

Bulletin

of the Rutherford Appleton Laboratory

8 Sept 1986 No.9

RAL still in space with ASTRO-C

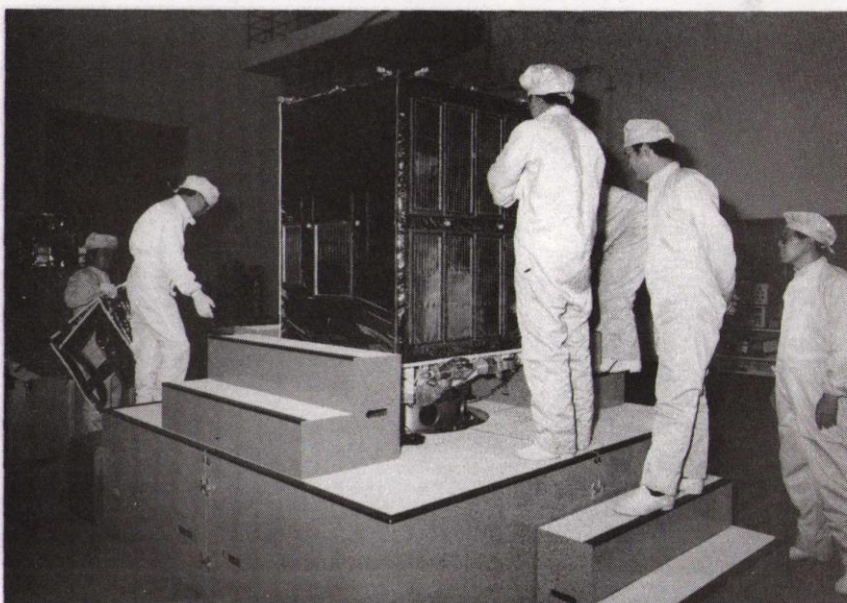
Despite the Challenger tragedy in January and the chaos now prevailing in space projects world-wide as a result, various space projects are continuing in the UK with collaborations between university groups and RAL.

International collaborations with countries outside ESA and NASA are assuming a high level of importance at present, especially when the country concerned has its own launch capability like Japan. A joint team from the University of Leicester and the Space and Astrophysics Division of RAL are in the final stages of delivering the X-ray detectors for the ASTRO-C satellite to the Institute of Space and Astronautical Science (ISAS) in Tokyo. The launch slot is currently February 1 to 15 of next year.

ASTRO-C carries three experiments. The All Sky Monitor built by the University of Osaka will search for short-lived bursts of X-ray emission from weak sources and dramatic changes of X-ray luminosity in brighter sources. A Gamma Ray Burst detector will monitor the sky at energies up to 400 KeV for isolated flashes of gamma rays such as those previously detected by the Vela satellites.

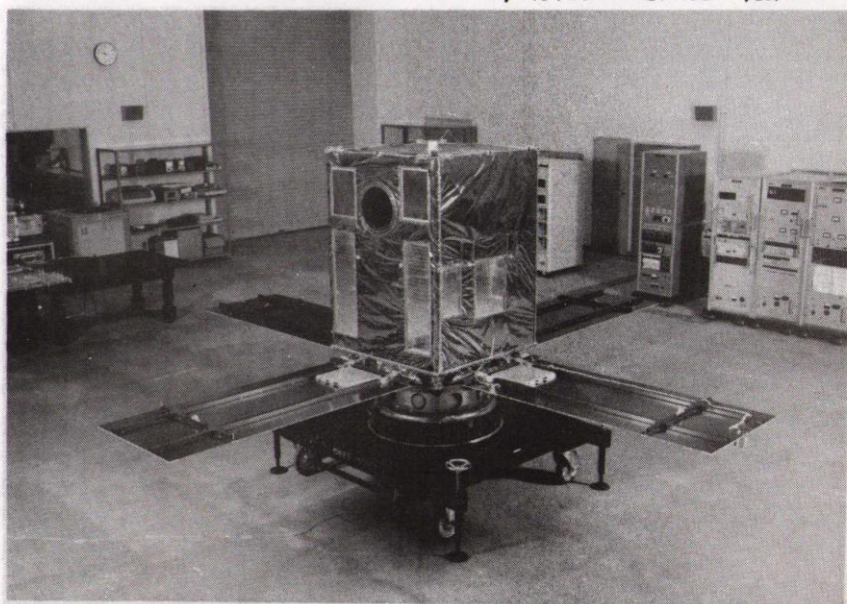
The Leicester-RAL-ISAS Collaboration is providing the Large Area Counter which consists of eight large gas-filled proportional counters totalling some 5000 cm² in area. The scientific objective is to study variability in the cosmic X-ray sources on timescales from months to multi seconds.

The Astro-C payload as a whole concentrates on time variability and X- and gamma-ray sources as a means of understanding the physical processes involved in the high energy emission. Since an object cannot vary its luminosity on a timescale faster than the time light (or any form of information) can travel across it, measuring the fastest significant variation in output is a means of placing limits on the size of the emitting region.



The eight Large Area Counters being installed on the ASTRO-C satellite.

Photos — Bruce Patchett.



The ASTRO-C satellite with solar panels extended.

(cont'd over)

ASTRO-C (cont'd from p1)

Another simple argument can convert this size limit to a limit on the mass of the object because the mass and radius are directly related to one another for neutron stars and black holes.

Almost certainly the high energy radiation (between 1 and 400 KeV) is produced by the infall of material onto a collapsed object such as a neutron star or blackhole. In the process of releasing the huge quantities of gravitational energy extremely hot plasma, up to hundreds of millions of degrees Kelvin, is created. This is an efficient mechanism for releasing energy if the accreting object is a black hole and up to one tenth of the gases rest-mass can be radiated away by the hot plasma.

Variations of luminosity which Astro-C hopes to study are caused by a variety of phenomena.

Local galactic black holes exhibit rapid changes on timescales from milli-seconds to minutes. These are due to instabilities in the plasma falling onto rotating stars, changes in the overall infall rate with time or the pile up of hydrogen on the star's surface followed by a brief episode of explosive nuclear burning once a critical temperature and density are reached. On a much larger scale the whole nucleus of an active galaxy can vary its X-ray luminosity in a period of hours or days if the accretion flow is varied.

Having a single mission devoted to one aspect of a scientific topic should be very productive and allow more detailed investigation of a few interesting sources with a wide range of instruments. The Leicester and RAL teams hope to be involved in the analysis of data from these fascinating objects for several years after launch.

RAL is also still firmly involved in European Space Agency plans. ESA missions using the Ariane launcher may be delayed pending investigations of recent launch failures but long term plans remain firm and the UK will be bidding for payload space on the solar coronal physics mission SOHO and the space plasma physics mission CLUSTER. A collaboration between QMC, UCL and RAL is currently working on the UK contribution to ISO, the infra-red space observatory, which will also use ARIANE. Meanwhile the RAL equipment on board the Solar Maximum Mission and the International Ultra-Violet Explorer still produces valuable scientific data.

A M Cruise

Acknowledgements are due to the University of Leicester, the Institute of Space and Aeronautical Sciences, Tokyo and Dr B Patchett RAL for the information and photographs incorporated in this article.

Appleton Laboratory Reunion

Old Appletonians held their first reunion on Monday 4 August at the Walton Cottage Hotel, Maidenhead and over 100 people enjoyed the occasion.

Former Director, Dr Fred Horner, several retired division heads and group leaders were there together with members of the staff who were working at the Laboratory's Ditton Park site on or before it merged with the Rutherford Laboratory. The evening provided ex-colleagues from the scientific and engineering community as well as the administrative and support staffs to meet up once more.

A good buffet supper and a bar helped the nostalgic reminiscing with old friends, many who had not met for five or six years, to go on late into the night

The event - the first (but not, it is hoped, last) of its kind, was organised by Barbara Jeremiah. If anyone is interested in taking part in a future reunion, or knows of a former colleague who may be, please contact John Cathrew, Ext 6532.

Frank Close Professor QMC

Frank Close, of HEP Division has been appointed visiting Professor of Theoretical Physics at Queen Mary College, London. The appointment begins on 1 September 1986.

Trade Exhibition

Nicolet Instruments Ltd will be displaying their range of high resolution digital oscilloscopes, logic analysers and digital plotters in the R12 Conference Room on Wednesday 16 September from 10:00 hrs to 15:30 hrs.

Sales to Employees

The sale of scrap materials to RAL staff will take place on 19 September and 3, 17, 31 October from 12:00 - 12:30 in the R24 scrap compound.

Thanks

Roger Childs wishes to thank all those kind colleagues who sent him into retirement with such a useful present. It has been put to good use and, with a bit of luck, will turn out some interesting articles in the coming months, he writes.

He adds, 'May the coming years be good to you all at RAL with a smoother financial future.'

Flaming July



A judgement on all who did not sit glued to TV for the Royal Wedding. RAL on Wednesday 23 July after a hail storm.

Steve Crothers

George Kalmus heads HEP



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Professor George Kalmus, the new head of RAL's High Energy Physics Division took up his post on 1 August 1986. He is also Associate Director: Nuclear Physics.

A graduate of University College London, Professor Kalmus gained his doctorate in 1959 and remained at the college as a Research Assistant until 1962. A year at the Lawrence Berkeley Laboratory, California was followed by a year lecturing at UCL. He returned to Berkeley in 1964 to continue Bubble Chamber research until in 1972 he was appointed head of the Bubble Chamber Research Group at Rutherford Laboratory. At RAL he became deputy-head of HEP division and in 1983 was awarded an individual merit promotion to DSCO Grade 5.

He was appointed Visiting Professor to the UCL Physics Department in 1984.

Until three years ago, George's entire career was in Bubble Chamber research. He was a founder member of the UCL Bubble Chamber Group, whose supervisor, Cyril Dodds, had studied with Donald Glaser, the inventor of the Bubble Chamber. With the end of the Bubble Chamber era in sight (there are none in Europe and only one in the US at Fermilab) he moved to counter experiments and became head of the RAL-DELPHI group - one of four experiments approved for the first stages of LEP, the world's highest energy electron-positron colliders, now being built at CERN.

Film Badge Notice

It is period 10 Colour Strip GREEN. Please return all beta-gamma films and fast neutron badges promptly.

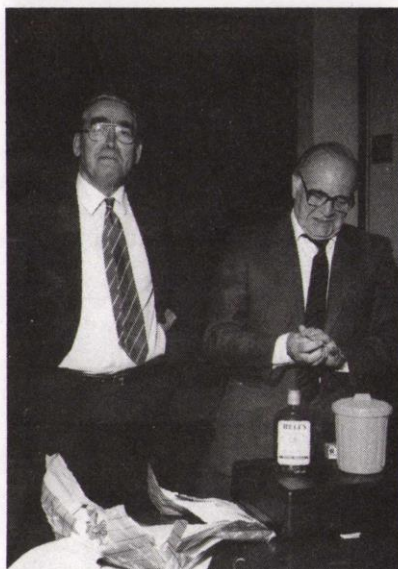
Bidding farewell

Roger Childs

Roger Childs, retiring Whitley Council Central Staff-side Secretary, returned to RAL on 30 July for a presentation ceremony to honour his 20 years work for the Laboratory.

Roger joined us in 1961, after 24 years in the Army, and in the same year started his association with Whitley Council Staff-side. For the next 20 years he combined working in Atlas, NIMROD/ISIS, EBW and Administration divisions with his voluntary Staff-side duties, for six of them also being Chairman of the Civil and Public Servants Association. In 1981 he was elected Secretary to Central Staff-side and transferred to Swindon Office.

Making the presentation on behalf of Roger's RAL friends and colleagues, Jack Wyatt thanked him for his sterling work in both fields. "You are concluding three careers," he said. "The first two I can understand - but Staff-side Secretary..... We all wish you a long, happy and easier retirement."



Roger can't believe it all.

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Gifts of a typewriter, Tipp-Ex (for covering mistakes) a mini-dustbin (for putting them in) and a bottle of whiskey (for when mistakes got overwhelming), left Roger almost speechless. "I'm very happy to have worked at SERC where I have made many friends, but I didn't expect all this," he managed. "Thanks very much indeed."

Alan Wells

Also making a return visit to the Laboratory in July for a belated presentation was Alan Wells with his wife Betty, warmly welcomed by many old friends and colleagues. Sadly, on his retirement day, Alan was too ill to attend a ceremony, but now his workmates gathered to give him a fitting send-off.

Alan came to RAL from AERE as a fitter in 1962, after serving in the army as a sergeant with Motor Transport, and working as a tool-maker for various firms in the Birmingham area. The value of his work at RAL is summed up in the words of one of his supervisors, Alec Goode; "Can be counted on to give reliable, loyal service."

For all his support and service, Roy Tolcher thanked Alan and presented him with gifts of a camera and a steam-meter specially prepared and mounted by his workshop colleagues. A fine Ray Roberts card depicting Alan's life story, so far, referred to a bogus set of site service rules, exhorting Alan to "ignore water leaks, beware gas leaks, avoid T.M. like the plague and retire as soon as possible." Alan, as an artist much appreciated this offering. Presenting Betty with a magnificent bouquet Roy, on behalf of all present, wished them both a long, happy healthy retirement.

"I have been dreading this moment", replied Alan "I'm too overwhelmed to say much except thank you all for looking after and putting up with me, especially The Workshop. For all your support, thank you."



Alan, Betty and friends.

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Bulletin

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