

7 May 1979 No.9

## SNS Preparations

### Rapid Progress

Following the closure of Nimrod in June 1978, its dismantling proceeded apace in preparation for the installation of the Spallation Neutron Source (SNS).

There has been considerable progress on several fronts since then.

The detailed design of the 800 MeV synchrotron is well advanced: orders have been placed for the 20 trim quadrupoles and the 20 doublet quadrupoles. Bids have been received for the 10 large bending magnets, and are being evaluated.

The external proton beam has been designed and will use 64 magnets - 63 of the quadrupoles and bending magnets are already available ex-Nimrod, together with their power supplies. The physics design of the target station is nearing completion and there is significant progress on the development of the control system and instrumentation. The scientific specifications of the first batch of neutron scattering instruments have been agreed with the University Users and the designs have reached the costing stage.

In this issue we bring you news of two recent advances in these preparations.

### Trim Quadrupoles

The synchrotron ring is sub-divided into ten identical sections, each containing 2 doublet quadrupole magnets, 2 trim quadrupole magnets, a single quadrupole and a large bending magnet. These magnets keep the proton beam on orbit and correctly focussed.

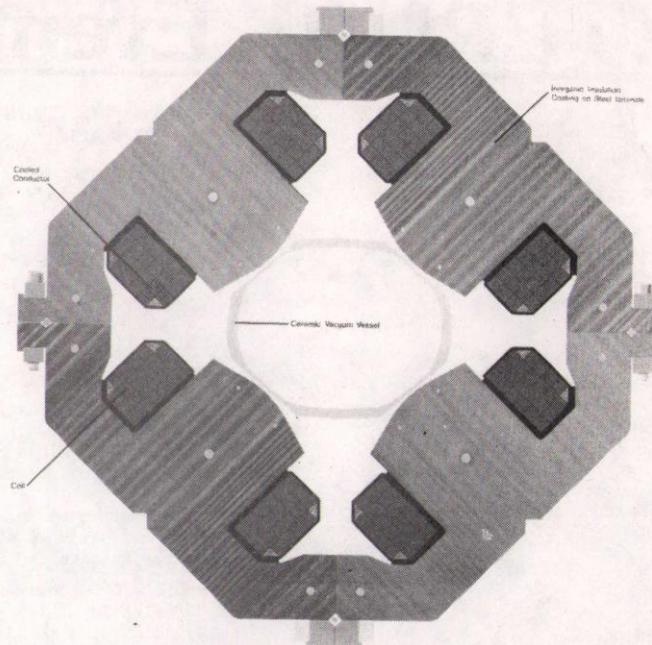
The "trim" quadrupoles are very short compared with their aperture, and are required to produce a magnetic field gradient which changes rapidly with time, particularly during the 480 microsecond injection interval.

#### Doublets

Each of these quadrupoles is made up of 6,500 thin laminations of sheet steel, coated with an inorganic insulator to prevent eddy currents. Production of the laminations has just started at Lintott

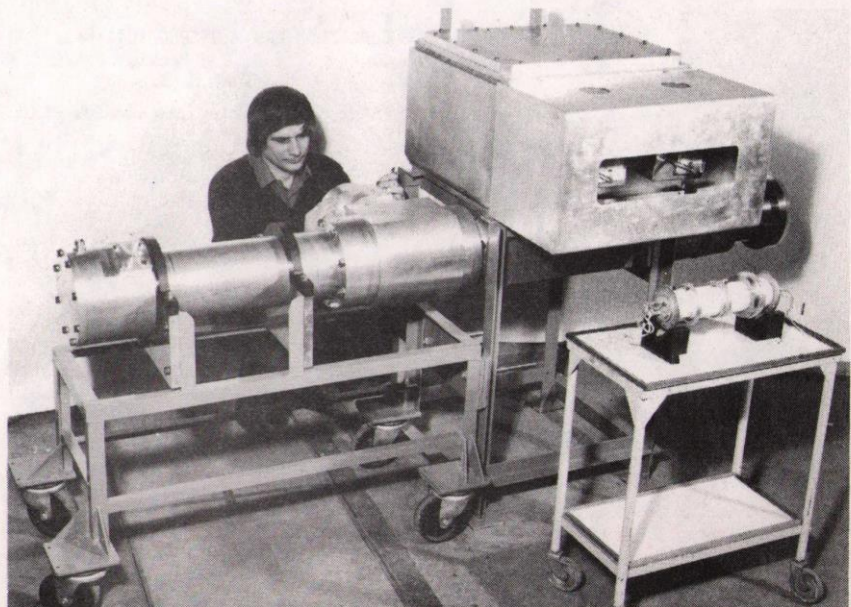
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not trim -  
doublets.



#### Doublet

The first lamination for the trim quadrupoles Q 137 has arrived and is incorporated into a display panel on view in the foyer of Building R1. Twenty of these quadrupoles have been ordered for the SNS synchrotron ring.



Dave Baker inspects the prototype thyatron assembly, now undergoing proving trials as a switch for the SNS fast extraction system.



# INTERNAL Events

## HEP SEMINARS

CONFERENCE ROOM R61 - 1100 hrs

9 May: Mike Stone/DAMTP  
Title to be announced.

16 May: Prof L.O'Raifeartaigh/Dublin  
"Algebraic Structures of Simultaneous Symmetry Breaking".

23 May: Prof. J G Taylor/Kings  
"Unification/Superunification and Superalgebras".

30 May: W S Deans/Durham  
Title to be announced.

## NIMROD LECTURES

LECTURE THEATRE - 1130 hrs

15 May: J Koener/DESY  
"Jet and Particle Phenomena at PETRA Energies".

21 May: R Cashmore/Oxford  
"TASSO Results at PETRA".

# EXTERNAL Events

## NPD COLLOQUIUM

H.8 AERE HARWELL - 1530 hrs

10 May: U McL.Michie/Inst of Geol. Science  
"Uranium Exploration"

17 May: Prof. J Draper/California  
"In Beam Electron Conversion in High Spin States of Pb".

## THEO. ELEM. PART PHYS. SEMINARS

N.P.L.OXFORD - 1430 hrs.

11 May: Dr Leroyer  
"Is a Classical Quark Surrounded by a Coulomb Field?"

18 May: Prof R Jaffe  
"Quark Masses for Low and High Q<sup>2</sup>".

## ELEM.PART.PHYS.SEMINARS

WESTFIELD COLL. - 1400 hrs

9 May: Prof. M T Vaughn/Southampton & N E Universities  
"Grand Unified Gauge Theories"

16 May: D B Fairlie/Durham  
"Models for the Weak Interactions Employing Graded Algebras"

## THEO.PHYS.SEMINARS

T.P.D. CONF. RM AERE - 1400 hrs

8 May: Dr C M Sayers/M.P.D.  
"Bonding at Transition Metal Surfaces"

15 May: Prof. J F Reading/Texas  
"Recent Advances in Inner Shell Processes".

## THEO.PHYS.SEMINARS

CLARENDON LAB. OXFORD - 1615 hrs

10 May: Prof S D Drell/Stanford & Oxford  
"Application of Real Space Renormalisation Group Method on the Lattice".

17 May: Prof. V Ambegaokar/Cornell  
"Dissipation in He Film Dynamics of a 2 - dimensional Phase Transition".

## ELEM. PART. PHYS. SEMINARS.

N.P.D. OXFORD - 1430 hrs.

17 May: Prof S Drell/SLAC  
"Efforts to Understand Quark Confinement via Field Theory on a Lattice".

24 May: Dr D Amati/CERN  
"Jets and QCD".

## HEP SEMINARS

DAMTP CAMBRIDGE - 1500 hrs

11 May: D Bailin/Sussex  
"Prospects for Gauge Theories"

18 May: S D Drell/SLAC-Oxford  
"Lattice Approach to Gauge Theory and PCAC".

## PHYSICS COLLOQUIA

CLARENDON LAB - OXFORD 1615 hrs

11 May: Prof. D H Perkins FRS/Oxford  
"Inside the Proton"

18 May: Prof. Sir Sam Edwards FRS/Cambridge  
"New Theories of the Amorphous State"

## THEO.PHYS.SEMINARS

SCHUSTER LAB. MANCHESTER - 1630 hrs

9 May: Prof.G L Shaw/California  
"The Role of Assemblies of Neurons in a Statistical Theory of Memory".

16 May: Dr J G Baker/Manchester  
"Intermolecular Rotational Energy Transfer studied by Lineshape and Pulse Coherent Spectroscopy".

## HEP SEMINARS

CAVENDISH LAB - CAMBRIDGE - 1500 hrs

9 May: Dr W S C Williams/Oxford  
"Deep Inelastic Charged Lepton Scattering by Nucleons and QCD".

23 May: Dr D Duke/RL  
"Asymptotic Freedom and Deep Inelastic Scattering"

## THEOR.GP.SEMINARS

DARESBURY LAB - 1400 hrs

8 May: Prof L M Delves/Liverpool  
"The Global Element Method for the Solution of Elliptic Partial Differential Equations".

11 May: Dr R K Nesbet/IBM San Jose  
"An Energy Modified Adiabatic Approximation for Scattering Theory".

14 May: Prof. M J Seaton/UCL  
"Some Ultra-Violet Observations of Stars and Nebulae".

## THEOR.PHYS.SEMINARS

QMC - 1615 hrs

14 May: Prof. L. O'Raifeartaigh/Dublin  
"Algebraic Structure of Spontaneous Symmetry Breakdown".

21 May: Prof. J S Bell/CERN  
Title to be announced.

## THEO.PHYS. SEMINARS

SOUTHAMPTON - 1430 hrs

11 May: Dr C Sachradja/CERN  
"Higher Order Calculations in QCD - What Do They Mean?"

17 May: Prof. C Jarlskog/Bergen  
"Proton Stability"  
(Please note this lecture is at 1245 hrs)

18 May: Dr J G McEwen/Southampton  
"J/ψ Production by Pions : First Results from Goliath".

## PART. PHYS. SEMINARS

BIRMINGHAM - 1615 hrs

11 May: Dr F Close/RL  
"Looking for 4-Quark Vector Mesons".

18 May: Dr P Higgs/Edinburgh  
"Spontaneous Breaking of Supersymmetries".



Engineering and delivery of the prototype quadrupole is expected in the next few weeks. A sample lamination is currently displayed in the foyer of Building R1.

## Prototype Thyatron Assembly

In the SNS synchrotron there are two circulating bunches of protons, and at 800 MeV the time separation between them is only 220 nanoseconds. "Kicker" magnets are used to extract each bunch of protons. In the SNS a set of 3 magnets is used, which establishes fields of about 400 Gauss in the time interval between bunches. The Kicker magnets use ferrite cores and the fast rise-time currents are generated by means of coaxial thyatron switches. A prototype thyatron switch (see photograph) is currently under test at the Laboratory.

The *Bulletin* plans to bring you news items of the highlights in the SNS construction programme. For a fuller description of all progress on the SNS, see "Neutron News".

## OVERSEAS Visits

L G Denton to DESY from 6-11 May to assist with installation of JADE.  
R Maybury, J A G Morris and HM Watson to CERN from 7-11 May to work on experiment N11.  
D H Saxon to DESY from 7-11 May to work on TASSO.  
J M Valentine to CERN on May 7 for discussions.  
C J Damerell to CERN from 8-25 May to work on Prop. 202.  
J S Hutton to USA from 8-27 May to attend conference and discussion at various laboratories.  
J D Lawson to DESY from 8-10 May to attend European Nuclear Conference.  
B Franek and G H Gray to USA from 9 May-6 June to attend conference and to visit SLAC and FNAL.  
G E Kalmus to SLAC from 14-23 May for discussions and collaboration on  $\gamma$ P experiment.  
F E Close to Orsay from 21 May-15 June to consult with DCI Experimentalists.  
W A Smith to Copenhagen from 27 May - 1 June to attend 2nd International Symposium on Energy Conservation.

## Missing

The following item has gone missing from building R5 70 MeV injector:-

TMK Multimeter  
type TW 50K  
Serial No. 0589008

Will anyone with information as to the whereabouts of this item please contact David Mann R18, Ext 6329

## Training

### LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY

#### Courses:-

- 24-29 June: Project Organisation and Control.  
22-28 July: The Applications of Heterogeneous Catalysis  
Industrial Waste Disposal and Reuse.

### BRUNEL UNIVERSITY

#### Courses:-

- 2-13 July or 22-2 Nov: Management of Research  
12-15 Nov: Organisation and Management of Research and Development.

### THE INSTITUTION OF MECHANICAL ENGINEERS

#### Conferences:-

- 26 June: Instruments and Computers for Cost Effective Fluid Power Testing.  
10-12 July: Noise & Vibrations in Engines and Transmissions.  
11-12 Sept: Environmental Monitoring. (Further information from IME.)

### THE INSTITUTION OF ELECTRICAL ENGINEERS

#### Conference:-

- 19-21 June: Electronic Test and Measuring Instrumentation.  
Vacation School.  
8-14 July: RF Electrical Measurements

### NATIONAL CENTRE OF TRIBOLOGY

#### Course:-

- 5 June: Maintenance & Fitting of Dynamic Seals.

### ACTON TECHNICAL COLLEGE

#### Conference:-

- 11 July: High Vacuum Technology

Further details may be obtained from TRAINING SECTION R20  
Ext 6285/266.

## Christian Fellowship

The next two meetings of the Fellowship will take place on Thursdays 10 & 17 May in the R2 Conference Room at 12.35 p.m. All are welcome to join us.

## Rutherford Wives

MAKE IT A DATE to come along to the May Coffee Morning at The Cosener's House on Thursday 10 May between 10.30 am and 12 noon.

For further information please contact Gillian Litt (Abingdon 26009) or Dorothy Gibson (Abingdon 25250).

## Warning

### SMALL TWIST DRILLS

Recent deliveries of small twist drills have included some which have been incorrectly ground at their cutting edges; some 30% of those sampled appear to be affected. Since distribution within the Stores supply organisation has already taken place, and users in many areas will have made withdrawals from Stores, it is impracticable for central inspection to be arranged. Users are therefore advised to examine the drills before using for the first time and to have them reground as necessary.

Complaint has been made to the manufacturer and efforts are being made to prevent recurrence.

So far as can be ascertained the sizes principally affected are as shown below together with the Stores Catalogue numbers: 27/18014, 20, 24, 30, 35, 41, 44, 47, 48, 50, 52, 56, 60, 62, 65, 68, 72, 73, 74, 76, 79, 82, 85, 87, 89, 93, 95, 100, 102, 103, 105, 107, 110, 112, 113, 115, 118.

## Film Badge Notice

It is Period 5. Colour Strip BROWN.

Please check that you are wearing the correct film and all old ones are returned.

## Radiation Protection Move

Radiation Protection Group will shortly be moving to the R12 area.

The FILM SERVICE will be in the Safety Section Office and the HEALTH PHYSICS ADVICE service will be in Lab 19.

The time of the move will be announced when finalised.

## Library Notice

Copies of transparencies from the Cosener's House Meeting of the U.K. HEP Forum are available for use at the Library desk.

## Wanted Urgently

Furnished house, vacant for the month of July, for visiting scientist and family, preferably in Abingdon. Contact Pam Lloyd Theory Division Ext. 403.



## RecSoc News

The AGM of the Rutherford Laboratory Recreational Society did NOT take place on Wednesday 25 April due to lack of support.

So - where were you all?

Rule 13 of the Constitution states that "a quorum for Annual General and Special Meetings shall be 30 Full Members. If a quorum is not present, the meeting will be adjourned to a date within twenty-one days. Seven days notice of the resumption of the meeting will be given, which will then reconvene in the same place at the same time and the business on the agenda will be conducted regardless of numbers present."

You are therefore, notified that the AGM will be reconvened on Wednesday 16 May, in the Lecture Theatre at 1240 hrs.

Seventy people attended the Indoor Sports, let's have at least that many at the AGM.

## SRC Sports Day

On a happier note the SRC Sports day at Runcorn on 23 April proved a great success. Not only did the Rutherford Laboratory score some good wins, but the event turned out to be a very enjoyable social get-together.

Rutherford 'A' Table Tennis team won their event, Arthur Chilvers, Peter Kent and John Varley playing brilliantly. The Badminton Men's Doubles was won by Dave Wootton and Roger Wolfenden, and in the Squash Competition, our team of 3 - Jenny Coates, Bob McClure and John Mogford were runners up.

R Wastle, D Edwards, A Robinson, E Capocc, C Grinstead and S Flynn, the Rutherford 'A' Darts team also notched up a first.

The less said about the Volley-Ball competition the better, but we intend to do better next year - when we get the rules sorted out!

Brian Oakley (Secretary of SRC) presented the prizes, and also attended the Hot Pot Supper and Disco at Daresbury Laboratory, which followed.

## Darts

It is planned, if sufficient interest is shown, to run a Darts Competition in October. There will be a section for teams of four, and a singles match.

To make it worthwhile there must be at least 32 competitors, so that refreshments can be supplied and the bar opened. A small charge will be made per person. Please bear this in mind when making up your calendars for the winter season.

## Folk Club

The Club has had four meetings, all well attended and, judging by the faces seen regularly at the meeting, obviously fulfils a need.

However, we do have an appeal to make, and that is for help in running the club if we are going to continue next season, which begins in October; club meetings to be held on the first Friday in each month.

Please contact John Ellis, Ext 6689

## Football

During the last year, the Soccer Club has continued with its well established programme of competitions. These are :

- (1) Rutherford Championship - open to RL and Atlas teams only.
- (2) Rutherford Challenge League (Div.1 and Div.2) open to RL and Atlas teams plus Harwell.
- (3) Rutherford Challenge KO Cup open to RL and Atlas teams plus Harwell.

At its AGM in Sept 1978, the Club reaffirmed its view that the Soccer Committee should consist of a representative from each of the RL teams with co-opted members as appropriate. The Committee Officers for 1978-79 are :

Chairman	R A Lawes
Treasurer & HEP rep.	K Paler
Match Secretary	L Patton
Referee Liaison	D Lucas
R20 representative	K Lewis
Atlas representative	R Smith

In recent years no treasurer has been appointed or financial report given as all finance has been through the Rec. Soc. itself. However after recent clarification of the view of the Rec. Soc. that clubs should be partly self financing, a treasurer has been appointed and an interim financial report produced. Only the short term purchase of equipment to replace that worn out through continuous use has been made while arrangements to raise revenue from RL teams are in hand. On the competitive front the Rutherford Championship has been hotly contested by all teams and finally won by the

CA team. The subsequently adverse weather conditions effectively stopped all football until relatively recently. Currently the Challenge League Competition is halfway through its programme.

## Golf

The Rutherford Laboratory Golf Section was formed in April 1978 and now has 27 members.

The main function of the Committee in 1978 was to organise the SRC Annual Golf Tournament which proved very successful.

In August a team of four players were entered for the Southern Region Civil Service Sports Council 1978 Golf Championship. The event was held at Royal Winchester and the Laboratory's team was placed third.

The 1979 SRC Tournament is being arranged by Daresbury Laboratory and we are expecting to field three teams.

For the future, management has given approval for a six hole golf course to be built on the area of land to the rear of the mound.

Work should begin shortly.

## Art & Craft Exhibition

An ART and CRAFTS Exhibition is to be held in the R12 Conference Room on 3, 4 and 5 July during the lunch period.

It is hoped that members of the Rutherford Laboratory will be willing to exhibit their work on these days. Application forms will be available nearer the time. Will those interested please contact one of the following:

Jenny Coates	Ext 430
Myra Gilbert	Ext 6143
Joan Homer	Ext 6163
Pauline Gammon	Ext 360
Audrey Foster	Ext 547

We are fully aware that in many a small corner of the Rutherford, lights are being carefully hidden under bushels. This is an opportunity to allow them to shine, and at the same time to fire the imaginations of a few of us less creative characters.

No prizes are offered, but the chance to meet fellow enthusiasts of your particular hobby, to exchange ideas and discuss technicalities, plus the satisfaction of having the results of your handiwork admired, must make the effort of preparing an exhibit worthwhile.

The more participants there are, the better the Exhibition. Please help to make it really interesting.



RUTHERFORD LABORATORY

# BULLETIN

Deadline for Insertions

1000 hrs Tuesday 15 May

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