

Bulletin

of the Rutherford Appleton Laboratory

31 July 1984 No.12

CHASE Integration Test Complete

CHASE, the "Coronal Helium Abundance Spacelab Experiment", a joint RAL, Mullard Space Science Laboratory project scheduled to be flown on the Space Shuttle in spring 1985 has recently completed its integration tests at NASA. It will be one of 14 scientific experiments on the spacelab 2 payload.

The main objective of the CHASE experiment will be to map the intensities of selected emission lines emitted within the solar corona. The corona is a very tenuous outer layer of our Sun, and is visible from the Earth only during total eclipses. Its lower boundary is well defined by a very steep rise in temperature (5.10^{30}K to 1.10^6K) and a correspondingly sharp drop in density. With such high temperatures a good deal of the radiation appears in the form of emission lines from ionised atoms. The majority of the strong resonance lines from these ions occurs in the extreme ultra violet (EUV), and for this reason the instrument has a spectral range covering 150\AA to 1350\AA .

Ratios of particular emission line intensities can give valuable information about the temperature, density, and composition of the solar atmosphere. A particularly important measurement will involve the He II 304\AA and H I 1216\AA lines, where the aim is to derive the ratio of Helium to Hydrogen in the Sun to a high order of accuracy. With helium contributing approximately 10% of the solar mass this ratio is obviously a vital parameter in models of the solar interior. In addition the helium abundance is thought to have changed little since the "Big Bang" creation of the Universe, and accurate measurement of its abundance will provide a constraint to Cosmological Models.

The instrument, built jointly by RAL and the Mullard Space Science Laboratory, is a combination of a grazing incidence telescope and a Rowland circle spectrometer. Scanning mechanisms associated with the telescope



Photo: NASA.

mirror and spectrometer provide a means of spatial scanning, and a further mechanism, which rotates the spectrometer grating, extends the wavelength coverage of the fixed detectors. Within the spectrometer there are 12 open channel multipliers, each positioned to receive an emission line of particular interest, and a channel multiplier array plate covering the wavelength region $150-220\text{\AA}$.

Operation of the instrument by the Shuttle crew has been simplified by the addition of a microprocessor. Its main tasks are to format the experiment data (eg detector outputs, mechanism positions, etc) and to execute sequences of mechanism movements associated with a particular scientific

objective. Such a sequence may perform 2 dimensional raster about a solar feature by movement of the slit and mirror mechanism, and can be activated by the crew by simply entering a sequence number at a computer console.

The instrument is shown in the picture during the mechanical integration at the Kennedy Space Center. It is being bolted to a cruciform shaped structure, which in addition supports three other solar experiments. The cruciform is attached to a pointing system, being developed by ESA, which has a designed pointing stability of 1 arc second.

(cont'd over)

CHASE (cont'd from p1)

The association of 4 solar experiments provides the opportunity for joint observations of solar features from the EUV to visible wavelengths. As a consequence the scientific return of the mission has been considerably increased. In recognition of this NASA has approved a second flight of the solar package during 1986, and to be known as SUNLAB 1. It is hoped that this will be the first of many reflights, giving RAL a continuing opportunity to participate in the field of solar space research.

For further information, please contact Bruce Patchett, Ext 6368

Acknowledgement

Mary Rousseau, Nicholas and Kate, would like to thank all the friends and colleagues of Michael at RAL who have offered sympathy, kindness and hope during the past few weeks.

Thanks also to all those who contributed towards the most generous donation to the Radcliffe Infirmary in memory of Michael.

We have also received a letter of thanks for the memorial donation from the Radcliffe Infirmary.

Christian Fellowship

PROGRAMME FOR AUGUST

Aug 2 Bible Study
Aug 9 Prayer Meeting - Phil Green
Aug 15 Joint meeting with Harwell's fellowship
Aug 23 Tape Presentation - Mike Woods/
Simon Atkin
Aug 30 Summertime Fellowship - Jimmy Darius

All meetings are held at 12.30pm on Thursdays in R2 Conference Room, except the Wednesday meeting on August 15. New members are most welcome.

Thanks

Carole Angell of R27 CD OPS wishes to thank everyone for their kindness, and the five happy years she had at RAL.

"Thank you all, who made my last day special and goodbye to all who I was unable to see before I left", she writes.

Missing

The undermentioned items have disappeared from R25 Stores Delivery Point.

LED anode
BCD switch
Marker pens

Will anyone knowing of their whereabouts please contact D Taylor, Ext 6663

Sales to Employees

The sale of scrap metal and plastics will take place (subject to the usual conditions) on 3, 17, and 31 August in the R40 scrap compound from 12-12.30hrs.

AMPTE Launch Imminent

The three AMPTE spacecraft, the CCE from the USA, the IRM from Germany and the UKS from RAL and MSSSL, which are confidently expected to open a new chapter in the study of plasmas in space, (see Bulletin Reports No 18 1982 and No 18 1983) are at the Kennedy Space Center (KSC) in Cape Canaveral Florida now undergoing their final preparations for launch on schedule on 9 August at approximately 1542 hrs BST.

The UKS preparations, which included the installation of the solar-cell array, flight batteries, pyrotechnic devices etc, have also involved commands being sent from the UKS Operations and Control Centre (UKOCC) in Building R1 at RAL to the UKS spacecraft at KSC via the Deep Space Network and the satellite's telemetry output being displayed at the UKOCC as it will be in orbit.

On 9 August a press conference will be held at RAL to describe the mission and in particular the UK contribution to it as well as to follow the first of the series of events taking place over several days to put the spacecraft into their mission orbits. These will include (at the approximate times shown)

9 Aug 1542 hrs - lift off of the Delta rocket carrying the three spacecraft stacked together.

9 Aug 1643 hrs - injection into a transfer orbit where the CCE will separate from the others and remain throughout the mission.

10 Aug 0853 hrs - firing of a kick motor which will take the IRM and UKS into their mission orbit.

12 Aug 0857 hrs - separation of the UKS from the IRM shortly after entering the second mission orbit, and the beginning of control from the UKOCC.

If for any reason the launch cannot take place on 9 August there will be further opportunities at approximately the same times over the following 11 days.

(For further information on the AMPTE mission see EOS Transactions, American Geophysical Union 63 843 1982 and J. British Interplanetary Soc. 37 309 1984 both available in the Library).

Film Badge Notice

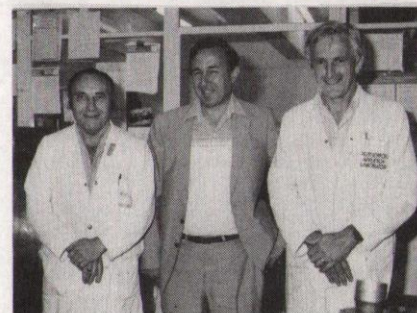
It is period 8 Colour strip ORANGE. Please check that your film badge is current and return all old ones. Next film Issue - Monday 13 August.

Suggestions Awards

July has been a bumper month at the Lab for Suggestions Awards. Paul Smith of the SNS Mechanical Workshop received an award of £865 from Geoff Manning (Director, RAL) on 4 July and Cyril Adair and Jim Culver of R25 workshop were handed cheques for £320 and £230 respectively by Ron Newport (Acting Head of Instrumentation Division), on 10 July.



Dr Geoff Manning and Paul Smith 84RB310



Cyril Adair, Dr Ron Newport and Jim Culver 84RB312

Paul's very handy windfall was the result of his idea for reclaiming for re-use the aluminium diamond vacuum seals used in large quantities on the SNS. The seals are expensive and were originally used once and discarded. By using Paul's simple jig to reform the sealing edge they can now be used up to four times. The idea may also be adopted at Daresbury.

Jim's idea for inhibiting spark erosion at junctions between electrical connectors and heater resistors within the pressure vessel of the Fluidised Bed Combustion Facility, has reduced repair time on a facility with a very demanding experimental schedule by 50%. This represents a considerable improvement, where down-time can occupy 20% of the operational time available.

Cyril Adair's suggestions just flow. The cheque he took charge of was for four of 27 he has now nominated, and provided simple solutions to problems associated with the manufacture of the Millimetre Wave Telescope Antenna and the cutting of panels for a screened room, in situ. He also designed a "follower rest" for the accurate turning of flexible long slender small diameter workpieces.

All three award winners were warmly thanked for the value of their suggestions to the Laboratory and their colleagues invited to follow their example.

Sports Day 1984

Birmingham provided us with beautiful weather once more on Friday 6 July for our second visit to the Civil Service Sports ground. It may even have been too hot for some of the exertions we witnessed.

RAL competitors had quite a successful day, being victors in the rounders; winning first and second places in the mixed doubles (Lorna Claringbold and Tim Pett being joined this year by Janet Charles and Tony Short) and taking first place in the Bowls Triples with Mary Shepherd, Bob Maybury and Del Forsyth. There were also run-away victories by Richard Hill in the 3000 metres and Alan Saxby in the 100 metre events. The cricket was eventually lost to Central Office (could we interest Hassan in RAL); as was the football, Rutherford 'B' coming a magnificent second. Sadly, the fish were unco-operative to RAL's anglers, though Peter Craske did well as usual, managing to produce one right on cue as the photographer approached, and Malcolm Davies came 2nd in the individual event.

Never-the-less everyone seemed to be having a marvellous day, culminating in a dusk prize-giving conducted by Mr Tony Eggington, Director of the Engineering Board.

We thank Mr Eggington for kindly agreeing to perform this duty, also the organisers of the day and the events. We would also like to express our appreciation to the staff of the three clubs whose facilities we took over for the day.

But, let some of the participants speak more graphically for themselves -

Rounders

This, as you may know, is the watered-down version of Baseball; the theory being the same: hit a ball with a wooden stick and charge off round a pre-defined route (normally this is done in an anti-clockwise direction and as each team followed this basic rule there were no nasty collisions!).

Three teams entered the event: Central Office, Daresbury and RAL, each team comprising 7 women and 3 men (except for RAL who had to be different and were one woman short). After finding the pitch tucked away close to a nearby hedge battle commenced.

The first match was between RAL (a mixture of the world famous Anthill Mob, and the Instrumentalists) and Central Office, with RAL cruising to an 18-4 win, the opposition being dazzled into submission by the fluorescent socks of some of our female players!

Daresbury were on next against Central Office and after a good contest emerged the winners by 11-2½. This then set up the Final between RAL and Daresbury which took place after a warm-up session during which one RAL team member lost the ball in the hedge,



Richard Hill - the agony

another had a "bump" on her leg and another was staggering around with a violent headache! A quick re-shuffling of teams and the Final was on with Daresbury showing that their pre-Sports Day training had paid-off by going into an end of-first innings lead of 5-3. RAL's Helen Dorsett then launched into a fine captain's innings of 3 rounders (highest individual score of the day), and with excellent support from the rest of her team, RAL carried off the trophy by a narrow 11½-8½ victory.

Special thanks go to Helen for her hard work in organizing both the RAL team and the event and to Peter Caulfield for umpiring all the games and coping with the "verbal abuse"!

BOB YOUNG

RAL

Helen Dorsett (Capt))
Zoe Binnie) The Socks
Penny Whitehead)

Janice Brown - The Bump
Margaret Haddock - Courtesy of GM
Sue Merrifield - Ooh! My Head

Steve Johnston - Iced Water only,
please
Bob Young - Lost Ball Dept
Colin Uden - The Hat

Angling

This year the Angling was held on the Sports Ground Lake for the first time and proved to be a good choice. Most anglers caught fish and it turned out to be a very good competition.

The strong Daresbury 'A' team again proved to be the best on the day, closely followed by the RAL 'B' team and the Daresbury 'B' team.

TEAM RESULTS

Daresbury 'A' - 26 points - 91b 6½oz
RAL 'B' - 23 points - 51b
(Craske, Davies, Hodges & Smith)
Daresbury 'B' - 14 points - 31b 8oz

It was good to see a team from Central Office participating.

INDIVIDUAL HONOURS

1. Colin Watson (DL) 41b 8oz
2. Malcolm Davies (RAL) 21b 6½oz



Helen at work.



Peter's fish.



Alan Saxby comes home first

Football

Football was held this year in glorious sunshine. We finally persuaded "THOSE IN CHARGE" that we should play on ½ size pitches with full size goals. Ten teams eventually turned up and after we had cleared the pitches of dead clay pigeons and empty shotgun cartridges play began in earnest.

The opening showpiece was a repeat of last years final Daresbury 'A' v Students (Ruth 'B'). As we had only been there an hour the students were still sober so the game contained some football. If only the BBC cameras had turned up as requested we would have seen 'PHIL' win the "save of the season" award and 'ROCK' win "the goal of the month". Still it wasn't to be and in decades to come only the spoken word will recall it. Anyway Daresbury 'A' won easily but it didn't dampen anyone's spirits.

There were two leagues and two easy winners Ruth 'A' and ATLAS. However as will be seen neither of these won the cup. Ruth 'A' won all their matches including a very tough battle with Central Office. Emerging 2-1 victors over C.O., Ruth 'A's confidence was sky high. Atlas won their first 3 matches but fell asleep in the fourth drawing 3-3 with Daresbury 'A', although the fact that the referee (PHIL) was 'relaxed' may have had something to do with it.

League A

	W	D	L	Pts
Ruth A	4	0	0	8
C.O.	2	1	1	5
Appleton A	1	2	1	4
Ruth C	1	0	3	2
Dars B	0	1	3	1

League B

	W	D	L	Pts
Atlas	3	1	0	7
Dars C	3	0	1	6
ROE	2	0	2	4
Dars A	1	1	2	3
Ruth B	0	0	4	0

Semi finals:- Ruth A v Dars C
4 - 0 *

Ruth 'A' won their semi-final with ease. but Atlas fought hard only to be beaten by an effort from 30yds, so we came to the final.

As previously referred to as "THOSE IN CHARGE" were moaning that the football final was going to clash with the 3000 metres and Tug-of-War we humbly consented to wait until 6.30pm for the final. This pleased C.O. because two of their players wanted to run in the 3000 metre and 100 metre sprint (fools). So 6.30pm came and the final kicked off under the command of P Hemmings.

As with their previous game this proved to be a close affair. C.O. though, seemed more in control and D.C. fluffed an easy chance for Ruth 'A' so half time came at 0-0. Just after half-time disaster struck. Mad Malc missed his tackle and the C.O. lad tucked away a good goal. Ruth 'A' became more flustered substituting their best forward and C.O. became more commanding. Just on full time C.O. scored again to win 2-0 and worthy winners they were - Well done Swindon.

Ruth 'A'	D Collerton	T R M Edwards
	D Carey	M Keen
	S Townsend	J Shropshire
	S Sewell	

R Newman

Showdown at the OK Sports Ground

The Sun sank low over the Civil Service Ground
Almost so low you could kick it
As the showdown began in the final round

Of the Sports Day 6-a-side Cricket.

The 'Rutherford Boys' were back on the field

To revenge last years dismal defeat
For although on the surface the scars had all healed

In their hearts they don't like to be beat.

A silence came over 'The Swindon Gang'
As the toss fell Andy Napper's way
But although this had gone according to plan

It was the end of Andy's luck for the day.

The keeper pulled down the rim of his hat

And adjusted the strap on his pad
As the Swindon openers came out on the field to bat

The keeper thought he must be mad

Within minutes spectators were running for cover

As the batsman peppered shot after shot
A young child cried for his mother
The keeper wished he was Alan Knott.

While Swindon battled, the ball like a bullet flew

But at last their innings was over
Facing a score of something like ninety for two

The keeper thought of heading for Dover.

But Napper's Number One Batsman started to sing

As he pulled a hat over his locks
Mike 'Sundance' Barber was sure of one thing

That was to come off the field in a box.

Now facing the salvoes of the Swindon attack

They all had to do what they must
But all the Spectators cried 'Alas' and 'Alack'

As the last Rutherford man bit the dust.

But I shan't complain or shed even a tear

I won't sulk, I won't brood, I won't hide

Because at Sports Day in July next year

I will be playing on the Swindon side.

Apart from this game Rutherford 'A' had a successful day beating all other opponents, and the 'B' team under Eric Thomas' captaincy avoided the wooden spoon by defeating the 'B' team from Daresbury.

Nick

Chinese Club?

For the past year I have acted as supervisor to a visitor from Peking who gave me some insight into Chinese life. I also watched the fascinating TV series 'The Heart of the Dragon'. I now want to learn Chinese and I am looking for other enthusiasts to form a 'Chinese' Society affiliated to The Recreational Society.

Our aim would be to arrange

- weekly lunchtime lessons in Chinese approximately during school terms. (I have found a teacher willing to come to Chilton)
- occasional talks on aspects of Chinese culture, science, archaeology, music, etc
- occasional visits to museums and art galleries for guided tours of Chinese exhibits

If you are interested please contact me, Kate Crennell, Atlas Centre, Ext 6397 during the next month or so. I will try to arrange an initial meeting in early September.

Table Tennis Club AGM

The Annual General Meeting of the Table Tennis Club will be held on Wednesday 15 August 1984 in the R58 table tennis room commencing at 12.30. There is a quorum of 6 so please try to attend.

The new evening league season starts in September and lasts until April. Teams have to be registered by the middle of August. Our club enters teams in the Didcot & District and the Oxford & District Leagues.

Any RAL Rec. Soc. members who are interested in playing in one of our teams or would like further information should contact Tim Pett, R27, Ext 5332, as soon as possible.

As well as league table tennis there are lunch-time sessions every day in the table tennis room in R58. All standards from beginners to experienced players are most welcome for both league and lunch-time play.

Library Notice

Would the person who took the following book from display in the Library - please put it back!

Energy in Electromagnetism (IEE Electromagnetic Wave Series 13) by H G Booker.

Lorna Claringbold's report on the Tennis will appear in the next issue.

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