J. Banford.

Bulletin

of the Rutherford Appleton Laboratory

9 Sept 1985 No. 12

CHASE ~ a Successful Mission

On the 29th July at 20.23 BST the space shuttle Challenger blasted off from the Kennedy Space Center, Florida. For a team of scientists from RAL and Mullard Space Science Laboratory this was a long awaited moment after several years of Instrument development.

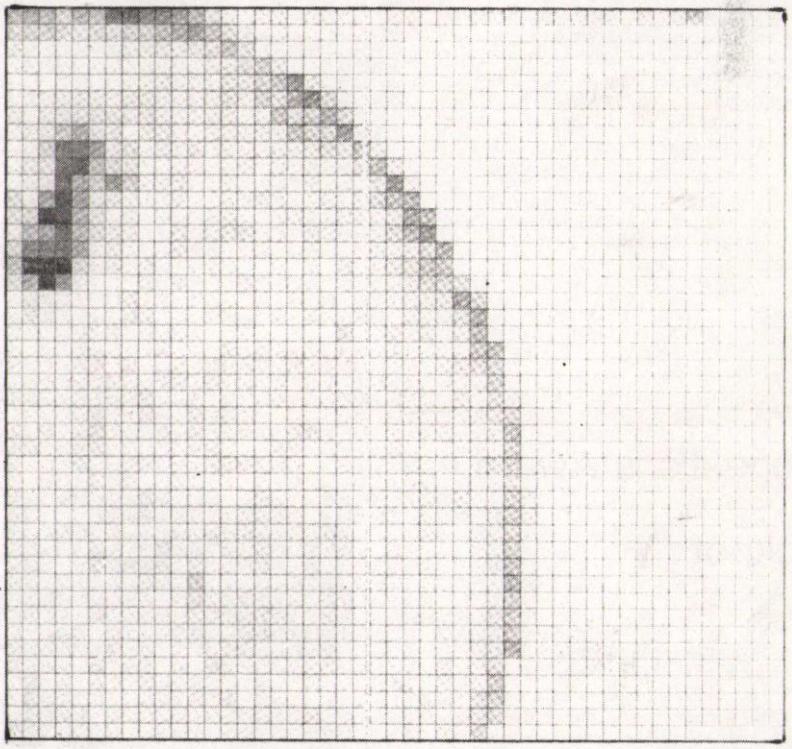
The Coronal Helium Abundance Experiment (CHASE) was one of thirteen experiments aboard the Challenger on the flight of Spacelab 2; the payload of which was designed to study a cross section of science ranging from Biology, through Astronomy and Solar Physics. As one of 4 solar instruments CHASE was mounted on the ESA Instrument Pointing System (IPS). Developed by Dornier, at a cost of some £45 million, the IPS is destined to become an essential part of the Spacelab system, and a major goal of Spacelab 2 was to test its performance.

An engine problem occured late into the launch which resulted in a lower than optimum altitude. This potentially could have had serious consequences for CHASE since the atmospheric absorption in the EUV (150-1200Å) becomes significant below ∿ 350km. Fortunately this absorption is variable, depending strongly upon the atmospheric temperature, and measurements indicated that the current conditions resulted in an adequately low absorption figures.

The turn-on of the Instrument was alarmingly fast for people more used to the leisurely pace of satellite missions. Nevertheless all the systems worked perfectly, and within only 13 hours mission elapsed time, we had already produced a solar map and several fine spectral scans. Much to our surprise the IPS was at this stage under CHASE experiment control. Due to a software bug in the IPS tracking system the pointing was delegated to our sun sensor, and throughout the Mission the shuttle crew would routinely use this device to acquire the Sun.

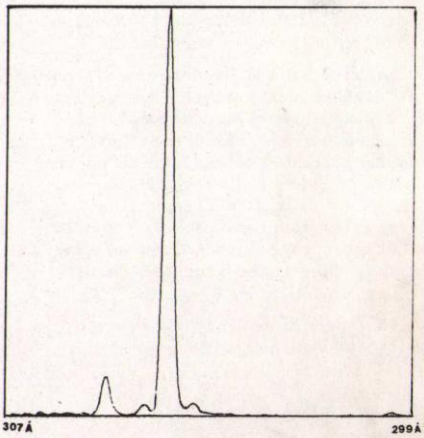
At every opportunity CHASE was able to gain valuable data, and achieved a large proportion of its primary scientific objectives.

A most surprising feature of Spacelab is just how helpful it is to have well trained personnel on board the shuttle. Certainly without their expertise, particularly as regards IPS operations, the scientific return of the mission would have been much reduced.



Solar map in the emission line of O VI 1032Å, showing an active region and evidence of limb brightening.

Now that all the team have returned from the control centre at Houston, and have fully recovered from their gruelling 12 hour shifts, it is time to analyse the mass of data. We look forward to many publications over the months to come, and especially to determining that elusive value for the Helium Abundance.



Solar Spectrum in the region of the strong He II resonance line. The smaller line is a blend of MgX and O IV.

For further information contact Bruce Patchett. Ext: 6368.

FR80 Closure

After 10 years of good and faithful service the FR80 microfilm recorder was switched off on 1 August 1985. This was one year later than expected.

Installed in 1975 it was the state of the art technology which could produce hardcopy film, both 35 mm and 16 mm, including colour and microfiche. The late Paul Nelson was mainly instrumental in seeing the machine in and tested.

David Greene, the Engineer, has been with the Laboratory for 17 years so he was almost a member of staff. Before this machine he engineered the Benson Lehner Plotter and the Stromberg Carlson (Datagraphix) SD 4020, so for him it truely was a sad day. We wish him well.

Members of staff who had worked on the machine gathered for the last time at 10.30 on 1 August to hear Doug House extol the virtues of the machine and tell a few stories about it. They were welcomed by the machine playing music. After Doug's eulogy the machine played Auld Lang Syne.

It was then switched off jointly by Maureen Smith, who was the last full-time operator, and Sally Nichols, who popped out of retirement to help officiate. RIP.

Present at the wake (from left to right), Kate Crennell, Dale Sutcliffe, Julian Gallup, Francis Yeung, Eric Thomas, Roland Branwood, Gillian Jones, Maureen Smith, Britt Jeeves, Sally Nichols and David Greene.

85RC 4223

Suggestions Award Jackpot

No wonder Derek Morrow looks slightly bemused in this photograph. He had just become the proud owner of a cheque for £2,990, the result of a bright idea concerning the shaping of aeroweb honeycomb for the panels of the Millimetre Wave Telescope.

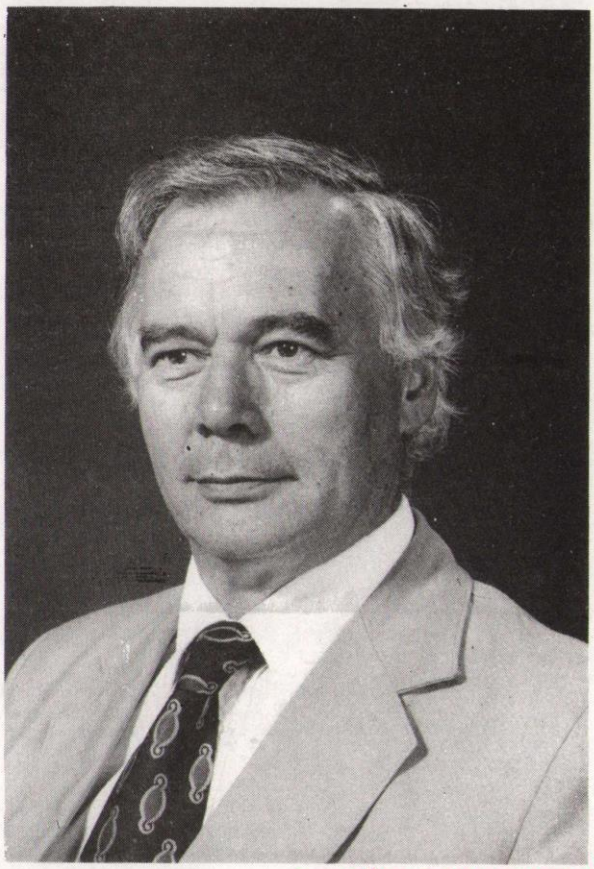
The award totalling £4000 (this was the second installment) was the largest ever made under the SERC Suggestions Award Scheme and was presented to Derek by Geoff Manning (Director RAL) on 5 August.

Originally it had been intended that the acroweb cores of the reflector panels for the telescope would be machined under outside contract, but sample cores were found to be on the limits of acceptability and heavily contaminated with cutting fluid. Derek's suggestion that they should be press-formed instead, saved time, enabled them to be produced on site and saved £40,000!

Derek's "roofing fund" looks much healthier now.

85RC 4234.

New Chairman for SERC



In file – personalities .

Professor Edgar William John (Bill) Mitchell, CBE, new Chairman of the Science and Engineering Research Council takes up his appointment on 1 October 1985.

Professor Mitchell has been head of the Cla endon Laboratory, Oxford since 1978 and is Dr Lee's Professor of Experimental Philosophy at the University and Fellow of Wadham College.

A graduate of the University of Sheffield, he spent a period at Metropolitan Vickers before joining the H H Wills Physics Laboratory of the University of Bristol where he was awarded his Ph.D in 1950 for measurements of the work function of metals and semi-conductors. In 1951 he moved to the University of Reading becoming Deputy Vice-Chancellor from 1976-78, and worked on a succession of topics in solid state physics - colour centres in quartz and diamond, radiation damage, the Faraday effects for determining effective masses in semiconductors, highly disordered gallium arsenide and the development of the now widely used method of small angle neutron scattering for the study of real crystals.

Well known in SERC circles for many years, Professor Mitchell served on the Council from 1970-1974 and from 1982; he was Chairman of the Physics Committee from 1967-70 and Neutron Beam Research Committee from 1967-74. His research is in the field of experimental solid and liquid state physics, using a variety of techniques. Recently he has been studying the structure and dynamics of molten salts by neutron and light scattering. He was awarded the CBE in 1976.

Death of Radar Pioneer

It is with sadness that we announce the death on Monday 5 August of Mr Arnold Fredrick Wilkins, co-inventor of Radar and former Deputy Director of the Radio and Space Research Station, Ditton Park (afterwards Appleton Laboratory).

Much has been written about the part which A F Wilkins played in the invention of Radar following the famous enquiry by Air Ministry about the possible use of radio energy as anti-aircraft deathrays. It was A F Wilkins who, when asked by Robert Watson-Watt, did the calculations which proved the idea to be impracticable. However, remembering a recent paper by Nancarrow, Mumford and Mitchell of Dollis Hill P.O. Research Station, regarding the nuisance of aircraft reflections to their Radio Field strength measurements, he immediately suggested to Watson-Watt that these reflections might be used for detection purposes. In this sense it may be said that his lateral thinking led to the birth of Radar.

Mr Wilkins career at the Radio Research Station Slough began in 1933 where he worked with Robert Watson-Watt on atmospherics. In 1935, seconded to the Air Ministry, he led a contingent to Orfordness in East Suffolk where he formed the nucleus from which grew the great complex of Radar. The work which he started there continued until it was transferred in due course to Dundee, Swanage and Malvern.

A F Wilkins, however, joined the RAF during the war years as Group Captain in the Operational Research section. After the war he chose to return to Ditton Park to continue his Ionospheric research, and continued to make significant contributions to the study of radio propagation at oblique incidence.

Many former staff members of the Radio and Space Research Station, later to become the Appleton Laboratory, will remember Arnold Wilkins with affection. His dry wit and unexpected classical references were a source of delight. When he retired from his post as Deputy Director in December 1968 he was greatly missed.

He leaves a wife, Nancy, and three daughters to whom we extend our deepest condolences.

Internal Events

HEP SEMINARS
R61 CONF. RM - 1100 hrs

18 Sept. D Hasell/RAL
'HERA inner tracking chambers'

20 Sept S Geer/CERN
'UA1 Results'

NIMROD LECTURES
R61 CONF. RM - 1400 hrs

24 Sept R A Saiden/Santa Cruz
1100 hrs 'Mark 3 results on J/ψ

7 Oct R Marshall/RAL
'Status of the electroweak' interaction (Ban and Kiryat) Anavim Conferences).

Film Badge Notice

It is period 10. Colour Strip RED. Please be sure your film badge is current and return out-dated ones.

NEXT FILM ISSUE
Monday 7 October.

Site Emergency

Wednesday 25 September

A site emergency exercise has been organised by Harwell on this date which will include RAL.

When the klaxons sound all personnel must enter the nearest main building and close all external doors and windows. The main gates will be closed; all incoming commercial traffic will be directed to the bus park on Fermi Avenue, private vehicles destined for RAL will be permitted to drive to our main gate.

During the exercise no one will be allowed to enter the site or to move outside any building without the permission of the RAL Emergency Controller (Ext. 5545). Special arrangements have been made to convey previously authorised visitors to R1 and R20 if they arrive during the exercise.

If there are any queries with regard to the exercise please contact Eric Hartley (Ext. 5329) before the 25th and extension 5545 during the exercise.

STAY INSIDE, CLOSE EXTERNAL DOORS AND WINDOWS, DO NOT USE THE TELEPHONE SYSTEM EXCEPT FOR CALLS CONNECTED WITH THE EXERCISE OR FOR EMERGENCIES.

Umpires will monitor the site during the exercise. The sounding of a CONTINUOUS NOTE on the klaxons will signal the end of the exercise.

Loan Pool Catalogue

The 1985/86 catalogue is now available. If you have not received your copy please ring John Jones Ext. 5571.

New additions to the Pool include:-

Spectrum and Mains Analysers
Programmable Synthesized Signal Generator 10 KH_z - $1GH_z$
Digital Storage Oscilloscope
Data Loggers
Optical Tachometer
Humidity Meter
Stereo Binocular Microscope
Digital Thermometers

Please contact John Jones if you have any suggestions or queries.

Your input will influence future purchases.

RAL TECHNOLOGY LECTURES

The next lecture in this series will be held on Thursday 26 September 1985 at 3.15 pm in **Conference Room 12 Building R68. PLEASE NOTE CHANGE OF VENUE.**

ADVANCED LITHOGRAPHY - THE INCREDIBLE SHRINKING TECHNOLOGY

by

MR R A LAWES
TECHNOLOGY DIVISION

Lithography is a major driving force behind the astonishing advances in microelectronics device performance over the last decade. Circuit dimensions are now approaching the wavelength of light and some 10^6 transistors can be packed onto a piece of silicon measuring less than 1cm x 1cm.

RAL has been involved in advanced lithographic techniques for nearly a decade, both to provide a service to universities and polytechnics and to develop new manufacturing processes and equipment. Current R & D is concentrated on producing a third generation electron beam machine under the Alvey Programme and investigating the uses of excimer lasers for lithography.

The talk will outline the problems facing the lithographer and the likely solutions. Some emphasis will be given to the contribution by SERC through its university and RAL programmes.

Trade Exhibition

Systems and Electrical Supplies Ltd will be holding an exhibition on 12 September in R12 Conference Room from 10am to 4pm.

Equipment on display will include stripping tools, trunking, air guns, glands, marking systems, ties etc.

Honeywell Industrial Products Group will be exhibiting their range of instrumentation in the R12 Conference Room on Wednesday 25 September from 10.30 am to 4.0 pm.

On display will be their latest products including controllers, recorders, transmitters and PLCs. Their test instrument department will be showing their test management system U.V and tape recorders.

Acknowledgement

Mrs Eileen Freeston, wife of the late Ken Freeston, wishes to thank Ken's many friends and colleagues for their tremendous support and comfort in her sad loss.

"I hope those of you who were there (at the funeral service) felt, as I did, that Ken left as he wished to - with dignity." she writes. "The collection for the Graseley Syringe Driver met with wonderful response. It has been ordered by the Macmillan Nurses for use in Newbury and I know will be greatly appreciated by those in need. My thanks to everyone for their generosity."

RAL Wives Group

Coffee mornings to December have now been booked, so please note them in your diary.

Thurs 10 October
Tues 5 November
Wed. 18 December

These will all be held as usual at The Cosener's House, Abingdon from 10.30 am until noon. Pre-school children are always welcome.

We hope our gatherings will be well attended and therefore be a good meeting place for old friends and new. Newcomers are especially welcome. Do come along to as many as you can.

Suzanne Litchfield will be succeeded by Celia Lockwood as joint organiser of our group, from September so please note her address and telephone number below.

For more information about our get-togethers please contact:-

Celia Lockwood
6 Long Barn
High Street
Sutton Courtenay
Tel: Abingdon 847266

Zoe Patrick
3 Bosley's Orchard
Grove
Wantage
Tel: Wantage 68809

Sales to Employees

Sales of scrap metal and plastics, will take place on 13 and 27 September in the scrap compound, R24 from 12 noon to 12.30 pm.

Bulletin

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Deadline for insertions: