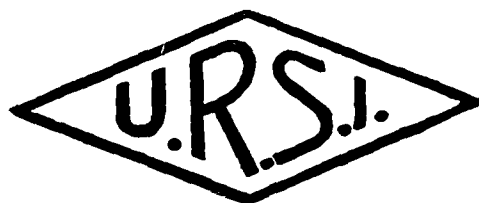


UNION RADIO-SCIENTIFIQUE INTERNATIONALE  
INTERNATIONAL UNION OF RADIO SCIENCE



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the existence of the auroral phenomenon at ionospheric levels is certainly well known and well studied, it is only in the last few years that the relevant magnetospheric extensions have been reasonably identified. On the day-side the polar cusp is now known to connect to the auroral oval, and currents flowing along the cusp radiate waves that interact with the particles. In the night hemisphere an analogous boundary appears to separate the outer radiation zone and the plasma sheet. This Working Group would be charged with analyzing the effects of waves and wave-particle interactions at these boundaries, with emphasis on the relations to substorm and auroral phenomena.

Since the questions to be dealt with by these three Groups are of interest also to IAGA, it is intended to study the possibility of setting them up as joint URSI-IAGA Groups.

#### SCIENTIFIC SESSIONS AT XVIII GENERAL ASSEMBLY.

It is expected that the primary topics to be dealt with in the Scientific Sessions of Commission IV will be those covered by the terms of reference of the Working Groups referred to above.

### COMMISSION V. — RADIO ASTRONOMY

*Chairman* : Prof. C. A. MULLER (Netherlands)

#### PAPERS PRESENTED DURING SCIENTIFIC SESSIONS

##### *Session on Spectral line observations*

— Review, B. ZUCKERMAN.

##### Contributed Papers :

- The Green Bank - Maryland Survey, G. WESTERHOUT.
- High velocity clouds, F. J. KERR
- Observations at Chalmers University, E. KOLLBERG
- Observations at Arecibo, F. D. DRAKE.
- CNES/USSR work at Nançay, J. C. RIBES
- Jodrell Bank observations, A. PEDLAR
- Water observations at Hat Creek, J. WELCH.
- VLB studies of interstellar masers, J. M. MORAN
- Spectroscopy with the Caltech interferometer, A. MOFFET.

##### *Session on Low frequency work, pulsars and galactic studies .*

— Review, J. E. BALDWIN.

##### Contributed Papers :

- Satellite observations, R. G. STONE.
- A 30 MHz survey, W. N. CHRISTIANSEN.
- Sky surveys of the galaxy, R. WIELEBINSKI.
- Sagittarius A, G. SWARUP.
- Nançay observations, J. KAZES
- Pulsar spectra, N. A. LOTOWA
- A pulsar search, J. G. DAVIES
- Pulsar studies at Arecibo, F. D. DRAKE
- Pulsar spectra, F. G. SMITH
- HII regions, J. W. M. BAARS.
- Westerbork observations, H. VAN DER LAAN
- Polarization of the Cygnus loop, M. KUNDU.
- Galactic structure, F. J. KERR.

*Session on Radiation from the Earth's plasma environment* (see Commission IV).

##### *Session on Instrumentation and data processing .*

— Review, R. WIELEBINSKI.

##### Contributed Papers :

- The 100-m telescope electronics, N. KEEN.
- The 100-m telescope pointing system, J. SCHRAML.
- Data processing, R. HASLAM.
- The Westerbork telescope, J. CASSE.
- The Cambridge 5-km telescope, G. POOLEY.
- The new Fleurs telescope, W. N. CHRISTIANSEN.
- New feeds at Arecibo, F. D. DRAKE.
- The Parkes telescope improvements, J. G. ABLES.
- Masers at Onsala, E. KOLLBERG
- Quadratic detection, J. C. RIBES.
- Phase error correction, H. TANAKA.
- A line spectrometer at Westerbork, K. G. WELLINGTON.
- Data processing, R. HARTEN.

##### *Session on High-resolution extra-galactic studies .*

— Review, H. VAN DER LAAN.

Contributed Papers :

- The Parkes interferometer, U. SCHWARZ.
- Occultations at Ooty, G. SWARUP
- Faraday rotation measures, S GOLDSTEIN
- Jodrell Bank interferometers, R. E SPENCER.
- VLB observations, L. J. MATVEYENKO
- VLB observations, M. COHEN
- Line interferometry, K. G WELLINGTON
- Line observations of galaxies, J. E. BALDWIN.
- 6-cm work with the 1-mile telescope, G. POOLEY
- Odd galaxies, R. ETERS.

*Session on Millimetre wave observations and techniques .*

- Review, S. WEINREB.

Contributed Papers :

- New mm-wave telescopes in the USSR, A. KISLIAKOV.
- The Bordeaux interferometer, E. J. BLUM.
- The Hat Creek interferometers, J. WELCH.
- A 23 GHz maser, E. KOLLBERG.
- Bolometric detectors, P. E. CLEGG.
- mm-wave molecular lines, B. ZUCKERMAN.
- Methyl alcohol, A. BARRETT.
- Solar eclipse results, J. P. HAGEN.
- Solar observations, M. KUNDU.
- Search for oscillations in solar flux density, W. SHUTER.

*Session - Reports from observatories.*

Brief reports on work :

- NRAO (USA), S WEINREB; Arecibo (Puerto Rico), F. D. DRAKE; British Columbia (Canada), W. SHUTER; Westerbork and Dwingeloo (Netherlands), R. ETERS, J. W. M. BAARS, K. WELLINGTON, J HAMAKER and A. BOS; Jodrell Bank (UK), F G. SMITH, Illinois (USA), G. W SWENSON; Fleurs (Australia), R. FRATER, Haystack (USA), G. PETTINGILL, Nançay (France), E. J. BLUM; Culgoora (Australia), N. LABRUM; Ahmedabad (India), R. BHONSLE; Clark Lake (USA), G. WESTERHOUT; Toyokawa and Nobeyama (Japan), H. TANAKA; Ootacamund (India), G. SWARUP; Committee of European Radio Astronomers, G. FEIX; Algonquin (Canada), N BROTEN; Cal Tech (USA), M. COHEN; Parkes (Australia), J. B. ABLES; Torun (Poland), S. GORGOLEWSKI.

REPORT ON BUSINESS MEETINGS

The Commission met on 21, 24 and 25 August with Prof. Muller in the Chair. Dr. J. W. Findlay acted as Secretary.

WORKING GROUPS.

No new Working Group was formed

H. Tanaka presented the Report of the Working Group on the Absolute Calibration of Solar Radio Flux Density which had already been published (*URSI Inf. Bull* , No. 174, March 1970) and which shows that the differences between the observations made by various observers have been satisfactorily resolved. It is expected that any further work will be carried out by Commission 10 of IAU (see Recommendation V.3).

The Commission thanked Dr. Tanaka and the members of his Group for a job well done. It was agreed not to dissolve the Group until IAU had indicated what action it proposed to take.

ELECTION OF VICE-CHAIRMAN.

It was agreed to submit the following candidates to the URSI Council, in order of preference : G. Westerhout (USA); G. Swarup (India); F. G. Smith (UK).

BROADCASTING SATELLITE SERVICE.

The Chairman of IUCAF reported on the work of the Commission.

The transmissions of future broadcasting satellites in a band adjacent to the radio astronomy band at 2690-2700 MHz are a cause of concern in view of the interference that may be caused to radio astronomical observations. It was agreed to ask IUCAF to keep this problem in mind and to coordinate the ATS-F satellite experiments which have been designed to provide advance information on the level of interference to be expected (see Recommendation V.2).

REORGANISATION OF URSI.

Commission V strongly supported the suggestion that qualified scientists should be eligible for individual membership of URSI and asked Prof. Christiansen to communicate this opinion to the URSI Council.

## XVIII GENERAL ASSEMBLY.

Suggestions were made regarding the scientific sessions at future Assemblies

The proposed programme should be circulated as early as possible and, if possible, the scientific sessions should be held within one working week. There should be no overlap with interesting sessions in other Commissions.

A balance should be maintained between papers on astronomy and those on instrumental questions. At the next Assembly, attention should be given to radio wave propagation, for example in interstellar space, and to optical mixers and optical interferometry.

## FUTURE SYMPOSIA

No proposals were made for future symposia, but it was suggested that one might be held in a year in which neither URSI nor IAU would hold an Assembly.

## COMMISSION VI. — RADIO WAVES AND CIRCUITS

*Chairman* . Prof H. M. BARLOW (UK)

## PAPERS PRESENTED DURING SCIENTIFIC SESSIONS

*Session on Active antenna arrays (see Commission VII).*

*Session on Media and structures for the guidance of microwaves.*

A. *Guiding of electromagnetic waves in cylindrical structures :*

- Guiding of electromagnetic waves in non-uniform cylindrical structures, J. R. WAIT.
- Surface properties of waveguides, F. A. BENSON.
- Screened surface waves of the dipole family in coaxial transmission lines, H. M. BARLOW

B. *Surface-wave and beam-wave techniques :*

- Dielectric waveguides for microwave antennas, P. J. B. CLARRICOTS
- Prism and grating couplers to surface-waves on thin films, A. A. OLINER.
- Frame beam waveguides, P. F. CHECCACCI, R. FALCIAI and A. M. SCHEGGI.

C *Ray-optical techniques in waveguide structures :*

- Real and complex rays in guiding and scattering problems, L. B. FELSEN.
- Ray optical analysis of dielectric loaded waveguides, M. A. K. HAMID, S. J. TOWAIJ and A. MOHSEN.
- Waveguide scattering problems treated by ray-optical methods, J. BOERSMA

*Session on Computer simulation of electromagnetic field problems and optimization in design.*

A. *Computer simulation of electromagnetic field problems :*

- Characteristic mode methods for use in the frequency and time domain, A. J. POGGIO.
- Diffraction radiation effect (Smith-Purcell effect), studies by computer and analytical methods, O. A. TRETIAKOV.
- A comparison of various numerical procedures used in propagation problems, A. S. VANDER VORST.

B. *Computer optimization in electromagnetic design*

- Optimization of antenna properties, J. BACH ANDERSEN.
- Computer optimization in electromagnetic design, J. W. BANDLER.
- Some optimum problems of quasi-optics and the theory of antenna synthesis, N. N. VOITOVICH.

C. *Computer electromagnetics in education :*

- Electromagnetics, computers and students, HENNING BACH
- One perspective on the rôle of computers in education in electromagnetics, A. R. NEUREUTHER.

D *Panel discussion on whither computer electromagnetics.*

*Session on Synthesis techniques in distributed circuits*

- Non-minimum-phase distributed networks, J. O. SCANLAN.
- Multivariable synthesis of cascade networks composed of uniform lossless transmission lines and lumped reactive elements, T. KOGA.
- Status of computer-aided circuit design, M. E. VAN VALKENBURG
- Analysis and computation of large nonlinear resistive networks, E. KUH.
- Complete simulation of modulated communication channels, J. K. SKWIRZYSKI.

*Session on Optical communications using guided wave and free space methods (see Commission VII).*