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APPLETON LABORATORY
NEWSLETTER

No. 174 November 1975

THE PROGRAMME OF WORK OF THE LABORATORY

It could, of course, scarcely be expected that the SRC would escape the effects of the country's overall economic problems, and a tightening of belts is inevitable at AL as elsewhere.

I think that staff will in fact already be aware that the Council's prospects for the funding of its work over the next few years are appreciably less bright than they appeared to be as little as a year ago. As a consequence the activities of the Astronomy Space and Radio Board will be reduced and this will have an effect on the AL programme, particularly in the space science field. Not only does it seem probable that less effort will in due course be required for the management of space science projects, but the opportunities for in-house space science research will also be fewer.

The committed projects IUE and UK6 are expected to proceed to completion but what new satellite projects are to follow and how much they will require AL support is not at present known. The use of Skylark rockets is currently planned to be on only an ad hoc basis after 1978. On the other hand it is expected that the Petrel rocket programme will continue, though on a reduced scale. It is further intended to have an on-going balloon programme, but again at a lower level of activity than envisaged last year.

However, it now appears that there are good prospects for a U.K. involvement in the EISCAT project, and it is hoped that the ASR Board will wish to proceed with a millimetre-wave radio astronomy facility. Both of these projects would bring work to the Laboratory.

The ASR Board will be formulating its Five-Year Forward Look over the next few months to cover the period from 1977, and it will then become clearer what the responsibilities of the Laboratory will be. I will keep the staff informed of developments. We have in fact more than enough work to do over the next two years; it is after that that problems will mainly arise.

All parts of our programme will feel the pinch, and we shall have to give thought to doing more work in-house and less by outside contracts for both our research programme and for university support purposes. This may well mean that research projects will have to proceed more slowly.

Finally, the view has been expressed in the Council that the efficient management of the cut programme (of the SRC as a whole) would probably require a reduction in the number of establishment sites as well as in supporting intra-mural staff. It is realised that this could not produce any significant short-term savings but it is felt that there might be economies in later years. The Council has therefore decided that a preliminary feasibility study should be made of reducing the number of establishment sites. This study will clearly involve consideration of the AL site.

Discussions are now in progress between the Official and Staff Sides through the Whitley machinery concerning manpower deployment and related matters in the years ahead. AL staff may expect to hear the outcome of these discussions through their own Staff Side representatives as well as from me in due course.

J. A. Saxton

I.U.C.A.F.

Staff will be interested to learn that the Deputy Director is the new Secretary-General of the Inter-Union Commission on Frequency Allocations for Radio-astronomy and Space Science (IUCAF). This appointment continues the association of the Laboratory with the Commission, the position having been previously held by our former Director, Dr. Smith-Rose and, latterly, by Dr. C. M. Minnis who was a member of our staff for many years. The Commission's role in ensuring a satisfactory radio environment for the conduct of space science and radioastronomy is explained in the following article.

THE INTER-UNION COMMISSION ON FREQUENCY ALLOCATIONS FOR RADIOASTRONOMY AND SPACE SCIENCE (IUCAF)

In the present context, the radio spectrum can be assumed to extend over the range of frequencies from 10 kHz to 275 GHz, although even higher frequencies can be expected to be used in time. It is in constant use by a wide variety of national and international services: fixed and mobile communication systems, radar and radio navigational aids for use in the air and at sea, meteorological and communication satellites, meteorological balloons, and so on. Scientists use parts of the spectrum, mainly above 1 MHz for making radioastronomical observations and also in connection with the exploitation of space vehicles for scientific research.

The intensive and ever-increasing use of the radio spectrum leads to serious problems in the efforts to satisfy the requirements of all services without mutual interference. In consequence, the use of the spectrum must be carefully managed and controlled as if it were a valuable naturally-occurring commodity of which only a strictly limited supply is available. The International Telecommunication Union (ITU) is the body which is competent to allocate frequency bands to the various competing services. These allocations are decided at World Conferences, convened from time to time by ITU, at which all the national administrations, representing the users, state their requirements and, when necessary, reach agreement on compromise arrangements when it is not possible for them to achieve their ideal objectives.

Frequency allocations for radioastronomy are used only for reception and therefore no interference is caused to other users of the spectrum. On the other hand space research involves both reception and transmission, though the transmissions are normally of low power. Because of the necessarily very high sensitivity of the radio receivers used by the radioastronomy and space research services, these services are particularly vulnerable to interference from any services sharing the bands and from spurious radiations from, for example, transmitters operating in the wavebands adjacent to their own. Because of the danger of "spill-over", it is highly desirable that the services which occupy these adjacent bands are those which will not cause harmful interference to scientific observations.

IUCAF has the international responsibility for making realistic assessments of the needs of radioastronomers and space scientists, and for taking all practicable steps to ensure that these receive sympathetic consideration by the national administrations which, collectively, make the final decisions at the World Conferences

To facilitate its task, IUCAF works closely with the International Radio Consultative Committee (CCIR), the relevant technical advisory body of ITU. In addition, contact is maintained with the scientific community through a network of correspondents in countries concerned with radioastronomy or space science, and these correspondents are encouraged to discuss their interference problems with their administrations.

IUCAF was formed in 1960 at the request of the International Union of Radio Science, the International Astronomical Union, and the Committee on Space Research. These bodies nominate representatives and support the expenses of the meetings of IUCAF at which representatives of CCIR and the International Frequency Registration Board also attend in an advisory capacity. Formal meetings are held about once a year.

IUCAF has established a reputation for its sense of responsibility when presenting the views of the scientific community, and for its appreciation of the problems of the many other services which must use the radio spectrum. The Commission has, therefore, been able to play an important role in the preparations for several World Conferences and is at present engaged in a similar task in view of the Conference to be convened in 1979.

The active pursuit of radioastronomy and space research depends heavily on the availability of adequately protected allocations in appropriate parts of the radio spectrum. If such allocations ceased to be made available, these branches of research could no longer be continued as observational sciences.

LETTER TO THE EDITOR

Dear Sir

As an ex-Liaison Officer for the Joint Fire Research Organisation, I feel I may speak with authority on the use of flammable instead of inflammable. You sir, I know, abhor the double negative; why then should we accept the double affirmative. Or is it after all the double negative for the Concise Oxford Dictionary quotes the use of the prefix "in" as implying both towards and against.

Furthermore, contrary to Peter Simple's idea, the use of flammable and nonflammable is not an American import but is the result of action taken by DSIR (of blessed memory) to guard against the possibility that the Peter Simples of this life might assume that an inflammable material was one that would not catch fire. It is gratifying that the HFL and LPG Regulations 1972 come down firmly in favour of the DSIR proposals.

However, I am at one with your correspondent on insisting that the first syllable of kilometre should carry the accent. It was, moreover, a cherished principle of a retired Division Head who devoted much of his time to BSI and who would readily appreciate this correspondence.

Yours faithfully

C.(overworked) Eng.

MRS. S. CROOM

We much regret to record the death of Sheila, wife of David Croom, on Saturday 1st November 1975.

Sheila Croom, a mathematics graduate, was herself involved in research, being co-author of a number of valuable contributions on ionospheric phenomena when Research Assistant to Mr. J. A. Ratcliffe at the Cavendish Laboratory. Despite family commitments she found time to undertake some work, at home, for our own establishment and, latterly, to take up a teaching career.

The attendance at the funeral by colleagues and the tokens of flowers, not only from the Laboratory as a whole, but from individual groups, were evidence of the deep sympathy felt for Dr. Croom and his family at the loss of a lively and charming lady.

An Appreciation

In the mid-fifties, computing techniques had just reached the stage at which it became practicable to get electron density profiles from ionograms quickly and cheaply. Without computers, the task is too laborious to be used routinely. A large-scale programme of ionogram reduction was successfully carried out at the Cavendish Laboratory under the direction of Dr. J. O. Thomas. At the time, organizing a large-scale computing operation was something of a novelty; Sheila Croom played a major part in this work, handling the data preparation and input to the computer with great efficiency. As a result, it became possible to compute and tabulate the hour-by-hour variations of electron density in the ionosphere in several representative months at four ionospheric observatories.

It would be difficult to point to many other projects that have had such an impact on ionospheric science. Of the innumerable scientific papers that were based on these data, Sheila herself was the senior author of two Letters to Nature, in which were discussed some interesting ionospheric anomalies that, even today, have not been totally explained.

H.R.

STAFF NEWS

Congratulations to:

Colin and Jenny Murphy on the birth of their daughter, Imogen, on 18th October.

Peter and Ann Barber on the birth of their son, Andrew Paul, on 9th November.

Pat O'Hara on her marriage to Albert Coggins, a member of the A.C.O. Staff, on 4th October at Slough Register Office.

Welcome to:

A. F. Lee — Craftsman I

Retirement:

A. F. Pill — Messenger

Other Changes

Mrs. M. Clarke, now p. sec. to Mr. Barker and Professor Wilson.

Miss S. Mackinnon, now p. sec. to the Deputy Director, Dr. Gebbie and Dr. Martin.

E. A. Buck HSO now with Gp. 5 in Div. 2 (Dr. Martin)
P. J. Powell HSO now with Gp. 1 in Div. 5 (Dr. Lane)
P. F. Shutie HSO now with Gp. 5 in Div. 6 (Mr. Meadows)
J. S. Wright SO now with Gp. 2 in Div. 2 (Dr. Martin)

SPORTS AND SOCIAL CLUB

Remember, Remember

On 5th November, oil crisis not withstanding, 48 gallons of used engine oil was put to good use for lighting one slightly damp bonfire. With a fire well and truly alight and a Guy already nothing but a smoke trail in the lower atmosphere the night erupted patches of coloured light interspersed with bangs and similar loud noises as bombs and mortars (as they are known in the trade) split the usual silence of Ditton Park after eight.

By slightly changing the relative timing of events the ladies dispensing hot refreshments were able to avoid the usual scramble at the end of the display. The evening ended in the normal noisy fashion around the bar.

Due to popular demand next year's display will include a "Goodnight" piece.

REPRINTS LIST FOR NOVEMBER 1975

NIL