
Rutherford Appleton Laboratory Bulletin

Acting Editor Jacky Hutchinson

January 1991

Cray Gigaflop Award

Dr Stephen Wilson of the Advanced Research Computing Unit at RAL is one of a team of theoretical chemists who gained third place in an international competition for computer programs which tap the power of modern supercomputers.

The 1990 Gigaflop Performance Awards were presented by Cray Research Inc for applications programs which achieve a sustained performance in excess of 1.5 gigaflops. A gigaflop, a thousand million (giga) FLoating point OPerations per Second (FLOPS), is a measure of the speed of a computer program. The chemists' program utilised both vectorisation and parallel processing techniques on Cray supercomputers. The code was developed on the Cray X-MP/416 at RAL. However, since this machine has a peak sustainable performance of only 0.88 gigaflops, the code had to be benchmarked on the more powerful eight processor Cray Y-MP/8128 in the United States.

The thirty programs which achieved the target performance covered a broad spectrum of scientific and engineering applications and were written by teams from Canada, France, Germany, Israel,



Dr Stephen Wilson with his Award

Stop Press

Congratulations to Peter Parry of the Vacuum Group, ISIS Operations, whose award of the British Empire Medal was announced in the New Year Honours list.

The Official presentation will be made later in the year and we shall cover the story in more detail then..... watch this space.

Japan, Switzerland, UK and USA. Of five UK award winners, two others were developed on the RAL system: Alan Davies (NERC) and Roman Grzonka (formerly of the Advanced Research Computing Unit at RAL) whose ocean modelling application returned 1.768 gigaflops, while Walter Temmerman (Daresbury Laboratory) and his team obtained a rate of execution of 1.509 gigaflops in studies of the electronic structure of solids.

The theoretical chemists (Stephen, Vic Saunders of Daresbury Laboratory and David Moncrieff of Florida State University) wrote a program to determine electron correlation effects in atoms using many body perturbation theory. Its performance of 2.229 gigaflops (now improved to 2.284 gigaflops!) was very close to that of the fastest program which

achieved 2.307 gigaflops and to the best theoretical sustainable performance of the Cray Y-MP/8 namely 2.492 gigaflops. This level of performance will have a very significant impact on the feasibility of certain molecular electronic structure calculations. It is expected that teraflop peak performance (US billions of floating point operations per second) will be achieved by the mid 1990s by machines such as the 64 vector processor Cray Y-MP (the Triton Project) and for certain applications by the so-called Cray Y-MPP, which will have a Massively Parallel Processor node. Exploitation of these and similar machines in practical applications represents a major challenge for theoretical chemists in the decade ahead.

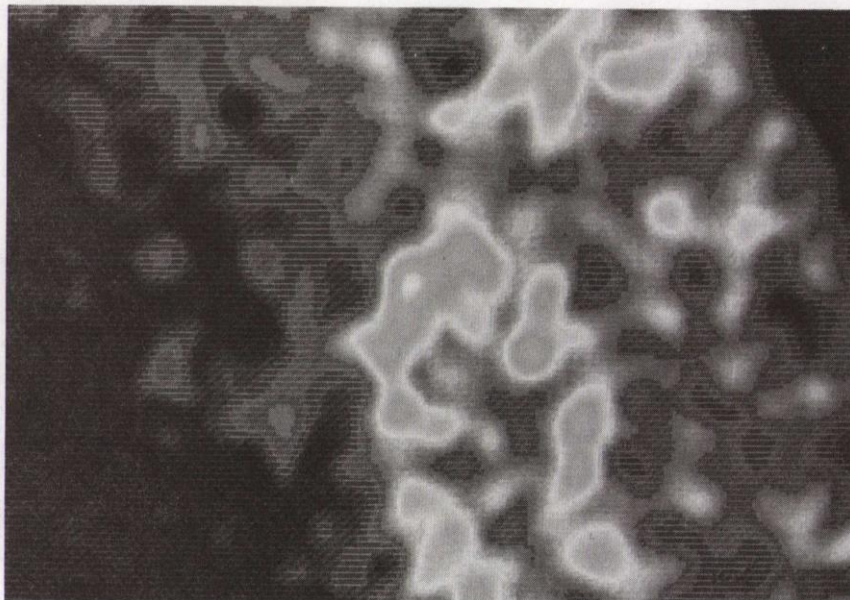
Wise Men follow an Old Star

A British telescope on board the ROSAT X-ray satellite, which was launched in June 1990, has detected extreme ultraviolet radiation from interstellar gas energised by the violent explosion of a star which occurred 15,000 years ago.

The Wide Field Camera on board ROSAT is sensitive to radiation in the range between X-rays and ultraviolet light, known as EUV. It has now completed nearly 75% of its survey of the skies, the first ever in this waveband. The instrument is a collaborative venture led by the University of Leicester, with the participation of groups at RAL, the University of Birmingham, the Mullard Space Science Laboratory and Imperial College.

In order to monitor the Camera's health and scientific performance, a special UK data analysis facility has been set up as part of the ROSAT Science Data Centre at the Max-Planck Institute for Extraterrestrial Physics in Garching near Munich. This so called "Quick-look Facility" managed by Dr. Alan Harris, a RAL Astronomer, checks data from the British instrument shortly after reception by the ground station.

This is the first time a supernova remnant has been imaged in EUV. The result constitutes another major triumph for the Wide Field Camera, which has so far detected over 100 new sources of EUV radiation. It is anticipated that 10 or 20 times this



Observations of the debris from the supernova explosion which occurred to the right of this picture.

number will be found when the full survey data is carefully analysed.

An exciting discovery was made by Gordon Bromage while he was observing at Vilspa, Madrid (the International Ultraviolet Explorer tracking station, another RAL managed project). He detected

several stellar flares on a binary star in the constellation of Draco. He then checked with the ROSAT ground station and discovered that they had also detected two of these enormous flares. As these last for only a few hours, it is rare for them to be detected simultaneously by two satellites in different wavebands.

£1000 for BBC Children in need



Some of the many staff who convinced us to part with our money for the Children in Need Appeal, shown here with the cheque for £1000. Staff at Radio Oxford coordinated events for Oxfordshire and telephoned to thank everyone—collectors and donors alike. The total amount collected for the county is currently standing at a massive £209,400.

Didn't they do well!

Three RAL apprentices on the AEA Technology's Apprentice and Laboratory Training Scheme have won prizes. There are 120 apprentices on this scheme of which 27 come from RAL.

At the annual prizegiving ceremony **Stephen Angood** (now a fully fledged craftsman in Central Laser Facility) won the premier award of the scheme - The Harold Tongue Cup. This is awarded to a final year apprentice deemed to have "made the most of their apprenticeship and acquired a high degree of competence in, and a sound understanding of, the techniques and practice of their craft".

Ian Rathbone received the Merit Award given to a first year apprentice in mechanical engineering.

Giles Lewis walked away with the Director's Cup for "outstanding application and achievement in his technical studies". Giles has since been awarded a full SERC bursary, along with **John Hartley**, another RAL apprentice who has just completed the scheme. Giles is studying Mechanical Engineering Mechatronics at Lancaster University, while John is studying Electronic Engineering at Warwick.

Congratulations to all three winners and to Giles and John for winning the Bursaries. Good Luck.

Rubberfoot Applefun

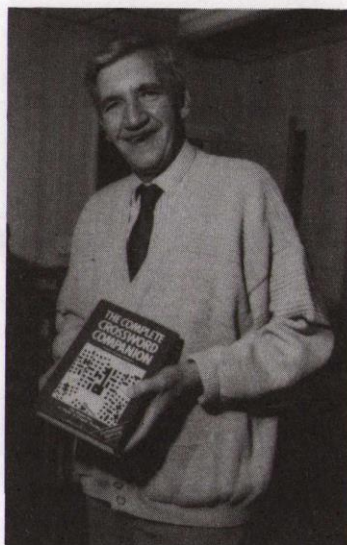
And here is another address for our collection!

Ruther Ford Applotron Lab
Chilton, Didest
Oxon

Poste Haste

The post ladies held a raffle to raise money for the Blue Peter Romanian Appeal. The magnificent sum of £246 was raised, and with an additional £79 collected at the Annual Carol Service, made a grand total of £325. Well done to everyone concerned, especially Rose Wadley who made most of the prizes.

Farewell to Dennis



Never a cross word for Dennis!

ISIS Division said a pre-Christmas farewell to Dennis Tredgett. Making the presentation to Dennis, Mike Johnson referred to him as 'the man who came in from outer

space', a reference to Dennis' earlier work on space payloads.

Dennis nearly avoided a career in Science altogether, because as a keen footballer at the age of 21, he received a professional trial for Watford Football Club. Instead he joined Harwell in 1950 and eventually came to RAL via GEC Research and Culham Laboratory.

Dennis was presented with a Bosch Electric Drill and colleagues from the Drawing Office gave him, a book (the Complete Crossword Companion) which should ensure that he is never without a solution!

After 49 years of work, Dennis feels entitled to call it a day, and as a complete change he plans to learn to play the piano.

MP Visits RAL

Simon Coombes, MP for Swindon, was shown around the Central Laser Facility by Bill Toner and the Director during his visit to RAL in December.



As well as the Central Laser Facility, the tour included a visit to ISIS, Microelectronics and the Central Computing Department. Mr Coombes enjoyed his visit and was "enormously impressed by the enthusiasm and commitment of staff and the great team spirit at RAL".

Open Day For Training



Natalie Barrett from Training Section answers questions at the Interactive Video Open Day

Over 100 staff attended the Interactive Video Open Day arranged by RAL Training Section. Local Training Officer John Cathrew told the Bulletin: "The response was very encouraging. Clearly people were impressed with the quality and variety of training courses on display".

At present, Training Section has a small selection of Management Courses, but Technical & Computing Courses are also available. Please let Training Section know your requirements. Applied Learning course catalogues are held by Training Section and by Departmental Training Officers, and courses are also available from other suppliers. You can book the facility by typing "IVTRAIN" on your PROFS command line, by telephoning ext 6285 or by sending a PROFS

note to TRAINING.

Thanks to Jim Beverley, Denyse Lea and Liz Eadesforth from Applied Learning who, along with Training Section staff, ensured that questions were answered and that someone was always on hand to demonstrate the courseware. Thanks also to everyone who paid us a visit. We look forward to you and others at RAL making full use of the Interactive Video facility in the future.

Notices

Film Badges

Period	From	To	Colour code
01	01.01.91	27.01.91	Green
02	28.01.91	24.02.91	Black
03	25.02.91	24.03.91	Purple

RAL Christian Fellowship

Programme for January

17 Jan Jesus' journey to the Cross, Part 1
24 Jan Lee Abbey experience
31 Jan Book review

All are welcome to the meeting in Conference Room 6 in R2 at 12:30pm.
John Hogston Ext 5183

Sales of scrap

Sales of scrap (mainly metal and plastics) will take place from 12 noon to 12:30pm in the R24 scrapcompound on FRIDAY 8 and FRIDAY 22 February.

RAL Lecture

The February Lecture will be given by Dr Harry Rosenberg from the Department of Physics at Oxford University. He will speak on the subject "Uncovering the Lord Rayleigh Laboratories - a glimpse of an epoch in 19th century physics" on 21 February 1991 in the R22 Lecture Theatre.

New Editor

Esther Peacock has now left the Section and is taking maternity leave. I have taken over as Editor of the Bulletin, supported by Mary Beackon, Assistant Editor, who will be helping me with the design and lay-out.

Do send me news articles, dates of future events, as well as ideas for future issues. It's been said before, but I'll say it again - this is your Newsletter, I can only include items that have been sent to me, so keep me informed of events at RAL, and the Bulletin will be an interesting newsletter.

Esther produced the Bulletin with a good mix of social and technical articles. She will be a hard act to follow and I do not envisage making any immediate changes. However I'd be interested to hear YOUR views - what you would like to see?

Jacky Hutchinson

Ext 6482 PROFS ID = JJCH