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XXIInd GENERAL ASSEMBLY OF URSI

FIRST ANNOUNCEMENT

The First Announcement for the XXIInd General Assembly of URSI, to be held in Tel Aviv, Israel, from 24 August to 2 September 1987, has been circulated to all Member Committees of URSI by the Israeli Organizing Committee at the beginning of July 1986. The Announcement contains a brief description of URSI, the Scientific Programme for the Assembly, as well as general information on travel, accommodation, registration, etc. Copies of the First Announcement are available from:

The Secretariat
XXIInd General Assembly of the
International Union of Radio Science
P.O.B. 50006
Tel Aviv 61500, Israel.
Tel: (03)654571
Tlx: 341171 KENS IL
Fax: 972 3 655674.

COMMISSION G PROGRAMME

The attention of those interested in the programme of Commission G in Tel Aviv is drawn to the following modification of the text appearing on pages 8, 16, 17 and 18 of *URSI Information Bulletin* No 237, and on pages 32, 42, 43, 44 and 45 of the First Announcement.

There will be no contributed papers for Commission G sessions, only contributed posters.

URSI ACCOUNTS

In accordance with the recommendations of the URSI Standing Finance Committee, the practice of publishing the accounts of the Union annually in the *URSI Information Bulletin* is being continued.

The Balance Sheet and the Income and Expenditure Accounts of URSI for the year ended 31 December 1985 are reproduced below. The original accounts have been audited by Van Poyer & Co, Reviseurs d'Entreprise, Brussels.

The assets held in Belgian francs have been converted to US dollars using the UNESCO exchange rate valid at 31 December 1985 (\$1 = 51 BF).

INTERNATIONAL UNION OF RADIO SCIENCE (U.R.S.I.)

BALANCE SHEET : 31 DECEMBER 1985

ASSETS

| | \$ | \$ |
|---|------------|------------------------------|
| <u>Dollars</u> | | |
| 551000 - Banque Degroof (restricted) | 27,432.66 | |
| 551001 - Banque Degroof (Free) | 0.00 | |
| 551100 - First National City Bank | (3.99) | |
| 551400 - Bank of America | 55,836.92 | |
| | ----- | 83,265.59 |
| <u>Belgian Francs</u> | | |
| 550100 - Banque Degroof | 2,033.10 | |
| 550200 - Société Générale de Banque | 322.59 | |
| | ----- | 2,355.69 |
| <u>Investments :</u> | | |
| 551300 - Merrill Lynch | 85,644.73 | |
| 512102 - Rorento Units | 139,144.26 | |
| 512100 - Merrill Lynch Shares | 75,000.00 | |
| 513000 - Bank Deposit | 49,019.61 | |
| | ----- | 348,808.60 |
| <u>Petty Cash and Stamps :</u> | | |
| 570100 - Petty Cash | 134.78 | |
| 570200 - Stamps | 115.25 | |
| | ----- | 250.03 |
| <u>Sundry Debtors</u> | | |
| 286000 - Deposit RTT | 276.47 | |
| 490000 - URSI Ties Fund | 1,588.25 | |
| | ----- | 1,864.72 |
| Total Assets | | ----- 436,544.63 ----- |
| <u>Less creditors</u> | | |
| 427010 - IUCAF (*) | 9,066.15 | |
| 427030 - IUWDS (*) | 1,537.45 | |
| | ----- | 10,603.60 |
| 489300 - Pension Fund (*) | 6,143.86 | |
| 427000 - Balth van der Pol Medal Fund (*) | 11,189.75 | |
| 427040 - Bureau RAHIER - Yearly Audit | 941.18 | |
| | ----- | 18,274.79 |
| NET TOTAL OF URSI ASSETS | | ----- 407,666.24 ===== |

INTERNATIONAL UNION OF RADIO SCIENCE (U.R.S.I.)

BALANCE SHEET : 31 DECEMBER 1985

| | | |
|--|-----------|------------|
| The net URSI Assets are represented by : | \$ | \$ |
| <u>Allocated Reserve Fund :</u> | | |
| 120000 - General | 25,000.00 | |
| 121000 - Closure of Secretariat | 76,128.61 | |
| | ----- | 101,128.61 |
| <u>Scientific Activities Fund :</u> | | |
| 489000 - Scientific Activities in 1986 | 49,900.00 | |
| 427020 - Young scientists in 1986 | 2,200.00 | |
| | ----- | 52,100.00 |
| <u>XXII General Assembly Fund :</u> | | |
| 489201 - Scientific | 58,300.00 | |
| Mr BAUER | (99.76) | |
| Mr CULLEN | (199.53) | |
| | ----- | 58,000.71 |
| 489202 - Organization | 33,000.00 | |
| Mr SHAPIRA | (143.65) | |
| Mr VAN BLADEL | (320.53) | |
| | ----- | 32,535.82 |
| 489203 - Young Scientists | 8,000.00 | |
| | ----- | 98,536.53 |
| 489100 - Unallocated Reserve Fund | | 155,901.10 |
| | | ----- |
| | | 407,666.24 |
| | | ===== |

INTERNATIONAL UNION OF RADIO SCIENCE (U.R.S.I.)

BALANCE SHEET : 31 DECEMBER 1985

Income and Expenditure Account ended 31 December 1985

| INCOME : | \$ | \$ |
|--|-----------|------------|
| 700000 - Sale of publications | | 615.96 |
| 740000 - Contributions from Member Committees | | 165,524.26 |
| 740100 - Allocations from Ministère Belge Enseignement | | 2,941.18 |
| 740100 - Allocations from I.C.S.U. | | 20,013.00 |
| 741000 - Reimbursement Italian Committee for registration fees (XXI G.Assy) | | 11,826.15 |
| - Reimbursement COSTED for expenses Young Scientists (XXI G.Assy) | | 2,382.00 |
| <u>Interest and dividends (net)</u> | | |
| 754000 - Belgian francs | 2,334.94 | |
| 754100 - US Dollars | 12,226.17 | |
| | ----- | 14,561.11 |
| | | ----- |
| Total income | | 217,863.66 |
| | | ===== |
| EXPENDITURE : | | |
| a) <u>Scientific Activities</u> : | | |
| 601500 - Meetings, Symposia, etc... | | |
| ISSS | 750.00 | |
| EMC | 600.00 | |
| ICPIG | 1,520.00 | |
| Magnet. Syst. | 931.14 | |
| I.R.I. | 1,360.31 | |
| Antenna Prop. | 3,020.00 | |
| | ----- | 8,181.45 |
| 601600 - Subventions : | | |
| IUCAF | 1,250.00 | |
| SCOSTEP | 1,000.00 | |
| | ----- | 2,250.00 |
| 615111 - Scientific travel : | | 3,332.45 |
| <u>XXI General Assembly</u> : | | |
| 602000 - Scientific expenses | 500.00 | |
| 602020 - Printing expenses | 6,348.75 | |
| | ----- | 6,848.75 |
| | | ----- |
| Total expenditure : Scientific Activities | | 20,612.65 |
| | | ----- |

INTERNATIONAL UNION OF RADIO SCIENCE (U.R.S.I.)

BALANCE SHEET : 31 DECEMBER 1985

Income and Expenditure Account ended 31 December 1985

| EXPENDITURE (suite) | \$ | \$ |
|--|----------|---|
| b) <u>Publication</u> | | |
| 602300 - Printing URSI Bull. nb 232 to 234 | | 4,394.37 |
| d) <u>Administration</u> : | | |
| 620201 - Salaries and pensions (incl. Soc. Sec.) | | 44,977.61 |
| <u>Office Expenses</u> : | | |
| 610000 - Rent, light, Heating | 2,352.94 | |
| 612400 - Stationery, Office Supplies | 770.49 | |
| 612401 - Office equipment | 121.00 | |
| 612510 - Postage | 1,473.41 | |
| 612520 - Telephone | 1,191.75 | |
| 613000 - Social and accounting fees | 5,018.88 | |
| 613350 - Bank charges | 1,670.89 | |
| 613500 - Insurances | 3,108.37 | |
| 615100 - Entertainment | 557.06 | |
| 615101 - Miscellaneous | 132.45 | |
| 615110 - Administrative Travel | 4,894.04 | |
| | ----- | 21,291.28 |
| Total expenditure : Administration | | ----- 70,663.26 ----- |
| 756000 - Difference of Exchange | | (18,108.15) |
| Total expenditure | | 73,167.76 |
| Excess of income over expenditure | | ----- 144,695.90 ----- 217,863.66 ===== |

INTERNATIONAL UNION OF RADIO SCIENCE (U.R.S.I.)

BALANCE SHEET : 31 DECEMBER 1985

| | |
|--|------------|
| Balance in hand on 1 january 1985 | 246,388.88 |
| Excess of income over expenditure to 31 Dec.1985 | 144,695.90 |
| Profit on Belgian Francs | 16,581.46 |
| | ----- |
| Balance in hand on 31 december 1985 | 407,666.24 |
| | ===== |

Rates of exchange :

1 january 1985 : \$ 1 = 61,50 BF
31 december 1985 : \$ 1 = 51,00 BF

Observation :

The accounts indicated with (*)
are constituted by :

- 40 % in RORENTO UNITS,
- 60 % in US \$.

IEEE/URSI SPECIAL SESSION ON HF RADAR

17-21 June 1985, Vancouver, Canada

This meeting was organized on the initiative of the Inter-Commission Coordinating Group on Remote Sensing of URSI as covering an important application of radio science, with topics of interest to a number of URSI Commissions (ocean remote sensing, ionospheric reflection, signal processing). It was designed to demonstrate the progress that has recently been made in applying H.F. radar techniques to surface based mapping of ocean and ice properties, and of ship location. The techniques can allow short range (to 100 Km) monitoring of coastal winds, waves and currents from shore stations, with longer range monitoring (to 300 Km) of wind and wave patterns and ship location, using ionospheric reflection.

Papers presented at the meeting have been gathered into a special issue of the IEEE Journal on Oceanic Engineering (Vol. OE-11, No 2, April 1986). The range of topics, and of nationalities of authors, attest to increasing interest and number of applications. Surface current mapping has been the most widely applied, with significant recent increases in accuracy. Directional wave-height information is rapidly catching up in demand and impact, and tracking of storms and fronts are now being implemented, as are systems to follow sea-ice motions.

J.F.R. Gower

CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS CPEM '86

The Conference on Precision Electromagnetic Measurements was held at the National Bureau of Standards, Gaithersburg, USA from 23 to 27 June 1986. The CPEM is held every two years and URSI is a permanent cosponsor. The Conference covers electromagnetic metrology at the highest orders of accuracy, precision and the related physics.

The most interesting developments presented at the CPEM '86 were: cryogenic hydrogen masers, Josephson arrays as voltage standards, precision measurements of millisecond pulsars with long term stability much better than existing atomic clocks, new results in accurate determination of the Quantised Hall Resistance.

The Conference was privileged by the presentation of a paper of the 1985 Nobel Prize laureate in Physics, Professor Klaus von Klitzing, as well as excellent talks by Professor Norman Ramsey and Professor Ian Harvey, who was presented the 1986 Morris Leeds Award at the conference.

340 attendees from many countries participated, including three young scientists supported by URSI. The Organizing Committee of the Conference was chaired by Dr. Oskar Peterson. The Proceedings of the conference will be published as a special issue of 'IEEE Transactions on Instrumentation and Measurements' (probably in June 1987). The CPEM '86 Digest has the IEEE Cat. No. 86CH 2267-3 and Library of Congress Card No 75-23855. The next Conference on Precision Electromagnetic Measurements will be held in May 1988 in Japan.

Prof. S. Hahn
Chairman, URSI Commission A
on Electromagnetic Metrology

COSPAR XXVI PLENARY MEETING AND ASSOCIATED ACTIVITIES

The COSPAR Plenary Meeting, held in Toulouse, France, from 30 June to 12 July 1986, was the largest ever (more than 1,600 participants and about 1,000 papers), so large that overlap occurred too often. The organization by CNES was perfect, but it might be difficult to find comparable conditions at other meeting places.

The Bureau of COSPAR was elected for the first time according to the new Statutes adopted in 1984. The result of this first multichoice election was:

President: W.I. Axford (NZ/FRG)

Members: S. Bauer (Austria), R.R. Daniel (India),
S. Gredzielski (Poland), K. Hirao (Japan),
A.J. Somogyi (Hungary), R. Wilson (UK).

As for the Vice-Presidents, they were nominated as usual: H. Friedman by the US Academy of Sciences and R.A. Sunyaev by the Academy of Sciences of the USSR.

The Executive Council was informed about four new programmes in which COSPAR, together with other organizations, is engaged:

- Satellite Land Surface Climatology Project (ISLSCP),
- Global (climatic) Change,
- International Heliosphere Study (IHS),
- International Geosphere-Biosphere Programme (IGBP).

While three are of prime interest for meteorology, the IHS programme depends on data obtained by far distant space probes, four yet in orbit and three more planned. The Programme leader is the incoming President.

More general new programmes are proposed by SCOSTEP:

- Polar Auroral Dynamics (PAD),
- Solar Interplanetary Variability (SIV),
- World Ionosphere/Thermosphere Study (WITS),
- Solar-Terrestrial Energy Programme (STEP).

STEP should allow also continuation of a part of the MAP activities.

Finally, a US proposal was presented to declare 1992 as "International Space Year". The emphasis shall be on worldwide coordination of space missions intended for that year, 500 years after Columbus. Different from the programmes mentioned above, this one will be one of COSPAR alone and should therefore be managed by the COSPAR Secretariat. A funding source for the management cost must, however, yet be found. On request of the URSI representative, the wording of the proposed text was considerably changed so that the advising role of the Unions was clearly spoken out, "agencies" being mentioned in the third place only.

COSPAR engages itself as sponsor or co-sponsor of 8 workshops to be held before the next Plenary Meeting in 1988. Six of these might be of some concern to URSI. For the 1988 Plenary Meeting, to be held near Helsinki, a probably too large number of sessions has been proposed: 18 symposia, 24 workshops and 24 topical meetings, totalling 220 half-day sessions. Of these 6 symposia, 5 workshops and 3 topical meetings might be of some interest to URSI. It was stated that the proposals must be reduced to a size manageable at the meeting place.

The Task Group on the International Reference Ionosphere (IRI) is a common panel of URSI Commission G and COSPAR. The executive membership remained unchanged with L. Bossy (Belgium) as Chairman, J. Taubenheim (GDR) as Vice-Chairman for COSPAR and T.L. Gulyaeva (USSR) as Vice-Chairman for URSI.

Fifteen recommendations were adopted by the COSPAR Plenary Meeting. Those which might be of particular interest to URSI are reproduced below.

An ad hoc Panel, on which URSI is represented, has prepared a report on space-based VLBI, which describes the future possibilities in this field.

K. Rawer
URSI Representative on the
COSPAR Executive Council.

Decision No 1/86, proposed by COSPAR ISC A

COSPAR,

noting that the World Climate Research Programme, and also the newly developing ICSU Programme on Global Change, require for their success: (i) long-term observations of certain variables for which prototype or conceptual observing systems have been demonstrated, but for which no specific plans for implementation are known, and (ii) research missions to observe certain variables for which instrument development is needed, but for which no experiments are yet planned explicitly, and

recognizing the report of the COSPAR ad hoc Group on Remote Sensing for Global Change, which discusses the technical possibilities for making such observations,

wishes to draw the attention of its National Members to the scientific importance of the following items:

1. long-term monitoring programmes for the elements of the Earth's radiation budget, including precise and detailed measurements of the solar output, based on such successful missions as ERBE and the Solar Maximum Mission;
2. monitoring missions for full global observation of ocean colour to continue the successful Coastal Zone Colour Scanner experiment, as well as observations for certain chemical constituents known to be important to the study of global chemistry and radiatively active gases (e.g. carbon monoxide, which is related to the observed increase in methane concentration in the atmosphere);
3. proof-of-concept missions designed to develop an operational capability for the study of rainfall and soil moisture. The rainfall mission, in particular, should be designed initially to make observations in the tropics from a low-inclination low-altitude satellite orbit, so as to make possible adequate corrections for the strong diurnal variability of rainfall, and should be carried out in the time frame of the WCRP TOGA experiment (circa 1986-1996).

Decision No 6/86, proposed by COSPAR ISC C

COSPAR,

noting that a proposal for the Solar-Terrestrial Energy Programme (STEP) has recently been submitted to the Scientific

Committee for Solar-Terrestrial Physics (SCOSTEP) and has been proposed by SCOSTEP as its long-range programme, and

recognizing that this programme requires major international and multidisciplinary efforts in scientific space research programmes and their coordination with ground-based, balloon, aircraft and rocket programmes;

further recognizing that STEP will require extensive involvement of theoretical and modelling workers, and will also require greatly improved facilities for creating, maintaining and accessing electronic data bases, and communications between participating scientists,

encourages this initiative, and

recommends that interested international and national bodies support this programme.

Decision No 7/86, proposed by COSPAR ISC C

COSPAR,

noting the successful initiative of SCOSTEP in proposing a new programme of comprehensive studies of the solar-terrestrial environment, known as STEP (Solar-Terrestrial Energy Programme), and

recognizing the successful continuation of the Middle Atmosphere Programme (MAP) by the period of Middle Atmosphere Cooperation (MAC), to terminate on 31 December 1988,

urges SCOSTEP to consider a programme of long-term middle atmosphere studies under STEP, as a counterpart to the approved SCOSTEP programmes, SIV, PAD and WITS, which will be incorporated into STEP during the 1990's.

Decision No 8/86, proposed by COSPAR ISC C

COSPAR,

noting that ICSU will consider at its next Assembly the proposal for an International Geosphere-Biosphere Programme (IGBP), and

having considered the draft recommendations made by the four Working Groups established by the ICSU ad hoc Planning Group on Global Change, and the proposals formulated by COSPAR's ad hoc Group on Remote Sensing for Global Change,

reaffirms its strong interest and willingness to participate actively in the planning and execution of the IGBP as a major international and interdisciplinary programme designed to provide an understanding of the total Earth environment and the cosmic and anthropogenic influences to which it is exposed, *draws attention* to the fact that the total Earth system includes the environmental medium in which an ever increasing number of technological systems, both unmanned and manned, will orbit during the interval for which global change is to be assessed by the IGBP, and that this environment, its variability, and especially its interactions, are still poorly understood,

requests ICSU to include scientists who are experts in both the near and distant terrestrial environments in the Scientific Committee and pertinent Working Groups to be established for the planning and implementation of the IGBP.

Decision No 10/86, proposed by COSPAR ISC C

COSPAR,

noting that the present understanding of the behaviour and coupling of the terrestrial thermosphere and ionosphere regions is incomplete, particularly for the range between about 80 and 400 km, and

noting that knowledge of these regions is of great practical as well as critical importance to many atmospheric processes,

recommends to member national scientific institutions a continuous scientific programme for coordinated and combined thermospheric, ionospheric, and magnetospheric observations, stressing dynamics and inter-region coupling to further our understanding of these regions and monitor their interactions through, at least, the duration of a solar cycle.

Decision No 12/86, proposed by COSPAR ISC E

COSPAR,

recognizing the formation of an ad hoc Committee to investigate the international coordination between potential Space Very Long Baseline Interferometry (VLBI) missions and present and future ground-based VLBI networks, and

recognizing that the Executive Council of COSPAR has accepted the report of this Committee;

further recognizing that the conclusion of the Committee was that the necessary coordination could be achieved by acceptance in COSPAR of the space VLBI missions as projects falling within the activities of the Inter-Agency Consultative Group,

recommends that the interested national representatives approach the relevant agencies to consider the advisability of including space VLBI missions within the scope of the Inter-Agency Consultative Group.

Decision No 14/86, proposed by IUCAF

COSPAR,

recognizing

- a) that certain frequency bands are reserved, by the Radio Regulations, for passive observations,
- b) that use of these bands for reception of emissions from natural sources, both terrestrial and astronomical, is essential to progress in several scientific disciplines,
- c) that interference to scientific observations in these frequency bands, whether they are made from the ground or from spacecraft, can be caused not only by intentional emissions in the band but also from spurious emissions from transmitters nominally confined to other bands,
- d) that important passive observations need to be made in some frequency bands shared with other radio services,

recommends that national scientific institution members of COSPAR request their responsible national organizations

1. that no emissions from stations used for space research shall be planned in the frequency bands allocated for passive observations,
2. that all transmissions for space research purposes shall be planned with due regard to the possibility that spurious emissions (e.g. sidebands or harmonics) could interfere with observations in passive bands,
3. that frequency assignments to active radio services do not result in emissions in passive bands,
4. that passive observations in frequency bands shared with active radio services be given the maximum practicable protection from interference.

Decision No 15/86, proposed by IUCAF

COSPAR,

considering

- a) the continual expansion of radio services in the portions of the spectrum of interest for scientific research,
- b) the increasing difficulties of ensuring that frequencies used for scientific observations and the transmission of scientific data are free from interference,

requests

1. that scientists or organizations engaged in space research should prepare clear statements of their current and future requirements for radio frequencies, both for observations and for data transmission, and
2. that, where practicable, such statements should include a quantitative assessment of the possible effects of interference, and
3. that this information be made available to IUCAF, together with any reports of interference which occurs in practice.

Decision No 16/86, proposed by the COSPAR Bureau

COSPAR,

considering that the year 1992 marks the 500th anniversary of the landing in the New World by Christopher Columbus, and that 35 years after the IGY and the launching of the first spacecraft, the fields of space science and applications can be considered to have reached maturity, and that it has been suggested that 1992 be named the International Space Year, and that a suitable role be undertaken by COSPAR for the scientific aspects,

resolves

1. to volunteer to ICSU its readiness to develop plans for the scientific components of an International Space Year in 1992, with the purpose of fostering broad international participation, and emphasizing the peaceful nature of scientific activities in outer space,
2. to appoint a preliminary COSPAR committee to consider the formulation of scientific activities, with appropriate world-wide scientific cooperation and public awareness, with

appropriate representation of all nations with significant space research programmes. This committee should receive suggestions from all International Scientific Unions and other ICSU bodies, National Scientific Institutions, National Agencies, and Scientific Societies concerned with space science, and establish liaison with other bodies concerned with ISY. The COSPAR Secretariat should serve as a clearing house for all ISY communications.

It is further noted that it took five years from the organization of the Comité Spécial pour l'Année Géophysique Internationale (CSAGI) to the implementation of the IGY programme. 1992 is only six years away; it is not too soon to give serious thought to the design of an ISY.

ACTIVE EXPERIMENTS

A Symposium on Active Experiments was held in Toulouse, France, from 30 June to 3 July 1986, in association with the COSPAR Plenary Meeting.

The emphasis was on release experiments in which either the upper atmosphere is used as a chemical and plasma laboratory, or natural phenomena in the Earth's environment are studied, for example with methods applying artificial "tracers". Two half-day sessions (27 papers) were devoted to plasma and neutral gas injections, 1,5 day (19 papers) to electron and ion beam injections and 1,5 day (13 papers) to vehicle-environment interactions.

In the first group the AMPTE mission played a major role, in particular the magnetotail tracer release. The released ions could not be detected by a second spacecraft nearer to Earth. The experiments created magnetic cavities, as well as did releases in the solar wind ("artificial comet"). Artificial depletions in the terrestrial ionosphere ("ionospheric holes") were another subject of interest.

Beam experiments have been made onboard SPACELAB and from rockets. Excitation of different waves in the environmental plasma is a persisting feature.

As for the third group, apart from the charging potential of the vehicle, the presence of a large vehicle might seriously influence its environment, in particular by outgassing. This must be considered as a draw-back for observations of the undisturbed spatial environment of Earth from aboard large spacecraft like manned ones. Therefore, a small "tethered" vehicle accompanying a large spacecraft at suitable distance is of particular interest. The same is true for "mother-daughter" combinations in which the "daughter" checks the effects of a release made aboard the "mother". The wake of a spacecraft in natural plasma remains a subject of great importance.

K. Rauer

THE INTERNATIONAL REFERENCE IONOSPHERE

A Workshop on the International Reference Ionosphere (IRI) was held in Toulouse, France, on 8 July 1986, in association with the COSPAR Plenary Meeting.

Since the end of 1985, IRI-9 is the latest version of the computer programme. It contains two important improvements: the topside formula, originally built from the Bent-Llewellyn model was improved by Bilitza in the equatorial zone (where the original is too much smoothed out); a more general electron temperature profile (Bilitza, Brace, Theis) was introduced using results from the AEROS and several ATMOSPHERIC EXPLORER satellites, and from incoherent scatter stations.

A discussion on the electron density profile was provoked by a paper by T.L. Gulyaeva, in which she insisted on evidence for a rather broad E-F-valley. The different methods of true height analysis from ionograms end-up with different results according to whether such a valley is admitted. Many of the available "true profiles" (including most of Becker's) were constructed by assuming the "lowest possible profile", i.e. excluding the possibility of a valley. At the end, a feeling was reached that Titheridge's POLAN (which admits a valley) is probably the most appropriate analysis programme. Though about thousand ionograms from different stations were POLAN-analyzed by McNamara and Reinisch, there are not yet enough

data to establish at the present time a reliable valley and peak altitude (hmF2) description. It is hoped that this can be done in the future, so that the indirect assessment of hmF2 from the propagation parameter M(3000)F2 can finally be given up.

It is intended to develop a "multiple choice" IRI in which different descriptions are available. The specification chosen shall be indicated by a five-digit number. The future development of IRI was discussed and indicated in this system.

Some progress was obtained by Kazimirovsky in establishing a (separate) computer programme for describing the results of ionospheric drift measurements. The programme is not yet ready for general distribution.

The Workshop on Ionospheric Informatics, to be held from 26 to 28 May 1987 in Novgorod, USSR, is considered to be an important milestone of IRI, in particular since, at the URSI General Assembly in 1987, only one 30-min slot is provided for presenting the status of the IRI project.

K. Rawer

XIXTH GENERAL ASSEMBLY OF THE INTERNATIONAL ASTRONOMICAL UNION

The XIXth General Assembly was held in New Delhi, India, from 19 to 28 November 1985. URSI was represented by Professor V. Radhakrishnan, Past Chairman of URSI Commission J on Radio Astronomy.

We reproduce below the official versions, in English and in French, of those Resolutions adopted at New Delhi, which are of interest to URSI.

Resolution B1 : Responsibility for Time

The International Astronomical Union,

recalling

- 1) that the establishment of International Atomic Time (TAI) and of Coordinated Universal Time (UTC) is one of the present tasks of the Bureau International de l'Heure (BIH), and
- 2) that the IAU is the main parent scientific Union of the BIH, the other parent unions being the International Union of Geodesy and Geophysics (IUGG) and the International Union of Radio Science (URSI), and

considering

- 1) that the atomic time scales, originally used mainly in astronomy, have now a much wider use, including numerous and important technical and public applications,
- 2) that TAI is based solely on physical measurements independent of astronomy,
- 3) that there exists an inter-governmental organization of which the Bureau International des Poids et Mesures (BIPM) is the Executive Body in charge of the unification of measurement of the major physical quantities,
- 4) that UTC is based both on TAI and on the astronomical time scale designated as Universal Time (UT1), and
- 5) the URSI recommendation A-1, 1984, relative to the transfer of TAI to the BIPM,

approves of TAI being taken over entirely by the Bureau International des Poids et Mesures, under the responsibility of the International Committee of Weights and Measures (CIPM) and of the General Conference of Weights and Measures,

recommends

- 1) that the function of determining and announcing the leap seconds of the UTC system, as well as the function of determining and announcing the $\Delta UT1$ corrections, be given to the new International Earth Rotation Service entrusted by the IAU and IUGG with the evaluation of the Earth rotation parameters, and
- 2) that a permanent committee, where the IAU will be represented, be created, under the sponsorship of CIPM in order to take care of the interest of TAI users, and

extends to the Paris Observatory its thanks for the service provided to the international community by supporting the BIH.

Resolution B3: CCIR Actions

The International Astronomical Union,

recalling the considerations (a) to (d) of IAU Resolution No 3 passed at the XVIIth General Assembly in 1979 concerning harmful interference to radio astronomy observations, and

noting

- a) that the IAU, URSI, and COSPAR have collaborated over many years in the Inter-Union Commission on the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF) in obtaining such bands by international agreement,
- b) that certain experiments have begun in which transmissions take place from space in one of these bands, and that these transmissions may interfere with observations of OH emission from Halley's Comet,
- c) that proposals for revision of Recommendation 314 of the CCIR, for consideration by its XVIIth Plenary Assembly, reflect the interests of astronomers, and
- d) that additions to CCIR Reports 224 and 697, and a draft new Recommendation (Doc.2/196) emphasize the concern of radio astronomers regarding the possible effects of spurious

emissions from space stations, especially those which are geostationary,

resolves

- 1) that the documentation of Study Group 2 of the CCIR, regarding revisions to Recommendation 314, Reports 224 and 697 and draft Recommendation (Doc. 2/196) is welcomed by astronomers as contributions to the XVIth Plenary Assembly of CCIR, and
- 2) that in respect to draft Recommendation (Doc. 2/196), astronomers should heed the likely limitations on observations within 5° of a geostationary satellite orbit from any single observatory, and of the need to reduce the side-lobe gains of their antennae to the greatest practicable extent, and

recommends in view of the particular danger of interference to radio astronomy from space-based radio transmissions, that all those concerned in the design of systems requiring radio transmissions from space should consult with IUCAF at the planning stage to ensure that sensitive passive radio observations are not jeopardized in the future.

Resolution B4: Radio Frequency Transmission from Space

The International Astronomical Union,

considering

- a) that certain frequency bands in the range 1300-1800 MHz are very important to the science of radio astronomy, in particular the allocated bands 1330-1427 MHz, 1610.6-1613.8 MHz, 1660-1670 MHz and 1718.8-1722.2 MHz,
- b) that radio astronomy observatories are particularly vulnerable to interference from transmitters located on aircraft and spacecraft,
- c) that the frequency range 1300-1800 MHz is also the object of considerable attention for satellite systems in a number of countries for navigation, position location, and communications,
- d) that certain modulation methods are coming into more common usage in Space Radio Services, such as spread spectrum techniques which may cause interference to radio astronomy,

not only in frequency bands adjacent to transmission bands, but also at frequencies far removed from bands allocated to space services,

- e) that the International Telecommunications Union (ITU) World Administrative Radio Conference (WARC) for Mobile Services, which is scheduled for 1987, may allocate frequencies in the band 1300-1800 MHz in order to accommodate satellite services, and
- f) that the Mobile Service WARC in 1987 and the WARC on the Use of the Geostationary-Satellite Orbit and the Planning of the Space Services Utilizing It, which is scheduled for 1988, may establish technical standards governing unwanted emissions from the transmitters in the space services,

urges

- a) that administrations should avoid, whenever practicable, planning space systems with transmitters on spacecraft or aircraft, which operate in the frequency bands listed in consideration (a) above,
- b) that administrations take into account the current allocations to the radio astronomy service and its vulnerability to air and space transmissions when preparing proposals for the 1987 WARC for the Mobile Services and the 1988 Space WARC,
- c) that administrations devise and adopt technical standards governing unwanted transmissions from transmitters in the space services both nationally and through the Radio Regulations of the ITU, and
- d) that administrations coordinate those satellite systems which may impact radio astronomy through the Inter-Union Commission on the Allocation of Frequencies for Radio Astronomy and Space Science (IUCAF) with sufficient lead time in the planning phase for an effective exchange of concerns to take place.

Resolution B5: VLBI Coordination

The International Astronomical Union,

recognizing

- 1) that the well-established international collaboration in

ground-based VLBI has resulted in high-angular-radio imaging,

- 2) that ground-based VLBI images have demonstrated the need for even higher resolution which can be achieved by the combination of ground arrays and future space-based antennae,
- 3) that the feasibility of launching space-based VLBI elements into Earth orbit is under investigation by space agencies around the world,
- 4) that the full scientific benefits of VLBI will result only from observations obtained through the combined and simultaneous use of all space-based antennae with existing ground facilities, and
- 5) that COSPAR has established an ad hoc Committee to examine the requirements for coordinated space and ground-based VLBI activities,

recommends that the appropriate national and international authorities concerned with space and ground-based VLBI make every effort to coordinate in a timely way the contributions to this important international programme.

x x x x x

Résolution B1: Responsabilité de l'Heure

L'Union Astronomique Internationale,

rappelant

- 1) que l'établissement du Temps Atomique International (TAI) et du Temps Universel Coordonné est une des tâches actuelles du Bureau International de l'Heure (BIH), et
- 2) que l'UAI est la principale Union scientifique mère du BIH, les autres unions apparentées étant l'Union Internationale de Géodésie et de Géophysique (UGGI) et l'Union Radio-Scientifique Internationale (URSI), et

considérant

- 1) que les échelles de temps atomiques, originellement utilisées principalement en astronomie, ont maintenant acquis une diffusion plus large comprenant de nombreuses et importantes applications techniques et publiques,
- 2) que le TAI est basé uniquement sur des mesures physiques

indépendantes de l'astronomie,

- 3) qu'il existe une organisation inter-gouvernementale dont le Bureau International des Poids et Mesures (BIPM) est le Corps Exécutif, ayant la charge de l'unification de la mesure des quantités physiques importantes,
- 4) que l'UTC est basé à la fois sur le TAI et sur l'échelle de temps astronomique connue sous le nom de Temps Universel, (UT1), et
- 5) la recommandation de l'URSI A-1, 1984, relative au transfert du TAI au BIPM,

approuve la prise en charge complète du TAI par le Bureau International des Poids et Mesures, sous la responsabilité du Comité International des Poids et Mesures (CIPM) et de la Conférence Générale des Poids et Mesures,

recommande

- 1) que la fonction de détermination et d'annonce des secondes intercalaires du système UTC, comme celle de déterminer et d'annoncer les corrections Δ UT1 soient confiées, en plus de l'évaluation des paramètres de rotation de la Terre, au nouveau service international "Rotation de la Terre", à qui l'UAI et l'UGGI donnent leur entière confiance,
- 2) qu'un comité permanent, dans lequel l'UAI sera représentée, soit créé, sous le parrainage du CIPM, dans le but de prendre soin des intérêts des utilisateurs du TAI, et

adresse à l'Observatoire de Paris ses remerciements pour le service rendu à la communauté internationale par le support apporté au BIH.

Résolution B3: Actions du CCIR

L'Union Astronomique Internationale,

rappelant les considérations (a) à (d) de la Résolution No 3 votée à la XVIIème Assemblée générale de l'UAI en 1979 concernant l'interférence nuisible sur des observations radio-astronomiques, et

notant

- a) que l'UAI, l'URSI et le COSPAR ont collaboré durant de nombreuses années au sein de la Commission inter-Unions

pour l'Attribution de Fréquences à la Radioastronomie et à la Science Spatiale (IUCAF) à l'obtention, par accord international, de telles bandes,

- b) que certaines expériences ont été entreprises dans lesquelles des transmissions ont lieu depuis l'espace dans une de ces bandes, et que ces transmissions peuvent interférer avec les observations de l'émission OH de la Comète de Halley,
- c) que des propositions de révision de la recommandation 314 du CCIR, dans le contexte de sa XVIème Assemblée plénière, reflètent l'intérêt des astronomes,
- d) que des additions aux rapports 224 et 697 du CCIR, et un projet de nouvelle Recommandation (Doc. 2/196) soulignent le souci des radioastronomes en ce qui concerne les effets possibles d'émissions intempestives depuis des stations spatiales, en particulier les stations géostationnaires,

décide que

- 1) la documentation de la Commission d'études 2 du CCIR, concernant les révisions de la recommandation 314, des rapports 224 et 697 et du projet de recommandation (Doc.2/196) est accueillie favorablement, par les astronomes, comme contributions à la XIXème Assemblée plénière du CCIR,
- 2) en ce qui concerne le projet de recommandation (Doc.2/196), les astronomes devront veiller aux limitations probables sur les observations à moins de 5° de l'orbite d'un satellite géostationnaire à partir de tout observatoire, et à la nécessité de réduire les gains de lobe de leurs antennes au maximum des possibilités pratiques, et

recommande, pour parer au danger particulier d'interférence avec la radioastronomie des transmissions radio à partir des stations spatiales, que tous ceux qui sont concernés par la définition de systèmes utilisant des transmissions radio depuis l'espace se mettent en contact avec l'IUCAF dès la phase de définition de leur projet afin de garantir que des observations radioastronomiques passives et sensibles ne soient pas compromises dans le futur.

Résolution B4: Transmissions radioélectriques à partir de
l'espace

L'Union Astronomique Internationale,
considérant

- a) que certaines bandes de fréquence dans le domaine 1300-1800 MHz sont très importantes pour la radioastronomie, en particulier les bandes allouées 1330-1427 MHz, 1610,6 - 1613,8 MHz, 1660-1670 MHz et 1718,8-1722,2 MHz,
- b) que les observations radioastronomiques sont particulièrement vulnérables aux interférences provoquées par les émissions issues d'avions ou de satellites,
- c) que le domaine de fréquences 1300-1800 MHz est aussi d'un intérêt considérable pour les systèmes de satellites dans nombre de pays pour la navigation, la localisation de la position, et les communications,
- d) que certaines techniques de modulation sont de plus en plus couramment employées dans les services de radio spatiale, telles par exemple les techniques de "spread spectrum", qui peuvent causer des interférences pour la radioastronomie, non seulement dans des bandes de fréquences adjacentes aux bandes de transmission, mais aussi à des fréquences très éloignées des bandes allouées aux services spatiaux,
- e) que la Conférence Administrative Mondiale des Radiocommunications (WARC) pour les services mobiles de l'Union Internationale des Télécommunications, qui est prévue pour 1987, pourra décider d'attribuer des fréquences dans la bande 1300-1800 MHz en vue d'installer des services de satellites artificiels, et
- f) que les Services Mobiles WARC en 1987 et la WARC prévue en 1988 pour l'Utilisation de l'Orbite Géostationnaire et la Planification des Services Spatiaux qui l'utilisent, pourront décider de l'établissement de standards techniques relatifs à des émissions non voulues à partir d'émetteurs dans des services spatiaux,

insiste pour

- a) que les administrations évitent, chaque fois qu'il est possible, de proposer des projets de systèmes spatiaux comprenant des émetteurs sur satellites ou avions opérant dans les bandes de fréquence dont la liste figure ci-

- dessus (considération a),
- b) que les administrations prennent en compte les allocations actuelles au service de radioastronomie et sa vulnérabilité aux transmissions aériennes et spatiales lors de la préparation des propositions pour la WARC 1987 pour les Services Mobiles, et pour la WARC spatiale de 1988,
 - c) que, au plan national, ou à partir des règlements radio de l'UIT, les administrations mettent au point et adoptent les standards techniques régissant les émissions intempestives à partir d'émetteurs spatiaux, et
 - d) que les administrations coordonnent les systèmes satellisés qui peuvent interagir avec la radioastronomie, par l'intermédiaire de l'IUCAF, en tenant compte d'un délai suffisant au niveau de la planification pour qu'un échange de vues puisse avoir lieu.

Résolution B5: Coordination relative à l'interférométrie à très grande base (VLBI)

L'Union Astronomique Internationale,
reconnaissant

- 1) que la collaboration internationale dans le domaine de la VLBI au sol conduit à de l'imagerie à haute résolution angulaire,
- 2) que les images VLBI au sol ont prouvé la nécessité d'une résolution encore plus grande qui peut être atteinte par la combinaison de réseaux d'observatoires au sol et de futures antennes placées dans l'espace,
- 3) que la faisabilité de placer sur orbite des éléments de VLBI est à l'étude dans différentes agences spatiales du monde,
- 4) que le maximum de retombées scientifiques de la VLBI ne pourra résulter que d'observations à la fois combinées et simultanées de toutes les antennes en orbite avec les installations existant au sol,
- 5) que le COSPAR a constitué un Comité ad hoc pour examiner les conditions nécessaires aux activités VLBI coordonnées entre l'espace et le sol,

recommande que les autorités compétentes nationales et internationales concernées par les VLBI dans l'espace et au sol consacrent tous leurs efforts à coordonner les contributions à cet important programme international.

COLLOQUE DE L'UNESCO: "LA SCIENCE FACE AUX CONFINES DE LA CONNAISSANCE: LE PROLOGUE DE NOTRE PASSÉ CULTUREL"

Le Directeur Général de l'UNESCO nous a demandé de diffuser le communiqué final du Colloque international qui s'est tenu à Venise en mars 1986.

"Les participants au colloque "La science face aux confins de la connaissance: Le prologue de notre passé culturel", organisé par l'UNESCO avec la collaboration de la Fondation Giorgio Cini (Venise, 3-7 mars 1986), animés par un esprit d'ouverture et de questionnement des valeurs de notre temps, sont tombés d'accord sur les points suivants:

1. Nous sommes témoins d'une très importante révolution dans le domaine de la science, engendrée par la science fondamentale (en particulier, par la physique et la biologie), par le bouleversement qu'elle apporte en logique, en épistémologie et aussi dans la vie de tous les jours à travers les applications technologiques. Mais nous constatons, en même temps, l'existence d'un important décalage entre la nouvelle vision du monde qui émerge de l'étude des systèmes naturels et les valeurs qui prédominent encore en philosophie, dans les sciences de l'homme et dans la vie de la société moderne. Car ces valeurs sont fondées dans une large mesure sur le déterminisme mécaniste, le positivisme ou le nihilisme. Nous ressentons ce décalage comme étant fortement nuisible et porteur de lourdes menaces de destruction de notre espèce.

2. La connaissance scientifique, de par son propre mouvement interne, est arrivée aux confins où elle peut commencer le dialogue avec d'autres formes de connaissance. Dans ce sens, tout en reconnaissant les différences fondamentales entre la science et la tradition, nous constatons non pas leur opposition mais leur complémentarité. La rencontre inattendue et enrichissante entre la science et les différentes traditions du monde permet de penser à l'apparition d'une vision nouvelle de l'humanité, voire d'un nouveau rationalisme, qui pourrait conduire à une nouvelle perspective métaphysique.

3. Tout en refusant tout projet globalisant, tout système fermé de pensée, toute nouvelle utopie, nous reconnaissons en

même temps l'urgence d'une recherche véritablement transdisciplinaire dans un échange dynamique entre les sciences "exactes", les sciences "humaines", l'art et la tradition. Dans un sens, cette approche transdisciplinaire est inscrite dans notre propre cerveau par l'interaction dynamique entre ses deux hémisphères. L'étude conjointe de la nature et de l'imaginaire, de l'univers et de l'homme, pourrait ainsi mieux nous approcher du réel et nous permettre de mieux faire face aux différents défis de notre époque.

4. L'enseignement conventionnel de la science par une présentation linéaire des connaissances dissimule la rupture entre la science contemporaine et les visions dépassées du monde. Nous reconnaissons l'urgence de la recherche de nouvelles méthodes d'éducation, qui tiendront compte des avancées de la science qui s'harmonisent maintenant avec les grandes traditions culturelles, dont la préservation et l'étude approfondie paraissent fondamentales. L'UNESCO serait l'organisation appropriée pour promouvoir de telles idées.

5. Les défis de notre époque - le défi de l'auto-destruction de notre espèce, le défi informatique, le défi génétique, etc. éclairent d'une manière nouvelle la responsabilité sociale des scientifiques, à la fois dans l'initiative et dans l'application de la recherche. Si les scientifiques ne peuvent pas décider de l'application de leurs propres découvertes, ils ne doivent pas assister passivement à l'application aveugle de ces découvertes. A notre avis, l'ampleur des défis contemporains demande, d'une part, l'information rigoureuse et permanente de l'opinion publique, et d'autre part, la création d'organes d'orientation et même de décision de nature pluri- et transdisciplinaire.

6. Nous exprimons l'espoir que l'UNESCO va poursuivre cette initiative en stimulant une réflexion dirigée vers l'universalité et la transdisciplinarité.

ANNOUNCEMENTS OF MEETINGS AND SYMPOSIA

MICROWAVE SIGNATURES IN REMOTE SENSING (MSRS 87)

This International URSI Commission F Symposium on Microwave Signatures in Remote Sensing will be held at Chalmers University of Technology in Göteborg, Sweden, from 19 to 22 January 1987. It is the fourth in the series of meetings held in Berne, Switzerland (1974), in Lawrence, Kansas, USA (1981), and in Toulouse, France (1984).

The Symposium is intended for specialists working with theoretical or experimental aspects of radar backscatter and microwave emission from the surface of the Earth, including oceans, ice and land.

The focus is on scientific aspects of the microwave interaction with water, ice, snow, ground surfaces and vegetation, and its implications for the interpretation of results from passive and active earth sensing systems. Of special interest are papers dealing with active radio systems for the observation of sea, ice and snow, and of polar areas. The importance of this subject area grows as ERS-1 and other radar satellites approach.

An extensive international Programme Committee has been set up. It is chaired by Åke Blomquist, Swedish URSI Committee and Swedish Defence Research Institute, with Folke Eklund, Remote Sensing Committee of the Swedish Board of Space Activities as Co-Chairman.

Advance registration and title of proposed papers were requested by 1 May 1986, and abstracts of proposed papers by 1 August 1986.

For further information on the MSRS 87 Symposium, contact the Chairmen of the Programme Committee at the following address:

Swedish Defence Research Institute
P.O. Box 1165
S - 581 11 Linköping, Sweden.

Phone: +46 13 11 80 00

Telex: 50073 FOAS

NATIONAL RADIO SCIENCE MEETING 1987

This open scientific meeting will be held at the University of Colorado, Boulder, Colorado from 12 to 15 January 1987. It is sponsored by the US URSI Committee, in cooperation with the following IEEE Societies: Antennas and Propagation, Circuits and Systems, Communications, Geoscience and Remote Sensing, Information Theory, Instrumentation and Measurement, Microwave Theory and Techniques, Nuclear and Plasma Sciences.

The Chairman of the Technical Programme Committee is Prof. Chalmers M. Butler.

Papers on any topic of interest to a Commission are welcome. In addition, papers on the special topics listed below are solicited.

Commission A - Electromagnetic Metrology: Antenna and EM field measurements; Time domain measurements; Integrated circuit measurements; EM measurements using satellites; EM measurements in biology.

Commission B - Fields and Waves: Scattering and diffraction; Transient fields; Numerical techniques; Inverse scattering; Antennas and arrays; Random media.

Commission E - Electromagnetic Noise and Interference: Characterization, measurement, and modeling of noise and interference; Performance of systems and non-gaussian environment; EMP.

Commission F - Remote Sensing and Wave Propagation - Neutral Atmosphere, Oceans, Land, Ice: Earth-space propagation; Tropospheric propagation; Radio meteorology; Propagation in the ground.

Commission G - Ionospheric Radio and Propagation: Auroral and polar cap irregularities; Global ionospheric variations; Ionospheric radio techniques; What is there left to study about the ionosphere and why?; World-wide acoustic gravity wave study; ELF/VLF radio wave propagation; Ionospheric modification.

Commission H - Waves in Plasmas: Wave, particle, and mass injections in space plasmas; Plasma chamber simulation of space phenomena; RF acceleration of particles in space; Ionospheric wave experiments from the space station.

Commission J - Radio Astronomy: Data management: storage, recording devices; Signal processing: spectrometers, correla-

tors, pulsar detectors; Future instrumentation: detectors, space/lunar based antennas; Millimeter and submillimeter wave techniques: detectors, antennas, optics, spectrometers, image processing.

Instructions for the submission of abstracts can be obtained from:

Prof. S.W. Maley, Chairman, Steering Committee
National Radio Science Meeting
Department of Electrical Engineering
University of Colorado
Boulder, CO 80309, USA.

The deadline for abstracts is 1 October 1986.

BIREGIONAL LATIN AMERICAN-AFRICAN WORKSHOP ON
RADIO PROPAGATION RESEARCH AND APPLICATIONS
(including spectrum management)

The Biregional Latin American-African Workshop on Radio Propagation Research and Applications is being organized by the URSI Standing Committee on Developing Countries. It will be held in Buenos Aires, Argentina from 30 March to 2 April 1987. The local organizer is: Programa Nacional de Radiopropagacion (PRONARP) of the Consejo Nacional de Investigaciones Cientificas y Técnicas. The official language will be English.

The objectives of this meeting, which is organized by Prof. S.M. Radicella (Argentina) and Prof. J.O. Oyinloye (Nigeria), are as follows:

1. To define the actual status of research work in the field of radio propagation in the regions involved (Africa and Latin America).
2. To evaluate the needs for future research programmes or projects in the regions, in the light of knowledge development and application needs.
3. To define the present status of the radio propagation research contribution to radiocommunication systems and radio spectrum management studies - including interference control in the regions, taking into account the

geographical peculiarities of the low latitudes areas.

4. To analyze coordinated activities for the best use of human and material scientific resources in the field in the Latin American and African regions.

The Workshop will include sessions with review papers on research results in the field of radio propagation and their applications, in the regions involved. The main part of the meeting will be devoted to round-table discussions on matters related to the objectives given above. A final document will be produced as a result of the Workshop.

Further information is available from:

Prof. Sandro M. Radicella
Executive Secretary, PRONARP
1987 Biregional Workshop
Julian Alvarez 1218
1414 Buenos Aires, Argentina.

REMOTE SENSING: UNDERSTANDING THE EARTH AS A SYSTEM

The 1987 IEEE International Geoscience and Remote Sensing Symposium (IGARSS'87) will be held jointly with USNC/URSI Commission F at the University of Michigan, Ann Arbor, USA, from 18 to 21 May 1987. The meeting is co-sponsored by the Canadian Remote Sensing Society, the European Space Agency, DFVLR, the Office of Naval Research, NASA and NOAA.

The theme of IGARSS'87 emphasizes the complementary roles of instrumentation, theory, and experiment in developing the requisite understanding for global applications and will be the focus of specially organized sessions. The technical sessions will be coordinated to provide a comprehensive and well-balanced programme of submitted and invited papers.

The authors are encouraged to submit papers on all topics of interest to the Geoscience and Remote Sensing Society and URSI Commission F.

The General Chairman is Prof. F.T. Ulaby. Inquiries

regarding the technical programme may be directed to the Technical Programme Committee Chairmen as follows:

IGARSS'87 Technical Programme Chairman
Prof. K.R. Carver
Department of Electrical and Computer Eng.
University of Massachusetts
Amherst, MA 01003
USA.

URSI Commission F Technical Programme
Chairman
Prof. T.B.A. Senior
Department of Electrical Engineering and
Computer Science
University of Michigan
Ann Arbor, MI 48109
USA.

Summaries of papers must be received by the Technical Programme Chairmen before 1 December 1986.

1987 IEEE AP-S INTERNATIONAL SYMPOSIUM AND
USNC/URSI RADIO SCIENCE MEETING

The 1987 International Symposium and Radio Science Meeting sponsored jointly by the IEEE Antennas and Propagation Society and by USNC Commissions A and B of URSI will be held at the Virginia Polytechnic Institute and State University, Blacksburg, Virginia, from 15 to 19 June 1987. The technical sessions for IEEE AP-S and URSI will be coordinated to provide a comprehensive and well-balanced programme. Authors are invited to submit papers on all topics of interest to the AP-S and URSI membership. Inquiries regarding the technical programme may be directed to:

Charles W. Bostian: IEEE AP-S/USNC-URSI Symposium
Technical Programme Chairman
Department of Electrical Engineering
Virginia Polytechnic Institute and State Univ.

Blacksburg, Virginia 24061
USA
Tel. (703) 961-6834.

Further information regarding the Symposium may be obtained from:

Warren L. Stutzman
General Chairman
Department of Electrical Engineering
VPI&SU
Blacksburg, VA 24061
USA
Tel. (703) 961 6835.

The deadline for receipt of abstracts is 2 January 1987.

FORUM 87

5e FORUM MONDIAL DES TELECOMMUNICATIONS

PARTIE 2, SYMPOSIUM TECHNIQUE

Le Forum, organisé par l'Union Internationale des Télécommunications (UIT) est patronné par des associations professionnelles techniques nationales et internationales des cinq continents.

Les sessions du Forum mondial des télécommunications se sont déroulées à Genève (Suisse) en 1971, 1975, 1979 et 1983 et l'Union Internationale des Télécommunications et un grand nombre d'associations professionnelles techniques de ses 161 pays Membres préparent actuellement le 5e Forum mondial des télécommunications, Partie 2, Symposium technique. Le Symposium aura lieu dans le cadre de TELECOM 87 au Palais des expositions et des congrès de Genève, du jeudi 22 octobre au mardi 27 octobre 1987.

Le Forum mondial des télécommunications, qui a lieu tous les quatre ans, est une rencontre de caractère universel et de haut niveau technique et scientifique. Le Forum est reconnu comme le "sommet" de l'échange des idées dans le monde des télécommunications, qui évolue rapidement. C'est aussi le plus important rassemblement international de spécialistes des télécommunications.

Le thème du Forum sera "Les services de télécommunication pour la communauté mondiale des nations".

Le Président du Forum est M. R.E. Butler, Secrétaire général de l'UIT; M. Th. Irmer, Directeur du CCITT est le Président du Symposium technique et M. R.C. Kirby, Directeur du CCIR, en est le Vice-Président. Le Comité du Programme technique comprend M. J.S. Ryan (Président), M. M. Thué (Vice-Président), le Prof. F.L. Stumpers (Président d'honneur) ainsi que 27 autres personnalités.

Les thèmes principaux du Symposium technique seront:

- L'utilisateur en point de mire
- Nouveaux services de télécommunication
- Evolution des réseaux
- Systèmes destinés à l'utilisateur mobile
- Services de radiodiffusion
- Tendances technologiques.

De plus amples renseignements peuvent être obtenus auprès du:

Secrétariat du Forum 87
Union Internationale des Télécommunications
CH - 1211 Genève 20, Suisse.
Téléphone: +41 22 99 51 90.

INTERNATIONAL SYMPOSIUM ON ELECTRONIC DEVICES,
CIRCUITS AND SYSTEMS (ISELDECS-87)

The International Symposium ISELDECS-87 will be held from 16 to 18 December 1987 at the Indian Institute of Technology at Kharagpur. It aims to provide a forum to research workers all the world over for exchange of information and technical perceptions in electronic devices, circuits and systems. The Symposium will cover a broad range of topics relating to the recent advances and present trends in the above area.

The Chairman of the National Organization Committee is Prof. G.S. Sanyal, and the Chairman of the Steering Committee is Prof. M.N. Faruqui.

The Technical Programme of the Symposium will consist of regular sessions of contributed and invited papers, poster sessions, keynote addresses and panel discussions. Topics for the sessions include, but are not limited to, the following areas:

- Devices: MOS bipolar VLSI, modelling, technology; High speed, microwave and millimeter wave devices; Optoelectronic devices.
- Circuits: LSI/VLSI logic and memories; CAD-standard cells, gate arrays, reconfigurable arrays, PLAs, statistical IC design, silicon compiler; High speed signal processing ICs, GaAs ICs; Switched capacitor networks; Communication circuits; Hybrid circuits, MICs; Distributed networks.
- Communication systems: Satellite, computer, optical communication; Mobile systems; Spread spectrum technique, error control coding, multiple access; Voice and picture coding; modulation techniques; ISDN.
- Computers: Artificial intelligence and expert systems; Testable design; Local and wide area networks; Concurrent and parallel algorithms; Fault tolerance.
- Control systems: System identification and parameter estimation; Robotics; Guidance; Learning systems; Distributed control systems.
- Microwaves and millimeter waves: Microwave networks; Phased arrays; Reflector antennas, microstrip antennas, feeds; EMI/EMC, scattering, imaging; Millimeter wave systems; Radar systems.
- Signal processing: Adaptive processing; Radar and sonar signal processing; Speech processing; Image processing; Digital filters; Remote sensing.
- Pattern recognition: Feature selection, segmentation and classification; Computer vision and shape analysis; Dynamic scene analysis, fuzzy sets; Biomedical applications.
- Fiber optics: Sources, detectors, links; WDM, coherent transmission; Picosecond electronics; Electromagnetics.

The deadline for the submission of extended abstracts is 31 March 1987.

Authors may obtain further information from:

Prof. N.B. Chakrabarti
Department of Electronics and Electrical
Communication Engineering
Indian Institute of Technology
Kharagpur 721302, WB, India.

BOOKS PUBLISHED BY URSI PERSONALITIES

K. RAWER (former Chairman, URSI Commission G)

*Meine Kinder umkreisen die Erde - Der Bericht eines
Satellitenforschers.*

Band 1226, pp.160. Herder Bücher, 1986.

W.N. CHRISTIANSEN (Honorary President, URSI) and J.A. HOGBOM

Radiotelesopes.

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This is the second edition of an excellent monograph written by two pioneers in radiotelescope design, and first published in 1969.

The new edition, though having the same structure as the first one, has been considerably revised and expanded to take into account the evolution of radio astronomy instruments and techniques. Chapter 1 gives an introduction to radio astronomy and a review of the various types of radiotelesopes. The second chapter deals with the characteristics of the antennas and the quantities they measure. In the following chapter, the authors present the characteristics and properties of the steerable parabolic reflector, the most common form of radiotelesopes. Chapter 4 is devoted to filled-aperture antennas others than the parabolic reflector. Chapters 5 and 6 take up the subjects of correlation telescopes and unfilled-aperture antennas. Chapter 7, which has been entirely re-written, is concerned with aperture synthesis fundamentals, the synthesis by the systematic use of the Earth's rotation,

antenna systems for aperture synthesis, the reception pattern of a synthesis telescope, image formation and spectral synthesis. The sensitivity and the observing efficiency of radio-telescope systems are discussed in the final chapter.

This new up-to-date edition will certainly be welcomed by radioastronomers, specialists in highly directional radio antennas and graduate students interested in radio astronomy.

R. Gonze

