukuro, Nakano-ku, TOKYO 165, JAPAN, Tel. (81) 33-294 1551/388 2751, Telex 2832611 DEMPA (74)

OKEKE, Prof. P.N., Dept. of Physics, University of Nigeria, NSUKKA, NIGERIA (85)

OKOSHI, Prof. T., Director RCAST, University of Tokyo, 4-6-1 Komaba, Meguro-ku, TOKYO 153, JAPAN, Tel. : (81) 3-3481 4436, Fax : (81) 3-3481 4576, Telex : J34189 RCASTUT (73, 74)

OLVER, Prof. A.D., Dept. of Electronic Eng., Queen Mary and Westfield College, Mile End Road, LONDON, E1 4NS, UNITED KINGDOM, Tel. : (44) 71-975 5345, Fax : (44) 81-981 0259 (77, 90)

OSSAKOW, Dr. S.L., Plasma Physics Division, Naval Research Laboratory, Code 4700, WASHINGTON, DC 21375, USA (87)

OWOLABI, Prof. I.E., Dept. of Electrical Eng., University of Ilorin, ILORIN, NIGERIA (82)

OYINLOYE, Prof. O., Department of Physics, University of Ilorin, ILORIN, NIGERIA (74, 83)

PADULA-PINTOS, Prof. V.H., CAERCEM, Julian Alvarez 1218, 1414, BUENOS AIRES, ARGENTINA, Tel. : (54) 1-772-1471, Fax : (54) 1-776 0410, e-mail address : postmast@caerce.edu.ar (80, 86, 88)

PAPIERNIK, Mr. A., Laboratoire d'Electronique, Université de Nice, Sophia Antipolis, CNRS-Bât. 4-SPI, Rue A. Einstein, F-06560 VALBONNE, FRANCE, Tel. (33) 9294 2800, Fax (33) 9294 2898 (77)

PAQUET, Prof. P., Obseratoire Royal de Belgique, 3 avenue Circulaire, B-1180 BRUSSELS, BELGIUM, Tel. : (32) 2-375 2484 (76)

PARIJSKY, Prof. Y. N., Special Astrophysical Observatory, Pulkovo, 196140 ST-PETERSBURG, RUSSIA, Telex : 123244 (85)

PARLOW, Dr. R.D., US Department of Commerce, Nat. Telecom. & Inf. Admin. /Room 4099A, 14th and Const. Av. NW, WASHINGTON, DC 20230, USA, Tel. : (1) 202-377 1850, Fax : (1) 202-377 4396 (81)

PATRICIO, Mr. J.F., Radio Adviser Engineer, Rua Alferes Barrilaro Ruas 1, 8°Dt°, P-1800 LISBOA, PORTUGAL (90)

PAULSSON, Dr. D.L.-E., Statens Stralskyddsinstitut, Box 60204, S-104 01 STOCKHOLM, SWEDEN (76, 86)

PAUW, Dr. C.K., CSIR, Division of Microelectronics & Communication Technology, P.O. Box 395, PRETORIA 1, SOUTH AFRICA, Tel. : (27) 12-841-3053, Fax : (27) 12-841-4720, e-mail address : pauw@mikomtek.csir.co.za (80)

PAVLASEK, Prof. T.J.F., Dept. of Electrical Engineering, McGill University, 3480 University Street, MONTREAL, PQ H3A 2A7, CANADA, Tel. : (1) 514-398 7165, Fax : (1) 514-398 4470 (80)

PAWELEC, Dr. J., Wojskowa Akademia Techniczna, ul. Kaliskiego, 00-908 WARSZAWA, POLAND (80)

PAWLOWSKI, Dr. W., Instytut Telekomunikacji, Politechnika Gdanska, ul. Majakowskiego 11/12, 80-952 GDANSK - WRZESZCZ, POLAND (82)

PERONA, Prof. G., Dip. di Elettronica, Politecnico di Torino, Corso Duca degli Abruzzi 24, I-10129 TORINO, ITALY, Tel. : (39) 11-564 4067, Fax : (39) 11-564 4099/4015, Telex : 220646 polito (84)

PETIT, Dr. M., Ministère de l'Environnement, Division de la Recherche, 14 Boulevard Général Leclerc, F-92524 NEUILLY SUR SEINE CEDEX, FRANCE (74, 75)

PFLEIDERER, Prof. J., Institut für Astronomie, Universität Innsbruck, Technikerstrasse 15, A-6020 INNSBRUCK, AUSTRIA (85)

PICKHOLTZ, Prof. R., School of Eng. and Applied Science, George Washington University, WASHINGTON, DC 20052, USA, Tel. : (1-202) 994-6538, Fax : (1-202) 994-0227, e-mail address : BITNET, PICKHOLTZ@SEAS.GWU.EDU (78)

PIEKARSKI, Prof. M., Instytut Telekomunikacji i Akustyki, Politechnika Wroclawska, ul. Wybrzeze Wyspianskiego 27, 50-370 WROCLAW, POLAND (78)

PILLER, Dr. O., Aeckerli, CH-1715, ALTERSWIL, SWITZERLAND, Tel. : pr. (41) 37-442 703 (76)

PILLET, Dr. G., CNET/DICET, 38 rue du Général Leclerc, F-92131 ISSY-LES-MOULINEAUX, FRANCE, Tel. : (33) 1-4529 5020, Fax : (33-1) 4529 6052 (74)

PIRJOLA, Dr. R., Finnish Meteorological Institute, Department of Geophysics, P.O. Box 503, SF-00101 HELSINKI, FINLAND, Tel. : (358) 0-1929-505, Fax : (358) 0-1929-539, e-mail address : risto.pirjola @fmi.fi (80)

POLITCH, Dr. J., TECHNION I.I.T., P.O. Box 2250, 32000 HAIFA, ISRAEL, Fax : (972) 4-792930 (76, 89)

POOLE, Prof. A.W.V., Herman Olthaver Institute for Aeronomy, Rhodes University, P.O. Box 94, 6140 GRAHAMSTOWN, SOUTH

AFRICA, Tel. : (27) 461 2-2023, Fax : (27) 461 2-5049, Telex : 24-4219 SA, e-mail address : phap@ruchem.ru.ac.za (90)

PRICE, Prof. R.M., Dept. of Physics & Astronomy, University of New Mexico, ALBUQUERQUE, NM 87131, USA, Tel. : (1-505) 277-3335, Fax : (1-505) 277-1520 (88)

PROTONOTARIOS, Prof. E., Faculty of Electrical Eng., National Technical University of Athens, 28th October 42, 10682 ATHENS, GREECE (78)

QUIJANO, Prof. A., Calle 4B y 116, 1900 LA PLATA, B.A., ARGENTINA, Tel. : (54) 21-243 709, Fax : (54) 21-250 804, Telex : 31151 bulap-ar, e-mail address : quijano@cetad.edu.ar (78)

RADECKI, Dr. K., Warsaw University of Technology, Institute of Radioelectronics, ul. Nowowiejska 15/19. 00-665 WARSZAWA, POLAND (76)

RADICELLA, Prof. S.M., Julian Alvarez 1210, 1414 BUENOS AIRES, ARGENTINA, Tel. : (54) 1-772-1471, Fax : (54) 1-776 0410, e-mail address : postmast@caerce.edu.ar (73, 74, 75, 82)

RAJI, Prof. T.I., Dept. of Electronic and Electrical Eng., Ladoke Akintola University of Technology, P.M.B. 4000, OGBOMOSO, NIGERIA (78)

RAJU, Dr. V.D., National Remote Sensing Agency, HYDERABAD-500 007, INDIA, Tel. : (91) 261564, Telex : 0425-6522 (82)

RANVAUD, Dr. R.D.P.K.C., INPE, C.P. 515, 12200 SAO JOSE DOS CAMPOS - S.P., BRAZIL (79)

RAO, Dr. M.K., Dept. of Telecommunications, Wireless Planning & Coordination Wing, Room No 113-D / Sardar Patel Bhavan, Parliament str., NEW DELHI 110 001, INDIA, Tel. : (91) 350607, Telex : 31-4422 COMN IN (80)

RASH, Dr. J.P.S., Dept. of Physics, University of Natal, K. George V Avenue, 4001 DURBAN, SOUTH AFRICA, Tel. : (27) 31-816-1401, Fax : (27) 31-261-6550, e-mail address : rash@ph.und.ac.za (83, 84)

RASKMARK, Mr. P., Institute of Electronic Systems, Aalborg University Center, Fr. Bajersvej 7, DK-9220 AALBORG, DENMARK, Tel. : (45) 9815 8522, Fax : (45) 9815 6740 (86)

RAZIN, Prof. V.A., Scientific Research Radiophysical Institute, (NIRFI), Lyadov St. 25/14, 603600 NIZNIJ NOVGOROD, RUSSIA (85)

REDDY, Dr. B.M., Assistant Director, Radio Science Division, National Physical Laboratory, Dr. K.S. Krishnan Road, NEW DELHI 110 012, INDIA, Fax : (91) 11-572 1436 (74, 88, 89)

REINECK, Prof. K.M., Dept. of Electrical Eng., University of Cape Town, Private Bag, 7700 RONDEBOSCH, SOUTH AFRICA, Tel. (27) 21-650-2801, Fax (27) 21-650-3726, e-mail erica@cerecam.uct.ac.za (86)

REINISCH, Dr. B.W., University of Lowell, 1 University Avenue, LOWELL, MA 01854, USA (83)

REMIZOV, Prof. L.T., Institute of Radioeng. & Electronics, Academy of Sciences, Vvedenskogo pl. 1, 141120 FRYAZINO (MOSCOW REGION), RUSSIA (80)

RESTIVO, Prof. F de Oliveira, Faculty of Engineering, University of Oporto, Rua dos Bragas, 4099 PORTO CODEX, PORTUGAL (79)

RICHARDS, Prof. J.A., University College, Australian Defence Force Academy, CANBERRA, ACT 2601, AUSTRALIA, Tel. (61) 6-268-8592, Fax (61) 6-268-8443, e-mail : j-richards@adfa.edu.au (81)

RICHTER, Dr. J.H., Naval Ocean Systems Center, Code 54, 271 Catalina Boulevard, SAN DIEGO, CA 92152-5000, USA, Tel. : (1-619)

553-3053, Fax : (1-619) 553-3058, e-mail address : OMNET : J.RICHTER (82)

RIEDLER, Prof. W., Institut für Nachrichtentechnik, & Wellenausbreitung, Technische Universität, Infeldgasse 12, A-8010 GRAZ, AUSTRIA (81, 82)

RISHBETH, Dr. H., Rutherford Appleton Laboratory, CHILTON, DIDCOT/OXON, OX11 0QX, UNITED KINGDOM, Tel. : (44) 235-446 496 / 703-592 073, Fax : (44) 703-585 813 (75, 88)

ROBINSON, Dr. B.J., CSIRO, Division of Radiophysics, P.O. Box 76, EPPING, NSW 2121, AUSTRALIA, Tel. : (61) 2-868 0222, Fax : (61) 2-868 0220, Telex : AA26230 ASTRO (88)

RÖDSRUD, Ms. E., PFM, (Program for Miljøovervakingsteknikk), P.O. Box 89, N-2001 LILLESTRÖM, NORWAY, Tel. : (47) 6-892661 (<15/4/93 : 63-), Fax : (47) 6-892670 (<15/4/93 : 63-) (90)

RUDNER, Mr. S., Swedish Defence Research Establishment, Dept. of Information Technology, P.O. Box 1165, S-581 11 LINKÖPING, SWEDEN (79)

RUIZ, Prof. M.S., Facultad Ciencias Fisicas, Depto. de Fisica Aplicada III, Universidad Complutense de Madrid, Ciudad Universitaria, 28040 MADRID, SPAIN, Tel. : (34) 1-394-4388, Fax : (34) 1-394-4688 (86)

RUSH, Dr. C.M., NTIA/ITS, 325 Broadway, BOULDER, CO 80303, USA, Tel. : (1) 303-497-3821, Fax : (1) 303-497-5993 (90)

RYAN, Prof. W.D., Dept. of Electrical & Electronic Eng., Queen's University, BELFAST (Northern Ireland), BT7 1NN, UNITED KINGDOM, Tel. : (44) 232-245133 x4052, Fax : (44) 232-667023 (79)

RYCROFT, Prof. M.J., College of Aeronautics, Cranfield Institute of Technology, CRANFIELD, BEDFORD, MK43 0AL, UNITED KINGDOM, Tel. : (44) 234-752707, Fax : (44) 234-750780 (88)

SAGALYN, Dr. R., 555 Annursnac Hill Road, CONCORD, MA 01742, USA, Tel. : (1-617) 377-3226, Fax : (1-617) 377-3160 (74)

SAHALOS, Prof. J., Department of Physics, University of Thessaloniki, 54006 THESSALONIKI, GREECE (76, 80)

SAID, Dr. S.M., Military Engineering College, Electrical Engineering Dept., BAGHDAD, IRAQ (82)

SAITO, Prof. M., Faculty of Medicine, Institute of Medical Electronics, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, TOKYO 113, JAPAN, Tel. : (81) 3-3812-2111 x3563, Fax : (81) 3-3812-2111 x3568 (86)

SALAMA, Dr. C.A.T., Dept. of Electrical Eng., University of Toronto, TORONTO, ON M5S 1A4, CANADA, Tel. : (1) 416-978 8568, Fax : (1) 416-978 7423 (79)

SALEH, Prof. N., Dean Faculty of Engineering, Ain Shams University, 1 Elsaryat St., 11517 ABASIA-CAIRO, EGYPT (78)

SALEM, Prof. I.A., 17 Elqouba St., 11341 HELIOPOLIS-CAIRO, EGYPT (74, 77, 89)

SARKAR, Dr. T.K., Dept. of Electrical Eng., Syracuse University, 121 Link Hall, NY 13244, SYRACUSE, USA, Tel. : (1) 315-443 4936 (87)

SAUNDERS, Dr. R.D., National Radiological Protection Board, CHILTON, DIDCOT/OXON, OX11 0RQ, UNITED KINGDOM, Tel. : (44) 235 831 600, Fax : (44) 235 833 891 (87)

SCAIFE, Prof. B.K.P., URSI Sub-Committee, Royal Irish Academy, 19 Dawson Street, DUBLIN 2, IRELAND, Tel. : (353) 1-7021 738/9, Fax : (353) 1-772 442 (76, 77, 89)

SCANLAN, Prof. J.O., Dept. of Electronic & Electrical Eng., University College, Belfield, DUBLIN 4, IRELAND, Tel. : (353) 1-706 1907, Fax : (353) 1-283 0921 (78, 80)

SCHALWIJK, Prof. J.P.M., Technische Hoogeschool, Faculteit Electrotechniek 13.33, P.O. Box 513, NL-5600 MB EINDHOVEN, NETHERLANDS, Tel. : (31) 40-47 35 15 (78)

SCHEFTE, Dr. H., Telefon AB LM Ericsson, S-126 25, STOCKHOLM, SWEDEN (78)

SCHEGGI, Prof. A.-M., Istituto di Ricerca sulle Onde Elettromagnetiche, IROE/CNR, Via Panciatichi 64, I-50127 FIRENZE, ITALY, Tel. : (39) 55-4221 941/4378 512, Fax : (39) 55-4379 569 (74, 89)

SCHLEGEL, Dr. K., Max-Planck-Institut für Aeronomie, Postfach 20/Max-Planck-Straße 2, W-3411 KATLENBURG-LINDAU 3, GERMANY, Tel. : (49) 5556 401 468, Fax : (49) 5556 401 240, Telex : 965527 aerli, e-mail address : ECD1::LINPI::SCHLEGEL (82)

SCHNIZER, Prof. B., Institut für Theoretische Physik, Technische Universität Graz, A-8010 GRAZ, AUSTRIA (77)

SCHWEICHER, Prof. E., Acting President, Belgian Committee, Leerstoel Radar en Optica, Koninklijke Militaire School, Renaissancelaan 30, B-1040 BRUSSELS, BELGIUM, Tel. : (32) 2-735.51.52 ext. 2420, Fax : (32) 2-735.24.21 (88)

SCUKA, Dr. V., Uppsala University, Institute of High Voltage Research, Husbyborg, S-752 28 UPPSALA, SWEDEN, Tel. : (46) 18-545591, Fax : (46) 18-102619 (80, 81)

SEBASTIAN, Prof. J.L., Dpto. Fisica Aplicada III, Facultad de Ciencias Fisicas, Universidad Complutense de Madrid, 28040 MADRID, SPAIN, Tel. : (34) 1-394-4393, Fax : (34) 1-394-4688, Telex : 47273 ffuc e (76, 77, 78, 79, 80, 82, 83, 84, 85, 90)

SEEBER, Mr. R., Division of Microelectronics & Communication, Technology - CSIR, P.O. Box 395, PRETORIA 1, SOUTH AFRICA, Tel. : (27) 12-841-4352, Fax : (27) 12-841-4720, e-mail address : rseeber@mikomtek.csir.co.za (82)

SEEDS, Dr. A.J., Dept. of Electronic & Electrical Eng., University College London, Torrington Place, LONDON, WC1E 7JE, UNITED KINGDOM, Tel. : (44) 71-387 7050 ext 3972, Fax : (44) 71-387 4350, e-mail address : a.seeds@eleceng.ucl.ac.uk (79)

SEN, Dr. A.K., Institute of Radio Physics & Electronics, University of Calcutta, 92 A.P.C. Road, CALCUTTA 700 009, INDIA, Tel. : (91) 35-9115 & 35-9116 (83)

SENIOR, Prof. T.B.A., Radiation Laboratory, Electrical Eng. & Computer Science, The University of Michigan, 4072 E. Eng. Building, ANN ARBOR, MI 48109-2122, USA, Tel. : (1) 313-764 3317, Fax : (1) 313-936 3492, Telex : 4320815 UOFM UI (74)

SENISE, Prof. J.T., Instituto Maua de Tecnologia, Sociedade Brasiliera de Micro Ondas, Estrado das Lagrimas, 2035 SAO CAETANO DE SUL, BRAZIL (77)

SERAFIMOV, Prof. K., Bulgarian Astronautical Society, 25 Ivan Vazov St., 1000 SOFIA, BULGARIA, Tel. : (359) 2-879 483, Fax : (359) 2-657 214 (75, 82, 89)

SEXTON, Prof. M.C., Dept. of Electrical Eng., University College, CORK, IRELAND, Tel. : (351) 21-276 871 ext. 2713, Fax : (351) 21-271 698 (83, 84)

SHA, Prof. Z., Chinese Institute of Electronics, 13th Floor / Room 2307, 12 Nongzhanguan Nanlu, 100026 BEIJING, CHINA, Tel. : (86) 1-500 11 44 Ext. 2310, Telex : 210431 cie cn (89)

SHAPIRA, Prof. J., Dept. of Electrical Eng., TECHNION I.I.T., P.O. Box 2250, 31021 HAIFA, ISRAEL, Tel. : (972) 4-794737&4-794028, Fax : (972) 4-225592 (74, 75, 89)

SHEVCHENKO, Prof. V.V., Institute of Radio Eng. & Electronics, Academy of Sciences, Mokhovaja St. 11, 103907 MOSCOW, RUSSIA, Fax : (7095) 203 8414, Telex : 411429 iresc, e-mail address : obukh@ire.msk.su (74)

SHILOH, Dr. J., Pulsed Power and EMP Section, RAFAEL Armament Development Authority, HAIFA, ISRAEL (75)

SHIMADA, Dr. S., Advanced Technlogy Institute, 3-6-1 Surugadai, Chiyoda-ku, TOKYO 101, JAPAN, Tel. : (81) 3-3255-5922, Fax : (81) 3-3255-5926 (76)

SHISHKOV, Prof. B., Institute of Applied Mathematics, & Informatics, Technical University of Sofia, P.O. Box 104, 1618 SOFIA, BULGARIA, Tel. : (359) 2-56 61 23, Fax : (359) 2-87 78 70 (78)

SHUHOUD, Prof. W.A., 48 Alkhalifa Almaamoun St., Manshiet Albakry-CAIRO, EGYPT (82, 89)

SIEBER, Dr. K.-W., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, W-5300 BONN 1, GERMANY, Tel. : (49) 228-52 53 17 (85)

SIFOROV, Prof. V.I., Institute of Information, & Transmission Problems, Academy of Sciences, ul. Ermolovoy 19, 103051 MOSKVA, RUSSIA (78)

SIHVOLA, Dr. A.H., Electromagnetics Laboratory, Helsinki University of Technology, Otakaari 5 A, SF-02150 ESPOO, FINLAND, Tel. : (358-0) 451 2261, Fax : (358-0) 451 2267, e-mail address : ari.sihvola@hut.fi (89)

SKELLERN, Prof. D.J., Electronics Dept./School of MPCE, Macquarie University, NORTH RYDE, NSW 2109, AUSTRALIA, Tel. : (61) 2-805 8908(w)/416 5008(h), Fax : (61) 2-805 8983, e-mail address : daves@mpce.mq.edu.au (79, 80, 88)

SLAVOVA, Prof. J., Technical Unversity of Sofia, W. Gladstone u. 7, 1421 SOFIA, BULGARIA (79)

SLUIJTER, Prof. F.W., Technische Universiteit Eindhoven, Afdeling Natuurkunde, Den Dolech 2, Postbus 513, NL-5600 MB EINDHOVEN, NETHERLANDS, Tel. : (31) 40-47.42.88, Fax : (31) 40-44.52.53, Telex 51163 (73, 83, 90)

SMITH, Dr. A.J., British Antarctic Survey, High Cross Madingley Road, CAMBRIDGE, CB3 0ET, UNITED KINGDOM, Tel. : (44) 223-61188, Fax : (44) 223-62616, Telex : 817725 bascam g, e-mail address : U_AJS@vaxc.nerc-bas.ac.uk (87)

SMITH, Dr. E.K., Dept. of Electrical & Computer Eng., University of Colorado, Campus Box 425, BOULDER, CO 80309-0425, USA, Tel. : (1-303) 492 7327, Fax : (1-303) 492 2758 (81)

SÖDERBERG, Dr. E.F., Analysis & Technology Inc., 258 Bank Street, NEW LONDON, CT 06320, USA, Tel. : (1-203) 859-0748, Fax : (1-203) 887-5748 (80)

SOICHER, Dr. H., U.S. Army CECOM, Center for C3 Systems, Tactical Radio Division AMSEL-RD-C3-TR, FORT MONMOUTH, NJ 07703-5000, USA, Tel. : (1-201) 532-0470, Fax : (1-201) 532-0456 (83)

SOMLO, Dr. P.O., Division of Applied Physics, CSIRO, P.O. Box 218, LINDFIELD, NSW 2070, AUSTRALIA, Tel. : (61) 2-413 7505/7508, Fax : (61) 2-413 7383, e-mail address : somlo@dap.csiro.oz.au. (76)

SONDE, Prof. B.S., Electrical Science Division, Indian Institute of Science, BANGALORE 560 012, INDIA, Tel. (91) 344411, Telex : 0845 8349 IISc IN (78)

SPASOV, Dr. A., Bulgarian URSI Committee, bld Lenina 72, 1113 SOFIA, BULGARIA (89)

SPAULDING, Dr. A.D., US Dept. of Commerce, NTIA/ITS/S3, 325 Broadway, BOULDER, CO 80302-3328, USA, Tel. : (1) 303-4975201, Fax : (1) 303-4973680 (81)

STEWART, Prof. J.A.C., Dept. of Electrical & Electronic Eng., Ashby Building, Stranmillis Road, BELFAST (Northern Ireland), BT9 5AH, UNITED KINGDOM, Tel. : (44) 232-245133 ext. 4064, Fax : (44) 232-667023 (79)

STOKKE, Mr. K.N., Statens Teleforvaltning, Parkveien 57 - Postboks 2592 Solli, N-0203 OSLO 2, NORWAY, Tel. : (47) 2-55.55.30 (80)

STONE, Dr. R., Chief Scientist of Expersoft, 1446 Vista Claridad, LA JOLLA, CA 92037, USA, Tel. : (1-619)459 8305(24hr), Fax : (1-619)459 7140 (74)

STRÖM, Prof. S., Royal Institute of Technology, S-100 44 STOCKHOLM, SWEDEN, Fax : (46) 8-108 327 (77)

STUBKJAER, Dr. K., Electromagnetics Institute - Bldg 348, Technical University of Denmark, DK-2800 LYNGBY, DENMARK, Tel. : (45) 4288 1444, Fax : (45) 4593 1634, e-mail address : ks@emi.dth.dk (79)

STUCHLY, Prof. M.A., Dept. of Electrical and Computer Eng., University of Victoria, P.O. Box 3055, VICTORIA, BC V8W 3P6, CANADA, Tel. : (1-604) 721-6030, Fax : (1-604) 721-6052, e-mail address : maria.stuchly@ece.UVic.ca (86)

STUMPERS, Prof. F.L.H.M., Elzentlaan 11, NL-5611 LG EINDHOVEN, NETHERLANDS (73)

STURM, Dr. R., Wehrwiss. Dienststelle der Bundeswehr, für ABC-Schutz, Postfach 1320, W-3042 MUNSTER, GERMANY, Tel. : (49) 5192 12 6103 (80)

SUCHY, Prof. K., Institut für Theoretische Physik II, der Universität Düsseldorf, Universitätsstraße 1, W-4000 DÜSSELDORF 1, GERMANY, Tel. : (49) 211-311 2746 (84)

SULYMAAN, Dr. S.D., Research Center, Bab Al-Muadam, P.O. Box 14080 BAGHDAD, IRAQ, Fax : (9641) 5383635, Telex : 213161 serch ik (89)

SUN, Prof. W.-S., Dept. of Physics and Astronomy, National Central University, CHUNGLI 32054, TAIWAN, Tel. : (886) 3-425-4960, Fax : (886) 3-425-1175 (85)

SWORDS, Dr. S.S., URSI Sub-Committee, Royal Irish Academy, 19 Dawson Street, DUBLIN 2, IRELAND, Tel. : (353) 1-762 570 and 1-764 222, Fax : (353) 1-762 346 (73, 89)

SZABO, Dr. L.D., F. J. Curie Inst. for Radiobiology, Pentz K. u. 5, H-1221 BUDAPEST, HUNGARY, Tel. : (36) 1-226-0144, Fax : (36) 1-226-6974 (86)

SZEMEREDY, Dr. P., ELTE - University of Sciences Lóránd Eötvös, Department of Geophysics, Ludovika tér 2, H-1083 BUDAPEST, HUNGARY, Tel. : (36) 1-134 3953 (80)

TADA, Prof. K., Dept. of Electrical Eng., University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, TOKYO 113, JAPAN, Tel. : (81) 3-3812-2111 ext. 6677. Fax : (81) 3-5684-3645 (79)

TARTARA, Prof. G., Dip di Elettronica e Informazione, Centro di Studio sulle Telecommunicazioni, Spaziali del CNR/Politecnico di Milano, Piazza Leonardo da Vinci 32, I-20133 MILANO, ITALY, Tel. : (39) 2-2399 3576, Fax : (39) 2-2399 3413 or 3587, Telex : 333467 polimi (78)

TAYLOR, Dr. W.W.L., NASA Headquarters, Code M-8, WASHINGTON, DC 20546, USA, Tel. : (1-202) 453-2961, Fax : (1-202) 426-6111 (84)

TENG, Mr. Y.-C., Directorate General of Telecommunications, MOTC, P.O. Box 91-84, TAIPEI 10098, TAIWAN, Tel. : (886) 2-344-3685, Fax (886) 2-392-8143 (76)

TESHIROGI, Dr. T., Communications Research Laboratory, Ministry of Posts and Telecommunications, 4-2-1 Nukuikitamachi, Koganei-shi, TOKYO 184, JAPAN, Tel. : (81) 423-27 7515, Fax : (81) 423-27 6692 (77)

THOMPSON, Dr. D.C., NZ Meteorological Service, 30 Salamanca Road, WELLINGTON, NEW ZEALAND, Tel. : (64) 4-472 9379, Fax : (64) 4-473 5231 (82)

THOMPSON, Dr. R., Sydney Regional Warning Centre, IPS Radio and Space Services, P.O. Box 1548, CHATSWOOD, NSW 2057, AUSTRALIA, Tel. : (61) 2-414-8325, Fax : (61) 2-414-8331, Telex : 20663 IPSO (88)

TIMOR, Dr. Uzi, Dept. of Electrical Eng., Technion I.I.T., 32000 HAIFA, ISRAEL, Tel. : (972) 4-294672 (-3), Fax : (972) 4-323041 (78)

TITHERIDGE, Dr. J.E., Department of Physics, University of Auckland, Private Bag 92019, AUCKLAND 1, NEW ZEALAND, Tel. : (64) 9-373 7599 Ext. 8866, Fax : (64) 9-373 7445, e-mail address : J.TITHERIDGE @AUKUNI.AC.NZ (83, 90)

TLAMICHA, Dr. A., Astronomical Institute, Czechoslovak Academy of Sciences, 251 65 ONDREJOV, CZECHOSLOVAKIA, Tel. : (42) 204-857324, Fax : (42) 204-85314, Telex : 121579 astrc, e-mail address : astsun@csearn.bitnet (85)

TOFANI, Prof. G., Osservatorio Astrofisico di Arcetri, Largo Enrico Fermi 5, I-50125 FIRENZE, ITALY, Tel. : (39) 55-2752 217, Fax : (39) 55-220039, Telex : 572268 arcetr (85)

TONNING, Prof. A., Institutt for Fysikalsk elektronikk, Universitetet i Trondheim, N-7034 TRONDHEIM NTH, NORWAY, Tel. : (47) 7-59.44.09, Fax : (47) 6-80 72 12 (77)

TRAINOTTI, Prof. V., Zufriategui 4380, 1603 VILLA MARTELLI, ARGENTINA, Tel. : (54) 1-761 0081, Fax : (54) 1-761 3063 (77)

TRULSEN, Prof. J., Institutt for teoretisk astrofysikk, Universiteter i Oslo, Postboks 1029 Blindern, N-0315 OSLO, NORWAY, Tel. : (47) 2-85.65.40 (84)

TUMSAROCH, Mr. S., Post & Telegraph Department, Paholyothin Road, 10400 BANGKOK, THAILAND, Tel. : (66) 2710151-60, Fax : (66) 2713514, Telex : 82503 deposte th (74, 90)

TUOMI, Prof. T., Optoelectronics Laboratory, Helsinki University of Technology, Otakaari 1, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-451-3120, Fax : (358) 0-465-077 (79)

TURSKI, Dr. A., ul. Krochmalna 3 m 419, 00-864 WARSZAWA, POLAND (84)

TURUNEN, Dr. T., Geophysical Observatory, SF-99600 SODANKYLÄ, FINLAND, Tel. : (358) 693-12226, Fax : (358) 693-14157 (82)

TYAGI, Dr. T.R., Radio Science Division, National Physical Laboratory, Dr. K.S. Krishnan Road, NEW DELHI 110 012, INDIA, Fax : (91) 11-572 1436 (83)

UNGSTRUP, Prof. E., Geophysical Institute - Space Physics, University of Copenhagen, Haraldsgade 6, DK-2200 COPENHAGEN N,

DENMARK, Tel. : (45) 3532 0584, Fax : (45) 3582 2565, e-mail address : eu@osiris.gfy.ku.dk (84, 89)

URPO, Prof. S., Metsähovi Radio Research Station, Helsinki University of Technology, Otakaari 5 A, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-451-2235, Fax : (358) 0-460-224, e-mail address : seppo.urpo@hut.fi (85)

UZUNOGLU, Prof. N.K., Microwave and Fiber Optics Telecomm, Dept. of Electrical Eng. and Computer Science, National Technical University of Athens, 28th October 42, GR-106 82 ATHENS, GREECE, Tel. : (30) 1-3616 908/ 3647 794, Fax : (30) 1-3647 704 (86)

VAN BLADEL, Prof. J., c/o University of Ghent, URSI Secretariat, Sint-Pietersnieuwstraat 41, B-9000 GENT, BELGIUM, Tel. : (32) 91-643321, Fax : (32) 91-643593 (73)

VAN DE CAPELLE, Prof. A., Afdeling Mikrogolven en Lasers, Kardinaal Mercierlaan 94, B-3001 HEVERLEE, BELGIUM (77)

VAN DE ROER, Dr. Th. G., Technische Universiteit Eindhoven, Afdeling Electrotechniek, Postbus 513, NL-5600 MB EINDHOVEN, NETHERLANDS (79)

VAN DEN BERG, Prof. P., T.U. Delft, Afdeling Electrotechniek, Postbus 5031, NL-2600 GA DELFT, NETHERLANDS (77)

VAN ECK, Prof. J.L., Electronique Industrielle, Université Libre de Bruxelles, 50 av. F.D. Roosevelt, B-1050 BRUSSELS, BELGIUM (79)

VAN GEMERT, Prof. M.J.C., Amsterdam Medisch Centrum, Laser Centrum - IWO 007, Meibergdreef 7, NL-1105 AZ AMSTERDAM, NETHERLANDS (86)

VERMAAK, Prof. J.S., 77 Greenacre Village, Ascot Road 4, 6001 PORT ELIZABETH, SOUTH AFRICA, Tel. : (27) 41-33-2026 (79)

VESZELY, Dr. Gy., Department of Electromagnetic Theory, BME - Technical University of Budapest, Egry J. u. 18, H-1111 BUDAPEST, HUNGARY, Tel. : (36) 1-166-5011, Fax : (36) 1-166-6808, Telex : 225931imuegy h (77)

VEYRET, Dr. B., Laboratoire PIOM, ENSCPB, Université Bordeaux 1, F-33405 TALENCE CEDEX, FRANCE, Tel. : (33) 5637 0728, Fax : (33) 5684 6631 (86)

VICH, Dr. R., Institute of Radio Eng. and Electronics, Czechoslovak Academy of Sciences, Chaberská 57, 182 51 PRAHA 8, CZECHOSLOVAKIA, Tel. : (42) 2-843741, Fax : (42) 2-840609 (78)

VILLAR, Dr. R., Consejo Superior de Investigaciones Cientificas, C.S.I.C., Serrano 144, 28002 MADRID, SPAIN, Tel. : (34) 1-561-8806 ext. 218, Fax : (34) 1-411-7651 (90)

VLOEBERGHS, Prof., Chaire des Télécommunications, Ecole Royale Militaire, av. de la Renaissance 30, B-1040 BRUSSELS, BELGIUM(80)

VOGE, Mr. J., avenue A. Bartholomé 5, F-75015 PARIS, FRANCE (74)

VOKURKA, Prof. J., Faculty of Electrical Engineering, Czech Technical University, Technická 2, 166 27 PRAHA 6, CZECHOSLOVAKIA, Tel. : (42) 2-332 2030, Fax : (42) 2-311 1786 (77)

WALLIN, Prof. P., E.E.Department, Laboratory of Metrology, Helsinki University of Technology, Otakaari 5 A, SF-02150 ESPOO, FINLAND, Tel. : (358) 0-451-2280, Fax : (358) 0-460-224 (76)

WANG, Dr. Y., Dept. of Computer Science, Beijing University, 100871 BEIJING, CHINA (79)

WANG, Dr. W.-K., Physics Laboratory - Institute of Physics, Academie Sinica of ROC, NANKANG 11529, TAIWAN, Tel. : (886) 2-782-3075, Fax : (886) 2-783-4187 (86)

WANG, Prof. B., Shangai University of Science and Technology, No 27, Lane 764, Changle Road, 200040 SHANGHAI, CHINA (86)

WATSON, Prof. P.A., Dept. of Electrical Eng., Bradford University, Richmond Road, BRADFORD, BD7 1DP, UNITED KINGDOM, Tel. : (44) 274-733466 Ext. 4002 (75)

WEISSGLASS, Prof. P., Swedish Institute of Microelectronics, P.O. Box 1084, S-164 21 KISTA, SWEDEN (90)

WERNIK, Prof. A.W., Space Research Centre, Polish Academy of Sciences, ul. Bartycka 18A, 00-716 WARSAW, POLAND, Tel. : (48) 22-403766 Ext. 379, Fax : (48) 39-121273, Telex : 825670 CBK PL, e-mail address : cbkpan@plearn.bitnet Attn. A.W.Wernik (75, 82)

WIELEBINSKI, Prof. R., Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, W-5300 BONN 1, GERMANY, Tel. : (49) 228-5251, Fax : (49) 228-525229, Telex : 8 86 440 MPIFR D (88)

WIK, Mr. M., Defence Material Administration, FMV, Department of Electronics, S-115 88 STOCKHOLM, SWEDEN (75)

WILKINSON, Dr. P.J., Ionospheric Prediction Service, P.O. Box 5606, CHATSWOOD, NSW 2057, AUSTRALIA, Tel. : (61) 2-414-8339 /969 Fax : (61) 2-414-8340, e-mail address : phil@ips.oz.au (82, 83, 84)

WILLIAMS, Dr. P.J.S., Dept. of Physics, University College of Wales, ABERYSTWYTH, SY23 3BZ, UNITED KINGDOM (83)

WILLIAMSON, Prof. A.G., Dept. of Electrical & Electronic Eng., University of Auckland, Private Bag 92019 AUCKLAND 1, NEW ZEALAND, Tel. : (64) 9-373-7999, Fax : (64) 9-373-7461, e-mail address : ag.williamson@aukuni.ac.nz (77)

WINNBERG, Dr. A., Chalmers Institute of Technology, Onsala Space Observatory, S-439 00 ONSALA, SWEDEN (85)

WITTKE, Prof. P.H., Deparment of Electrical Engineering, Queen's University, ON KINGSTON, K7L 3N6, CANADA, Tel. : (1) 613-545 6499/2925, Fax : (1) 613-545 6500, e-mail address : WITTKE@ QUCDNEE.BITNET (89)

WODNICKA, Dr. E., Space Research Centre, CBK PAN, ul. Ordona 21, 01-237 WARSZAWA, POLAND (83)

WOLF, Prof. D., Institut für Angewandte Physik, Universität Frankfurt, Robert-Meyer-Straße 2/4, 2-4, W-6000 FRANKFURT, GERMANY, Tel. : (49) 69-798 2390 (78)

WOODMAN, Dr. R.F., Jicamarca Radio Observatory, Instituto Geofisico del Peru, Apartado 13-0207, LIMA 13, PERU, Tel. : (51) 14-318056, Fax : (51) 14-792155, e-mail address : ron@roj.pe (90)

WU, Dr. S., Beijing Astronomical Observatory, Chinese Academy of Sciences, 100080 BEIJING, CHINA, Tel. : (86) 1-281968, Telex : 22040 BAOAS CN (85)

WU, Prof. Y., Dept. of Electronic Eng., Tsinghua University, 100084 BEIJING, CHINA, Tel. : (86) 1-256-7733 ext. 5063, Fax : (86) 1-256-4176 (78)

WU, Prof. T.-S., Dept. of Electrical Engineering, National Cheng Kung University, Ta, Hsueh Rd. No. 1, TAINAN, TAIWAN, Tel. : (886) 62-757-575 ext. 62330, Fax : (886) 62-345-482 (79)

WYNER, Dr. A.D., AT&T Bell Laboratories, Room 2C-365, 600 Mountain Avenue, MURRAY HILL, NJ 07974, USA, Tel. : (1) 201-582 2916 (78)

YAMADA, Dr. M., KDD, R & D Laboratories, 2-1-15 Ohara, Kamifukuoka-shi, SAITAMA 356, JAPAN, Tel. : (81) 492-66-7304, Fax : (81) 492-66-7510 (90)

YANG, Dr. X., National Institute of Metrology, 18 Bei Shan Huan Dong Road, 100013 BEIJING, CHINA (76)

YELL, Mr. R.W., National RF & Microwave Standards, c/o R.S.R.E., St. Andrews Road, GREAT MALVERN/WORCS, WR14 3PS, UNITED KINGDOM, Tel. : (44) 684-894 893, Fax : (44) 684-895 547 (76)

ZAHRADKA, Dr. T., Institute of Radio Eng. & Electronics, Czechoslovak Academy of Sciences, Chaberská 57, 182 51 PRAHA, CZECHOSLOVAKIA, Tel. : (42) 2-843741, Fax : (42) 2-840609 (89)

ZHABOTINSKIJ, Prof. M.E., Institute of Radioeng. & Electronics, Academy of Sciences, Mokhovaja St. 11, 103907 MOSKVA, RUSSIA, Fax : (7095) 203 8414, Telex : 411429 iresc, e-mail address : obukh@ire.msk.su (74, 79)

ZHANG, Prof. X., Wuhan Ionospheric Observatory, Wuhan Institute of Physics, P.O. Box 415, WUCHANG - HUBEI, CHINA (84)

ZHOU, Dr. S., Beijing University of Science & Technology, Department 5, 100083 BEIJING, CHINA (77)

ZIMA, Prof. V., Zima Electronics, Jarnikova 1893, 149 00 PRAHA 4, CZECHOSLOVAKIA, Tel. : (42)2-843741/344 or 7929445, Fax : (42)2-840609, Telex : 122 646 UREP (74)

ZOLIN, Prof. V.F., Institute of Radioeng. and Electronics, Russian Academy of Sciences, Mokhovaja St. 11, 103907 MOSCOW, RUSSIA, Fax : (7095) 203-8414, Telex : 411429 iresc, e-mail address : obukh@ire.msk.su (86)

ZOMBORY, Prof. L., Dept. of Microwave Telecommunications, BME, Technical University of Budapest, Goldmann Gy. tér 3., H-1111 BUDAPEST, HUNGARY, Tel. : (36) 1-181-2968, Fax : (36) 1-181-2968, Telex : 225931moegy h, e-mail address : h340zom@ella.hu (74, 79, 89)