Bulletin
of the Rutherford Appleton Laboratory 3 June 1985 No.8

# CHASE & XRT to Fly on Spacelab 2

Spacelab 2 and the two UK-prepared experiments which will form part of the payload, were the focus of attention at a Press Briefing held at RAL on Monday 13 May.

Interest was further enhanced by the presence at the briefing of Loren Acton, one of the Spacelab payload specialists for the flight, and of Jeff Hoffman the astronaut whose space-walk with the 'fly-swat' caught the imagination of the media during the previous Spacelab mission.

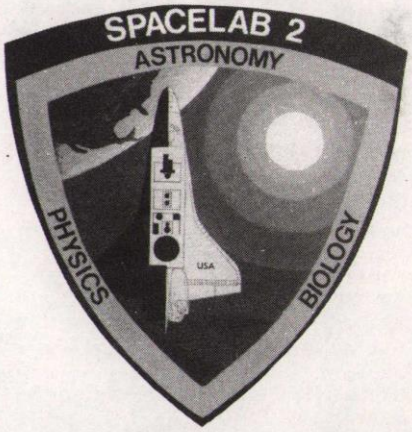
Due to the launch as part of Spacelab 2 from the Kennedy Space Centre on Wednesday 12 June for a 7 day mission, CHASE (Coronal Helium Abundance Spacelab Experiment) is a joint project of RAL and Mullard Space Science Laboratory. The instrument is one of four solar experiments in the multi-disciplinary payload and together with the Birmingham University X-ray Telescope will form part of the first pallet-only Spacelab flight.

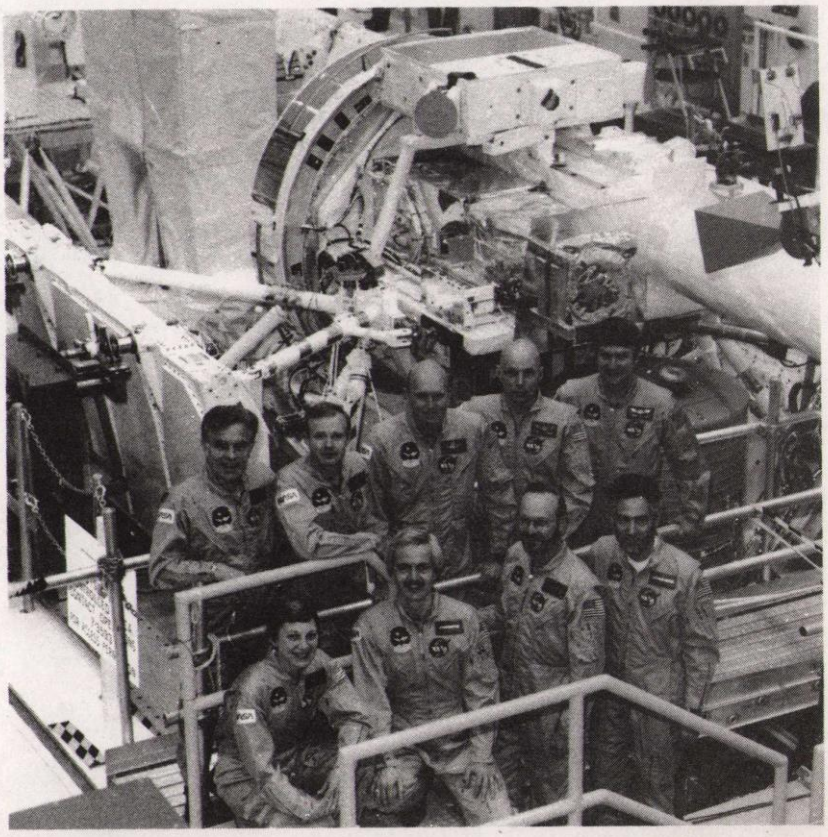
## Spacelab 2

Spacelab, which is provided by the European Space Agency and flown as a part of the NASA Shuttle-based Space Transportation System, is a system of pressurised, habitable modules and unpressurised experiment pallets. These elements can be arranged in several different combinations within the Shuttle Orbiter cargo bay.

On Spacelab 2, the payload bay will be occupied by pallets and special structures which support various experiments and expose them to the space environment. The payload crew will operate the experimental equipment from inside the orbiter crew cabin. This differs from Spacelab 1 where the crew worked inside a habitable module in the payload bay. Coarse pointing of Spacelab payloads is provided by the Orbiter. If additional accuracy is required a Spacelab-supplied Instrument Pointing System mounted on a pallet segment permits high-precision pointing of Spacelab payloads.

On this mission CHASE will be mounted, together with three other experiments for coordinated solar studies, on the Instrument Pointing System. This assembly of instruments will be



*The Spacelab 2 crew pictured against the payload assembly. Loren Acton is third from the left, bottom row.*

# INTERNAL Events

NEUTRON DIVISION SEMINARS
R3 CONF. RM - 1330 hrs

11 June Prof M Woolfson/York
'Direct Methods in Crystallography'

18 June Dr M Dove/Cambridge
'Computer Simulation of Orientationally Disordered Crystals'

25 June Dr D Chaplin/Imperial
'Three-dimensional Granular Superconductors'

GEOPHYSICS SEMINARS
R68 CONF. RM - 1400 hrs

11 June Dr R G Derwent/Harwell
'Acidification in the Environment'

18 June Dr A F Tuck/Met Office
'Aircraft Studies of Tropospheric Ozone'

2 July Mr D R Lepine/RAL
'Electron Observations from AMPTE UKS'

COMPUTING SEMINAR
ATLAS CENTRE COLLOQUIUM - 1515 hrs

11 June Prof J R Gurd/Manchester
'The Manchester Dataflow Project'

# EXTERNAL Events

ELEM PART PHYS SEMINARS
NPD - OXFORD - 1430 hrs

6 June Dr P Watkins/Birmingham
'New Results from the UA1 Experiment at CERN'

13 June Mr P Shotton/Oxford
'Structure Functions for Neutrino and Antineutrino Interactions in Hydrogen

20 June Mr S Towers/Oxford
'New Measurements on Neutral Currents for Neutrino - and Antineutrino - Proton Interactions'

PHYSICS COLLOQUIA
CLARENDON LAB - OXFORD - 1615 hrs

14 June Dr D M Brink/Oxford
'Nuclear Physics with Heavy Ions'

SEMINARS IN PLASMA PHYSICS
DEPT ENG SCI - OXFORD - 1615 hrs

11 June Dr N L Allen/Leeds
'Some Aspects of Avalanche and Streamer Formation in Air'

18 June Dr L M Lea/Oxford
'The Volume Production of $H^-$ Ions in a Large Source'

## Spacelab 2, CHASE & XRT *(cont'd from p1)*

controlled for much of the time by one of the two payloads specialists, Drs Loren Acton and John Bartoe, from the Spacelab control and display panel in the aft flight deck of the Shuttle Orbiter. Both are non-NASA scientists who both have been specially trained to fly the mission and will be advised throughout the flight by RAL and MSSL scientists specially based at Houston, Texas.

### CHASE

The acronym CHASE refers to the first objective of the joint experiment: Coronal Helium Abundance Spacelab Experiment. After hydrogen, helium is the most abundant element in the Universe, having about 10% concentration, by number of atoms. Yet, in spite of this, the value of the abundance is poorly known. Existing measurements lie between 5% and 25%. It is expected that CHASE, by using a new technique, will determine this abundance in the solar corona to an accuracy of 10% of the actual concentration. There are good reasons to believe that the coronal abundance would be typical of the Sun as a whole and that the solar abundance will be typical of the Universe in general because it will have been increased only marginally by nucleosynthesis in stellar interiors. Thus the measurement will be directly related to the primeval helium abundance, the concentration produced in the 'big bang' at the origin of the Universe, and is therefore an important test of cosmological models.

CHASE consists of a two-metre grazing incidence spectrometer covering the wavelength range 140 to 1350 Å, illuminated by a two-reflection grazing incidence telescope. The basic helium abundance measurement will be carried out by studying the hydrogen 1216 Å and ionised helium 304 Å radiation re-emitted by the corona through resonance scattering of the bright light at these wavelengths emitted from the solar disc.

### X-ray Telescope

XRT Birmingham's X-ray Telescope comprises of two telescopes mounted side by side, carried on their own pointing mount which allows them to point at targets relatively independently of the orbiter vehicle, thus giving efficient utilisation of the mission duration. The telescope will be given operational instructions about once per orbit, either by the Spacelab payload specialists or from the payload team in the mission control centre at Houston. It will then operate almost automatically until the instructions are updated. The telescope is a large structure and it is essential that its operation should present no hazards to the flight of the orbiter. To ensure that, its entire telescope control system has been duplicated. Accordingly, one control system operates the telescope while the second monitors its performance, ready to take over if it detects evidence of malfunction.

On the Spacelab 2 flight it will obtain pictures of clusters of galaxies, of the centre of the Milky Way and of some supernova remnants.

*Information sheets on both experiments may be obtained from Mrs Julia Gilling, R25 Ext. 6174.*

## RAL TECHNOLOGY LECTURES

The next lecture in this series will be held on Thursday 20 June 1985 at 3.00 pm in the R22 Lecture Theatre.

**MANAGING ENERGY EFFICIENCY INNOVATION**

by

**DR W M CURRIE**
**ENERGY EFFICIENCY BRANCH**
**ENERGY TECHNOLOGY SUPPORT UNIT**
**HARWELL**

The Energy Technology Support Unit at Harwell manages the Energy Efficiency Demonstration Scheme and an associated R&D Programme for the Government's Energy Efficiency Office. The objective of the ED Scheme is to stimulate 10 Mtce/yr of energy saving by around 1995 for a total public outlay of £65M on 500 projects in industry and buildings. The aim of the R&D programme is to assist in the realisation of comparable benefits on a longer timescale, for an outlay of perhaps £20-25M. The ED Scheme is going reasonably well but it is more difficult to stimulate effective R&D in this area. The talk will focus on the management challenges presented by these two tasks.

**FOR YOUR DIARY:** The next lecture in the series will be held on Thursday 8 August 1985 by Dr J R Rees Associate Director, Stanford Linear Accelerator Centre, on the SLAC Linear Collider Accelerator.

## Christian Fellowship

Meetings of the Fellowship are held in R2 Conference Room at 12.30 pm on Thursdays. Everyone is very welcome.

June's Programme is given below.

| | | |
|---|---|---|
| 6 | Bible Study | Adrian Cole |
| 13 | Prayer Meeting | Jim Darius |
| 20 | Personally speaking 'The Bible & Experience I' | Frank Smith |
| 27 | 'The Bible & Experience II' | Vicky Murray |

## Film Badge Notice

It is period 6, colour strip PURPLE. Please be sure you are wearing the correct dosimeter, and return all old ones.

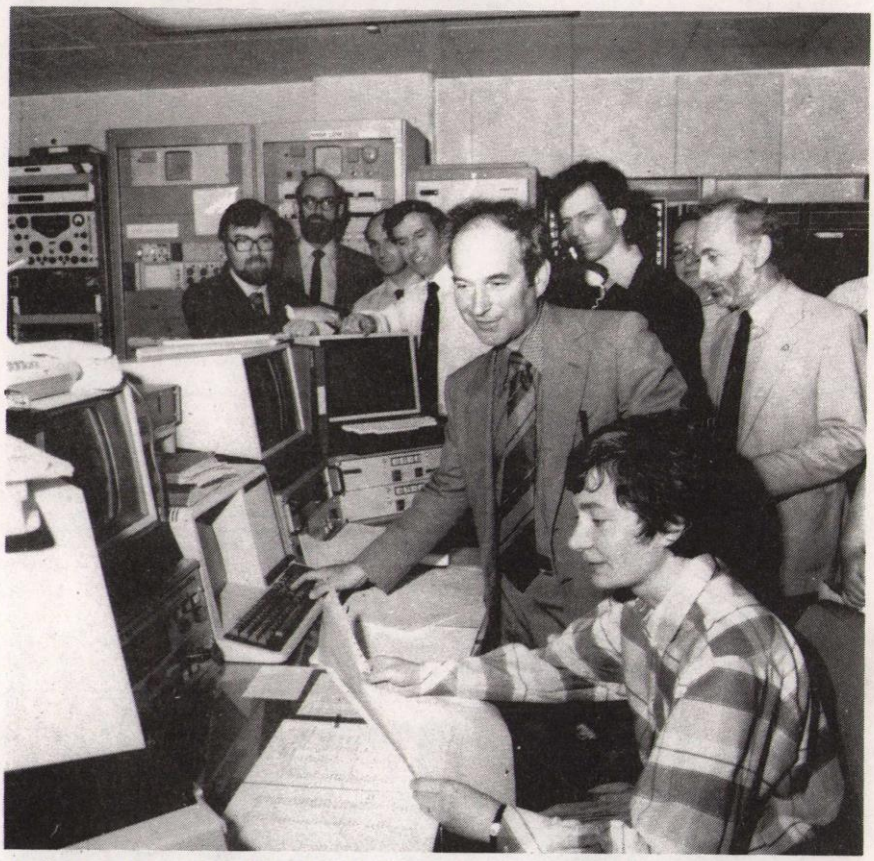
NEXT FILM ISSUE

Monday 17 June.

## Sales to Employees

The sale of scrap metal and plastics, to RAL employees will take place on 7 and 12 June from 12 to 12.30 in the R24 Scrap Compound.

# Extra IRAS Mission Ends



*At 9am on Thursday the 9th May Dr Manning, at the console in the RAL Satellite Control Centre, initiated commands to switch off the transmitter on-board the Infra Red Astronomical Satellite (IRAS).*

*Data lines were used to relay the final minutes of data from the Control Centre to the Netherlands where our Dutch colleagues congregated to participate in the final event of the IRAS operations.*

*The operations, beginning in January 1983, played an important role in the successful IRAS mission. Although the mission ended in November 1983, when the supply of liquid helium necessary to cool the telescope was exhausted, limited operations were continued until May 1985. This enabled a series of technical experiments to be made using the spacecraft as a "test bed".*

*Alas, it is not now as it hath been of yore;*
*Turn wheresoe'er I may*
*By night or day;*
*The things which I have seen I now can see no more.*

*Wordsworth.*

## RAL Annual Report '84

The day you have been awaiting is here!

Annual Reports can now be obtained from the Library R61.

## Trade Exhibition

SIGMEX Ltd will be exhibiting their high performance GKS terminals in the Atlas Centre Colloquium on Wednesday 19 June from 1000 hours until 1600 hours.

## Acknowledgement

Jim and Jamie Coupland would like to thank all Ann's friends and colleagues at RAL for their support and kindness throughout the last few years.

## We Were There

This photograph, taken about half a minute after the dust had cleared, shows how near RAL came to losing some of its favourite sons (and daughters) - a fair proportion of the Millimetre Wave Telescope team - on 20 April.

The absence of 'camera shake' could be attributable to the iron nerve of the camera man, or that after a night on the ferry from Holland, he was slightly non compos mentis.

The pipe-work festooned delicately above the carriage way is a mixture of gas main and electricity cable.

RAL was a very welcome sight that day!

### Crane crash escape

**DRIVERS on the A2 at Cobham, Kent, had a narrow escape yesterday when a low-loader carrying a crane hit a footbridge, knocking 200 tons of concrete onto the road. The driver of the low-loader was unhurt.**

## RAL Wives Group

The next coffee morning for all RAL wives will be held on

Thursday 20 June

at Joy McWhirter's house at

13 Park Crescent, Abingdon

from 10.30 am until noon.

We hope that the weather will be fine enough to be outdoors in the garden, so please come along with your pre-school children and any newcomers to the area.

We are in the process of organising a pub lunch and walk during July, so watch for further details.

Please telephone for information:

| | |
|---|---|
| Suzanne Litchfield | Abingdon 21310 |
| Zoe Patrick | Wantage 68809 |
| Savita Shah | Abingdon 29136 |

## '100 Club

Members of RecSoc are invited to join the 100 Club, which is run to produce funds for RecSoc activities.

Members contribute 25p per week. A monthly draw is held for one prize of £25 and additionally on the 13th week for £125.

At present there are 8 membership numbers available.

## Outdoor Sportsday

The Outdoor Sportsday is to be held in Birmingham again this year, on 5 July. The events are tabled below. If you would like to take part in any of these, please contact the organiser named.

| | | |
|---|---|---|
| Angling | P Craske | Ext 6273 |
| 6-a-side Football | K Lewis | Ext 6713 |
| Cricket | A Napper | Ext 5411 |
| Rounders | H Dorsett | Ext 5580 |
| Croquet | N Whitehead | Ext 6521 |
| 3000 metres (men) | | |
| 100 metres (men) | T Morgan | Ext 5563 |
| 100 metres (ladies) | | |
| Bowls | | |
| Tennis | T Pett | Ext 5332 |
| Tug-of-War | T Morgan | Ext 5563 |

Spectators should give their names to A Forster Ext 6363 if transport is required.

## Cricket

The cricket season is upon us once again and we are faced with the annual problem of players (or lack of players) available for consideration.

### Six-a-Side Dave Craddock Cup

Last year we ran a six-a-side competition, after work, on various evenings, for the 'Dave Craddock Cup'. If anybody is able to raise six players from their section of the Lab and would like to enter please let Andy Napper know.

### Sportsday

We need players for the Outdoor Sports - always an enjoyable occasion - at the Civil Service Sportsground opposite Birmingham Airport on Friday 5 July.

### RAL Friendlies

We play a number of friendly matches each year against local sides including AERE Police etc, usually on Tuesday and Thursday evenings. If anyone feels like weilding a piece of willow on a summer evening and then relaxing in the bar with a nice cold pint, please let me know as soon as possible. We are short of players and any help would be appreciated.

Andy Napper R9 Metal Store
Ext. 6136

Bulletin

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