Rutherford Laboratory

22-29 January 1973

bulletin 3

RAPID PROGRESS IN NBRU COLLABORATION PROGRAMME

As most people will know, at the end of last August, the Government after considering the various possibilities of new high flux neutron facilities, decided that the interests of British Scientists could best be served by collaborating with the French and Germans using the new reactor at Grenoble.

A Department of Education and Science press release on 21 December 1972 announced that agreement had been reached between the SRC and the existing French and German partners giving British Scientists access to the facilities at Grenoble on equal terms with scientists from France and Germany.

Under this agreement the SRC will have one-third representation on the Steering Committee, the Scientific Council and the Audit Board. The chairmanship and vice chairmanship of the Steering Committee will rotate between France, Germany and the UK and the Director will be alternately German or British. There are of course many other important aspects contained in the agreement.

All this has meant an intensive period of activity for the Neutron Beam Research Unit (NBRU) at the Lab. Subjects such as instrumentation, computing, experimental proposals, technical liaison and many more including the problem of transportation of samples and apparatus to and from Grenoble has meant much burning of candles (at both ends), and it is to the great credit of the Unit under Dr Hobbis that so much has been achieved in what is an astonishingly short time.

The Grenoble reactor, similar in design to the Brookhaven High Flux Reactor is of the steady state type and apart possibly, from the new Dubna pulsed reactor which may be operating by this time, has the strongest thermal neutron source in the world. The fuel is concentrated in a small core from which fast neutrons can escape with relatively high energies of approximately 1 MeV. The core is surrounded by a heavy water reflector tank, 2.5 m in diameter, in which the neutrons are slowed right down to thermal energies (of about 0.025 eV). Some of the neutrons return to the core to produce further fissions there and the rest are used for the experimental programme. The core itself is constructed of thin plates of aluminium uranium alloy, highly enriched with U235, contained between aluminium plates; the whole system being removable as a single unit when approximately 30 per cent of the uranium has been used up (or after about 36 days of operation at full power). The core/reflector assembly is surrounded by a tank of ordinary water, 6 m in diameter and 15 m high, supplemented laterally by 1.2 m of heavy concrete. The intense thermal neutron flux reaches its maximum (1.5×10^{15} neutrons per square centimetre per second) in the heavy water outside the core at a distance of approximately 15 cm from it: it is here that the channels used for extracting neutron beams are arranged. (For further information on the Grenoble reactor see "Endeavour" vol XXXI May 1972, page 67).

Why the interest in neutron physics? This interest is not new but lack of suitable high flux facilities has greatly curtailed the amount and variety of research that could be undertaken. Apart from research on the neutron itself, a neutron source of high intensity provides a research tool of wide application in many fields. The unique properties of the neutron - no electric charge (which enables it to penetrate matter very easily) - a magnetic moment (which enables interaction with magnetic structures) and, in the case of fairly slow moving thermal neutrons, a wave length roughly equal to the distances between atoms in liquids and solids - are extremely useful in the study of the structure and dynamics of all kinds of materials.

This leads to applications in solid and liquid state physics, chemistry, biology and materials science.

A veritable flood of good proposals shows the interest of British Scientists in this field with 47 proposals being considered at a special meeting on 25 October 1972. Of these, 35 were accepted, the rest can be resubmitted in later rounds.

The first of the UK experiments from Reading University had a short run before the reactor was shut down for 4 weeks in mid December. Several UK experiments should be under way at Grenoble very shortly.

Finally, should the partners decide to build a new source of intense neutron beams, this will be in the UK, and not, as reported in this week's New Scientist, in the US.

NIMROD SHUT DOWN

Nimrods annual shutdown will commence on 12 February.

news continued on page 4

INTERNAL EVENTS

NIMROD LECTURE SERIES
Monday 22 January
11.30
Lecture Theatre

1. Eta Primes 2. Tachyons

Dr G Kalbfleisch/Brookhaven

HEP DISCUSSION GROUP
Wednesday 24 January
11.00
Conference Room, Building R1

Parity Doublets and The Mandelstam-Sommerfeld-Watson Transformation in Backward K^+p Elastic Scattering (an application).

Dr E J Sacharidis/RHEL

FILM SHOW
Wednesday 24 January
13.15
Thursday 25 January
12.40
Lecture Theatre

The Tide of Traffic - a 29 minute colour film.

This film, made by British Petroleum as a contribution to the UN Conference on the Human Environment, Stockholm, 1972, looks at the increasing use of the motor vehicle. Man now finds himself caught in a dilemma between the motor vehicle's massive benefits and the social and environmental problems brought about by its usage. This dilemma is becoming one of the major issues of our time; perhaps there is no ultimate solution, but as numbers increase the world must find a way for the motor vehicle and man to coexist more satisfactory.

SEMINAR IN COMPUTING
Friday 26 January
11.00
Conference Room, Building R12

Momenta in Milliseconds

M J O'Connell/RHEL

Current and future spark chamber experiments with data samples of 10^6 to 10^7 triggers demand a fast way of determining momenta from co-ordinates in magnetic fields.

Parametric methods, i e fitting functions to the momenta, using Monte Carlo generated data sets, provide a satisfactory way of doing this. Programs which are operational on the 195 and suitable for this purpose will be discussed, particularly the methods developed by H Wind at CERN.

NIMROD LECTURE SERIES
Monday, 29 January
11.30
Lecture Theatre

Proton - Proton Scattering at all Angles

Professor J Tran Thank Van/Orsay

NIMROD SCHEDULE

CYCLE 2 23 1 73 - 11 2 73 MACHINE PHYSICS HIGH ENERGY PHYSICS

Team	Beam	Experiment	State
BRISTOL UNIVERSITY/ SOUTHAMPTON UNIVERSITY/ RHEL	K15	$\pi^{\pm}p$ Differential Cross-Sections	Data
GLASGOW UNIVERSITY/ RHEL	π9	π^-p Differential Cross-Sections	Data
IMPERIAL COLLEGE/ SOUTHAMPTON UNIVERSITY	π7	Studies of η ω and A2	Data
CHURCHILL HOSPITAL/ BART'S MEDICAL COLLEGE/ RHEL	π11	Radiobiological Experiments	Data

* * * * * * * * * * * * * * * * * * *

RECORD SOCIETY

Tuesday, 23 January at 12.40 in the Lecture Theatre

Jazz fans, and others, your many requests are hereby granted so come along and listen to a post war re-recording of a famous 1938 recording of such jazz classics as Honeysuckle Rose, Night and Day, Georgia Brown, Liza etc played by those unique musicians, Django Rheinhart and Stephane Grappelly with the Quintet of the Hot Club of France. Stephane Grappelly, jazz fiddler supreme seems to go from strength to strength: it is interesting to recall that only three violinists have ever made a name for themselves in the jazz field, Joe Venuti, in the early days, Stuff Smith and Grappelly at least to the best of the Editor's knowledge. (I shall now be shot down - Ed).

EXTERNAL EVENTS

NUCLEAR STRUCTURE & NUCLEAR ASTROPHYSICS SEMINAR
Monday 22 January
14.30
Nuclear Physics Lab Oxford

Nuclear Reactions and Stellar Evolution

Professor R J Taylor/University of Sussex

THEORETICAL PHYSICS SEMINAR
Wednesday 24 January
14.30
University of Manchester

Particle Interactions at Very High Energies

Professor P Murphy/Manchester

ELEMENTARY PARTICLE PHYSICS SEMINAR
Thursday 25 January
14.15
Nuclear Phys Lab Oxford

Polarization in Inclusive Reactions

Dr R J N Phillips/RHEL

THEORETICAL PHYSICS SEMINAR
Thursday 25 January
16.15
Clarendon Lab Oxford

The Bounds Approach to Solid-State Physics

Dr D P Johnson/American University, Cairo

ELEMENTARY PARTICLE THEORY SEMINAR
Friday 26 January
14.15
Nuclear Physics Lab Oxford

Dual Properties of Inclusive Spectra

Dr H M Chan/RHEL

COLLOQUIUM
Friday 26 January
16.15
Clarendon Lab Oxford

Molecular Rotations in Solid Hydrogen

Dr A Brooks Harris/University of Pennsylvania

EVENTS AT AERE

THEORETICAL PHYSICS SEMINAR
Tuesday 23 January
14.00
Conference Room, Building 8.9

Wilson Theory of Critical Processes

Dr J Hubbard/T P Division, AERE

NUCLEAR PHYSICS COLLOQUIUM
Thursday 25 January
15.30
Conference Room, Hangar 8

Searching Legal Text by Computer

Dr B Niblett/N P Division, AERE

* * * * * * * * * * * * * * * * * * *

CHRISTIAN FELLOWSHIP

The Rev R Baggott, Minister of All Saints Methodist Church, Abingdon will be visiting the Laboratory on Friday, 26 January. All are welcome to come along to hear him, at 12.30 in the Conference Room, Building R12.

MODEL RAILWAY CLUB

The next meeting on Monday 22 January will be a working session on the club lay-out. Dont forget the new time - 12.30; venue as usual - the Music Room at the Recreational Society's Hut. Information from Ray Roberts on Ext 254.

RUTHERFORD LABORATORY BULLETIN *Published by the Scientific Administration Group*

Editor: H F NORRIS
Room 42 Building R20
Rutherford Laboratory
Chilton Didcot Berks
Abingdon 1900 Ext 484

Deadline for Insertions	GENERAL & SOCIAL NEWS	INTERNAL & EXTERNAL EVENTS
	Tuesday 1600	Wednesday 1200

DEVONSHIRE CREAN & CIDER

On a gloomy foggy day in January the thought of a cottage overlooking the harbour at Brixham in Devon is most attractive and probably a secret dream of a lot of people. For Nora Henderson it is more than a dream, it's a reality as today, Wednesday 17 January, she said farewell to the Laboratory and before many weeks have passed will be living in that cottage. Nora joined the Lab just over ten years ago and after a few months in R1 moved over to R25 as soon as the building was completed, and has remained there ever since. Up to August 1970 she was Secretary to Dr J D Lawson, since which time she has undertaken the same duties for Mr M Snowden and Dr P F Smith.

After an amusing speech Mr Snowden, on behalf of Nora's many friends and colleagues, presented her with a handsome cheque. Nora in reply, thanking everyone, said that Mr Snowdon had in fact traded her in for a newer model with far fewer miles on the clock. She then introduced her successor, Miss Anne McNaught.

Nora and her husband Alan have a great interest in antiques (Alan also likes barometers and telescopes - for bird watching!) and one feels that the cottage will soon house a collection of those objects.

We would like to add our good wishes to Nora and her husband for a long and very enjoyable retirement in Devon.

All that cream and cider - and no frosts - well hardly ever; back to the Bulletin again.

FILM BADGE NOTICE

It is Period 1. Colour Strip - PURPLE for βγ films and neutron packs. Please check that you are wearing the correct dosimeters and that all old ones are returned. Next film change - Monday 29 January.

INSTRUCTION BOOKLET REQUIRED

An instruction booklet for the Facit LX calculator is required for reference. Anyone having a copy of this booklet is asked to ring Ext 238 or 475.

MISSING EQUIPMENT

The following items of equipment have been reported missing:-

One 3 cwt set of Sheer Legs (Lifting Tripod) No RLX 300, apparently taken from Safety Group Stores R23 on the Runway. Also mislaid, one battery operated fluorescent hand lamp belonging to Safety Group. Would anyone with information regarding either of these items please inform Safety Group Ext 6249/314.

Missing from Lab 5, R1:-

Digital Voltmeter, DM 2020 Ser No 11144 with the name, R Sidlow on it.

Anyone with information on the present whereabouts of this instrument is asked to contact Mr R Sidlow R1 Ext 294.

LIBRARY NOTICE

During the next two months the Library will have on display examples of furniture for possible use in the new Library. This furniture is intended for use and staff are invited to write their comments in the notebooks attached to each item.

OVERSEAS VISITS

Dr C J S Damerell, to CERN, 21 - 26 January to work on the S120 experiment.

Mr G H Rees and Mr M R Harold, to CERN, 22 - 23 January to attend meeting of the GESSS/MD Committee.

SOCIAL NEWS

CHESS NEWS

As forecast last week the sixth round was vital with Jim Riddle beating Alan Gilby and Peter Craske after a hard fought game, drawing with Bill Turner.

The leading positions after 6 rounds are - Bill Turner and Jim Riddle with 5½ points, Peter Craske with 5 points and, after had starts, SK Chanda and Peter Hemmings right on the leaders heels with 4½ points.

In the next round the leaders, Bill and Jim play one another and Peter Craske, having closed the gap to ½ point, will be trying to improve his position with, one suspects, many a glance over his shoulder at Hemmings and Chanda who are only ½ a point behind. This year's contest looks like building up to an exciting finish and we will try and give weekly reports on the situation

HORTICULTURAL SOCIETY AGM

Owing to the illness of the Secretary it has become necessary to postpone the AGM. The new date will be announced in due course.

more social news at bottom of pages 2 & 3