

Bulletin

of the Rutherford Appleton Laboratory

18 April 1983 No.6

Millimetre Wave Telescope Wins Hawaiian Approval

The first quarter of 1983 has been a time of great activity for the Millimetre Wave Telescope project. First, in January, the Environmental Impact Statement for the development of the site was accepted by the Office of the Governor of Hawaii. Then, at the end of February, the application to build a telescope in the conservation area near the summit of Mauna Kea was approved by the Board of Land and Natural Resources of the State of Hawaii.

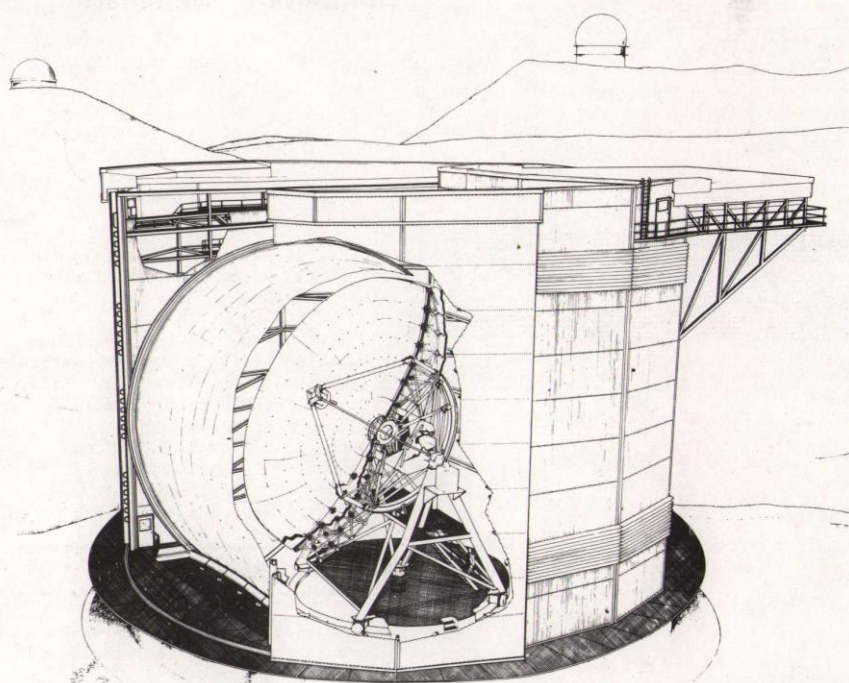
Although certain formal agreements within the University of Hawaii have yet to be completed the way is now open to start clearing the site and to lay the foundations for the enclosure.

The new drawing of the enclosure and antenna shows how the facility will appear on the plateau below the summit ridge which is occupied by the existing telescopes. Contractors for the site works and also for the rotating enclosure have been selected and a contract for the site preparation has been placed.

The project is indebted to those people in Hawaii, particularly in the Institute of Astronomy within the University of Hawaii, in the University itself and the staff of the UKIRT facility, who have given considerable help in achieving the various approvals on a tight schedule.

Progress

At the site the foundations for a 60 feet high meteorological mast have been laid and the mast itself will be erected this month. Already the sky emission monitor (see *Bulletin* No 20, December 1982) installed at the UKIRT facility has begun collecting statistics on the transparency of the atmosphere. This information will be used to plan the operating schedule of the facility. Provisional analysis of the data confirms the excellent properties of the site.



Closer to home, in the Rutherford Appleton Laboratory, the development of the telescope has continued. In particular, a short pre-production run of the panels which will form the surface of the antenna has been completed. The average surface accuracy of these panels is better than 12 microns rms, which is only a half of the value allowed in the formal error budget. Also, a small, tetrahedral test piece representing a part of the space frame backing structure, on which the panels will be supported, has been made. This allowed checks to be made on the shrinkage and distortion during welding. Both effects were acceptably small and we are now awaiting the completion of a larger, more representative section of the structure.

In Holland, at the National Foundation for Radio Astronomy Observatory, Dwingeloo a theoretical analysis of the thermal behaviour of the system has confirmed the role of the enclosure in providing a very satisfactory environment for the telescope. Arrangements are being made with the University of Utrecht for the manufacture of the secondary mirror system. The specification of this system has recently been upgraded to provide a fully vibrating or chopping unit.

Returning to United Kingdom effort, the main computer for the facility has been delivered to the Mullard Radio Astronomy Observatory at Cambridge University. MRAO, as it is usually referred to, has

(Cont'd over)

INTERNAL Events

HEP SEMINARS
R12 CONF ROOM-1100hrs

20 April Dr A P White/Imperial
"Search for Narrow Meson
States in pN Interactions
at the SLAC Hybrid
Facility".

THEORY GROUP COFFEE ROOM, R1
1100hrs

21 April Dr M Teper/Anney
"Recent Progress in
Lattice-regularised QCD:
(1) first direct quark
physics, (2) status of
glueball/oddball
predictions".

R61 CONF ROOM - 1100hrs

27 April Dr H Osborne/Cambridge
"Field Theory with a
Background".



The next Lecture in this series
takes place in the Lecture Theatre
at 3.15pm on Thursday 21 April.

"FAR INFRA-RED ASTRONOMY"

by

Dr P E Clegg

Queen Mary College

The Earth's atmosphere is almost
completely opaque between wave-
lengths of about 20 micrometers and
1 millimetre and yet information
about many interesting and exciting
astrophysical processes is contained
in this region of the spectrum.
Astronomers have therefore laboured
to peer through the few murky
spectral "windows" that exist to
extract what data they may.
Observers on high mountains, in
aeroplanes and using telescopes on
balloons take advantage of the
thinner atmosphere at high altitudes
and recently the IRAS satellite has
broken free completely from telluric
constraints.

The data gathered in this way have
revealed much about how stars are
formed from cool clouds of dust and
gas in our own and nearby galaxies.
They have shown extraordinary
activity in some galaxies super-
ficially like our own and they have
led us nearer to the power source
of the still rather mysterious
quasars.

CONDENSED MATTER SEMINARS
R3 CONF ROOM -1330 hrs

26 April B D Rainford/Southampton
"Localised Spin
Fluctuations in Pd with
1% Ni".

3 May R J Elliott/Oxford
"Diffusion in Partly-
Blocked Lattices".

NIMROD LECTURES
LECTURE THEATRE-1400hrs

25 April Prof B Anderson/Lund
"The Lund Model".

Computing Seminars

SKIM Functional Programming Machine

by

Dr Arthur Norman

Cambridge University

This lecture will take place in the
Colloquium, Atlas Centre on Tuesday
3 May at 3.15pm

SKIM is a bit-sliced micro-programmed
computer designed to use combinators
in its macro instruction set. This
makes it directly suitable for the
execution of programs written in a
pure functional style. The two
iterations on SKIM'S design will be
described and experience with
applicative programs will be reported.

Film Badge Notice

It is Period 4 Colour strip BROWN.
Please make sure you are wearing
the correct dosimeter.

Next Film Change

Monday 25 April.

Please make sure films are changed
promptly.

Library Notice

Would all staff, please check their
offices for "British Standard 5500:
Unfired fusion welded pressure
vessels". This Standard is in a RED
ring-binder. (It is the Library
copy we are looking for).

UNIVERSE Exhibition

From 24-26 May the UNIVERSE project
will be on show at the Barbican
Centre as part of an Exhibition
entitled "Business Telecom".

Further information can be obtained
from Dr John Burren Ext 6671

MWT - Hawaii (Cont'd from 1)

responsibility for the Control and
Data Handling System and the
computer is the principle element
of this system. It is now being
used to develop software and
interfaces for the control of the
telescope.

Finally the Receiver Working Group
has determined the initial phase
of the programme for the development
of sophisticated components to be
incorporated in the receiving
systems. Agreements have already
been reached with groups in both
Britain and the Netherlands for
this work to be carried out.

R W Newport

New Manageress

Miss Lesley Kennell is the new
manager of the RAL Restaurant. She
took up her duties on Tuesday 5 April
and is looking forward to providing
a service equal to, if not better
than, her predecessor.

Lesley Barrows and her Deputy Linda
Bell have been promoted and will now
be working at British Leyland,
Cowley. We would like to say
'thank you' to them both for their
efficiency, innovation and help over
the period they have been at the
Laboratory and wish them well in the
future.

Blood Donors

There will be blood donor clinics
held in the Colloquium, Atlas Centre
on Monday 16 and Tuesday 17 May 1983.

We are looking for more new donors.
There are many members of Staff
retiring or moving and we have to
replace these - so get a friend or
work-mate to enrol or go along on
one of the above dates with you.
To make things easy for you to
become a donor - jaundice is no
longer a bar, you can now enrol as
a blood donor as long as you have
recovered from jaundice more than
one year ago.

If you require any further
information, please contact
Mrs Irvine, Ext 5441.

Thanks

Ernie and Eileen Russell wish to
express their thanks to all those
friends and colleagues who made
Ernie's retirement such a pleasant
occasion.

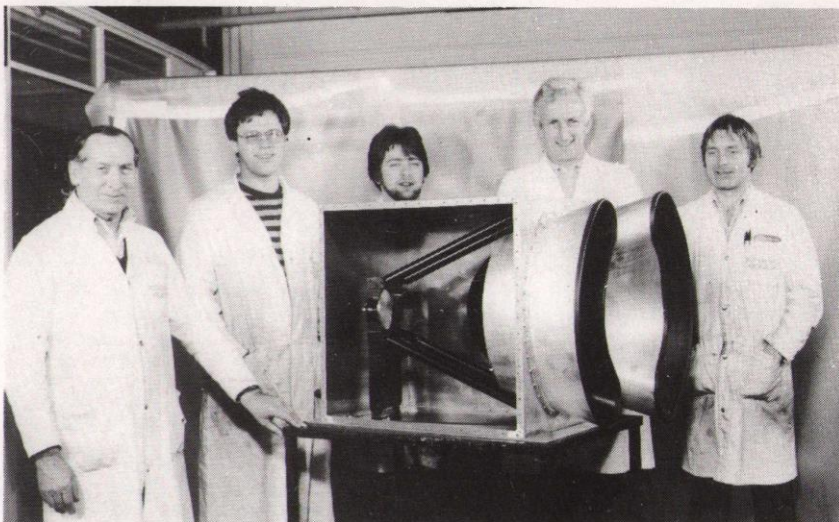
"Please pass on any best wishes, to
all those I did not see personally",
he requests.

RAL Delivers Hardware to Space Agency

Within one year of being selected by the European Space Agency (ESA) for inclusion as scientific payload on the Agency's first remote sensing satellite ERS-1, RAL has delivered a full-size mock-up of ATSR (Along-Track Scanning Radiometer) to ESA for preliminary radio frequency compatibility tests. The model, although lacking in engineering detail at this early stage in the project, has to be an accurate representation of the proposed structure in order for the tests to be meaningful. Much credit is due to the Instrumentation Workshop team who assembled and completed the model for delivery on time, in spite of the rather short notice of the requirement.

At present the model is at Toulouse on the roof of a large electromagnetic compatibility facility run by the French Agency (CNES) as part (the best looking part, we are unofficially told) of a mock-up of the entire satellite.

These tests are very important to ATSR because the ERS-1 satellite mainly comprises several powerful microwave radars, while ATSR is a sensitive infra-red radiometer which is inevitably susceptible to radio-frequency interference unless the right precautions are taken in its basic design and construction.



Pictured with their latest masterpiece, (from left to right) Ken Kirk, Nick Johnson, Andy Robinson, Jim Culver and Don Collister.

The ERS-1 satellite is a major new venture for ESA. Not only is it the Agency's largest satellite project to date, it also represents a major shift in emphasis, away from telecommunications satellites, which are becoming the province of commercial operators, towards the new field of remote sensing of the Earth from space.

ATSR is being designed and built by an RAL-led consortium which comprises Mullard Space Science Laboratory, Oxford University, the Meteorological Office and a French Laboratory, CPRE, who are responsible for a microwave package that is to be part of ATSR.

We are indebted to Dr David Llewellyn-Jones for news of this interesting development.

Sports Days Trophies

The annual presentation of Trophies for RAL prize winners of events at the SERC Indoor and Outdoor Sports Days, took place on Friday 8 April.

Mr Peter Craske, Chairman of RAL RecSoc introduced the award winners to Dr Geoff Manning, who presented them with their individual trophies, congratulated them all and said that he confidently expected them to do the same this year, plus he remarked laughingly, any that they hadn't yet managed to get their hands on!

The winner of Individual Trophies for 1982 were:

Indoor (Fairweather) Sports

Badminton (Mixed Doubles)	Kay Knight Tony Short
Badminton (Men's Doubles)	Roger Wolfenden Dave Wooton
Squash (Team)	Frank Close Will Johnson Jenny Coates
Darts (Team)	Stan Buckel Russ Jones Martin Bennett Fred Roberts Pat O'Connor

Crib (Pairs)	Gordon Richards Ricky Lyle
Table Tennis (Team)	Eric Thomas Tim Pett Peter Kent
Outdoor Sports	
Angling (Team)	Peter Craske Stan Buckel Eamon Capocci
Tennis (Mixed Doubles)	Lorna Claringbold Tim Pett
Cricket (Team)	Neil Johnston Mike Yates Russell Newman Charlie Wrench Bob Blowfield Nick Myer
Bowls (Pairs)	Norman Ferguson Alec Goode
Bowls (Triples)	Mary Shepherd George Pullinger Cyril Grindrod

Congratulations to you all.

Christian Fellowship

Meetings of RAL Christian Fellowship are held on Thursday at 12.30pm in the R2 Conference Room (4th floor).

Subjects and speakers for the next few weeks are detailed below:-

21 April	Discussion I Christian Living "In the present"- Eric Greenslade
28 April	Discussion II Christian Living "Facing the future"- Meyrick Wyard
5 May	Prayer Meeting- Jimmy Darius
12 May	Christian Aid Film "Strike a Light"

This last event is to be held in the Lecture Theatre. All are welcome.

RecSoc AGM

The Annual General Meeting of the Rutherford Appleton Laboratory Recreational Society will be held in the Lecture Theatre on Thursday 28 April at 12.40pm. Will members please make every effort to attend.

Not Bad for First Time Out

After great preparations, and with a check-list' that would do credit to a transantarctic exploration or a flight to the Moon; on the evening of Friday 25 March the Laboratory Model Railway Club members, plus layout, set off for darkest Abingdon.

The plan was to arrive at St Nicholas' Church Hall at 7pm, which in fact we did. On arrival, consternation ruled! A wailing and gnashing of teeth could be heard from inside the hall, which on investigation was found to emanate from the Abingdon Model Railway Club, who, having been setting up the Exhibition since 2pm had just found out that the hall had been double booked! Panic had set in.

"Can we come in?" asked the intrepid travellers from RAL. "No, not until 8pm, was the answer from a nerve-shattered Exhibition Manager. "Why not?", shouted the lads from RAL. "Because there are young ladies in leotards in the hall about to dance!"

"Hurrah" was the cry from the RAL contingent. "Avert your gaze and get thee to a Tavern for an hour; answered the Exhibition Manager. "I will stay here and look after things."

After the said hour at the tavern, the team returned to a much calmer situation. Was all now well again? Not Quite. Yellow chalk marks had been put down on the floor to mark out the Exhibition stands - the young ladies had sat on the floor and shuffled, and had now made their

way home with yellow chalk marks about their persons. However, the next two hours passed without hitch and all was set for the Big Day to come.

Dawned the morning after. The layout was working like a dream and all the RAL team was present and correct. An air of tension still pervaded the hall, -three quarters of an hour to go and still two layouts were missing. (The Gas Board having dug up Ock St did not help matters). Then peace returned, all was well, the doors opened at ten thirty and in came the world and his wife.

OH DEAR! RAL's layout had stopped working. Six bodies dives under the baseboards only to emerge a few minutes later, all smiles. Just a small short in the electrics. From then, the day went well. Many people showed great interest in the layout, from long established Model Railway enthusiasts to little boys with toffee flavoured fingers that stick to everything that moves on rails.

And at the end of the day, great jubilation in the RAL camp-the public had voted "Houghton Park" the best layout at the Exhibition! This was a great honour for the RAL Club, especially as it was our first showing at an Exhibition.

We would, therefore, like to take this opportunity to sincerely thank all the people at the Laboratory who helped, in so many ways, to make this such a happy and successful day.
Ray Roberts

Barbara Says Farewell

Barbara Powell first came to the Laboratory when, in her words, it was a mass of white clay and temporary buildings". In the twenty one years since then she has helped order our finances, and made a host of friends, most of whom somehow squeezed into Conference Room 1 on Thursday 15 March to wish her well in her retirement.

It was one of those occasions that are both happy and sad, and Dr Jim Valentine expressed this feeling on behalf of all present, when he thanked Barbara for her cheerfulness and loyalty during all those years.

One of a dwindling band of ex-NIRNS staff, Barbara had spent most of her time in Finance except for a brief excursion into Reprographics and a temporary escape to Atlas in 1974. (The amalgamation of Rutherford and Atlas was engineered to recapture her!)

The cribbage community at RAL will always remember her as a demon at the cribbage board, with Rutherford singles and SERC's doubles trophies to her credit.

The beautifully wrapped packages which had been fascinating the company throughout the ceremony were, at last, opened by Barbara to reveal a food mixer, a 13amp plug (a work of art this parcel) a faceted crystal rabbit (a reminder of R20) and a bottle of sparkling beverage. She was also presented with flowers and chocolates.

Thanking everyone for all the gifts and the help and friendship she had enjoyed, Barbara said that she had mixed feelings about leaving. She would miss her many friends. "I have enjoyed my stay", she said, "but I am looking forward to my retirement. I have lots to do- and I hope you will come to see me from time to time."

Barbara Powell would like to express her gratitude to all her friends for the lovely gifts presented to her on her retirement. She also apologises to those she was not able to say 'goodbye' to before she went. "I am going to miss everyone after all the happy years I spent at the office", she writes.



Bulletin

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Deadline for insertions: