

R(12), NDT(60,3), ISW(3500), ANGLE(60), YINI(60), DUMY (60,3), NACHT(48), XCEN(12) 4-11 (12 December CH1972 AR MMON/CF ID/MFX(20,3), MFY(20,3), NFDX(10,3), NFX(3), NFD(3), IB(2,20,3), NX(100,4), NY(100,4), XN(2), YN(8), IB(10/2), ID DY(100,2), JDX(4), JDY(4), FHS(4), IDV(2), IUN(2), ID DECF(16), IFS, NFS, FX, FY, JK, PIC, KPIC, NCOUNT, NBIN, M/AXN, CTA, CTB, MX, MY, JA, JB, JC, JD, JE, JF, XF(20,3), YMMON/C JACK/NSY(20,30), NMS(20), NDR(20 bulletin XA 60 YA (20), BX(20), NST1(20), NST2(20), INFR(20), NSX(20,30), AWT(60

PHYSICS CAN BE FUN -EVEN AT SCHOOL The Rutherford Lbaoratory has been actively concerned over a number of years to help schools where possible and to establish collaboration in projects of mutual interest. The importance of such a link, that between Abingdon School and the Laboratory is well illustrated in an article, "School-research laboratory liaison" by Brian Woolnough the Senior Physics Master at Abingdon School, published in Physics Education, Volume 7 1972 (an Institute of Physics publication).

The article discussed the project which was associated with the superconductivity programme of the Rutherford Laboratory and in particular with the physical properties of resins which were being considered for coil potting. The aims were fourfold: (I) For boys to do some original experimental work and hence to learn what real scientific investigation is all about. (2) To apply some 'A' level theoretical work to real, important problems. (3) The opportunity of using modern scientific tools and facilities, and to see a scientific establishment at work. (4) To find and supply useful information to the Rutherford Lbaoratory which would help them in their research programme. It was realised that the fourth aim was unlikely to solve any major problems facing the Laboratory.

The advantages to the boys (a lower sixth physics set) over the standard type practical work is of great value. An example of such standard work is given, the measurement of the conductivity of copper, and as Brian Woolnough remarks, "that is a value no one wants to know, and if they did they would refer to a data book But to be given some resin whose properties are not known yet need to be, and to be told to plan an original method for determining these properties does present a challenge and is of real educational value".

Various experimental techniques were discussed on how to measure the elastic properties of resins. Small groups of boys designed, constructed and carried out their own experiments. Discussion of the results proved to be most revealing. Values for Young's modulus for the same resin from different groups who claimed a maximum uncertainty of about 5% were found to vary by a factor of 5 or even 10! And calculated by a computer too! Suddenly, and with a shock, the complacency of the boys vanished and the difficities of a 'real' problem became apparent. Various other properties were investigated with increasing enthusiasm; theory became meaningful and the involvement in and the enjoyment of the project grew. Practical skills and critical faculties increased visibly over a very short time and the boys have had fun 'doing science'.

What then has the Laboratory gained? It is probably true to say very little, in the tangible sense but again to quote from the article, "insofar as the better education of future scientists and engineers is in the best interests of every scientific establishment then I think there has been a long term advantage to the Rutherford Laboratory". The liaison continues, now with a new lower sixth set, and the project, although allied to the original is different. This fits in well with the Laboratory programme where a suitable resin has now been selected. Interest now lies in the behaviour, especially long term, of the resins under stress and the Abingdon boys will be working in four parallel groups investigating various aspects of stress.

Brian Woolnough opens his article with the following words, "Many of us feel that physics in the schools has in the past been too limited to the context of the school environment". Abingdon School has, one feels gone a long way towards overcoming these limitations. They have made other contacts and established fresh lines of communications with the result that physics, to a large extent, has been taken out of the school environment. And what fun the boys had with the liquid nitrogen!

BEREAVEMENT NOTICE

A letter has been received from Mrs Weatherall thanking all friends and colleagues of her late husband Fred for their sympathy and friendship in her recent sad loss.

POPPY APPEAL

The Local Collection based on AERE Harwell, totalled £238.51. The total collected at the Rutherford Laboratory was £37.22 $\frac{1}{2}$. Grateful thanks are conveyed from Hilda Salmon, the Honorary Organiser, to all those who contributed so generously.

FILM BADGE NOTICE

Period 13 commenced Monday 27 November. Colour Strip - YELLOW for βγ films and fast neutron packs. Please check that you are wearing the correct dosimeters and that all old ones are returned.

Note:- Next film change will be on Monday I January 1973.

news continued on page 4

INTERNAL EVENTS

SEMINAR IN COMPUTING Friday | December

Conference Room, Building R12

The Work of the HEP Data Handling Group

R Rosner, D Maden, J Hutton

Please note - this is to be held in $\underline{\text{Building RI2}}$ and not RI as stated in previous Bulletin.

NIMROD LECTURE SERIES

Monday 4 December 11.30 Lecture Theatre Correlations in Inclusive Reactions

Dr M Jacob/CERN

METRICATION TRAINING

Tuesday 5 December 15.30 Lecture Theatre The fifth showing of the introductory session on metrication

Full details were given in Bulletin No 37

HEP DISCUSSION GROUP

Wednesday 6 December II.00 Conference Room, Building RI Analytic Structure of Multi Regge Vertices

M B Green/Cavendish Laboratory, University of Cambridge

FILM SHOW

Wednesday 6 December 13.15 Thursday 7 December 12.40 Lecture Theatre Under Control - a 22 minute colour film sponsored by the Science Research Council.

'Under Control' which uses both live action and animation starts by showing the components of a simple control loop. Then by examining the reactions of the driver of a car it demonstrates the problems posed by two or more interacting loops. Three principal university Control Engineering Groups from about twenty supported by SRC grants are featured; University of Manchester Institute of Science and Technology, Cambridge University and Imperial College, all working on different aspects of control engineering. Sir Brian Flowers sums up the Council's work in this field.

STAFF MEETING Friday 8 December 14.15 Lecture Theatre The Director will preside. Full details, including eligibility to attend, are given in Circular No 34/72.

NIMROD LECTURE SERIES

Monday II December II.30 Lecture Theatre Resonance Couplings and the Quark Model

Professor G Moorhouse/Glasgow University

NIMROD SCHEDULE

16 12.12.72 - 2.1-73

CYCLE 15 21 11 72 - 12 12 72

MACHINE PHYSICS

HIGH ENERGY PHYSICS

Team	Beam	Experiment	State
RHEL/UCL/Berkeley/ Torino	К9	4 GeV/c $\pi^{^{+}}p$ interactions using the track sensitive target	Data
Cambridge University/ RHEL	KI3C	Associated Production Cross Sections	Data .
Imperial College/ Southampton Univ	π7	Studies of η ω and A2	Data

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EXTERNAL EVENTS

LEAR STRUCTURE SEMINAR
Monday 4 December
14.30
Nuclear Physics Lab, Oxford

Ultra-stability in Ge(Li) Spectrometers with Applications to DSAM Measurements

Professor A L Carter/Carleton and Nuclear Physics Laboratory Oxford

PHYSICS COLLOQUIUM Monday 4 December 17.00 University of Reading

The Use of Computers in Optics

Mr J MacDonald

BRITISH NUCLEAR ENERGY SOCIETY Monday 4 December 18.00 at Inst of Civil Engineers The Evaluation of Research and Development

David Newby/Joint Programmes Analysis Unit (DTI and UKAEA) Chilton

NUCLEAR PHYSICS GROUP LECTURE Wednesday 6 December 14.30 King's College Radiation and Health Physics Problems of Nuclear Submarines

Dr S A Harbison/Royal Naval College

APPLIED PHYSICS COLLOQUIUM Wednesday 6 December 16.30 University of Reading Speculations on Man Management
B S Walker

IERE BRANCH MEETING Wednesday 6 December 19.30 University of Reading MEDIA: A Continuous Digital Process Control System

J R Halsall and I J Kirby/ICI Ltd

OXFORD SOCIETY FOR SOCIAL RESPONSIBILITY IN SCIENCE Wednesday 6 December 20.15 Room Cll3, Psychology Bldg, Ox Science and Oppression

Professor Steven Rose/Open University

THEORETICAL PHYSICS SEMINAR Thursday 7 December 16.15 Clarendon Laboratory Oxford Soft Modes and Phase Transitions $Dr \ R \ J \ Elliott$

ELEMENTARY PARTICLE THEORY SEMINAR Friday 8 December 14.15 Nuclear Physics Lab, Oxford Short Distance Behaviour in the Thirring Model

Dr T L Trueman/Oxford

EVENTS AT AERE

NUCLEAR PHYSICS COLLOQUIUM Thursday 7 December 15.30 Conference Room, Hangar 8 Proton Surgery

Dr C Whitehead/AERE

RUTHERFORD LABORATORY BULLETIN

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Deadline for Insertions GENERAL & SOCIAL NEWS
Tuesday 1600

INTERNAL & EXTERNAL EVENTS

Wednesday 1200

OVERSEAS VISITS

Dr B N Ratcliff, to CERN, 3 - 8 December, to continue work on Experiment S120.

Dr G Manning, to CERN, 5 - 6 December, to attend NPRC Meeting.

Messrs R T Elliott, P S Flower, H J Olive, J E Ellis and M T Glover, to CERN, 6 – 16 December, for full scale test of High Field Magnets for the Cambridge Σ Experiment.

SOCIAL NEWS

FOLK CLUB

Friday I December at 8 pm in the Coffee Lounge R22

PATCHWORK - A very good group well known to regular visitors to the club.

They are very similar to the <u>old</u> Seekers.

Friday 8 December at 8 pm in the Coffee Lounge R22

STANLEY and KNOWLES - The best in traditional country music performed on banjo, guitar, autoharp and dulcimer by a highly talented group. Banjo instrumentals to set the feet tapping, old time melodies of the confederacy, and humour and showmanship from the country's top TV, Radio and recording twosome who have absorbed the content meaning and instrumental and vocal styles of the traditional. Tickets for this evening (8 Dec) are obtainable from Alan Bishop R2, Sue Watts R1, and Tony Royal R34 at 25p. At door 30p.

SIX-A-SIDE SOCCER

The final results for Table A are not to hand at time of going to press, these will be published next week plus a report on the draw for the final phase of the competition.

CHRISTIAN FELLOWSHIP

Friday 8 December. Captain Hiscock of the Salvation Army at Abingdon will be visiting the Laboratory at 12.30 pm in the Conference Room RI2. All are welcome to come along.

Advance Notice The Rutherford Laboratory carol service this year will be held on Friday 15 in the Lecture Theatre led by the Rev E Atkins of Harwell Parish Church.

RECORD SOCIETY

Tuesday 5 December, at 12.40 pm in the Lecture Theatre

New World Symphony (No 9 in E Minor) - Zurich Tinhalle Orchestra with Josef Krips.

Dvorak's very popular symphony was composed in America during his first visit to that country. Contrary to general belief, he did not use American tunes but as he himself said, composed in their spirit. It is a very tuneful work with an exciting climax at the end of the final movement.

XMAS DANCE - RUSH COMMON

There will be a Christmas Dance at Rush Common House, Abingdon on 8 December, 8 pm - 1 pm. Three groups, Capability Brown, Skint and Poot will provide the entertainment, there will also be a bar, open until 12.30 and food.

Tickets at 60p from A Shave, RI, Ext 6642/6362 or 1 Bowden, RI2, Ext 466.