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Editorial

Dear URSI Correspondent,

When this issue of the Radio Science Bulletin will reach you, another year will have started. I hope that you have spent a merry Christmas period. On behalf of the editorial team I am happy to wish you and your family a Happy New Year.

The December issue of the Bulletin traditionally contains much administrative information, including the addresses of all scientists holding a position in the official structure of URSI. As we are at the end of a triennum the present issue in addition provides reports about the decisions made during the General Assembly in Lille.

Some of you may have observed that, already in the previous issue of the Bulletin, the list of Associate Editors has been completed with representatives from each Commission. This is the result of a proposal which was discussed and adopted in Lille. It reflects the willingness to have a stronger involvement of the community of URSI scientists in this publication. As I wrote earlier, dear Correspondent, the Bulletin is YOUR journal as it is sent to all URSI Correspondents. Your contributions, either articles (subject to peer reviewing), notes, letters to the editor or book reviews are welcome provided they are of interest to the broad URSI community. Please eventually have a look at the instructions to authors appearing at the end of the Bulletin.

Dear Correspondent, I have been happy to serve as the editor of the Bulletin during about three years. From the March 1997 issue on, this responsibility will be transferred to my colleague Professor Sobieski. I am inviting you to encourage and support him in this undertaking which, I believe, is very important to maintain the cohesion between all radioscientists.

Paul Delogne
Editor

URSI

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In Memoriam

LUCIEN BOSSY
1918 - 1996

Le 21 septembre Lucien Bossy nous quittait après une maladie pénible au cours de laquelle, conscient de son état, il a souffert physiquement et moralement face au diagnostic de ses médecins qui ne lui ont pas dissimulé la gravité de sa situation de santé.

Heureusement grâce aux soins palliatifs qu'il a reçus à l'hôpital St Luc de l'Université catholique de Louvain, grâce à la sollicitude de ses amis, notamment de la part de Monsieur et Madame Mallet et de sa fille Dominique, Monsieur Bossy s'est éteint dans la dignité et dans la paix à l'âge de 78 ans.

Lucien Bossy est né le 8 juin 1918, à Fosse sur Salm, près de Trois Ponts. C'était un vrai ardennais, fier de l'être, bon vivant et d'humeur joviale.

Il fit ses humanités modernes scientifiques à l'Athénée de Malmédy. En 1939, il devient Licencié en sciences mathématiques à l'Université catholique de Louvain, épreuve qu'il réussit avenc grande distinction. La dissertation qu'il prépara sous la direction de Monseigneur Georges Lemaître était intitulée : *Contribution à l'étude des trajectoires d'une particule électrisée au voisinage d'un dipôle magnétique*. En 1963, il défendit dans cette même université sous la direction du même promoteur, une thèse de doctorat intitulée : *Etude du mouvement des particules des ceintures de Van Allen du point de vue du problème de Störmer*.

Après s'être intéressé à plusieurs autres problèmes scientifiques et surtout à l'ionosphère de la Terre, Lucien Bossy avait repris l'étude des trajectoires de Störmer, à l'institut d'Aéronomie Spatiale où il a travaillé pendant les dernières années de sa vie.

Mais avant de rejoindre l'Institut d'Aéronomie Spatiale il y a 13 ans après sa mise à la retraite, Lucien Bossy eut une carrière scientifique bien remplie. Il occupa des fonctions et mandats importants tant à l'échelon national que sur le plan international.

Après son service militaire et sa captivité en Allemagne de 1939 à 1945, il devient aspirant du Fonds national de la recherche Scientifique. En 1946 il devient membre du personnel scientifique de l'Institut Royal Météorologique, où il termine en 1983 sa carrière comme chef de section honoraire. Il y dirigea la section autonome de Géophysique Externe, et équipa la station de Dourbes d'un sondeur ionosphérique des plus moderne pour l'époque. En 1964 il devient membre du personnel académique de l'Université catholique de Louvain. A l'Institut Georges Lemaître dont il est un des membres les plus fidèle, il enseigna pendant de nombreuses années le cours de Physique de l'Ionosphère. En 1985 l'UCL lui conférait le titre de Professeur émérite, une distinction à laquelle il tenait becaucoup.

Il faisait partie de plusieurs comité nationaux : *le Centre National de Recherches Spatiales (CNRS)* dont il était membre associé; le *Comité national belge de Géodésie et Géophysique (IGGI)* dont il a aussi assumé les fonctions de Président de juillet 1983 à mars 1988; le *Comité national belge de l'Union Radio Scientifique Internationale (URSI)* dont il a été Président de 1978 à 1981; pendant de nombreuses années jusqu'en 1996, il a été le représentant belge aux des *Commissions G et H* de l'URSI.

Le professeur Bossy a été Président du Comité organisateur de l'URSI 60 et membre du Comité organisateur de l'URSI 75.

En 1984, il organisait à Han-sur-Lesse, avec J. Lemaire de l'Institut d'Aérnomie Spatiale de Belgique, un cours de troisième cycle en géophysique externe intitulé : *Geophysics and Solar Activity incides*.

Au cours de sa longue carrière il a également organisé des symposiums et des ateliers internationaux notamment à Munich, en 1988, le Symposium de l'*AGARD* intitulé : Ionospheric structure and variability on a global scale and Interaction with the Atmosphere and Magnetosphere.

Il organisait en 1985 à Louvain-la-Neuve, à Toulouse en 1986, à Novgorod en 1987, à Espoo en 1988, à Abingdon en 1989 et à La Haye en 1990 des Symposia et des ateliers de l'*International Reference Ionosphere (IRI)* dont il a également été le Président pendant plusieurs années.

Sa première publication sur le problème de Störmer était signée avec son ancien maître Georges Lemaître. Il a également publié un certain nombre d'articles en collaboration avec Marcel Nicolet, Raymond Coutrez, W.R. Piggot, B.W. Reinisch et son grand ami Karl Rawer. Ces travaux concernaient des sujets très diversifiés depuis l'actinomètrie, les sondages ionosphériques et la structure de l'ionosphere, jusqu'aux variations du flux radioélectrique au cours du cycle d'activité solaire.

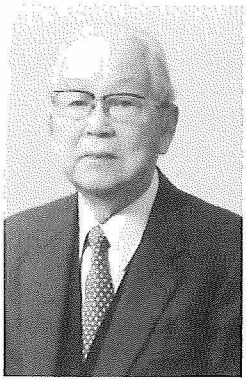
Monsieur Bossy était une personne fort respectée dans les milieux scientifiques. A L'Institut d'Aéronomie Spatiale où il travaillait depuis 1983, le Professeur Bossy était connu pour sa grande culture, sa discrétion. Derrière un visage buriné par le temps, mais toujours souriant, les personnes qui l'ont côtoyé, ont aussi découvert quelqu'un qui avait gardé intact le bonheur de vivre et le respect du savoir vivre.

Nous avons perdu un confrère et beaucoup d'entre nous ont perdu un ami.

J.F. Lemaire

KEN-ICHI MAEDA
1909 - 1995

Professor Ken-ichi Maeda passed away on October 14, 1995. Professor Maeda was one of the most outstanding scholars in Japan, who had lead the research activity in ionospheric radio propagation and ionospheric physics, and initiated the space science activity in Japan. He attended 9th (Zurich), 11th (The Hague), 12th (Boulder), 14th (Tokyo), 15th (Munich), and 16th (Ottawa) General Assembly of URSI as the Japanese representative in Commission G, and contributed much to the field of the ionospheric radio propagation.



Professor Maeda was born on August 1, 1909 in Osaka. After graduation from the Department of Electrical Engineering of Kyoto University in 1932, he entered the Electrotechnical Laboratory under the Ministry of Communications, where he participated in the research of the ionosphere and radio propagation. He received the degree of Doctor of Engineering from Kyoto University in 1941 by his thesis on the study of the ionosphere and short distance propagation of high frequency radio waves.

His main contributions in ionospheric propagation were as follows:

In the period from 1938 to 1942, he worked to devise a method to calculate the propagation distance of short wave signals via the ionosphere for various emitting angles and frequencies, using the virtual height of the ionosphere calculated from the apparent ionospheric reflection height obtained by ionosonde observations. He also calculated absorption through the ionospheric paths and he could estimate the signal intensity at distant destination points for any given transmitting power and frequency, even for a distance beyond 2000 km, taken account of the curvature of the ground surface and the ionosphere.

In 1944 to 1945, he studied fading phenomenon of 20 to 40 MHz radio wave propagating signals due to ionospheric scattering, and he first proposed a usage of this ionospheric scattered component for communication.

In 1942, he studied the worldwide distribution of electron density in the F layer, and he first pointed out that the F layer electron density is not simply determined by the solar zenith angle. He discovered that the worldwide contour map of the F layer electron density has asymmetric two peaks with respect to the geographic equator even at spring equinox, but becomes symmetric with respect to the magnetic equator.

He also pointed out that the daily variation of foF2 shows two maxima in the morning and afternoon hours and no peak at noon.

He called the above phenomena a magnetic distortion of the F layer. The phenomenon that the contour map of the F layer electron density represented by foF2 shows two peaks in the northern and southern hemispheres symmetric with respect to the magnetic equator was commonly called as Appleton anomaly from the paper by Sir Appleton in 1946, but the discovery by professor Maeda was 4 years earlier.

From 1942 he moved to the Radio Physics Laboratory in the Ministry of Education and was appointed as Director from 1946. In 1948 he became the director of the Radio Frequency Division in Electrical Communication Laboratories, the Ministry of Communications, which were newly established in this year. In 1949, he became the director of the Research Division of the same Laboratories. Electrical Communication Laboratories were the origin of the subsequent Nippon Telegraph and Telephone Public Corporation.

In 1953, he was appointed as a professor in the Department of Electrical Engineering of Kyoto University. Later, he had chaired the professorship in the Department of Electronics, and the Second Department of Electrical Engineering of the University.

Associated with IGY in 1957, he encouraged Japanese scientists to join space observations by using Japanese rockets. He had been the Japanese representative for COSPAR from the second to 20th assembly. He was elected as Vice-President and President of the Insitute of Electronics and Communication Engineers in Japan for two years from 1955 and for one year from 1967 respectively, and Vice-President of the Insitute of Electrical Engineers in Japan for two years from 1967.

He established the Ionosphere Research Laboratory in the Faculty of Engineering, which has developed as the Radio Atmospheric Science Center of Kyoto University since 1981. He also made a strong effort to introduce the first Japanese transistorized digital computer to Kyoto University in 1960.

During his career in Kyoto University, he educated many disciples, who are now actively working in Japan in various fields, especially in the field of space science and URSI. He was strict in academic work to himself and to his staff and students, but had a rich sense of humour.

In 1973 at his age of 63, he retired from Kyoto University with the rank of Professor Emeritus. He movedto Kyoto Sangyo University as a professor in the Faculty of Science and later worked as Dean of the Faculty. He retired from Kyoto Sangyo University in 1981 at the age of 72.

Until the end of his life, he had never ceased his research activity, and even published a paper concerned with his work on the dynamics of the ionosphere, at his age of 83.

He had received many prizes; especially the Japan Academy Prize in 1972, and the Purple Ribbon Medal from the Japanese Government in 1973 are most noteworthy. He was nominated as a member of the Japan Academy in 1990.

Professor Ken-ichi Maeda will be widely missed by many old friends and desciples.

Iwane Kimura
Professor of Osaka Insitute of Technology
Emeritus Professor of Kyoto University

Book review

The Plane Wave Spectrum Representation of EM Fields

by Philip C. Clemmow, Cambridge University
IEEE Classic Reprint Series 1996
ISBN 0-7803-3411-6

As a commissioning co-editor, with Professor Alex Cullen, I am pleased to see that the IEEE Press has secured the rights to republish this excellent monograph by Dr. Phil Clemmow who had written a long-cherished exposition on the angular spectrum concept. Because the original published version by Pergamon Press in 1966 did not have a bibliography, the reader might wish to consult the following masterpiece of erudition :

P.C. Clemmow, Radio Propagation Over a Flat Earth Across a Boundary Separating Two Different Media, Philosophical Transactions of the Royal Society of London, Vol. 246, pp. 1-55, 1953.

This paper contains an extensive list of related publications on the subject including the seminal one by H. Weyl (Annalen der Physik, Leipzig, Vol. 60, 481, 1919). I might also call attention to Phil's cogent contributions to the mathematical theory of diffraction as contained in the celebrated *Principle of Optics* by Max Born and Emil Wolf (3rd Ed. Pergamon Press, 1965). In connection with my own research on radio wave propagation, I have made much use of the angular spectrum concept particularly as in two papers Phil co-authored with the late Henry Booker (Proc. Inst. Electr. Engrs., Vol. 97, p. 11 and 19, 1950). Also I found Phil's elegant development of the coupled integral equation technique very helpful (e.g. as in J.R. Wait, "Propagation on Electromagnetic Waves Over a Smooth Multi-section Curved Earth-an Exact Theory", Jour. Math. Phys. Vol. 11, pp. 2851-2860, 1970).

(An additional list of relevant papers was prepared by Dr. Rod Donnelly and it appears at the end of the book with interesting annotations.)

James R. Wait
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Raj Mittra Travel Grants

The Raj Mittra Travel Grant (RMTG) has been established by former students and research associates of Raj Mittra to support travel by qualified graduate students and research scientists to the annual IEEE AP-S/URSI Symposium. The award's purpose is to encourage participation in the annual Symposium by graduate students and researchers who could not otherwise afford the cost of travel to the meeting. Before applying for the 1997 RMTG awards, interested persons are encouraged to carefully read the following information to insure that they are both eligible and can comply with the application requirements and deadlines.

ELIGIBILITY

Candidates need not be members of either the IEEE or URSI, but must have contributions accepted for presentation at the 1997 IEEE Antennas & Propagation and North American Radio Science Meeting. In order to receive an award, Awardees must personally present their contributions at a regular AP-S or URSI Commission B session organized at the Symposium. Since the intent of the award is to encourage participation in the annual Symposium by promising researchers who likely could not otherwise attend due to financial reasons, financial need shall also be a consideration in the selection process.

AWARDS

Two grants in the amount of $750 each are to be offered to young scientists pursuing research in areas of traditional interest to AP-S and Commission B of URSI. The third grant, for $1,000, will be awarded to a senior researcher associated with a research or educational institution and having an active research program in areas of interest to AP-S and URSI Commission B. Awards cannot be presented before the Symposium, and candidates must make their own arrangements to cover travel expenses to the meeting.

APPLICATION & SCHEDULE

The schedule for evaluating candidates and notifying Awardees is very short, and parallels the review process for Symposium submissions. For this reason, all applications must be submitted via e-mail. To receive an e-mail application kit with instructions for filing, please submit a request for an RMTG Award Application Kit to the awards Chair at "wilton@uh.edu." Several items will be required from the candidate, including a short biographical and research publication summary, and a copy of the summary or abstract submitted to the meeting. Other items must be sought by applicants from external sources, including a statement of need for travel support and letter of endorsement from the candidate's institution. This statement should also include an indication of the institution's commitment to supplement the travel expenses on an as-needed basis, if the candidate is selected to receive a grant.

No applications will be processed until all application materials are received by:

Prof. Donald R. Wilton
Awards Chair (RMTG)
Department of Electrical and Computer Engineering
University of Houston
Houston, TX 77204-4793 USA
E-mail: wilton@uh.edu
FAX: (713)743-4444

The due date for applications and letters of endorsement is the same as that for submission of abstracts and summaries to the Symposium. The selection process for Awardees and alternates will be completed prior to the meeting of the Symposium Technical Program Committee (TPC).

SELECTION

Selection of an Awardee will be based upon a candidate's need for travel support and his/her potential or demonstrated aptitude for research. Following the usual submission guidelines, candidates and alternates must also have their abstracts or summaries accepted by the TPC. Successful candidates will be notified of their selection immediately following the TPC meeting. Upon notification of selection, prospective Awardees will be asked to submit the minimum applicable Symposium registration fee as a non-refundable deposit to be applied toward the registration fee. If it is determined that a prospective Awardee has not met this requirement within 60 days after award notification, the Chair of the Awards Committee may select an alternate Awardee. A check for the award amount will be presented to each Awardee at the Symposium.

Conferences

CONFERENCE REPORTS

31ST COSPAR SCIENTIFIC ASSEMBLY

Birmingham, UK, 14-21 July 1996

Symposium C4.2

Quantitative Description of Ionospheric Storm Effects and Irregularities

Convenor: Dieter Bilitza, Hughes STX, USA

The current International Reference Ionosphere model, IRI 95, does not include ionospheric storm effects. This two-day symposium was addressing the need of incorporating ionospheric storm effects in the IRI model. Seven subsessions dealt with specific aspects of the modeling problem.

The "Coordinated Storm Studies" session reviewed specific storm events that had been the topic of coordinated studies like CEDAR (Buonsanto, Richards) and PRIME (Bradley,Pavlov, Tulunay). The "Theoretical Storm Studies" session started with overviews by Anderson (Phillips Lab.) and Schunk (Utah State U.). Manifestation of storm effects were presented in the session on "Storm-related Data Studies" by Reinisch (Digisonde observation), Proelss (trough model), Rishbeth (30 years of ionosonde data), Oyama (Akebono and Hinotori data), Truhlik (IK-19 and Magion data). Potential methods of representing storm effects in IRI were presented in the session on "Stormtime Updating" by Kishcha and Fuller-Rowell. The session on "Spread-F and Irregularities" included reviews by Abdu and Fejer.

Very interesting in terms of the IRI ion composition model were the presentations by Triskova (Czech R.) and Lathuiller (France) who showed the dependence of the ion transition heights (lower and upper) on magnetic activity based on Active and Apex data, and EISCAT data, respectively.

The poster session consisted of 14 posters included contributions by Zherebtsov, Shubin,and Depuev dealing with the variation of peak parameters during disturbances, and two application-oriented papers reporting on the use of IRI for altimeter data analysis (Shum, Bilitza). Papers by Scotto and by Gonzalez presented improvements of the IRI F1 region model that resulted from the ongoing work of the IRI F1/Bottomside Task Force Activity at the International Center of Theoretical Physics (ICTP) in Trieste, Italy.

Selected papers of this two-day session will be published in Advances in Space Research (ASR).

Symposium C1.1

Coupling and Energetics in the Coupled Stratosphere-Mesosphere-Thermosphere-Ionosphere System

"Coupling and Energetics in the Coupled Stratosphere-Meso- sphere-Thermosphere-Ionosphere System," was the largest symposium held during the Birmingham Scientific Assembly, consisting of 109 papers dis- tributed over 3.5 days of oral presentations (15-18 July 1996) and a poster session (19 July 1996). The program included fifteen solicited review papers, 48 contributed oral and 46 contributed poster papers, ar- ranged into sessions by Main Scientific Organizer, Dr. J. Roettger (Sweden), and Deputy Organizers, Dr. R.H. Picard (USA) and Dr. E.S. Kazimirovsky (Russia).

The symposium dealt with all aspects of the energy and momentum budget of the middle atmosphere, the lower thermosphere, and ionosphere, including densities and fluxes of energy and momentum in all their forms - such as dynamical, chemical and radiative - at all spatial and temporal scales. Vertical and horizontal coupling and interaction, forcing from above through the solar wind - magnetosphere interaction and from below due to atmospheric waves and turbulence, and related meteorological processes were incorporated, as well as chemical reactions, phase changes, and radiative processes. The symposium encompassed high, middle and low latitudes under disturbed and quiet conditions. Papers on theory, modelling, experimental applications, and observational results from ground-based, in-situ, and space remote-sensing techniques, covered also by international programmes and campaigns, were incorporated.

The general topics of coupling and energetics were subdivided into a number of sessions and subsessions: Ionosphere - thermosphere; ionosphere - thermosphere coupling; high-latitude ionosphere-thermosphere; low- and mid-latitude ionosphere-thermosphere; lower thermosphere and middle atmo- sphere; high-energy particle effects on the ionosphere and thermosphere; energetics, radiation, and thermal/dynamical structure; coupling by plane- tary waves and tides; gravity waves and turbulence; and nucleation, instabilities, and irregularities.

The Scientific Organizers, together with the Scientific Editors, Dr. W.E. Ward (Canada), Dr. D. Rees (UK), and Dr. J. Lastovicka (Czech Rep.), and the Organizing Committee solicited fifteen review papers spanning the field of coupling and energetics. Authors and titles were:

T.J. Fuller-Rowell: Dynamical coupling effects and global circulation models; P.-L. Blelly, A. Robineau, J. Lilensten, and D. Alcayde: Iono- spheric numerical model as a diagnostic tool; A.D. Richmond and R.G. Roble: Electrodynamic coupling effects in the thermosphere/ ionosphere system; K.D. Cole: A theory of equatorial field-aligned thermosphere-iono- sphere-plasmasphere irregularities; T.L. Killeen: The role of iono- sphere-atmosphere coupling in the energy budget of mesosphere - lower thermosphere; C.H. Jackman: High energy charged-particle effects on the neutral and ionized middle atmosphere; M.G. Mlynczak: Energetics of the middle atmosphere and lower thermosphere; J.R. Winick: Non-LTE processes in the mesosphere and lower thermosphere: Energetics and dynamical impli- cations; G.G. Shepherd, C. McLandress, and W.E. Ward: Thermal-dynamical structure of the mesosphere and lower thermosphere; S. Miyahara: Numerical simulation of atmospheric tides and Rossby waves in the upper mesosphere and lower thermosphere; J. Lastovicka: Observations of tides and planetary waves in the atmosphere-ionosphere system; N.A. McFarlane: Parametrization of gravity-wave drag in comprehensive models of the middle atmosphere; M.J. Taylor: Observed and intrinsic gravity wave measurements: A review of optical observations of the middle and upper atmosphere; F.-J. Luebken: Turbulence in the middle atmosphere; G.C. Reid: The nucleation and growth of ice particles in the upper mesosphere.

The many high quality solicited review papers set the tone for excellent contributions and sometimes lively discussion on the various aspects of coupling and energetics, at sessions which were generally well attended, usually by 40-80 delegates. Advances presented resulted from vigorous analysis of available satellite, space shuttle, rocket, and ground-based data sets, as well as by advances in modeling capabilities. Increased un- derstanding of airglow and minor species variability, planetary waves and tides came about through analysis of data from the UARS satellite's WINDII and HALOE instruments. A novel application of TOPEX/Poseidon satellite altimeter data to measuring structure of the ionospheric total electron content was reported. Analysis of CIRRIS space shuttle data and TURBO, MALTED, and SISSI rocket data increased our knowledge of radiative, turbu- lent, and gravity-wave contributions to coupling and the energy budget. Continued analysis of radar data sets, alone and in conjunction with lidars and passive optical sensors, has improved our understanding of pla- netary-wave, gravity-wave, and sporadic (for example, PMSE, NLC, and in- version layer) contributions to energetics and coupling. For example, imagers combined with lidars and radars have yielded a wealth of measure- ments of intrinsic gravity-wave parameters and have suggested the impor- tant role played by ducted gravity-waves in the mesospheric energy budget. Orographic effects on minor species and the energy budget were reported. Instrumental advances, notably in the availability of improved CCD imagers and imaging Fabry-Perot spectrometers, have led to increased understanding of structure in emissions, wind, and temperature. Global models have been integrated and extended to encompass more regions, as well as add proces- ses and improve external forcing from space and the lower atmosphere. Simultaneously, local models have examined the role of specific processes in greater detail and with great exactness. Interactions between radiative processes, energetic charged particles, chemistry, and gravity waves have been modeled and reported.

Sadly, a change of schedule was required due to the unexpected death of death of one of the authors, Dr. J.F. Vickrey, two weeks before the start of the Symposium. Vickrey's paper on electromagnetic energy transfer in the high-latitude ionosphere with J.P. Thayer and R.A. Heelis was with- drawn, and in its place in the Monday morning (15 July) session the Scien- tific Organizers, in collaboration with Vickrey's colleagues, hold a short memorial to him and to his more than twenty years of contributions to ionospheric research. Speakers in the J.F. Vickrey Memorial were J. D. Kelly, R. A. Heelis, and J. Ro"ttger.

There were a few problems associated with the Symposium. (1) The extensive scope of the Symposium in terms of altitude regime (stratosphere to ther- mosphere), charge state (neutral atmosphere and ionosphere), processes (electrodynamic, dynamical, radiative, chemical, phase change), and spa- tial/temporal scale (planetary scale through gravity waves and tides to turbulence), reflecting its origin in a merger of several proposals manda- ted by the Program Committee, made the Symposium difficult to manage at times. (2) The longstanding problem of no-show oral papers and posters affected substantially part of one afternoon session, where a large number of poster previews had been scheduled and the previews were attended by only fifteen participants.

Despite the considerable progress reported in coupling and energetics in at this Scientific Assembly, there is still a lot of opportunity for fur- ther progress to be reported in future Assemblies. This is true, for ex- ample, in the areas of global and small-scale variability, the interaction of different processes and scales, and localized or sporadic structure. Advances in these areas will be driven by future more extensive and im- proved data sets from platforms on rockets (for example, MIDAS) and satel- lites (for example, TIMED) and existent and new MST, coherent and incoherent scatter radars. Increases in computing power and visualization methods will also spark advances in and more powerful implementations of present atmosphere / ionosphere models.

R.H. Picard, J. Röttger and E. Kazimirovsky

Meetings sponsored by URSI :

COMMSPHERE'97

Lausanne, Switzerland, 11-14 February 1997

COMMSPHERE'97 is sponsored by the International Union for Radio Science in collaboration with ITU-R.

COMMSPHERE is an international discussion forum on the challenges facing the future of telecommunications and other uses of the EM radiation. Discussions are focused on the interaction of disciplines affecting that future. Theoretical, technological, industrial, services and administrative issues are being considered by leading scientists, experts and administrators in a series of 5 plenary sessions, complemented by 6 half-day topical workshops. The main findings and results of these sessions are presented in a summarizing session. Proceedings including contributions presented at the plenary sessions as well as selected presentations from the workshop sessions will be published during the conference. A report on the summary session will appear in the "Radio Science Bulletin". Most of the presentations are invited and the subjects are carefully selected so as to address current interdisciplinary issues and challenges likely to affect the future of telecommunications and other services.

The opportunity for the participants to exchange ideas and experience with the leaders influencing the line of events is highly beneficial to all parties involved. Previous COMMSPHERE meetings, in 1991 and 1995, have proven to be of great service to scientists, administrators and industries, and have been considered by the ITU-R as an extremely useful preparation for the coming WRC meetings.

Papers

The sessions will comprise both contributed and invited papers, focused on the topics. A one-page summary should be sent to the session/workshop organizer as soon as possible

Photo ready manuscripts are due **January 1, 1997**.

Plenary Sessions

- Developments in spectrum management policies and techniques
- Global Information Superhighway - the wireless arm
- Global integration
- Radio astronomy and the EM environment
- Personal communications satellites: Issues and Challenges
- Communications development in developing countries

Workshops

- Wave oriented space-time signal processing
- Wireless alternatives for Telecommunications in Developing Countries
- UMTS/IMT2000
- Poster Session (papers covering any of the topics of the sessions/ workshops and related topics).
- Smart antennas in wireless communications
- Satellites Personal communications - Network Integration Issues
- Wireless Communication Systems : Biological Effects, Dosimetry, Protection Techniques

Reports of working groups that will summarize the sessions and the workshops will be presented and discussed in this session. The final summaries will be reported in the Radio Science Bulletin and possibly in another publication.

Organisation

Swiss Federal Institute of Technology of Lausanne with the collaboration of Telecom PTT of Switzerland and the Swiss URSI Committee.

Symposium Chairman : Prof. M. Ianoz Swiss Federal Institute of Technology of Lausanne, Tel. : +41 21-693 26 64, Fax : +41 21-693 46 62, E-mail : michel.ianoz@lre.de.epfl.ch

Program chairman: Dr. Joseph Shapira, Tel. : +972 4 8251 563, Fax : +972 4 8258 441, E-mail: jshapira@netvision.net.il

Contact

Mrs. Marcela Lenz
COMMSPHERE'97
Swiss Federal Institute of Technology of Lausanne
CH-1015 Lausanne, Switzerland
Tel. : +4121 693 27 86, Fax : +4121 693 46 62
E-mail : marcela.lenz@lre.de.epfl.ch

BIANISOTROPICS'97

Glasgow, United Kingdom, 5-7 June 1997

BIANISOTROPICS'97 is an International Conference and Workshop on Electromagnetics of Complex Media.

Topics

Authors are invited to submit papers on any aspect of electromagnetics relating to complex media. The scope of the meeting encompasses a broad spectrum from fundamental theoretical work to technological applications for novel devices from the microwave to the optical regimes.

The conference/workshop will comprise 5-6 half-day sessions on a variety of research concerned with theory and applications of complex (i.e., chiral, anisotropic, bianisotropic, nonhomogeneous, nonlocal, nonlinear, random) media.

There will be a mixture of special talks by key speakers, contributed papers and posters, and a round-table discussion in a multidisciplinary environment, bringing together applied mathematicians, physicists, engineers, material scientists from universities and industries.

Deadlines

Abstract deadline:	**10 February 1997**
Notification of acceptance	10 March 1997
Registration	15 April 1997
Submission of summaries	15 April 1997

Registration fee

The registration fee is GBP 70 (reduced rate of GBP 35 for students). This includes one copy of the Proceedings and attendance of the conference dinner. Assistance with accommodation arrangements will be provided by the organizers.

Contact

BIANISOTROPICS'97
Dr W S Weiglhofer (Organizer)
Department of Mathematics, University of Glasgow
Glasgow G12 8QW, Great Britain
Tel: +44 - 141 - 330 4124
Fax: +44 - 141 - 330 4111
Email: tropics@maths.gla.ac.uk
(E-mail should be used for all correspondence)

WWW

http://www.maths. gla.ac.uk/~tropics/

ISRAMT'97

Beijing, China, 4-7 August 1997

ISRAMT'97 will be the 6th International Symposium on Recent Advances in Microwave Technology. It is ponsored by the Chinese Institute of Electronics University of Nevada, Reno, NV, USA in cooperation with URSI, IEEE Northern Nevada Section, IEEE Beijing Section, IEEE Beijing, MTT Chapter, IEEE Beijing, AP-Chapter, Beijing Institute of Technology China and the National Natural Science Foundation

Topics

The 6th 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-IC's, remote Sensing, Biological Effects and Applications, Communication Systems, CAD Technology, Propagation and Measurements, Electro-Optics, Microwave/mm-wave Optical Technology, Microwave Superconductivity, Industry & Environment and Microwave Education are especially proposed.

Deadlines

4-Page Paper Submission	February 15, 1997
Acceptance Notification	March 31, 1997
Paper Presentation Confirmation	May 15, 1997
Preregistration	June 15, 1997

Working language

The working language of the symposium will be English.

WWW

Website: http://www.cs.unr.edu/~sushil/isramt.html

Contact

(North/South America & Europe)

Prof.Banmali Rawat
Tech. Program Co-Chair
Department of Electrical Engineering
University of Nevada
Reno Reno, NV 89557-0153 U.S.A.
Tel. :(1-702) 784-1457 , Fax:(1-702) 784-6627
E-mail: rawat@ee.unr.edu

(Asia, Pacific Region, Africa)

Prof. Yue Wang
Technical Program Co-Chair
Beijing Institute of Technology
P.O. Box 327 , Beijing 100081 China
Tel. : (8610) 6841-2840, Fax: (8610) 6841-2889
E-mail: youanke@public.bta.net.cn

Exhibits

Exhibits of Industrial Products and Workshops are also planned. For Exhibits, please contact:

Zhou Mengqi
P.O. Box 165, Beijing 100036, China
Tel:(8610) 6828-3463, Fax: (8610) 6828-3458
E-mail: shaz@sun.ihep.ac.cn

Symposium Organization

General Chairman:Prof.Lin Weigan, University of Electronic Science & Technology, China

Technical Program Committee Co-Chairs :
- Prof.B.S. Rawat University of Nevada, Reno, USA
- Prof.Yue Wang Beijing Institute of Technology, China

Organizing Committee Chair:
Prof. Zong Sha Chinese Institute of Electronics, China
Exhibits Committee Chair: Zhou Mengqi

International Advisory Committee
- Prof. B.S. Rawat, Chair, USA
- Prof.Zong Sha, Vice Chair, China
- Dr. K.S. Sunduchkov, Vice Chair, Ukraine

Other meetings/workshops brought to our attention :

Workshop Course on Wavelets and Filter Banks

San Diego, CA, USA, 3-5 January 1997

Participants will receive the new textbook (published in 1996) WAVELETS AND FILTER BANKS by Gilbert Strang (MIT) and Truong Nguyen (Boston University) , Wellesley-Cambridge Press, Box 812060, Wellesley MA 02181

This text is already in class use in many EE and mathematics departments. It was chosen to accompany MATLAB's Wavelet Toolbox, which will be the simulation software at the San Diego Wavelet Workshop. NOTE The book could be ordered directly by email to gs@math.mit.edu It comes with an invoice and payment is after the book is safely received.

The Workshop will aim for the right balance of theory and applications. The text gives an overall perspective of the field - which has grown with amazing speed.

Topics

The topics will include :

1. Analysis of Filter Banks and Wavelets

Multirate Signal Processing: Filtering, Decimation, Polyphase Perfect Reconstruction and Aliasing Removal Matrix Analysis: Toeplitz Matrices and Fast Algorithms Wavelet Transform: Pyramid and Cascade Algorithms Daubechies Wavelets, Orthogonal and Biorthogonal Wavelets Smoothness, Approximation, Boundary Filters and Wavelets Time-Frequency and Time-Scale Analysis

2. Design Methods

Spectral Factorization Cosine-Modulated Filter Banks Eigenfilters and Quadratic Constrained Least Squares Lattice Structure Ladder Structure (Lifting)

3. Applications

Audio and Image Compression, Quantization Effects Transient Detection and Non-Destructive Evaluation Digital Communication and Multicarrier Modulation Transmultiplexers Text-Image Compression: Lossy and Lossless Medical Imaging and Scientific Visualization

4. Hands-on Experience with Simulation Software

MATLAB Wavelet Toolbox Software for Image Compression Software for Filter Design

The goal of the Workshop is to be as useful as possible to all participants. Please request information by an email message with subject Workshop to the organizer Gilbert Strang: gs@math.mit.edu

We will reply about the program and tuition cost and housing. The tuition includes the textbook and will be the same as in 1995 and 1996 (San Jose and Tampa Workshops). It will be reduced by 50% for graduate students. We are very glad to answer all questions.

Contact :

Gilbert Strang
Room 2-240 MIT Cambridge MA 02139, USA
Tel. : +1-617 253 4383, Fax : +1-617 253 4358
E-mail : gs@math.mit.edu
Web sites :
http://saigon.ece.wisc.edu/~waveweb/QMF.html
http://www-math.mit.edu/~gs

WIAMIS'97

Louvain-la-Neuve, Belgium, 26 -27 June 1997

The WIAMIS'97 Workshop on Image Analysis for Multimedia Interactive Services will be held on 26 and 27 June 1997 at the Université catholique de Louvain, Belgium.

The objective of the workshop is to provide a forum for discussion of new and recent results on techniques for advanced image analysis and image processing for emerging interactive multimedia services in the context of MPEG-4 and MPEG-7. Therefore especially active participation from members of ongoing European collabora- tive R&D projects of the COST, ACTS and ESPRIT programs is encouraged in order to preserve its characteristic as a workshop.

Topics

Areas of interest are targeted for both real-time and non real- time image and video applications and include, but are not limited to: * Supervised and unsupervised segmentation of objects in 2-D/3-D image sequences * Indexing of images and video * Motion/texture/shape descriptors * Identification and tracking of regions in scenes * 2-D/3-D feature extraction * Voice/audio assisted image/video segmentation * Feature-based image/video query * Searching and browsing of images and video * Content generation and manipulation

Deadlines

30 January 1997 Submission of Questionnaire
15 March 1997 Submission of Abstracts (3 copies)
15 April 1997 Notification of acceptance mailed
15 May 1997 Submission of camera ready paper (4 pages)

Organisation

Chairperson:B.Macq - Université catholique de Louvain
Organisation T.Sikora - Heinrich-Hertz-Institute Berlin
Program Steering Committee:
L.Chiariglione - CSELT, Italy
P.Delogne- UCL, Belgium
Local Organisation Committee (UCL, Belgium):
P.Delogne, B.Macq, X.Marichal and C.Rouyer

Contact

Mrs Catherine Rouyer
WIAMIS'97 Secretariat
Laboratoire de Télécommunications et
Télédétection - Bâtiment Stevin 2
Place du Levant
B-1348 Louvain-la-Neuve, Belgium
Tel: +32 10 47 80 75 , Fax: +32 10 47 20 89
Email: rouyer@tele.ucl.ac.be

Parallel and Distributed Methods for Image Processing

San Diego, CA, USA, 27 July - 1 August 1997

The Parallel and Distributed Methods for Image Processing conference is part of the SPIE Annual Meeting.

It is generally perceived that the economical way to achieve the high performance required by image processing applications is through parallel processing. Research on parallel and distributed computing for image processing applications has been and remains an active research field.

This conference is intended to bring together researchers and practitioners in parallel and distributed computing and image processing areas. The conference will provide a mechanism for researchers to keep abreast of new parallel and distributed methods for image processing applications and industrial needs, and for practitioners to learn of new available technologies.

Emphasis will be placed on application of parallel and distributed techniques to image processing problems, including parallel and distributed systems, algorithms, and architectures.

Organisation

Conference Chairs: Hongchi Shi, University of Missouri/ Columbia; Patrick C. Coffield, Air Force Wright Lab.
Program Committee: H. John Caulfield, Alabama A&M Univ.; Su-Shing Chen, University of North Carolina

Topics

The conference welcomes original papers in fundamental parallel and distributed methods for image processing. Papers are solicited in the areas including, but not limited to the following:

- parallel and distributed image processing algorithms
- parallel architectures for image processing
- parallel languages and environments for image processing
- optical image processing systems
- optoelectric systems
- performance analysis and benchmarking.

Deadlines

Paper Abstracts Due from Authors: 30 December 1996
Manuscripts Due from Authors: 30 June 1997

Contact

SPIE
P.O. Box 10
Bellingham, WA 98227-0010 USA
Tel. : +1-360/676-3290
Fax : +1-360/647-1445

ICIAP'97

Florence, Italy, 17-19 September 1997

ICIAP'97 stands for the 9th International Conference on Image Analysis and Processing which is to be held in the Centro Affari, Florence, Italy from 17-19 September 1997

The International Conference on Image Analysis and Processing is organized biennially by the Italian Chapter of IAPR (International Association for Pattern Recognition) since 1981 with the aim to be an international forum for presentation and discussion of advances in the field and new perspective research areas. The scientific program of ICIAP'97 will include plenary lectures given by invited speakers and contributed papers presented in Conference sessions. Papers will be accepted for both oral and poster presentation. Conference proceedings will be published by Springer Verlag in the series Lecture Notes in Computer Science.

In memory of Professor Eduardo Caianiello, an award will be assigned to the best paper presented at the Conference.

Organisation

A. Del Bimbo, V. Cappellini, A. Del Bimbo
Programme Committee :
C. Arcelli, I.C. Braccini, I M. Brady, UK
Organising Committee
L. Alparone S. Baronti C. Colombo J.M. Corridoni A. Del Bimbo M. Lusini P. Pala E. Vicario

Topics

Contributions are sought on new research in the fields of Image Analysis and Pattern Recognition and related technologies. Topics include but are not limited to:

- Image Analysis and Pattern Recognition
- Computer Vision
- Image Enhancement and Restoration
- Active Vision Image Segmentation
- Shape Analysis and Representation Statistical and Syntactical Patt. Rec.
- Motion Analysis and Representation Color and Texture Analysis
- 2D and 3D Object Recognition
- Machine Learning and Understanding
- Architectures for Image Processing
- Neural Networks
- Multiprocessor Systems Image Understanding
- Massively Parallel Architectures Spatial Reasoning
- VLSI Architectures
- Imaging Technologies and Image Databases Imaging Applications and Multimedia Vision-based HCI
- Biomedical Applications Merging Graphics and Vision
- Remote Sensing Image and Video Compression
- OCR and Document Processing Image and Video Indexing/Retrieval
- Integration with Other Media

Deadlines

Paper submission deadline : Deadlines
Paper submission deadline : 30 January 1997
Notification of acceptance : 1 May 1997
Camera-ready copy : 1 June 1997

Contact :

ICIAP'97
Prof. Alberto Del Bimbo
Dipartimento di Sistemi e Informatica
Universita' di Firenze
Via Santa Marta, 3
I-50139 Firenze - ITALY
E-mail address: iciap97@dsi.ing.unifi.it.

WWW

http://dsi.ing.unifi.it/iciap97/

URSI CONFERENCE CALENDAR

December 1996

APMC'96 - Asia-Pacific Microwave Conference
Delhi, India, 17 - 20 December 1996
Contact: Dr. R.S. Gupta, Conference Secretary, APMC'96, Department of Electronic Science, University of Delhi, South Campus, New Delhi, India, 110021 India, Tel. : +91 11-601955, +91 11-602440, Fax : +91 11-6886427, +91-11 6885270, e-mail : bic_dusc@dbt.ernet.in

February 1997

COMMSPHERE'97
Lausanne, Switzerland, 11 - 14 February 1997
Contact : COMMSPHERE'97 - Secretariat, Swiss Federal Institute of Technology of Lausanne, CH-1015 Lausanne, Switzerland, Tel. : +41 21 693 27 86, Fax : +41 21 693 46 62, e-mail : marcela.lenz@lre.de.epfl.ch

EMC Zurich'97 - Electromagnetic Compatibility
Zurich, Switzerland, 18 - 20 February 1997
Contact: Dr. Gabriel Meyer, Symposium Chairman, EMC Zurich'97, ETH Zentrum - IKT, CH-8092 Zurich, Switzerland, Tel. : +41 1-632 27 90, Fax : +41 1-632 12 09, e-mail : gmeyer@nari.ee.ethz.ch, WWWsite at : http://www.nari.ee.ethz.ch/

March 1997

ISSS-5 - The Fifth International School / Symposium for Space Simulations
Kyoto, Japan, 13 - 19 March 1997
Contact : Prof. Hiroshi Matsumoto, Chairman of the Organizing Committee, ISSS-5, Radio Atmospheric Science Centre, Kyoto Univrsity, Uji, Kyoto 611, Japan, Tel. +81 774-332532, Fax : +81 774-318463, E-mail : isss@kurasc.kyoto-u.ac.jp

April 1997

ICAP'97 - Tenth International Conference on Antennas and Propagation
Edinburgh, U.K., 14 - 17 April 1997
Contact : ICAP'97 Secretariat, Conference Services, Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, United Kingdom, Tel. : +44 171-344 5467/5473, Fax : +44 171-240 8830, e-mail : lhudson@iee.org.uk, mswift@iee.org.uk

Radio Emission From Galactic and Extragalactic Compact Sources
Socorro, New Mexico, U.S.A., 21 - 26 April 1997
Contact : Dr. J.A. Zensus, National Radio Astronomy Observatory, 520 Edgemont Road, Charlottesville, VA, 22903, U.S.A., Tel. : +1 804-296-0231, Fax : +1 804-296-0278, e-mail : azensus@nrao.edu

May 1997

EMC-97 - International Symposium on Electromagnetic Compatibility
Beijing, China, 21 - 23 May 1997
Contact : Ms. Fang Min, Secretariat, EMC'97, Chinese Institute of Electronics, P.O. Box 165, 100036 Beijing, China, Tel. : +86 10-68283463, Fax : +86 10-68283458, e-mail : shaz@sun.ihep.ac.cn

June 1997

BIANISOTROPICS'97
International Conference and Workshop on Electromagnetics of Complex Media
Glasgow, United Kingdom, 5 - 7 June 1997
Contact: Dr. Werner S. Weiglhofer, Dept. of Mathematics, University of Glasgow, Glasgow, United Kingdom, Tel. +44 141-330 4124, Fax : +44 141-330 4111, E-mail : tropics@maths.gla.ac.uk

Second World Congress for Electricity and Magnetism in Biology and Medicine
Bologna, Italy, 11 - 13 June 1997
Contact : Prof. Paolo Bernardi, Università "La Sapienza" di Roma, Dipartimento di Ingegneria Elettronica, Via Eudossiana 18, I-00184 Roma, Italy, Tel.: +39 6-4742647, Fax : +39 6-44585855, e-mail : bernardi@tce.ing.uniromal.it

July 1997

Seventh International Conference on HF Radio Systems and Techniques
Nottingham, United Kingdom, 7 - 9 July 1997
Contact : HF Radio '97 Secretariat, Conference Services, Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, United Kingdom, Tel. : +44 171-344 8425/5469, Fax : +44 171-240 8830, e-mail : conference@iee.org.uk (please quote HF Radio 97 in your message)

August 1997

IGARSS'97 - International Geoscience and Remote Sensing Symposium
Singapore, 4 - 8 August 1997
Contact : IEEE Geoscience and Remote Sensing Society, 2610 Lakeway Drive, Seabrook TX 77586, U.S.A., Tel. : +1 713-2919222, Fax : +1 713-2919924, e-mail : tstein@phoenix.net

ISRAMT'97 - 6th International Symposium on Recent Advances in Microwave Technology
Beijing, China, 4 - 7 August 1997
Contacts :
(North/South America & Europe) : Prof.Banmali Rawat, Tech. Program Co-Chair , Dept of Electrical Engineering , University of Nevada, Reno, NV 89557-0153 U.S.A., Tel. : +1 702-784-1457 , Fax : +1 702-784-6627 , E-mail: rawat@ee.unr.edu
(Asia, Pacific Region, Africa) : Prof. Yue Wang, Technical Program Co-Chair , Beijing Institute of Technology , P.O. Box 327 , Beijing 100081 China , Tel. : +86 10-6841-2840, Fax: +86 10-6841-2889, E-mail: youanke@public.bta.net.cn

ISRP'97 - International Symposium on Radiowave Propagation
Qingdao, China, 12 - 16 August 1997
Contact : Professor Zong Sha, Chinese Institute of Electronics, P.O. Box 165, 100036 Beijing, China, Tel. : +86 10-68283463, Fax : +86 10-682834 58, e-mail : ZSha@Sun.Ihep.ac.cn

ISAE'97 - Fourth International Symposium on Antennas and EM Theory
Xi'an, P.R. China, 19 - 22 August 1997
Contact : Prof. Shuxi Gong, XIDIAN Univrsity, P.O. Box 377, Xi'an, Shaanxi 710071, China, Tel. : +86 29-8228200 ext. 2662/3814, E-mail : nlam@xidian.edu.cn

September 1997

URPS'97 - Urban Radiowave Propagation Symposium
Tomsk, Russia, 2 - 4 September 1997
Contact : Prof. German S. Sharygin, Tomsk State Academy of Control Systems and Radioelectronics, 40 Lenin Ave., Tomsk 634050, Russia, Tel. : +7-3822-224 302, E-mail : gssh@tiasur.tomsk.su and gssh@cp.tomsk.su

June 1998

14th International Wroclaw Symposium on Electromagnetic Compatibility
Wroclaw, Poland, 23 - 26 June 1998
Contact : EMC Symposium, Box 2141, 51-645 Wroclaw 12, Poland, Fax : +48 71-728878, E-mail: emc@ita.pwr.wroc.pl

July 1998

CPEM98 - Conferences on Precision Electromagnetic Measurements
Washington, DC, U.S.A., 6 - 10 July 1998
Contact : Katherine H. Magruder, Conference Secretary, NIST, Bldg. 220, Room B162, Gaithersburg, MD 20899-0001, USA, Tel. : +1 301-975-4223; Fax : +1 301-926-3972; E-mail : katherine.magruder@nist.gov., WWW site : http://www.eeel.nist.gov/cpem98/

URSI cannot be held responsible for any errors contained in this list of meetings.

International Geophysical Calendar 1997

International Geophysical Calendar 1997 (Final)

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

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

	S	M	T	W	T	F	S
			1	2	3	4	5
JULY	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	2
AUGUST	3	4	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
SEPTEMBER	[31	1	2‡*	3‡*	4	5	6]
	7	8	(9)	(10)	(11)	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
OCTOBER	28	29	30	1	2	3	4
	5	6	(7)*	(8)*	(9)	10	11
	12	13	14	15	16	17	18
	19	20	21+	22+	23+	24	25
NOVEMBER	26	27	28	29	30	31	1
	2	3	4‡	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
DECEMBER	30	1	2‡	3‡	4+	5	6
	7	8	9	10	11	12	13
	14	15	(16)	[17]	(18)	19	20
	21	22	23	24	25	26	27
1998	[28	29	30*	31*	1	2	3]
JANUARY	4	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
	S	M	T	W	T	F	S

(21) Regular World Day (RWD)

(22) Priority Regular World Day (PRWD)

[19] Quarterly World Day (QWD) also a PRWD and RWD

[1] Regular Geophysical Day (RGD)

[10 11] World Geophysical Interval (WGI)

6 + Incoherent Scatter Coordinated Observation Day

[8] Day of Solar Eclipse

[9 10] Airglow and Aurora Period

14* Dark Moon Geophysical Day (DMGD)

This Calendar continues the series begun for the IGY years 1957-58, 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 Centers (WDCs) in many instances emphasize Calendar days. The Calendar is prepared by the International Space Environment Service (ISES) with the advice of spokesmen for the various scientific disciplines. For some programs, greater detail concerning recommendations appears from time to time published in IAGA News, IUGG Chronicle, URSI Information Bulletin or other scientific journals or newsletters. For on-line information, see http://www.sec.noaa.gov/ises/ises.html.

The definitions of the designated days remain as described on previous Calendars. Universal Time (UT) is the standard time for all world days. Regular Geophysical Days (RGD) are each Wednesday. Regular World Days (RWD) are three consecutive days each month (always Tuesday, Wednesday and Thursday near the middle of the month). Priority Regular World Days (PRWD) are the RWD which fall on Wednesdays. Quarterly World Days (QWD) are one day each quarter and are the PRWD which fall in the World Geophysical Intervals (WGI). The WGI are fourteen consecutive days in each season, beginning on Monday of the selected month, and normally shift from year to year. In 1997 the WGI will be February, May, August and November.

The Solar Eclipses are:

a.) 8-9 March 1997 (total) eclipse, with totality visible only in Mongolia north of Ulaan Baator and in eastern Russia. Totality will last up to 2 minutes 50 seconds, though the Sun never appears higher than 23 degrees above the horizon. Totality in Mongolia is 2 minutes 25 seconds with the Sun 13 degrees above the horizon, and then clips the Chinese border before continuing into Russia. Partial phases will be visible throughout Eastern Asia except the extreme south, in the North Pacific Ocean including Japan, in Arctic regions, in Alaska, and in western Canada. Track begins at N49 E87 and ends at N83 W158.

b.) 2 September 1997 (partial) eclipse will be visible in all of Australia and New Zealand, in western Antarctica, and in the ocean between them. Maximum magnitude is 90% of the solar diameter covered. (Descriptions by Dr. Jay M. Pasachoff, Williams College (jmp@williams.edu)—Hopkins Observatory, Chair of the Working Group on Eclipses of the International Astronomical Union, based on "Fifty-Year Canon of Solar Eclipses: 1986-2035," by Fred Espenak, NASA Goddard Space Flight Center, NASA Reference Publication 1178 Revised.) See web site http://umbra.gsfc.nasa.gov/eclipse/predictions/eclipse-paths.html.

Meteor Showers (selected by R. Hawkes, Mount Allison Univ, Canada, rhawkes@mta.ca) include the most prominent regular showers. The dates for Northern Hemisphere meteor showers are: Jan 3-5 (Quadrantid); Apr 21-23 (Lyrid); May 3-6 (Eta-Aquarid); Jun 6-11 (Arietid, Zeta-Perseid); Jun 27-29 (Beta-Taurid); Aug 11-14 (Perseid); Oct 21-23 (Orionid); Nov 16-19 (Leonid); Dec 13-15 (Geminid); Dec 22-24, 1997 (Ursid); and Jan 3-5, 1998 (Quadrantid). The dates for Southern Hemisphere meteor showers are: May 3-6 (Eta-Aquarid); Jun 6-11 (Arietid, Zeta-Perseid); Jun 27-29 (Beta-Taurid); Jul 27-Aug 2 (S. Delta-Aquarid, Alpha-Aurigid); Oct 21-23 (Orionid); Nov 16-19 (Leonid); and Dec 13-15, 1997 (Geminid). Particular attention is drawn to the Leonid shower as part of the International Leonid Watch with somewhat enhanced rates expected in 1997 (and possible meteor storms in 1998 and 1999). Maximum is expected at 11h UT on Nov. 17, 1997.

The occurrence of unusual solar or geophysical conditions is announced or forecast by the ISES through various types of geophysical "Alerts" (which are widely distributed by telegram and radio broadcast on a current schedule). Stratospheric warmings (STRATWARM) are also designated. The meteorological telecommunications network coordinated by WMO carries these worldwide Alerts once daily soon after 0400 UT. For definitions of Alerts see ISES "Synoptic Codes for Solar and Geophysical Data", March 1990 and its amendments. Retrospective World Intervals are selected and announced by MONSEE and elsewhere to provide additional analyzed data for particular events studied in the ICSU Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) programs.

RECOMMENDED SCIENTIFIC PROGRAMS

FINAL EDITION

(The following material was reviewed in 1996 by spokesmen of IAGA, WMO and URSI as suitable for coordinated geophysical programs in 1997.)

Airglow and Aurora Phenomena. Airglow and auroral observatories operate with their full capacity around the New Moon periods. However, for progress in understanding the mechanism of many phenomena, such as low latitude aurora, the coordinated use of all available techniques, optical and radio, from the ground and in space is required. Thus, for the airglow and aurora 7-day periods on the Calendar, ionosonde, incoherent scatter, special satellite or balloon observations, etc., are especially encouraged. Periods of approximately one weeks' duration centered on the New Moon are proposed for high resolution of ionospheric, auroral and magnetospheric observations at high latitudes during northern winter.

Atmospheric Electricity. Non-continuous measurements and data reduction for continuous measurements of atmospheric electric current density, field, conductivities, space charges, ion number densities, ionosphere potentials, condensation nuclei, etc.; both at ground as well as with radiosondes, aircraft, rockets; should be done with first priority on the RGD each Wednesday, beginning on 1 January 1997 at 0000 UT, 8 January at 0600 UT, 15 January at 1200 UT, 22 January at 1800 UT, etc. (beginning hour shifts six hours each week, but is always on Wednesday). Minimum program is at the same time on PRWD beginning with 22 January at 1800 UT. Data reduction for continuous measurements should be extended, if possible, to cover at least the full RGD including, in addition, at least 6 hours prior to indicated beginning time. Measurements prohibited by bad weather should be done 24 hours later. Results on sferics and ELF are wanted with first priority for the same hours, short-period measurements centered around the minutes 35-50 of the hours indicated. Priority Weeks are the weeks which contain a PRWD; minimum priority weeks are the ones with a QWD. The World Data Centre for Atmospheric Electricity, 7 Karbysheva, St. Petersburg 194018, USSR, is the collection point for data and information on measurements.

Geomagnetic Phenomena. It has always been a leading principle for geomagnetic observatories that operations should be as continuous as possible and the great majority of stations undertake the same program without regard to the Calendar.

Stations equipped for making magnetic observations, but which cannot carry out such observations and reductions on a continuous schedule are encouraged to carry out such work at least on RWD (and during times of MAGSTORM Alert).

Ionospheric Phenomena. Special attention is continuing on particular events which cannot be forecast in advance with reasonable certainty. These will be identified by Retrospective World Intervals. The importance of obtaining full observational coverage is therefore stressed even if it is possible to analyze the detailed data only for the chosen events. In the case of vertical incidence sounding, the need to obtain quarter-hourly ionograms at as many stations as possible is particularly stressed and takes priority over recommendation (a) below when both are not practical.

For the vertical incidence (VI) sounding program, the summary recommendations are: (a) All stations should make soundings on the hour and every quarter hour; (b) On RWDs, ionogram soundings should be made at least every quarter hour and preferably every five minutes or more frequently, particularly at high latitudes; (c) All stations are encouraged to make f-plots on RWDs; f-plots should be made for high latitude stations, and for so-called "representative" stations at lower latitudes for all days (i.e., including RWDs and WGIs) (Continuous records of ionospheric parameters are acceptable in place of f-plots at temperate and low latitude stations); (d) Copies of all ionogram scaled parameters, in digital form if possible, be sent to WDCs; (e) Stations in the eclipse zone and its conjugate area should take continuous observations on solar eclipse days and special observations on adjacent days. See also recommendations under Airglow and Aurora Phenomena.

For the incoherent scatter observation program, every effort should be made to obtain measurements at least on the Incoherent Scatter Coordinated Observation Days, and intensive series should be attempted whenever possible in WGIs, on Dark Moon Geophysical Days (DMGD) or the Airglow and Aurora Periods. The need for collateral VI observations with not more than quarter-hourly spacing at least during all observation periods is stressed. Special programs include:CADITS/MLTCS — Coupling and Dynamics of the Ionosphere-Thermosphere System/ Mesosphere, Lower-Thermosphere Coupling Study — combined local E and F region measurements, including vector velocities, with 15 minute time resolution. Latitudinal coverage may be sacrificed to meet this goal. (Contacts are: Casandra Fesen - fesen@tides.dartmouth.edu and Roberta Johnson - rjohnson@dexter.sprl.umich.edu); DATABASE — Incoherent Scatter Database — emphasis on broad latitudinal coverage of the F region (Anthony van Eyken - tony@eiscat.no); POLITE — Plasmaspheric Observations of Light Ions in the Topside Exosphere — global coordinated measurements of topside light ions. Simultaneous optical observations of neutral hydrogen and helium are highly desirable where possible (Phillip Erickson - pje@hyperion.haystack.edu); SUNDIAL — Weather and climatology of the global ionospheric-thermospheric system. Full 30 day round-the-clock ionosonde coverage of E- and F-region characteristics including intermediate, descending and sequential layers (Edward Szuszczewicz - szusz@mclapo.saic.com); WLS — Wide-Latitude Substorm Dynamics (John Foster - jcf@hyperion.haystack.edu). Special programs: Dr. Anthony P. van Eyken, EISCAT Scientific Association, Ramfjordmoen, N-9027 Ramfjordbotn, Norway. Tel. +47 77692166; Fax +47 77692380; e-mail: tony@eiscat.no; URSI Working Group G.5.

For the ionospheric drift or wind measurement by the various radio techniques, observations are recommended to be concentrated on the weeks including RWDs.

For traveling ionosphere disturbances, propose special periods for coordinated measurements of gravity waves induced by magnetospheric activity, probably on selected PRWD and RWD.

For the ionospheric absorption program half-hourly observations are made at least on all RWDs and half-hourly tabulations sent to WDCs. Observations should be continuous on solar eclipse days for stations in eclipse zone and in its conjugate area. Special efforts should be made to obtain daily absorption measurements at temperate latitude stations during the period of Absorption Winter Anomaly, particularly on days of abnormally high or abnormally low absorption (approximately October-March, Northern Hemisphere; April-September, Southern Hemisphere).

For back-scatter and forward scatter programs, observations should be made and analyzed at least on all RWDs.

For synoptic observations of mesospheric (D region) electron densities, several groups have agreed on using the RGD for the hours around noon.

For ELF noise measurements involving the earth-ionosphere cavity resonances any special effort should be concentrated during the WGIs.

It is recommended that more intensive observations in all programs be considered on days of unusual meteor activity.

Meteorology. Particular efforts should be made to carry out an intensified program on the RGD — each Wednesday, UT. A desirable goal would be the scheduling of meteorological rocketsondes, ozone sondes and radiometer sondes on these days, together with maximum-altitude rawinsonde ascents at both 0000 and 1200 UT.

During WGI and STRATWARM Alert Intervals, intensified programs are also desirable, preferably by the implementation of RGD-type programs (see above) on Mondays and Fridays, as well as on Wednesdays.

Global Atmosphere Watch (GAW) The World Meteorological Organizations (WMO) GAW integrates many monitoring and research activities involving measurement of atmospheric composition. Serves as an early warning system to detect further changes in atmospheric concentrations of greenhouse gases, changes in the ozone layer and in the long range transport of pollutants, including acidity and toxicity of rain as well as of atmospheric burden of aerosols (dirt and dust particles). Contact WMO, 41, avenue Giuseppe-Motta, P.O. Box 2300, 1211 Geneva 2, Switzerland.

Solar Phenomena. Observatories making specialized studies of solar phenomena, particularly using new or complex techniques, such that continuous observation or reporting is impractical, are requested to make special

efforts to provide to WDCs data for solar eclipse days, RWDs and during PROTON/FLARE ALERTS. The attention of those recording solar noise spectra, solar magnetic fields and doing specialized optical studies is particularly drawn to this recommendation.

FLARES22(FLAre RESearch at the maximum of solar cycle 22). 1990-1997 worldwide Solar-Terrestrial Energy Program (STEP) project. Aimed at understanding basic physical processes of transient solar activity and its coupling with the solar-terrestrial environment, including times of the various solar ALERTS. Coordinates satellite and ground-based observations. Observational campaigns are driven by specific scientific objectives rather than observations per se. Satellites include SOLAR-A, GRO, CORONAS, WIND, GEOTAIL, ULYSSES, etc. Program will focus on international collaboration of data analyses and theoretical work via electronic mail and workshops. For more information, contact Dr. Mona J. Hagyard, Marshall Space Flight Center, Code ES52, Huntsville, AL 35812. 205-544-7612; e-mail mhagyard@solar.stanford.edu.

SOLTIP (SOlar connection with Transient Interplanetary Processes). Program within the SCOSTEP STEP (Solar-Terrestrial Energy Program) project: 1990-1997. Its focus is on remote and in situ observations and analyses of solar-generated phenomena and their propagation throughout the heliosphere, including times following the various solar ALERTS. Desired goals include: (1) interplanetary scintillation observation of remote radio galaxies as well as telemetry signals to/from interplanetary spacecraft; (2) coordination of Earth-orbiting spacecraft such as IMP-8 in the solar wind and solar-orbiting spacecraft such as ICE, GIOTTO, SAKIGAKE, VOYAGER 1/2, PIONEER 10/11, ULYSSES, RELICT, WIND, SOHO, Galileo, and ACE. Contact is Dr. M. Dryer, NOAA R/E/SE, 325 Broadway, Boulder, CO 80303 USA. Phone: (303)497-3978; FAX number (303)497-3645; e-mail address mdryer@sec.noaa.gov.

Space Research, Interplanetary Phenomena, Cosmic Rays, Aeronomy. Experimenters should take into account that observational effort in other disciplines tends to be intensified on the days marked on the Calendar, and schedule balloon and rocket experiments accordingly if there are no other geophysical reasons for choice. In particular it is desirable to make rocket measurements of ionospheric characteristics on the same day at as many locations as possible; where feasible, experimenters should endeavor to launch rockets to monitor at least normal conditions on the Quarterly World Days (QWD) or on RWDs, since these are also days when there will be maximum support from ground observations. Also, special efforts should be made to assure recording of telemetry on QWD and Airglow and Aurora Periods of experiments on satellites and of experiments on spacecraft in orbit around the Sun.

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

This Calendar for 1997 has been drawn up by H.E. Coffey, of the ISES 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.

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Additional copies are available upon request to ISES Chairman, Dr. R. Thompson, IPS Radio and Space Services, Department of Administrative Services, P.O. Box 5606, West Chatswood, NSW 2057, Australia (FAX number (61)(2)414 8331; e-mail richard@ips.gov.au), or ISES Secretary for World Days, Miss H.E. Coffey, WDC-A for Solar-Terrestrial Physics, NOAA E/GC2, 325 Broadway, Boulder, Colorado 80303, USA (FAX number (303)497-6513; e-mail hcoffey@ngdc.noaa.gov).

The calendar is available on-line at http://www.sec.noaa.gov/ises/ises.html.

NOTES on other dates and programs of interest:

1. Days with significant meteor shower activity are: Northern Hemisphere 3-5 Jan; 21-23 Apr; 3-6 May; 6-11, 27-29 Jun; 11-14 Aug; 21-23 Oct; 16-19 Nov; 13-15, 22-24 Dec 1997; 3-5 Jan 1998. Southern Hemisphere 3-6 May; 6-11, 27-29 Jun; 27 Jul-2 Aug; 21-23 Oct; 16-19 Nov; 13-15 Dec 1997. These can be studied for their own geophysical effects or may be "geophysical noise" to other experiments. The International Leonid Watch focuses on the Leonid shower which shows enhanced rates in 1997 and possible meteor storms in 1998 and 1999; 1997 maximum is expected 1100 UT 17 Nov.
2. GAW (Global Atmosphere Watch) — early warning system for changes in greenhouse gases, ozone layer, and long range transport of pollutants.
3. SOLTIP (Solar connection with Transient Interplanetary Processes). Observing Program 1990-1997: solar-generated phenomena and their propagation throughout the heliosphere.
4. FLARES22 (FLAre RESearch at solar cycle 22 maximum). Observing Program 1990-1997: basic physical processes of transient solar activity and its coupling with solar-terrestrial environment.
5. + 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: 6-10 Jan 1997 MLTCS/CADITS; 11-12 Mar SUNDIAL; 8-10 (7-11, 14-18, 28-2) Apr WLS ("floating" campaign tied to recurrent solar activity. One period will be selected in month prior to this campaign. Instruments which must finalize schedules earlier should plan to operate on 8-10 Apr); 3-6 Jun POLITE; 23-27 Jun MLTCS/CADITS; 2-3 Sep DATABASE; 21-23 Oct WLS; 4-5 Nov DATABASE; and 2-4 Dec POLITE where CADITS = Coupling and Dynamics of the Ionosphere-Thermosphere System (Contacts are C. Fesen — fesen@tides.dartmouth.edu; R. Johnson — rjohnson@dexter.sprl.umich.edu); DATABASE = Incoherent Scatter Database (A. van Eyken — tony@eiscat.no); MLTCS = Mesosphere, Lower-Thermosphere Coupling Study (Same contacts as CADITS); POLITE = Plasmaspheric Observations of Light Ions in the Topside Exosphere (P. Erickson — pje@hyperion.haystack.edu); SUNDIAL = Coordinated study of the ionosphere/magnetosphere (E. Szuszczewicz — szusz@mclapo.saic.com); WLS = Wide-Latitude Substorm Dynamics (J. Foster —jcf@hyperion.haystack.edu).

FINAL EDITION, October 1996

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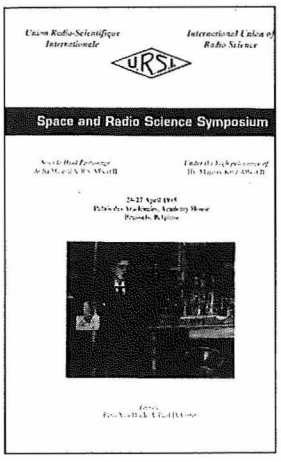

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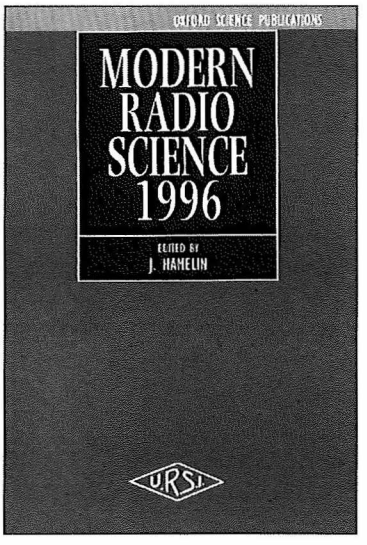

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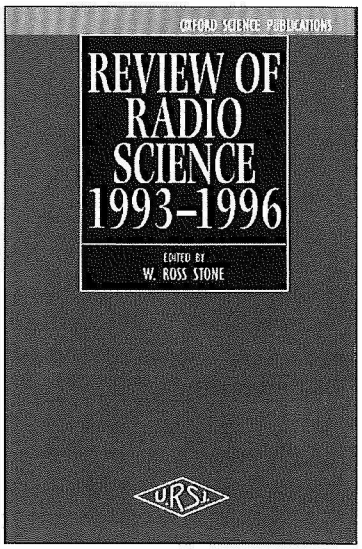

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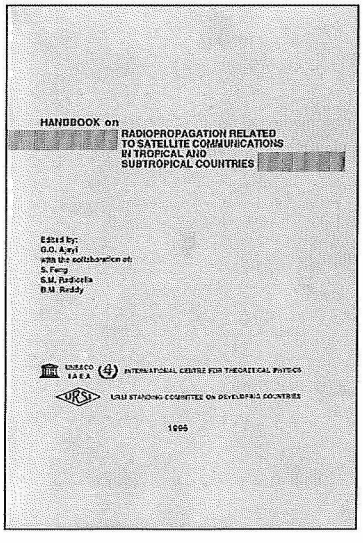

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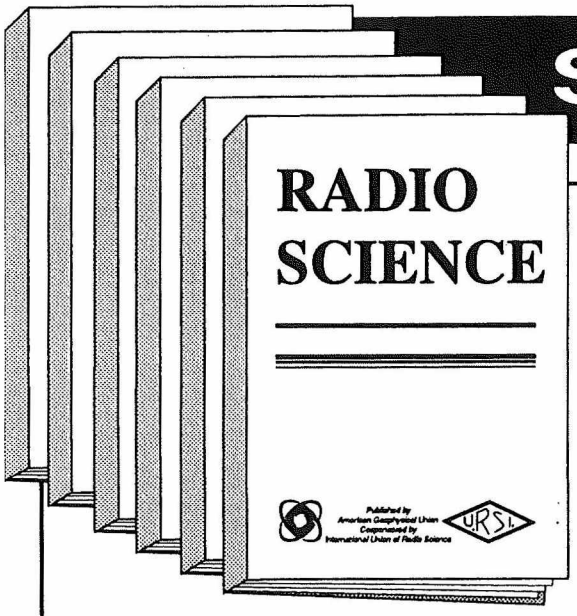

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