RUTHERFORD

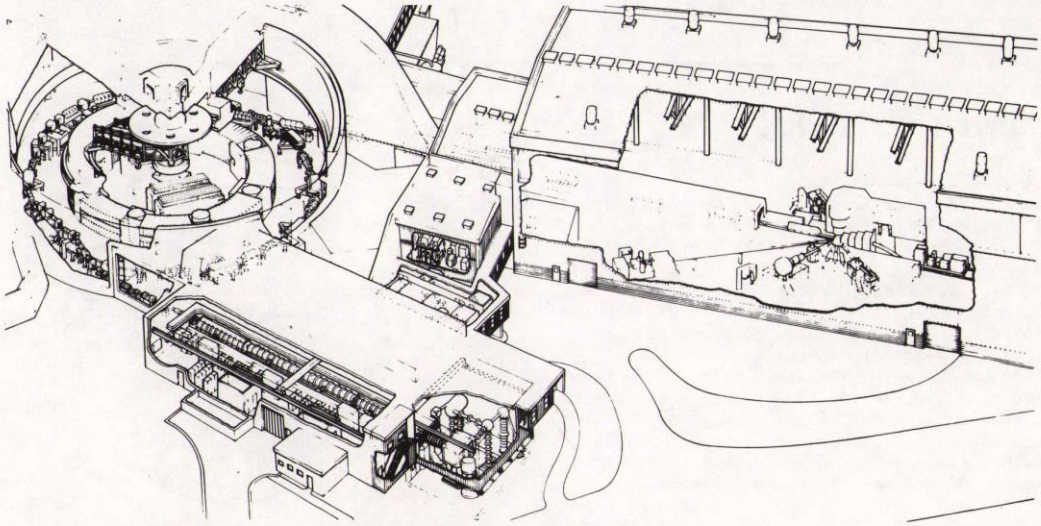
Bulletin 10

5-19 JUNE 1978

GOODBYE NIMROD !

Sir John turns the first turf.

24 April 1964 NIMROD officially springs to life.



SNS The shape of Things to Come

TUESDAY 6 JUNE- A DAY TO REMEMBER

The date for Nimrod's final close-down has arrived.

(Some of the high-lights of the experimental programme of Nimrod were reviewed in Bulletin No. 3 February).

Many people will be able to remember the early days during the design and construction of the large "Atom Smasher" as the newspapers described the new proton synchrotron. The 7 GeV accelerator took six years to build and in the course of construction some very difficult problems had to be overcome - notably the manufacture of the vacuum vessels which were of unparalleled scale and complexity in construction.

It is appropriate to stress the high level of skill that went into the construction and development of Nimrod since it is such skill and expertise which will be required for the construction of the new facility to take its place. The building of the new accelerator (SNS) will be in many ways more demanding than its predecessor and will represent a further significent achievement for the Rutherford Laboratory.
Readers will be interested in the photographs from the archives of events in the early days. To give a taste of things to come a drawing of the probable configuration of the SNS is also included.

INTERNAL EVENTS

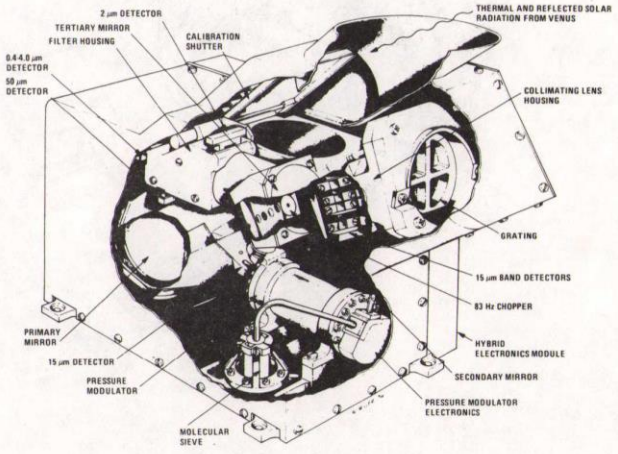
PROPOSAL TALK Tuesday 6 June 1100 Lecture Theatre	Proposal No 207 'A Proposal for the study of Baryonium States in K_p Interactions using the Omega Spectrometer *Prof I S Hughes/Glasgow*
PROPOSAL TALK Tuesday 6 June 1145 Lecture Theatre	Proposal No 206 'A Proposal to study Photoproduction of Charmed Particles, Higher Vector Mesons and Baryonium States in Omega Prime at High Luminosity and Higher Energies. *Dr M A R Kemp/Rutherford*
HEP DISCUSSION GROUP Wednesday 7 June 1100 R61 Conference Room	Gravitational Conformal Anomalies - An Introductory Review *I Drummond/DAMPT Cambridge*
HEP DISCUSSION GROUP Thursday 8 June 1100 R22 Lecture Theatre	Report on the Time Projection Chamber *O Chamberlain/Berkeley*
HEP DISCUSSION GROUP Wednesday 14 June 1400 R22 Lecture Theatre	Direct Electron Production in $\pi^{\pm}$p Interactions at 18 GeV. *G Hall/Imperial College*
NIMROD LECTURE Monday 5 June 1130 Lecture Theatre	Neutrino-Electron Scattering at High Energies *Dr G Conforto/CERN*
NIMROD LECTURE Monday 12 June 1130 Lecture Theatre	The Upsilon Region: Results from PLUTO and DASP *Dr R Devenish/DESY*

PIONEER LAUNCH TO VENUS

On Saturday May 20th the latest Pioneer Spacecraft to Venus was launched from the Kennedy Space Centre. This Spacecraft will be the first to orbit Venus and is designed to study the Meteorology of this Planet. It carries a combined Jet Propulsion Lab/Atmospheric Physics Oxford Experiment called VORTEX (Venus Orbiter Radiometric Temperature EXperiment) and the Oxford part is a Pressure Modulated Radiometer (PMR) designed to measure the temperature of the Venusian Atmosphere in three bands from 90 km to 150 km above the surface. This covers the region above the clouds where the temperature and pressure are similar to those on Earth.

The Engineering Design and Vacuum Processing and Gas Filling of this PMR was done jointly by the Department of Atmospheric Physics of Oxford University and Rutherford. The Spacecraft will reach Venus in early December.

We thank Mr H Hadley for the above information.



OVERSEAS VISITS

Mr P E Gear to USA 3-17 June to discuss the current situation and future development of H^- ion sources at the following laboratories - LASL, ANL, FNAL and BNL.
Dr M Edwards to CERN, 5-16 June, to work on proportional and drift chambers for EMC.
Mr M D Jeffs to CERN, 7-23 June, to work on EMC muon MWPCs.
Mr Julian Hoskins to CERN, 9-16 June, to service RL electronics on muon experiment.
Mr B T Payne and Mr K A Freeston to DESY, Hamburg, 11-15 June, for discussions on cable installation schedules, manpower requirements and associated work.
Dr J C Hart to DESY, Hamburg, 11-23 June, to have discussions on analysis of data from the Tasso experiment, to work on analysis programs and to attend Collaboration Meeting.
Mr D A Cragg to CERN, 12-13 June, to discuss polarised target magnets.
Dr J C Thompson to CERN, 15-24 June, EMC experiment running.
Dr P Sharp to CERN, 18-28 June, work for Prop 202.
Mr J C Gordon to CERN, 18-30 June, work on WA42.

EXTERNAL EVENTS

NUCLEAR STRUCTURE SEMINAR/OXFORD - 1430 hrs
5 June: Dr Gordon Thompson - Nuclear Power - Promises and Pitfalls.
12 June: Mr H R McK Hyder/Nuclear Physics Lab - The Folded Tandem.

THEORECTICAL PHYSICS SEMINARS/SOUTHAMPTON UNIVERSITY - 1430 hrs
23 June: K Konishi/Rutherford Lab - Various Aspects of the Topological Expansion.

THEORETICAL PHYSICS SEMINARS/AERE HARWELL - 1400 hrs
6 June: Dr A Temple/TPD - The Role of Theory and Modelling in Ultrasonic Testing.

HEP SEMINAR/DAMPT/CAMBRIDGE - 1500 hrs
8 June: Dr F Foster/Lancaster - y - y Experiments at PETRA Energies.

THEORETICAL PHYSICS SEMINARS/OXFORD - 1615 hrs
8 June: Dr D Olive/Imperial - Solitons Gauge Theories
15 June: Dr D M Brink - Path Integral Methods for Nuclear Reactions.

THEORETICAL PHYSICS SEMINARS/MANCHESTER UNIVERSITY - 1615 hrs
7 June: Miss C Proctor/Manchester - Effects of Anharmonicities on Chemical Reactions at 1430 hrs.
14 June: Professor M Moore/Manchester - Spin Glass.

THEORETICAL PHYSICS SEMINARS/QMC - 1615 hrs
5 June: Professor M A Moore/Manchester - Spin Glass.

NUCLEAR PHYSICS SEMINAR BIRMINGHAM UNIV - 1615hrs
9 June: Dr D Ward/Cambridge University - Results from the Fermilab 100 GeV $\bar{p}p$ Experiment.
16 June: Dr A Martin/Durham University - Physics from the University of Geneva Spectrometer Data.

SHEDDING LIGHT ON THE UNKNOWN

For the past year a large collaboration of British, French and German physicists have been performing experiments using a high energy photon beam at the CERN SPS. Photons are really just very high frequency light. Now the group has added further success to their work by producing polarised photons and now have the world's highest energy polarised photon beam.

The photons are produced when a high energy electron beam strikes a foil target. By measuring the energy of each electron before and after a scattering in the foil, one can calculate the energy of each photon produced in foil. If the target is an accurately aligned crystal (in this case it was a 70 mm diameter single crystal of silicon of 2 mm thickness) a polarised photon beam is produced.

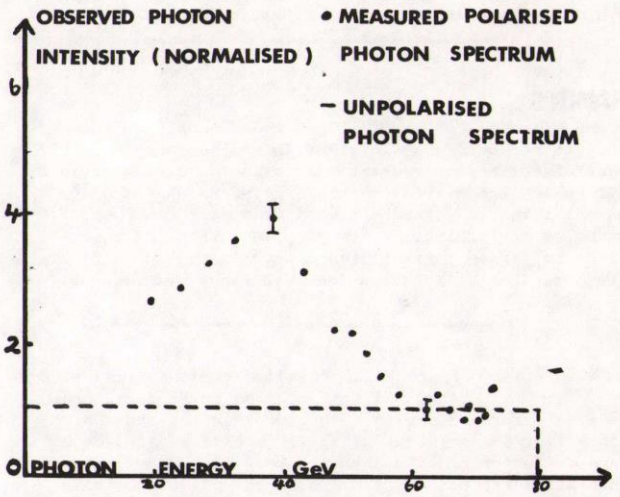
One of the technical difficulties is to align the direction of the incident electrons with the crystal planes by scanning the crystal in steps of 10 micro-radians. To do this the crystal is mounted on a precision goniometer which can be rotated by remote-control. The alignment of the crystal planes is performed by studying the spectrum of soft photons produced in the forward direction.

The incident electron beam is then collimated (electronically) to within a divergence of 100 micro-radians and the photon spectrum compared for two cases:
(a) with an arbitrary orientation of the crystal to produce normal (unpolarised) bremsstrahlung,
(b) an orientation with the electron beam direction at 70 microradians to the appropriate crystal plane where coherent effects are expected to produce polarised photons.

The results are shown in the figure. The spectrum for unpolarised photons is quite flat, whereas that for polarised photons shows a characteristic (and calculable) broad peak around 40 GeV for an incident 80 GeV electron beam. By rotating the crystal by 100 microradians the peak moved to lower or higher energies in agreement with calculations.

For experiments, the polarisation of each photon will be precisely calculated and samples of data with polarisations over 70% will be available. In a new proposal, the group plans to use the polarised beam to study vector meson photoproduction. The polarisation information will be useful to aid the separation of overlapping states and in determining the spins and parities of some states.

(We thank Dr Ian Duerdoth of Manchester University for the news contained in this report).



NIMROD SPECIAL EVENTS

(Details in Special issue 12 May 1978)
TUESDAY 6 JUNE
17.00 NIMROD CLOSURE CEREMONY IN THE CONTROL ROOM

FRIDAY 9 JUNE
21.00 to 01.00 NIMROD COMMEMORATION BALL

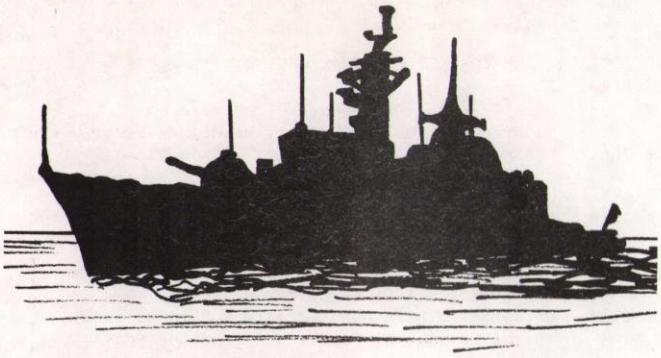
Tickets £2 each from Val Goodwin, Dave Evans or Peter Craske.

SATURDAY 10 JUNE
1400 to 1700 FAMILIES DAY

The Laboratory will be open for members of staff and others associated with the Laboratory to bring their families to see over the Laboratory.

For information contact Accommodation Office Ext. 263 or 476.

PORTSMOUTH NAVY DAYS



AUGUST 26-27-28 1978
AIR DISPLAYS, STATIC EXHIBITIONS
HARBOUR TRIPS, ROYAL MARINE BAND
REFRESHMENTS

Gates Open 10.30 am-5.30 pm
Admission - Adults 30p - Children 20p
Cars (including passengers and parking) £1.50
Coaches " " " " £10

The perfect Family Outing

For further details contact Mr F Harden Ext 6114.

THANKS

John Milne would like to thank those people he was unable to see before he left Rutherford for his wonderful retirement present. He says in his letter to me, and I quote 'The multi-meter is lovely and has already been put into use. The bottle of Champagne, however, has not, as yet, fulfilled its purpose. This, of course, will be rectified shortly!" unquote.

We hope John will have a long and happy retirement.

FILM NOTICE After Nimrod's closure, it is requested that all fast neutron packs be returned immediately for processing. For people at present on the monthly list please ensure that all questionnaires on future dosimeter requirements are completed and returned to Radiation Protection, R2 as soon as possible. Those people not remaining on the monthly list, please return any film badges in your possession. Questionnaires for future dosimeter requirements will shortly be sent out to people who are at present on the six monthly list.

MISSING EQUIPMENT

Stanley Electric Saw No 14/6311 is missing from the Electrical Workshop in R6. Any information as to its whereabouts, please contact Mr P Swan-Taylor Ext 6300.

Avometer Model 8 No 90187-A-459 has also disappeared from Lab 4 in R34. Information as to its present whereabouts would be much appreciated. Please contact Mr W A Smith Ext 6600.

NEW THEATRE OXFORD Tel: Oxford 44544/5

6 June: AC/DC 7.30 pm. Tickets £2.50, £2.00, £1.50

8 June: QUINTON CRISP 8.00 pm. Tickets £2.50, £2.00, £1.50

9 June: MIKE YARWOOD 6.45 and 9.15 pm. Tickets £2.75, £2.25, £1.75, £1.35.

12 June: DONKEY'S EARS - Comedy Play - 7.30pm Tickets £2.50, £2.00, £1.50. Running for one week: Matinee Wednesday 2.30 pm and Saturday 5.00 pm.

1978 OUTDOOR SPORTS DAY Tuesday 18 July at Chiswick
Events: Football, Cricket, Netball, Hockey, Tennis, Bowls and Angling. More details later.

COFFEE MORNING

The next two coffee mornings for Rutherford wives have been arranged for

Wednesday 14 June
Wednesday 5 July

at 10.30 hours at The Cosener's House, Abingdon.
All Rutherford wives are welcome to come along and meet some old friends and new faces. Young children can watch TV.
For further information, call Suzanne Litchfield (Abingdon 21310), Gillian Litt (Abingdon 26009) or Julie McGeogh (Oxford 722781).

SALES TO EMPLOYEES Sale of Scrap Metal/plastics as set out in RLN 12/75 will be made on 9 and 23 June.

RUTHERFORD LABORATORY BULLETIN ACTING EDITOR G Stapleton

Please mail or phone-in contributions to:
Room 42, Building R20
Rutherford Laboratory
Chilton Didcot Oxon OX11 0QX
Abingdon (0235) 21900 Ext 484

Deadline for Insertions
1000 hrs 13 June 1978

Published by the Scientific Administration Group