

Bulletin

of the Rutherford Appleton Laboratory

28 Jan 1984 No.1

In Like a Lion

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RAL entered 1985 in overdrive and as a focus of attention for the news media.

The magnificent achievements of SNS and Neutron Divisions have already been chronicled in the special edition of the Bulletin issued just before Christmas and attention is still being felt as the interest of journalists and television teams continues unabated.

IRAS continues to attract its share of attention, the NASA Award Ceremony being well attended by reporters from national newspapers and technical journals. MP, Robert Jackson, added his congratulations the following day when he paid a visit to the AMPTE control room.

The AMPTE Christmas 'Comet' release took place at 1232 GMT on 27 December with very interesting results (see page 2 of this issue) and swelled the crowd of fascinated information gatherers, including an ITN team.

Yorkshire Television arrived with the visit of 1984 Nobel Prize winner Carlo Rubbia, on site to address the "Christmas Theory Meeting" arranged annually by HEP Division. This attracted over 200 physicists from a dozen countries.

The new Laser initiative to demonstrate the feasibility of plasma beat wave acceleration was also on Yorkshire Television's agenda, as was SNS, this time for a programme on Discoveries featuring David Bellamy, to be screened in the Spring.

Latest arrivals on site have been a BBC team interested in making a feature for HORIZON starring IRAS.

If 1985 continues in this vein, and we confidently expect it will, an exciting year for RAL is assured.

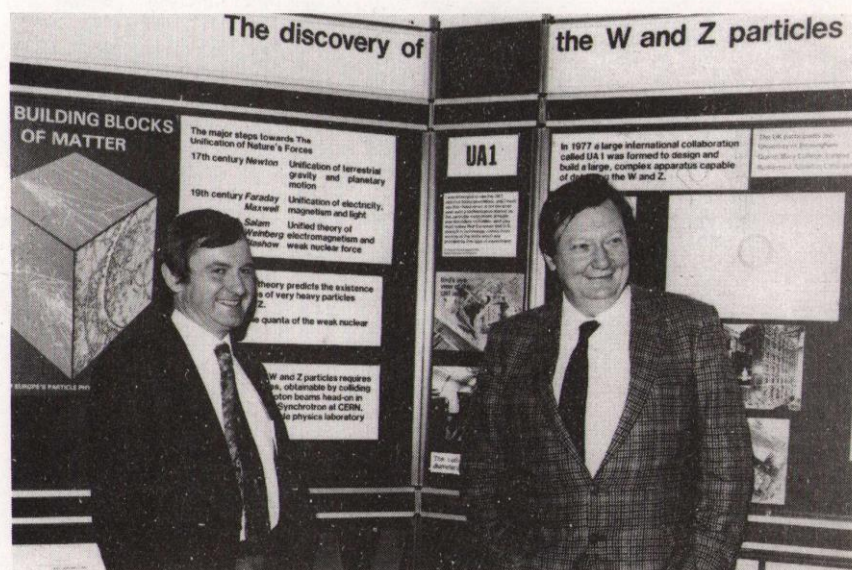
NASA IRAS Awards

Members of IRAS teams received NASA Honour Awards from the Chief Administrator of NASA, Mr James Beggs, at a special ceremony held in the RAL Lecture Theatre on Thursday 13 December.

In an address of welcome, Dr Geoff Manning, Director - RAL, introduced the guests of honour and gave a brief resume of the technical aspects of the IRAS project.



Pictured (from left to right) Mr Harry Bevan (RAL), Mr Gene Giberson (JPL), Professor Dick Jennings (MSSC), Dr Eric Dunford (RAL), Dr Dick Holdaway (RAL), Dr Peter Clegg (QMC), Mr James Beggs (NASA), Mr Alan Rogers (RAL), Mr Richard van Holtz (NLR) and Dr Geoff Manning (Director RAL), after the NASA award ceremony (84RB 5290).



Dr Carola Rubbia (right) and Professor John Dowell (Birmingham) with appropriate background, in the foyer of RL. 84RB 5305/6).

NASA IRAS Awards

(Cont'd from p1)

A short talk by the Astronomer Royal, Professor Graham Smith followed, in which he explained how the IRAS survey fitted into the overall concept of modern astronomy. In musical terms there are 50 octaves of the spectrum to be investigated, was his analogy, but some of the notes are missing. The IRAS survey has filled in some of these gaps between the radio and visible wavelengths. Many hitherto unknown sources of emission have been discovered: eg, a ring round Andromeda, new comets, embryo stars, interstellar dust. Many more, we are certain, are contained in the data from the survey which will keep astronomers busy for years to come. The IRAS project has filled in another part of the celestial picture and is of the greatest historical importance. International collaboration has allowed us to do things which could not otherwise have been done.

Awards & Citations

Mr Beggs presented Public Service Medals to Dr Peter Clegg (QMC) resident astronomer at RAL for the period of the survey, "in recognition of his outstanding contribution to the success of the IRAS Mission through his scientific leadership of the near real-time analysis and uplink processing: to Dr Eric Dunford (RAL) for outstanding contributions to the successful design and implementation of the IRAS ground operations system: and to Mr Alan Rogers for the development and implementation of the operations plan for the IRAS mission, also described as an outstanding contribution. Professor Dick Jennings (MSSL) accepted an award on behalf of the IRAS Joint Infrared Science Working Group for outstanding scientific and engineering contributions to all aspects of the IRAS project, as did Dr Richard Holdaway and Mr Harry Bevan for the work of the RAL operations team who contributed to the success of the mission through the design, development testing and operation of the IRAS Operations Control Centre.

As if to emphasise the collaborative aspect of the mission, one of our Dutch colleagues, Richard van Holtz, on a visit to RAL, also received his medal at the ceremony.

The ceremony ended with a short talk emphasising the enormous discoveries made by IRAS. Astrophysics had undergone a revolution in the last 25 years and the IRAS mission had opened another window onto a universe we have only just begun to understand, said Mr Beggs. With international collaboration of this calibre, yet another revolution was heralded for the future. The NASA Space Station concept for the 1990s was a new and dynamic opportunity for such collaboration, he was certain. Such a station could keep all other project fuelled, linked repaired, etc. He viewed a Space Station as a means to do many things we've always wanted to do. "We believe we are at the beginning of a new era and that scientists will realize this system will provide bright new science. We have done marvellous

things in the past, but have only just begun", he said.

'Comet' - Success

The three AMPTE satellites achieved another of their major goals on 27 December 1984 by producing an artificial comet. The purpose of the experiment was to simulate under controlled conditions the interaction that takes place between the solar wind (the stream of ions and electrons which flow from the Sun) and material expelled from the surfaces of comets by solar radiation. The experiment was highly successful - the comet-like interaction developed as planned and complete sets of measurements were obtained by two spacecraft within the 'comet' and from airborne and ground-based instruments.

At 1232 GMT on 27 December 1984 two canisters that had been ejected 10 minutes earlier from the German spacecraft (the Ion Release Module) exploded to release an expanding cloud of barium atoms 64,000 miles above the Eastern Pacific Ocean. The atoms, 5×10^{24} in number and of total mass 1.25kg, were ionized within tens of seconds by solar ultraviolet light to be transformed into a plasma of barium ions and electrons. The atoms and ions emitted light which was visible in the dawn sky from the Western USA (Pacific Standard Time 0432). Due to continued cloudy conditions, which had caused an attempt on Christmas Day to be abandoned, the 'comet' was largely obscured from the prime observing sites and the main observations were made by two aircraft.

These showed over a period of some 12 minutes the appearance of the new 'comet' approximately 140 miles across, with a tail developing to a length of over 7,000 miles, which is more than ten times the angular diameter of the Moon. These events were caused by the expansion of the barium plasma being resisted by the pressure of the solar wind and the magnetic field embedded within the solar wind. The German spacecraft initially at the centre of the cloud and the UK spacecraft 100 miles away at the beginning of the event, observed clearly that the flow of the solar wind was impeded so much by the barium cloud that its unusually high speed of more than 1,300,000 mph on the day in question was halved. The magnetic field was expelled from the cloud with a consequent amplification of the field outside. This major interruption of solar wind flow released energy which produced a rich variety of plasma wave oscillations, and a twenty-fold increase in the energy of solar-wind electrons. The solar wind that flowed around the edges of the cloud drew away some of the glowing particles to form the visible tail, while the pressure exerted by the solar wind on the front caused the whole phenomenon to accelerate, tail first, downstream. While it was not anticipated that these barium particles released into the solar wind at the down flank of the Earth would eventually penetrate into the radiation belts within the

magnetosphere, the American spacecraft (the Charge Composition Explorer) remained alert to the possibility that some particles might enter.

The data from the three spacecraft and the ground and airborne observing sites are currently being intensively examined in order to clarify and refine the initial impressions so that they can be of value in connection with the forthcoming spacecraft investigations of the Giacobini-Zinner comet in 1985 and Halley's comet in 1986.

Meanwhile the AMPTE satellites are setting out on the next phase of their epic journey, during which releases of barium and lithium ions will be made in the Earth's magnetosphere, which is the source region of the particles that produce the highly intriguing phenomenon of the aurora borealis and the australis - the northern and southern lights.

A Fitting Reward



Harold Wroe says thank you to John in a most welcome way. (84RB 1074)

While on secondment to SNS, John Spencer of Instrumentation Division has thought of a simple and inexpensive gadget for fitting O-rings. This has enabled the speedier and more reliable fitting and locating of some 300 O-rings for the vacuum tubes in the wave guides for HRPD and IRIS.

On presenting John with a cheque for £170, Harold Wroe said that the device is a practical and valuable suggestion, enabling the many metre long tubes in the vacuum systems to be quickly and efficiently assembled. Previously, this was a very time-consuming job with a 15% failure rate. The device expedited the completion date of the system, and contributed to achieving the December deadline for the run producing the first neutrons.

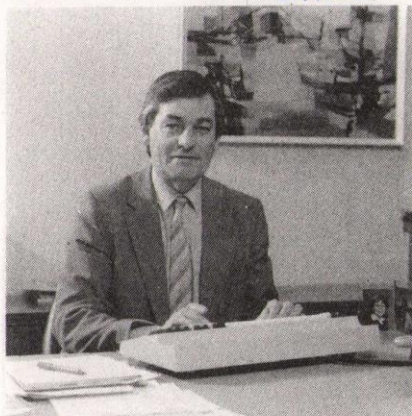
He concluded by saying that "the performance of the guides equalled our expectations".

Sir John

The Honour of Knight Bachelor was conferred upon Professor John Kingman in the 1985 New Years Honours list. Sir John is Chairman of the Science and Engineering Research Council.

Introducing Dr Davies

84 RB 5144



Dr Brian Davies, new Head of Central Computing Division and also SERC's new Director of Computing, joined the Laboratory in October 1984. Before that he was head of the Computer Systems and Electronics Division at Daresbury.

Brian is no stranger to RAL. In the early 1960s he spent several years at the Laboratory, first as a research student using the PLA and then as a member of a team from Queen Mary College working on Nimrod.

He moved to Daresbury in 1966 where he held a succession of posts in computing and was appointed Division Head in 1976.

At present he is commuting weekly from Cheshire, but will soon be moving to a house in Didcot with his wife Margaret, who was at one time a secretary at RAL, and thirteen year old daughter, Katherine.

Mark Warner New Appointment

Dr Mark Warner of Neutron Division has recently been given a joint appointment as Visiting Lecturer to the Solid State Physics Group at Imperial College of Science and Technology. The appointment began on 1 January 1985.

Mark will participate in the development of research in this field at Imperial, particularly in graduate studies of mutual interest to their Solid State Group and the Condensed Matter Theory Group at RAL.

Apprentice Prizes

At the Annual Prizegiving for the Harwell Apprenticeship Scheme on Wednesday 5 December 1985, two of our RAL apprentices obtained awards.

Philip Bailey was awarded "The Director's Cup" for outstanding application and achievement in his technical studies, and Brian Ford, a 3rd Year Electrical Apprentice, received a Merit Award.

Contratulations to you both, and best wishes for a bright future.

RAL TECHNOLOGY LECTURES

The first lecture of 1985 will be held on Thursday 31 January at the usual time of 3.00 pm in the R22 Lecture Theatre.

THE INVISIBLE LOCAL AREA NETWORK

by

Dr P E Bryant
RAL

The building of a wide area network linking the various universities and the Research Councils' sites started in about 1977. This was a difficult job considering the availability of equipment, lack of protocols and, dare I say it, the ever present lack of cash to undertake it.

It was optimistically thought that on a site networking would be far easier. This was because there would be no PTT involvement, connections would be faster and more reliable, and there would be far fewer management problems without the lunatics from 'the other sites' and the costs would be low. How wrong can you be!

In the event the introduction of local area high speed networks has proved to be far more difficult than expected. The reason for the delays are numerous ranging from the lack of resources, through unreliable manufacturers, passing lack of standards and finishing with down-right bungling.

Nonetheless, there has been progress and this presentation will give an analysis of the past and attempt to predict the future with particular reference to Rutherford Laboratory.

FOR YOUR DIARY: The next leccure in the series will be held on Thursday 28 February 1985 by

Dr D T Llewellyn-Jones, Geophysics and Radio Division, and will be entitled "Remote Sensing of the Earth from Space".

Indoor Sports

These will be held at the Oasis, Swindon, on 1 March.

Would competitors please give their names to A Forster (R2 Electrical Workshop) or T Morgan, R18 before 14 February.

A Disco and Supper will be held at night in Central Office. Tickets £3. Tickets may be obtained from A Forster until 17 February. Two buses will leave the Lab at 9.15 am-9.30 am for the Oasis. One will return from CO at 1900 hrs, the other between 2300 and 2330 hrs. Will people wishing to return on either bus please give names and state preference to A Forster before 15 February. It would be helpful if people using their own transport could also contact A Forster.

Obituary

David Baugh

It is with deep regret that we announce the sudden death of David Baugh at the age of 44 on 15 January.

In David's tragically short career he achieved recognition and distinction in two fields, science and administration.

A graduate of Birmingham University he joined the Australian National University, Canberra in 1966 on a three year appointment as an RA in Nuclear Physics.

On his return to the UK David worked on Nimrod from 1969-72. He joined the SRC administrative staff in 1973, was Secretary to the Division Head's Committee 1973-76 and gained wide experience in a variety of posts at the Laboratory and at Central Office. His intellect, scientific training and personal qualities were recognised and he achieved early and rapid career advancement, returning to the Laboratory as SEO in Administration Division in 1981.

David was a prodigious and tireless worker, popular with his colleagues and respected by all. Essentially a shy person David's strong humanitarian interests were evidenced by his active work with the Samaritans.

We offer our deepest sympathy to his mother, sister and brother for the tragic loss which we share.

Coffee at Cosener's

Many RAL wives enjoyed mince pies and sherry at our Christmas Coffee Morning at the end of last year. Also, despite inclement weather, there were quite a few present at our first coffee morning of the year on 16 January.

There will be no coffee morning in February, as our St Valentine's Buffet Supper is arranged for the evening of Friday 15 February. Tickets for this are now completely sold out, so we are looking forward to an enjoyable evening.

The next coffee morning is scheduled for

Tuesday 19 March

from 10.30 am until noon. Do come along, and bring your pre-school children, and any newcomers to the area.

Please ring for information about our get-togethers:

Suzanne Litchfield	(Abingdon 21310)
Zoe Patrick	(Wantage 68809)
Savita Shah	(Abingdon 29136)

Farewell Two Friends

Though throughout RAL a state of euphoria reigned for the last few weeks of 1984, there was also sadness, for we had to say farewell to two colleagues who had helped to make the year such a success: Wilf Buxton and Alf Brett.

Wilf Buxton

Twenty years ago Wilf joined Nimrod workshop and apart from welding hydraulic and vacuum systems, came to know the old plunging mechanisms of Nimrod extremely well. He also worked with drift tubes on the injector and made and welded jigs and frames for the inner chambers made for one of the big experiments at CERN. For SNS he worked on some of the equipment for the Target Station remote handling and fitted the magnetic sole plates. At one time he was the only person at RAL qualified to weld lifting gear and pressure vessels.

Despite increasing problems with his knees, Wilf continued to the end of his service to give unstintingly of himself to whatever job came his way, sharing the fruits of his experience with all his colleagues. He has borne his disability with fortitude, and we are sorry that his last operation was not as successful as the first, and he has to go through it all again.

"We wish you well in your retirement", said Gordon Grossart who was making the farewell presentation on behalf of all Wilf's friends. "We hope your recovery will be complete and that you then have the freedom to enjoy your leisure."

To help him to do this, his colleagues had subscribed to provide a decanter and glasses, together with the necessary ingredients to "induce proper euphoria!" They came, they averred, with everyone's best wishes for the future.

Wilf thanked everyone for their generosity and for their companionship. He would miss them all, and wished SNS well for the future.

Alf Brett

Nimrod also figured large in Alf's career, he being one of the first five members of the vacuum group that gradually grew to a complement of 27. From Nimrod's beginning to its demise Alf stayed on shift work, learning radiation monitoring on the way, which helped him to see-off Nimrod when dismantled. He personally has monitored 1,000 tons of Nimrod.

At his farewell ceremony on Friday 15 December, gifts of gardening tools and a magnificent clock-barometer were presented by Gordon Grossart, who



Mrs Brett smiles at Alf's obvious delight in his tipper truck. 84RB5271

thanked Alf for all the work he had done for the group, the division and the Lab. "We wish you and your wife well in your retirement, and we present these tokens of esteem on behalf of all your many friends and colleagues."

Unveiling the barometer set, Alf was delighted into the spontaneous remark "I shall treasure that, definitely!" He then went on to express his gratitude to everyone for all the gifts and the friendships of 23 years. "Everyone knows I don't want to leave", he said. "Have a lovely Christmas - and thank you once again."

Thanks

Linda Clarke wishes to thank all her friends and colleagues for the generous gift and good wishes they expressed for her forthcoming event.

She also says thankyou and goodbye to all those she did not see personally before she left.

Sue Merrifield writes "To those I missed - many thanks for the wonderful send-off. Best Wishes, and thanks.

Des and Margaret Old wish to say thank you for the lovely crystal glasses and the best wishes expressed by friends and colleagues on our recent marriage in Guernsey.

Harold Normington would like to thank everyone at RAL and CERN for their good wishes and for all the gifts he received on his retirement. He is sorry if he missed saying goodbye to anyone, and he and Mary would like to wish you all a very Happy New Year.

Bridge Club

New Blood Needed

At long last the RAL Bridge Club is official, in existence and in full swing. But the formation of the Club has not been a straightforward deal. After unofficial existence last year using left over old playing cards and some old bridge boards from Appleton Laboratory, the way ahead seemed clear - to obtain a grant from RAL Recreational Society to buy the essentials to set up the Bridge Club properly.

We made our request and after a great deal of explanation that Club Bridge needed more than a couple of packs of cards and a green baize cloth, an almost adequate grant was obtained from the Rec Soc.

At present the Bridge Club has set itself a simple task of expanding and increasing its membership. So this is an open invitation to everybody; from those who can play to those who would like to learn to play but somehow never got round to taking the first step. Now is your chance, because on Tuesdays and Wednesdays the Club members play from 12.30 to 13.30, usually in R61, Conference Room 3. Tuesdays are reserved for beginners and new players. So come along because with other beginners you would not feel left out. The existing Club members will teach you and guide you to become better players and promise not to laugh at your mistakes. They all made mistakes when they were learning, so they know the importance of learning properly. Later on or concurrently, depending on level of support, the Bridge Club is hoping to organise evening matches for pairs and possibly teams of four, with a view to participating in local leagues.

For all these advantages, the Club charges a modest yearly membership fee of £2. There could also be a small charge for table fees for other matches and tournaments.

For more information contact any of the following people:

Chairman, Hari Shah X5688, 6504
Secretary, Jackie Freeman X6205
Treasurer, Dorothy Irvine X5441

So current or potential bridge players, come along. Membership is not only limited to SERC, but is open to members of Harwell, MRC, NRPB etc.

Finally the SERC Indoor Sports Day is on 1 March 1985 at Swindon. Last year's Bridge winners are hoping to win and retain the trophy this year. If you wish to enter follow the instructions displayed on the notice boards or contact Hari Shah on Extension 5688 or 6504.

Bulletin

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J. Banford.

INTERNAL Events

ASTROPHYSICS SEMINARS R68 CONF ROOM - 1400 hrs

- 6 Feb Dr C Mackay/Cambridge
'CCD Detectors for Astronomy -
New Techniques and Results'
- 20 Feb Dr Richard Willingale/Leicester
'Cygnus X-3'
- 6 Mar Dr John Parkinson/MSSL
'Chasing Shadows and Clutching
Straws - Measuring the Sun'

JOINT THEORY SEMINARS R3 CONF ROOM - 1330 hrs

- 21 Feb J D Lawson/RAL
'Radiation, Antennas and
Accelerators'

EXTERNAL Events

SEMINARS IN PLASMA PHYSICS DEPT ENGINEERING - OXFORD - 1615 hrs

- 29 Jan Dr S P Thompson/Kratos.Anal.
Instr.Manchester
'Ion Sources for Space
Propulsion'
- 5 Feb Dr M Michaelis/RAL*visitor
'Refraction Studies of Flame
Plasmas'
- 12 Feb B A Ward/Culham
'Lasers used for Material
Processing'
- 19 Feb Dr G Doucas/NPD Oxford
'Negative Ions Produced from
Solid Surfaces'

THEO PHYS SEMINARS QMC - LONDON- 1430 hrs

- 31 Jan Dr F Vivaldi/QMC
'Renormalisation in Dynamic
Systems'
- 7 Feb Prof L O'Raifeartaigh/Dublin
'Effective Potentials for
Non-convex Potentials'
- 14 Feb Prof R A Stradling/Imperial
'Far Infrared Spectroscopy
of Semiconductors'

Trade Exhibition

BICC-Vero Electronics Ltd will be bringing their latest range of equipment, including circuit boards, connectors and sub-racks, to Conference Room 7, R12, for a one-day exhibition on Wednesday 30 January. BICC staff will be in attendance from 10.00 am to 4.00 pm.

There will be a one-day exhibition by Texas Instruments on Friday 15 February in the Atlas Colloquium from 10.00 - 16.00 hrs. On display will be Texas Instruments professional computers, including AI Silent 700 portable terminals, Omni 800 dual mode printers, etc.

Sales to Employees

The sale of scrap metal and plastics will take place on 1 and 15 February from 12-12.30 pm in the R24 scrap compound.

Missing

The following items are the subject of loss reports. Would anyone having any information on any missing object please contact the person making the enquiry.

Tony Lowe, Ext 6495 -

Wolf portable electric drill
Serial No 437A
Label No V007713

Dr C P Challenor, Ext 6511 -

BBC 'B' Computer
Serial No 03 AN B01 3003897

A J Dorsett, Ext 5250 -

Black & Decker portable grinder
Serial No 2473
Label No X001364

A J Brown, Ext 6110 -

3/8" electric drill, AERE 27682.
Wolf electric drill 14/2874
Serial No 053274.
Wolf electric drill, 1/4", SRC 3847
Serial No 966.
Wolf electric drill, 1/4", 14/1505
AERE 9366
Serial No 26401216.

Film Badge Notice

It is period 2. Film strip BLUE STRIPE. Please be sure you are wearing the correct dosimeter and return all old ones.

Next Film Issue -
Monday 25 February

'100' Club

Prize winners in the club draw:

September

Bob Reaney	R18	£125
Paul Angell	R59	£25

October

D Stanley	R25	£25
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November

Ken Louch	R8	£25
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Library Notice

The computing Library, R27, have acquired a book, which is not theirs, entitled 'A Guide to COBOL Programming by McCracken and Carbarsi. Would the owner collect please.

It's endemic! Returned to the main Library R61 "Modern Physics" by R L Sproull: not one of theirs either. A pair of tinted, silver metal-framed glasses are also awaiting collection.

Would staff who attend conferences please remember to order a copy of the proceedings for the Library. We would also be grateful for copies of slides, depicting work connected with RAL, from other establishments.

Book Scrum

The event you have all been waiting for. The Library is once again GIVING AWAY books, on Monday 4 Feb. Doors open at 9 am. Donations to charity (not Librarians Benevolent Fund) gratefully received. The last one made £50 for Oxfam and Sir Michael Sobell House.