Bulletin
of the Rutherford and Appleton Laboratories 3 Nov. 1980 No.16

Starlink is Launched

On 24 October, in the Atlas Centre Colloquium, Mr Neil Macfarlane, Under Secretary of State in the Department of Education and Science inaugurated the Starlink Facility. In the presence of prominent astronomers from the UK and Europe he initiated a computer program which caused astronomical images to be fetched from all nodes in the network and assembled onto a colour image display system.

The Starlink project, managed by the RAL Computing Division, is an SRC initiative to provide and coordinate image processing and data reduction facilities for use by the UK astronomical community.

Great Day for SRC

Professor Sir Geoffrey Allen, SRC Chairman, welcomed everyone to the Inauguration.

'It is a great day for the SRC,' he said. 'The essence of its work is co-operation between research laboratories and universities and Starlink is a particularly good example of an integrated community's response to a scientific need.' He thanked Mr Macfarlane for agreeing to inaugurate the facility, and especially welcomed Professor Mike Disney, leading protagonist for Starlink and Professor Malcolm Longair, Director of the Royal Observatory, Edinburgh.

Rapid Progress

Dr Godfrey Stafford spoke briefly of his pleasure at being involved in a new development. This was one of the largest astronomical facilities in Europe and thanks to the efforts of all involved on the six co-operative sites, it had been set up in only one year from approval to inauguration.

Future Development

Professor Mike Disney (University College Cardiff) who had chaired the SRC Panel which recommended Starlink, and Professor Malcolm Longair then described the background and outlined the future of the Starlink project.

Neil Macfarlane pushes the button - and it works! 34084

Professor Disney stressed the vital role played by the inter-disciplinary committee which had worked so hard on setting-up Starlink. Such a facility had required the know-how of many people, - 'It is a system one man cannot grasp', he said.
Professor Longair outlined the exciting plans for the facility. 'The easy bit is finished,' he remarked, 'now all our expertise will be needed in the future to respond rapidly to technological change - this can be done'. The crucial years are ahead, developing Starlink from a beautiful concept to a working system.

Ahead of the World

Before performing the Ceremony, Mr Macfarlane praised the success of the collaboration between the various establishments and universities, "Today" he said "the Science Research Council is launching the Starlink Facility which will effectively provide and coordinate image processing and data reduction facilities for use by the UK astronomical community. This will enable these researchers to process and analyse their astronomical images quickly and effectively and enable outstanding science to be done. It gives me great pleasure that Starlink puts the UK ahead of the rest of the world in developing a system for processing astronomical data in such a way that it will enable most university astronomers in the UK to have near-by a terminal link to a powerful computing facility, thus allowing fast analyses to be carried out by university staff and their postgraduate students in their own backyard. This collaboration between the Rutherford and Appleton Laboratories, the two Royal Observatories, the Universities of Cambridge and Manchester and University College London is itself worthy of mention and its success augers well for the future.

Continued overleaf

Prof Mike Disney, Mr Neil Macfarlane and Prof Malcolm Longair, appear pleased with the results. 34080

Mr Macfarlane then pressed the key on the SIGMA terminal and the black and white picture of himself, which had been on the ARGS monitor the whole morning, changed colour, was overwritten by a 'false colour' image of part of the PAVO cluster of galaxies, and was then replaced by a set of astronomical pictures being simultaneously fetched over the network from all sites.

He was then presented with a framed picture of part of the PAVO cluster of galaxies, by Dr Stafford to commemorate the occasion.

Response to a Problem

There have hitherto been very limited facilities in the UK for performing scientific analysis of the observations. Astronomers have either had to reduce the data manually, or devise their own data processing facilities on an *ad hoc* basis. Even those modest facilities which existed could be used by only a few astronomers. Also, effective interaction of the astronomer with the reduction procedure is very much in demand. In this decade the vast majority of astronomy will be done using data in digital form and adequate image processing facilities are essential. Starlink is SRC's response to these problems and is in line with its policy to maintain the UK in the forefront of astronomy.

Starlink is based on six computers - VAX 11/780s located in Chilton, at the two Royal Observatories, and at University College London, Cambridge and Manchester - all important centres of astronomical research. All are now offering a service, and linked together in a network to enable software to be managed and distributed, from Chilton. System software, in particular an 'environment' for interactive data reduction, is being developed at the Laboratory. Astronomical applications work, while being coordinated centrally, will be undertaken at a large number of sites, and contracts are now being placed.

The Starlink System

Interactive image processing has become an important technique in astronomy. Starlink has ordered twelve new 'Advanced Raster Graphics Systems' from the British Company Sigma Electronic Systems. ARGS is a system where a television-type display is refreshed from semi-conductor picture stores. It contains powerful 16-bit micro-processors, giving an extensive range of graphics operations, together with facilities to store subroutines and picture files. The Starlink systems will each contain ½Mbyte of memory which can be assigned to images in a flexible way (ARGS will accommodate up to 16Mbyte in principle). There will be two such 'image processing workstations' connected to each VAX, allowing display and manipulation of astronomical images in full colour on high precision 22 inch monitors.

The first ARGS is installed on the RAL system and was used during the inauguration. By the end of the year each node will have at least one. Already applications have been received from well over fifty projects to use the Starlink systems. A newsletter 'Enterprise' has been established, and by its third issue has achieved a circulation at astronomical centres throughout the world.

Film Badge Notice

Period 12 commences Monday 3 November. Colour Strip YELLOW. Please change your film promptly and return all old ones.

Note

Any forms still to be completed for the National Registry - please do so as soon as possible and send them to Jenny Coates, R12.

RAL Lectures

The next lecture in this series will be held as usual in the Main Lecture Theatre on ~~Thursday~~ Wednesday 12 November at 3.15 p.m.

NATIONAL AND INTERNATIONAL DEVELOPMENT IN VIEWDATA
by
Mr K E Clarke
Head of Prestel Research and Development
British Telecom Research Laboratories

The United Kingdom Prestel service, the worlds first public viewdata service, commenced operation in September 1979. The lecture will start with a resumé of its progress to date. There has been considerable international activity in the viewdata field and a brief comparison of French, Canadian and Japanese alternative proposals for international standards will be given.

At British Telecom Research Laboratories research into future systems has continued. New proposals include Picture Prestel (which is a merging of viewdata and slow scan techniques), Dynamically Redefinable Character Sets and Telesoftware. Details of these techniques, and of other likely commercial applications will be given.

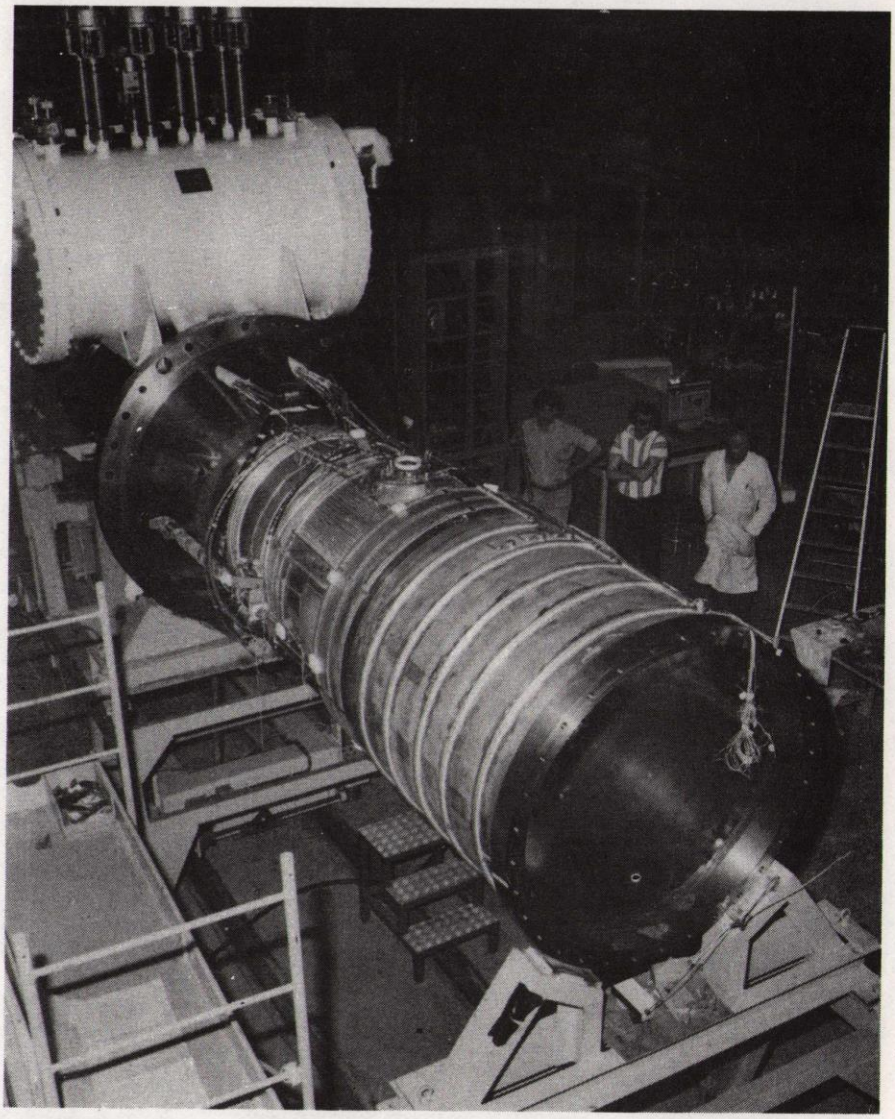
Restaurant News

ARA Food Services Ltd. We will shortly be hearing this name all over site. But who are ARA? On Monday, 3 November, you will be able to find our by eating in the Restaurant. ARA Food Services Ltd was established in 1972 and now employs nearly 3000 people within its organization. ARA is a service company currently engaged in 5 major areas of activity, Industrial, Stadium and Leisure Catering, Vending Machine Operations, Office Coffee Systems, and Offshore Services. It is a major contract caterer to business and industry and has nearly 300 clients throughout the country. Listed among their clients are BL Cars, Chrysler UK, Barclaycard, and The Lord Chancellor's Office.

The foundation of the ARA philosophy is that every client they serve is different. Therefore, every service provided must be tailored to a client's specific needs and objectives. Every day, over 10 million people use ARA services in offices, factories, schools, colleges and hospitals. We hope that Laboratory Staff will boost ARA's users to greater numbers and that they will like the service that will be provided.

To Margaret Howson and her staff who have looked after 'the inner man' for the past two years, we give our thanks and wish them well in the future.

RCBC at CERN



The Rapid Cycling Bubble Chamber body and valve vessel were delivered to CERN in July.

The photograph shows these two major components after assembly in the No. 1 Northern Experimental Area of the SPS at CERN.

The complete chamber assembly has been pressure and vacuum tested inside the vacuum tank and installed in the magnet.

Re-assembly with low temperature, indium seals is now almost complete. Pipework and cabling, necessary for the first cooldown to the operating temperature of 26K is being installed and tested.

CERN 047-09-80

Thankyou from the Chairman SRC

'It is with pleasure that I acknowledge the very generous cheque of £205.27 raised by the Laboratories for the Royal National Lifeboat Institution in memory of Henry Walker. I know Henry's family will want the donation to go towards purchasing an item for the new lifeboat under construction for Aldeburgh in Suffolk, and I have asked Alasdair Rose to write to you in due course letting you know what specific item which will be purchased from the Laboratories' donation.

You will be interested to learn that this donation brings the total funds raised by SRC for the RNLI in memory of Henry to over £600.

Please add my warm thanks for the generosity of the Laboratories.'

Suggestions Awards

The following awards were approved by the Local Suggestions Award Committee at the end of September:-

Mrs M Daley	Admin.	R1	£5
Mr D J Hylton	"	R59	£5
Mr T Morgan	EBW	R18	£10
Mr R E Chandler	Inst.	R18	£10
Mr R P Hogan	"	R9	£5
Mr J W A Summers	"	R12	£50
Mr A I Borden	SNS	R2	£5
Mr A Brandi	"	R51	£15
Mr A Smith	"	R51	£10
Mr A Smith	"	R51	£60
Mr A Smith	"	R51	£10
Mr S N Watson	"	R8	£30

Congratulations to you all!

Trade Exhibition

There will be a one-day exhibition of high voltage equipment by Hartley Measurements Ltd on Wednesday 17 November in Conference Room 2, Building R1 from 10.00 to 16.00 hours.

ERSU Talk

THE EXPLOITATION OF PATENTS AND KNOW HOW - HOW NRDC CAN HELP THE SRC AND UNIVERSITIES

by

MR D KING - NRDC Exploitation Controller
MR S CRESPI - NRDC Patents Controller

on

Thursday 6 November

in

Conference Room 3 at 1115 hrs

If your work in the Council leads to an invention that should have patent protection you are required to do whatever is needed to secure this. The Council will meet the expenses of doing this but you will probably need advice on how to go about it. The National Research Development Council can give this advice. Similarly, if you are collaborating with a university on work funded by the Council and the possibility of exploiting this arises, then the NRDC can offer helpful advice on the protection of property rights.

The Year We Raced to Cherbourg

For several years the Interdepartmental Offshore race has been sailed in gale force winds. The Meteorological Office states that there is an 80% certainty of high winds during the first week of October. Because of its performance in high winds the SRC team in the Interdepartmental Race chartered a vessel which, dependent on the skill of its crew, would give a good all round performance in winds of force 4 and above. Unfortunately the three races between Thursday 2 October and Saturday 4 October were all sailed in very light winds and we were unable to make any use of the boat's heavy weather ability.

We met at Lymington Marina at 4pm on Sunday 28 September to admire the beautiful, large, almost brand new boat we had chartered - an Offshore One Design 34. A quick calculation revealed that the boat called 'Black Douglas' could be sailed at a maximum of about 7 knots as a displacement vessel but the boat had a planing hull - rare in a craft of this size - and we knew that we might be able to double this maximum speed if conditions were such that it could be lifted onto the plane. Losing no more time we set sail into the Solent and within 2 hours had tried out all the sails - 10 in number which included a rather curious looking sail known as a 'blooper' or 'big boy'. The wind was about force 2 at the time and so forgave us all our mistakes.

The next day was spent getting to know the boat properly and learning to work as a team. This was easier than last year, as Martin Hall, Geoff Stapleton, John Macgraw, John Macdougall and Lawrence Byrne had sailed together before.

Wednesday morning brought a steady force 4 with it and we were able to see Black Douglas in a new light. Just outside Cowes a new Sigma 33 approached skippered by Julian Forrester - last year's winner and, in our opinion, the man to beat. We joined friendly combat on a dead beat for 2 or 3 miles and it was soon apparent that we could beat him with our eyes shut - even though he told us that night that he had not really been trying! Late Wednesday afternoon we returned to Lymington to pick up John Macraw who was replacing Tony Cash. With the wind still holding we had a long spinnaker leg up to Cowes, where we had a date with the Island Sailing Club. For the first time we were able to lift the boat onto the plane and although a wind of force 5 or 6 would have been better, we were travelling at 8 or 9 knots, occasionally touching 10 knots, the exhilaration of which is indescribable.

Thursday morning saw us at the start line off Cowes for the scheduled all day race in the Solent. The wind was very light (3-4 knots) and after making a near perfect start to the West we found we were just able to carry our Starcut spinnaker whereas the rest of the fleet could not. We substantially increased our lead and after rounding the first mark the nearest boat was some half a mile behind us, but at the entrance to Southampton water good fortune deserted us. The wind dropped completely for us while the rest of the fleet still had sufficient wind to catch us up. From this point of the race became a lottery, the conditions greatly favouring the small, slower handicap boats.

A short race was to be raced on Friday morning before the race to Cherbourg and once more, in light winds, we made an excellent start and we were within 20 years of the first mark, with an adverse tide and all the fleet behind us when the wind died. Again the fleet seemed to have their own private wind and they sailed around us.

By 3pm there was a good fresh breeze blowing and at 3.10 pm we made our third consecutive good start and led the fleet eastwards down the Solent close-hauled. Half way down the Solent the scratch boat - a Contessa 43 which would not be out of place as an Admiral's Cup contender - went past us, finding the conditions at last to her (and our liking). We soon rounded the Bembridge Ledge Buoy, off the East coast of the Isle of Wight and we set a course for Cherbourg. After dusk the wind gradually died and by the time we reached mid-channel we were constantly altering sail trim. Just before daybreak the lights of the French coast showed through the early morning haze, and as a result of excellent navigation, the light of the Fort de l'Quest - our finish mark - lay dead ahead on the compass reading we had been following. Fighting an eastgoing tide we finished, noted our time and made our way to the Cherbourg inner harbour where we were much relieved to find only the Contessa 43 had finished before us. The crew told us her finishing time and there was a strong probability that we had beaten her. Similar to the first race, the wind appeared to increase slightly, favouring those boats still to finish and they started to arrive about an hour and a half behind us.

The provisional results show that the SRC team finished 8th on corrected time in the Cherbourg Race and this gave us a final overall position of 7th covering all three races. We remained convinced that we had the right crew and the right boat but were just very unlucky with the lack of wind.

Farewell Mike

"It has often been said that the strength of a research group lies in its support men. The support that Mike (Ches) Cheshire has given to each group he has worked with, in all the years I have known him, has been invaluable", said David Salter at a ceremony held to mark Mikes retirement from the Laboratories. David was speaking on behalf of all those who had known Mike, as he presented him with a wrist-watch,a gift from all his friends and colleagues as a small token of their appreciation.

Mike joined Atomic Energy Section at TRE Malvern in August 1946 from the RAF. As a radar mechanic he was stationed for a period at Harwell, where he returned in 1946 to join General Physics Division working on the Cyclotron. When the Cyclotron became operational in December 1949 he became an operator until he joined the NIRNS Vacuum Group in 1960. This group worked on the development of the Nimrod Vacuum Vessels, and other equipment connected with them until 1964. From 1964 he worked on Particle Separators until the closure of Nimrod since when he has worked for NBRU now Neutron Division. Amongst all this Physics, he also found a more laudable outlet for his talents, - being the one-time landlord of The Crown at Childrey.

All his colleagues wish him good luck and a long and happy retirement.

Lunchtime Music

Lecture Theatre - 12.30 - 12 November

'CARMINA BURANA'
by
Carl Orff

Written in 1935/36 Carmina Burana was the first of Orff's stage works.

The texts are 13th century poems in low Latin with a few in old German. Orff wished to return music in general, and Opera in particular to its earliest roots. "Music, movement and rhyme" is a description of what Orff has tried to do to bring to contemporary music medieval symplicity. The chorus frequently sings in block harmony and the melodic style is a curious mixture of elements of folk song, Gregorian chant and Romantic period harmonies.

Thanks

Mike Cheshire wishes to thank all those who contributed to his farewell gifts and would like to apologise to those he was unable to thank personally.

Bulletin

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INTERNAL Events

RAL LECTURES
LECTURE THEATRE - 1515 hrs

12 Nov Mr K E Clarke/P.O. Research Centre
"National and International Developments in Viewdata Systems"

ASTROPHYSICS SEMINARS
R61 CONF RM - 14.00 hrs

12 Nov Dr J E Bateman/RAL
"Development in X-ray and γ-ray Imaging Detectors"

19 Nov Dr A H Gabriel/RAL
"Scientific Results from the Solar Maximum Mission"

WHAT'S NEW?
LECTURE THEATRE - 1515 hrs

5 November Dr David Clark
"Stellar Explosions and the Destiny of the Universe".

HEP TECHNIQUES SEMINARS
R61 CONF. RM - 1400 hrs

6 Nov Dr C M Fisher/RAL
'Holography'

SAFETY FILM
LECTURE THEATRE - 1230,1315 & 1400 hrs

18 Nov 'Mind Your Back'
This film looks at some of the easily avoidable bad habits developed by men & women at home and work. Experts in lifting technique and posture show how these can be avoided.

EXTERNAL Events

THEO PHYS SEMINARS
TPD LECTURE TH, AERE 14.00 hrs

4 Nov Prof J R Willis/Bath
"A Variational Approach for Waves in Randomly Inhomogeneous Media"

NPD COLLOQUIUM
CONF RM H8 AERE - 15.30 hrs

6 Nov Dr B W Hooton/AERE
"The Quantitive Determination of Plutonium by Passive and Active Neutron Measurements".

ELEM. PART. THEORY SEMINARS
NPD LECT. TH. - OXFORD - 14.30 hrs

7 Nov Prof D J Wallace/Edinburgh
"Instantons in Vacuum Decay and First Order Phase Transition'

14 Nov Prof C Michael/Liverpool
"Relativistic Treatment of Heavy Quark Bound States"

ELEM PART PHYS SEMINARS
NPD LECT. TH - OXFORD - 14.30 hrs

6 Nov Prof J Ballam/Imperial & SLAC
"SLAC Linear Collider Program"

13 Nov Prof L Hand/Cornell
"Results from a Hybrid Emulsion Neutrino Experiment (#553) at Fermilab"

HIGH ENERGY PHYSICS SEMINARS
CAVENDISH LAB - CAMBRIDGE - 14.30 hrs

5 Nov Dr C M Fisher/RAL

12 Nov Dr D Radojicic/Oxford
"Some Results from a BEBC Neutrino Experiment"

SOLID STATE SEMINARS
CLARENDON LAB - OXFORD - 14.30hrs

6 Nov Dr R Martin/Xerox
"Mixed Valence Systems - Metals or Insulators"

THEOR. PHYS SEMINARS
CLARENDON LAB - OXFORD - 16.15 hrs

13 Nov Dr C Itzykson/Saclay
"Roughening in Lattice Gauge Theories"

COMPUTERS AND NATURAL LANGUAGE
NPD LECTURE TH. - OXFORD - 16.30 hrs

6 Nov E C Sedman/Computer Analyst and Programmers.
"Intelligent Terminals for Viewdata Systems"

13 Nov Dr R W Last/Hull
"Computer Assisted Learning of Languages"

HEP SEMINARS
DAMPT - CAMBRIDGE - 15.00 hrs

7 Nov Prof E Squires/Durham
"Why Quarks and Leptons are/are not composite"

SHEP SEMINARS
SOUTHAMPTON - 14.30 hrs

5 Nov Dr R Farnwell/Imperial
"Gauge Theory of Electric and Magnetic Spinors"

ELEM. PART. PHYS SEMINARS
WESTFIELD COLL - LONDON - 14.00 hrs

6 Nov Dr H Reinders/RAL
"QCD Sum Rules for Heavy Quark Systems"

13 Nov Dr I G Halliday/Imperial
"Infrared Problems in QCD"

PHYSICS COLLOQUIA
H H WILLS LAB - BRISTOL - 17.00 hrs

3 Nov Prof M Hart/Kings
"Future Uses of Synchrotron Radiation"

10 Nov Dr D Sherringdon/Imperial
"Spin Glasses"

PART PHYS SEMINARS
BIRMINGHAM - 16.15 hrs

7 Nov Dr J Proudfoot/RAL
"TASSO"

14 Nov Dr B Duff/UCL
title to be announced.

HEP SEMINARS
MANCHESTER - 14.00 hrs

4 Nov Dr J Malos/Bristol
"Ring Image Cerenkov Counters"

11 Nov Mr J Lane/Manchester
"Inclusive ϕ photoproduction
Mr A Waite/Manchester
"Some New Resonances in the 5π System"

THEO. PHYS. SEMINARS
MANCHESTER - 14.30 hrs

5 Nov Prof B Banerjee/Tata Inst.
"Pion Condensation"

12 Nov Dr S Lovesey/RAL
Dynamic Correlations in Classical Heisenberg Spin Chains"