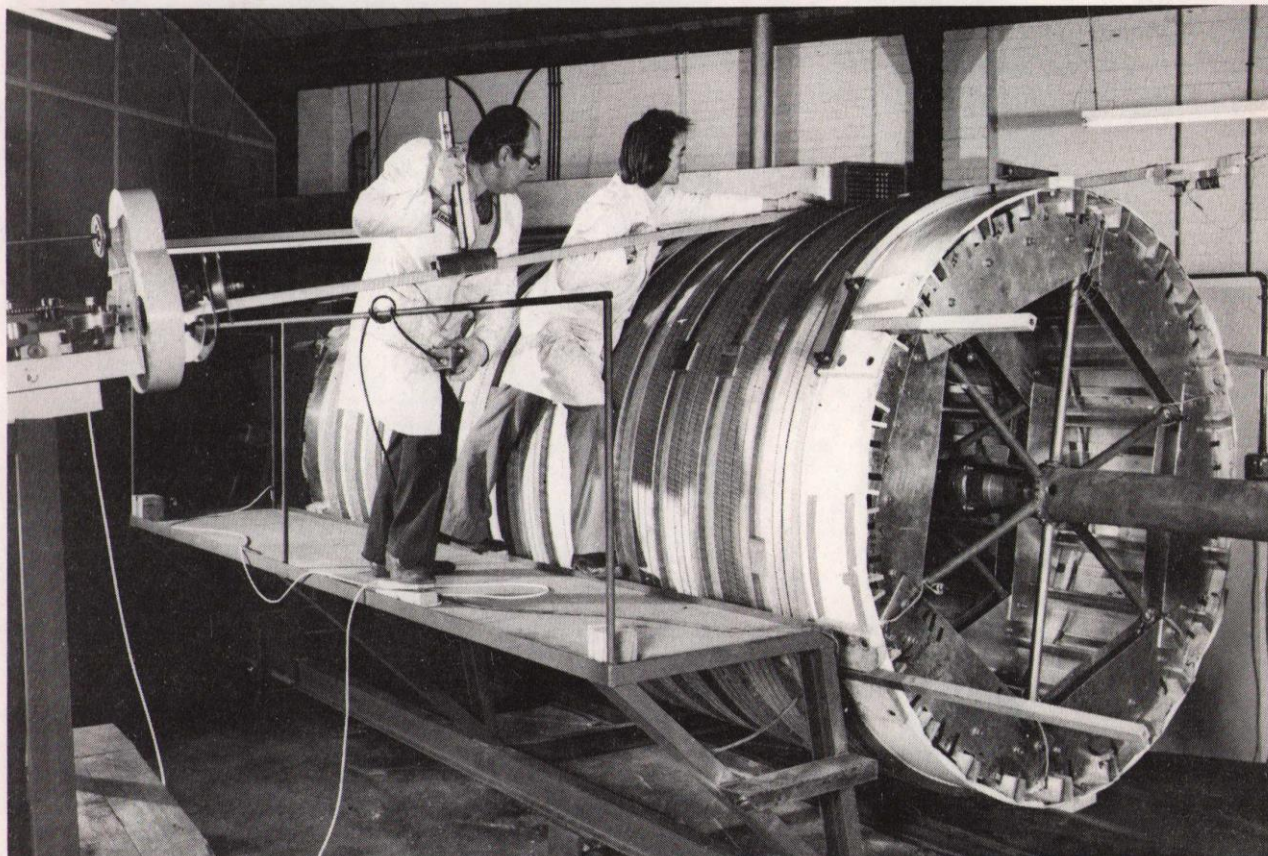


Half a tesla from Tesla



The new electron-positron colliding beam machine, called PETRA, is nearing completion in Hamburg, Germany. Meanwhile, five major international collaborations are busily preparing large sets of equipment for the first round of experiments. UK physicists are involved in two of these collaborations, in experiments carrying the code-names JADE and TASSO (short for the Japan-Deutsch-England, and Two Arm Spectrometer Solenoid).

In Bulletin 17 (Sep 12 1977) we showed the prototype cylindrical proportional chamber for the TASSO experiment, and here we thank Robin Marshall for this progress report on the manufacture of the large solenoid for the JADE experiment.

At the heart of the JADE detector which will be assembled in Hamburg during the course of 1978, there is a large solenoid coil whose function is to provide a uniform field of 0.5 tesla. The coil is being made to a Rutherford design by the firm of Tesla Engineering Ltd in Sussex and the final turn of the coil was wound on Friday the 13 of January.

Luck, of course, does not play any part in the

construction of such a major piece of engineering for a physics experiment. The UK physicists concerned with this experiment (from the Universities of Lancaster and Manchester and the Rutherford Lab), are now under pressure to rapidly commission the various pieces of equipment, including this magnet, in order to match the programmes of the manufacturing firms concerned and more importantly, the construction of the PETRA storage rings.

The solenoid which is 2 m in diameter and 3.5 m long will be assembled on the spot in the experimental area in Hamburg during July and August this year. The detector will then be installed in and around the magnet in a race against time; the first colliding electron-positron beams from the machine are promised for Autumn 1978.

The photo shows two of the Tesla personnel in the process of winding the first of the two layers of aluminium conductor. To produce the field, 200 turns of conductor are required, carrying a current of 8000 amps and this results in a thermal dissipation of 2.5 MW. Substantial cooling is required therefore, together with heat shields, to protect heat-sensitive equipment, such as photomultipliers.

INTERNAL EVENTS

NIMROD LECTURE SERIES

Monday 30 January
1130
Lecture Theatre

Quark and Lepton Masses and Mixing in Gauge Theories

D G Sutherland/Glasgow

RUTHERFORD LABORATORY LECTURE

Tuesday 31 January
1515
Lecture Theatre

The Changing Skies

Dr Patrick Moore (see 'News' section for details and abstract. Closed circuit TV will be used in the R22 Coffee Lounge).

HEP SEMINAR

Wednesday 1 February
1100
R61 Conference Room

Tunnelling in Quantum Physics

D Wallace/Southampton

NIMROD LECTURE SERIES

Monday 6 February
1130
Lecture Theatre

Neutrino Interactions at FNAL

H Bingham/RL

COMPUTING SEMINAR

Tuesday 7 February
1400
R27 Colloquium

Uses of GEC 4070s on the Nuclear Structure Facility at Daresbury

Dr T Daniels/Daresbury

TRADE EXHIBITION

Wednesday 8 February
1000 to 1630
R2 Conference Room

UK Solenoid Limited are staging an exhibition of their products some of which are in use at the Lab. On display will be their latest range of rotary switches, contactors and motor control gear. Representatives of the firm will be available for consultations.

NIMROD LECTURE SERIES

Monday 13 February
1130
Lecture Theatre

Review of Quantum - Chromodynamics and Quark Confinement

M B Green/Oxford

HEP SEMINAR

Wednesday 8 February
1100
R61 Conference Room

Status Report on the BEBC Beam Dump Experiment.

Dr G Myatt/Oxford

FOUND A sum of money has been found. The loser should contact Anne Curran, Personnel, R20 Ext 495.

SALES TO EMPLOYEES Sales of scrap metal/plastics as set out in RLN 12/75 will be made on 3 and 17 February.

LOST LOST LOST LOST

The following four - 7 track magnetic tapes have been mislaid. Will all 7 track tape users please check that they do not have the following tapes - Nos: 752955, 752956, 752949, 752950. These tapes contain N5 data; anyone knowing their whereabouts, please contact Jim Hiddleston, R1, Ext 6270.

EVENING TABLE TENNIS

The table tennis room in R15 is available for use in the evenings. However, since the room is also used for matches, anyone wishing to play in the evenings is asked to contact Eric Thomas (R27, Ext 6219) beforehand, or leave a message with the secretary (Ext 372). This will avoid any disappointment caused by a clash of bookings.

CHRISTIAN FELLOWSHIP Friday 3 February: This month's prayer meeting will be led by Jimmy Darius. If you have any requests for prayer we will be happy to include them during our meeting. Please contact any member of the committee (F Smith, D Williams, C Biddlecombe, R Powell) or why not come along?

Friday 10 February: Continuing our series of 'Everyday Life', Ray Powell will lead a study on Chastity. Is it just an old fashioned word or does it have some effect on our lives today?

Friday 17 February: Meyrick Wyard will chair the meeting on the subject, 'Parents and Children'. What difference does the Christian faith make in marriage and does it help or hinder in the bringing up of children? Why not come along and share in this time and join in our open discussion?

All meetings are held in the R2 Conference Room at 1230 hours.

EXTERNAL EVENTS

ELEMT PART PHYSICS SEMINARS/NP DEPT, OXF - 1430 hrs

- 2 Feb: Dr E Witten/Harvard - The S-Matrix in two-dimensional QCD.
- 9 Feb: Dr J Ellis/CERN - QCD jets in e^+e^- annihilation.

ELEMT PART THEORY SEMINARS/NP DEPT, OXF - 1430 hrs

- 3 Feb: Dr P Senjanovic - Particle-string variables in field theory.
- 10 Feb: Dr J S Dowker/Manchester - Anomalies and the index theorem.

THEORETICAL PHYSICS SEMINAR/CLARENDON LAB, OXF - 1615 hrs

- 2 Feb: Dr A M Green/Sx - The nucleon-nucleon potential and nuclear resonances.

NUCLEAR STRUCTURE SEMINARS/NP DEPT, OXF - 1430 hrs

- 6 Feb: Dr C Llewellyn-Smith - Recent developments in high energy physics.
- 13 Feb: Prof H A Weidenmuller/Heidelberg - Heavy ion reactions (title to be announced).

HEP SEMINARS/ROOM A, DAMPT, CAMBRIDGE - 1500 hrs

- 2 Feb: Dr D Wallace/Soton - Dimensional regularisation in tunnelling calculations.
- 9 Feb: Dr J C Taylor - What can you do with perturbation theory in QCD?

THEORETICAL PHYSICS SEMINAR/QMC - 1615 hrs

- 6 Feb: Dr D Clive/IC - Solitons and gauge groups.

THEORY GROUP SEMINARS/DARESBUURY LABORATORY - 1400 hrs

- 6 Feb: Prof J N Murrell/Sx - Potential energy surfaces of small molecules.
- 13 Feb: Prof E P Wohlfarth/IC - Itinerant electron magnetism with reference to photoemission.

NUCLEAR PHYSICS SEMINARS/SURREY UNIV - 1400 hrs

- 1 Feb: H T Fortune/Oxf - 2 particle - M hole excitation in oxygen region.
- 8 Feb: A Bowdard/Saclay - Analysis of (D,P) and (P,D) reactions.

HEP SEMINARS/4TH FLOOR SEMINAR RM, MANCHESTER - 1415 hrs

- 7 Feb: J Armitage - Search for heavy mass states.

THEORETICAL PHYS SEMINARS/NIELS BOHR C.R, MANCHESTER - 1430 hrs

- 1 Feb: Dr M Green/Oxf - Quantum chromodynamics and quark confinement (jointly with HEP).
- 8 Feb: Prof D Franklin/Edinburgh - Electron-coherent light interactions.
- 15 Feb: Dr K F Barnes/Soton - New elementary particle symmetries (jointly with HEP).

THEORETICAL & HEP SEMINARS/SOUTHAMPTON - 1430 & 1615 hrs respectively.

- 3 Feb: Dr D B Fairlie/Durham - The Yang equations for an SU(n) gauge theory.
- 10 Feb: Dr A J Legget/Sx - Possible macroscopic effects of the weak interactions.

NUCL PHYS DIV COLLOQUIA/CONF RM, H8, AERE - 1530 hrs

- 2 Feb: Dr P Musgrove/Reading - Prospects for wind energy in the UK.
- 9 Feb: Dr Ian Blair - Safety and nuclear power.

THEOR PHYS SEMINARS/CONF RM, BLDG 8.9, AERE - 1400 hrs

- 7 Feb: Dr J S Briggs/TPD - New sources of continuum X-ray emission from ion-atom collisions.
- 14 Feb: Dr W P Jones/IC - Calculation of turbulent flame properties.

RUTHERFORD LABORATORY LECTURE

As announced in Bulletin No 1/78, Dr Patrick Moore will be giving the next

talk in this series, at 1515 hours on TUESDAY 31 January (please note change of day), in the RL Lecture Theatre.

Born 1923, he became interested in astronomy at an early age. He served with the RAF (1940-45) becoming a navigator in Bomber Command and after the end of hostilities was concerned with the running of a school, later becoming Director of the Armagh Planetarium. He has written more than 60 books mainly astronomical, including 'Can you speak Venusian'. However, he is best known for his TV series, 'The Sky at Night', now in its 21st year, and his appearances in the televised Apollo Moon Shot programmes.

His contributions to astronomy have been recognised by the award of the Lorimer Gold Medal 1962; the Goodacre Gold Medal 1968; the OBE, 1968 and the Arturo Gold Medal (Italian Astronomical Society) 1969. He is also an Honorary Member Astronomical Geodetic Society of the USSR and an Honorary Doctor of Science, Lancaster 1974.

A huge man, both in size and heart, one is sure his talk, illustrated with slides, will be both informative and entertaining, providing one can keep up with his speed of delivery!

The title of Dr Moore's talk is "The Changing Skies" and he has kindly supplied the following abstract.

A look at the way in which astronomy has changed during the past few decades. The speaker reviews the situation as it used to be when he entered the field, in the 1930s, and gives an account of some of the great discoveries made since then, ranging from black holes to quasars. He also deals with space research, particularly the exploration of the Moon and Mars.

TIE-LINE CHANGE The existing tie-line system within Rutherford Laboratory for dialling (74) direct to State House, London will cease on 23 March 1978 and reopen as a tie-line from Rutherford Laboratory to the new SRC building in Swindon on 28 March 1978. The present tie-line dial code of 74 will remain when the change over is completed.

OVERSEAS VISITS

Mr G E Gallagher-Daggitt, to Canada, 28 Jan-5 Feb, for discussions.

Dr R L Sekulin, to the USA, 29 Jan - early May, to participate in p experiment at SLAC and to visit FNAL.

Mr A R Mortimer, Mr W T Smith and Mr E Hartley, to Hamburg, 30 Jan-1 Feb, to attend JADE collaboration meeting at DESY.

Dr A F Gibson and Mr J Boon, to the USA and Canada, 31 Jan-15 Feb, to attend the International Conference on inertial Confinement Fusion at San Diego and to visit various laboratories. Dr M Key will also attend the Conference from 5-10 Feb.

Mr P M Cutler, to CERN, 31 Jan-10 Feb for asset checking. Dr M A R Kemp, to CERN, 1-9 and 13-17 Feb, to work on e/y experiment.

The Director and Dr D B Thomas, to Paris, 2-3 Feb, to attend GESSS Meeting.

Miss M E Fry, to CERN, 5-10 Feb, for asset checking.

Dr J T Hyman, to Brussels, 6-9 Feb, as delegate at the International Conference on Trans-National Data Regulation. Mr D C Salter, to Grenoble, 12-17 Feb, for scientific liaison with ILL staff and processing of current round of proposals.

Dr P E Bryant, Mr P M Girard, Dr G W Robinson and Dr R A Rosner, to Liege, Belgium, 13-15 Feb, to attend symposium on Computer Network Protocols.

Dr J E Bateman, Dr P H Sharp and Dr T G Walker, to Vienna, 13-17 Feb, to attend Wire Chamber Conference.

FILM BADGE NOTICE

Period 2 commences Monday, 30 January. Colour Strip -

BROWN for $\beta\gamma$ films and neutron packs. Please change your dosimeter promptly and retain all old ones.

Six monthly dosimeter change for people with surnames commencing E,F,G and H.

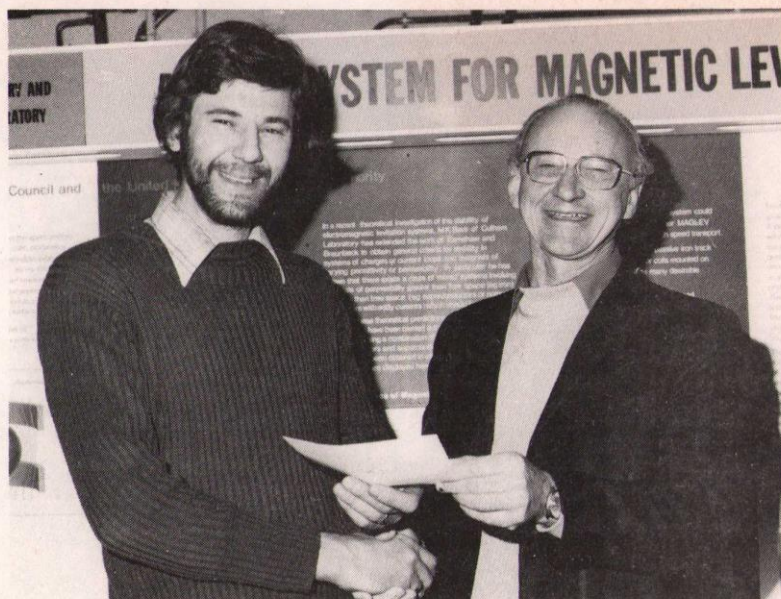
FILM SHOW

'This is the CSMA' a 30 minute colour film showing some of the activities ie -

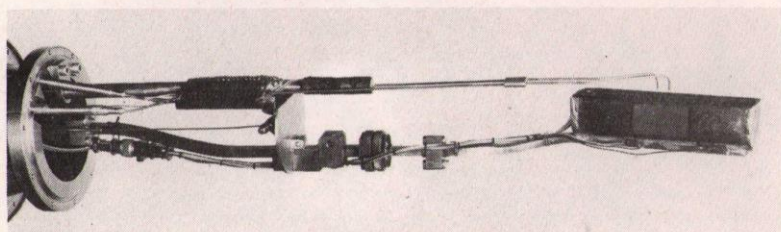
country club, recovery service, insurance, sporting facilities etc. Useful for members and non members alike. Mr Ron Rigley, Culham Lab, the Secretary of the Oxford Group CSMA will give a short talk after the film showing which is at 1240 on Friday, 3 February in the RL Lecture Theatre.

A Lucky - Friday the Thirteenth

Eddie receiving his cheque from the Director: Eddie's smile was to become even bigger later (see end of text).



The business end of the Deuteron Target showing, on right hand side, the tiny microwave 'oven' lined with the moulded FEP.



Perhaps the superstitious among us should ponder awhile as both of our main stories are concerned with the same date - Friday, 13 January. As reported on page 1, the final turn of the 'JADE' coil was wound that day, and at the RL, Mr Eddie Towndrow was presented with a cheque for £190 by the Director, Dr G H Stafford. After congratulating Eddie, Dr Stafford said that he hoped to have the opportunity to give him more awards.

(Hint to Eddie - the next and only time this year that the day and date coincide is in October, otherwise it's April or July 1979!).

The award, made under the Suggestions Awards Scheme, is the fifth in the last three months to exceed £100. Many of the best ideas are simple, once they have been conceived and produced and this is the case with Eddie's suggestion.

The business end of the Deuteron Target is a tiny microwave oven, about 10 cm long in which the target material is polarised. "Oven" is hardly the right word, though, because it runs at 0.45K - less than half a degree above absolute zero - cooled by liquid helium -3.

The problem was to make a suitable container for the target material, out of a material which was transparent to the microwaves, but contained no free electrons. Eddie, with the originality that characterises all his work, perfected a novel form of vacuum moulding for making seamless, leaktight containers out of thin FEP

sheet (Fluorinated Ethylene Polymer). His technique saved the cost and delay of placing a development contract outside the Lab, and with his apparatus on site and quick to use, the usual spares problem is solved.

Eddie, a Craftsman 1 in Technology Division, joined the Lab in June 1968 from Hants and Sussex Aviation Ltd of Portsmouth Airport where he had worked on the overhaul and modification of aero engines. He also worked on the vintage aircraft used in the film, "Those Magnificent Men in their Flying Machines", in particular, the winning 'Antoinette'.

After two months in Nimrod Division, Eddie was transferred to the Nuclear Physics Apparatus Group, moving again in May 1975 to Technology Division where he has worked mainly on polarised targets with some effort on the Sixsmith compressor and the assembly of the 10 KV alternator for the windmill generator.

Some of his spare time is devoted to REMAP, working with Peter Hey on mobile carts for disabled children, a worthy cause. (Where are all those volunteers?).

Congratulations to Eddie are in order on two counts; first for the award, and as from 7 pm on Tuesday, 24 January, on the birth of his first child, a son, Mathew Francis, weighing 6lb 10oz.

The latest situation report is that mother and child are doing well and given time, Eddie is expected to recover.

RUTHERFORD LABORATORY BULLETIN

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Insertions

1000 hours Tuesday 7 February

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