Rutherford Laboratory

15-29 July 1974

bulletin 14

XVII INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS

We hope to report on this Conference in the next issue. The photographs were taken at the wine and cheese party arranged by the Physics Department of Imperial College on the first Tuesday evening.

Dr G H Stafford, our Director listens to comments from Professor R (Bob) Wilson, Director, Fermi National Accelerator Laboratory U.S.A.

Dr G Manning, Deputy Director, RL, with (on left) I Butterworth I.C., Mrs Samios and (on right) M Neveu CEN Saclay and N P Samios, F.N.A.L., showing that HEP Conferences have their lighter side.

NATIONAL SAVINGS CERTIFICATES SALARY CYCLE ENDING 31 JULY 1974

Certificates can be collected from the Cash Office, Building R20 from the 1 August onwards. New members wishing to join the scheme can obtain enrolment forms from the Cash Office.

FILM BADGE NOTICE

It is Period 7. Colour Strip - BROWN for βγ films and neutron packs. Please check that you are wearing the correct dosimeter and that all old ones are returned.

Please note - the Film Service is now in G4A, Building R2 having moved from Building R20.

news contd. on page 3 and 4

INTERNAL EVENTS

NIMROD AND HEP LECTURE SERIES

During the next few weeks, lectures in both these series are expected to be arranged at very short notice. Please watch the small portable notice boards for details.

CERN'S COMPUTING FACILITIES - FURTHER MEETING
Monday 15 July
15.30
Conference Room, Building R12

This will be a follow-up to the recent meeting at which members of the CERN Thursday Club spoke. It is hoped that this will allow a fuller expression of opinions than was possible at the previous meeting. Copies of the first two chapters of the CERN report on future computing facilities are available on request. These provide background material for those interested in participating in the discussion. Copies of the full report will be available later.

SEMINAR IN COMPUTING
Friday 19 July
11.00
Conference Room, Building R12

Introduction to Computer Networks - ***J W Burren/R.L.***

Recently there has been much discussion in the press on the subject of computer networks and in particular the ARPANET. This talk will give a general introduction to the technical problems of building computer networks and will outline some of the users of networks. The facilities of some existing networks will be described and the potential usefulness of networks to the Laboratory will be discussed. Two further talks, in September-October, will go into more detail on the problems of network communications systems and the implication of network operations on operating systems.

PROPOSAL TALKS
Monday 22 July
14.30 (approx)
Lecture Theatre

PROPOSAL NO 151: "A Study of Exclusive Hadronic Processes at Large P_T", CERN/Genova/UCL.
The talk will be given by Dr B Duff and Dr D C Imrie/UCL.

PROPOSAL NO 156: "A Study of X-Rays from K^-p Atoms", Birmingham/Surrey/RL.
The talk will be given by Professor A Roberts, visiting Scientist from FNAL.

PROPOSAL NO 112: "Investigation of Spin-Dependent Effects in High Energy proton-proton Interactions at RL and CERN", Oxford /CERN/Orsay.
The talk will be given by Dr K Green/Oxford University.

EXTERNAL EVENTS

EVENT AT A.E.R.E.

Computer Science and Systems Division Seminar/Conf. Rm 7.12 - 10.30 hours.
15 July: DEC comm 11, Robin Stanley-Jones, of DEC (Reading) will describe the DEC comm 11 system (formally known as COMTEX). This is the communication software system for the PDP-11 range of computers. The talk will explain the structure of the package, its use with DOS and bulk storage devices, and will also cover available system bases (including a front-end communications processor for IBM 370 Computers). Some mention will be made of the hardware interfaces for communications.

KING'S COLLEGE

N.P. Group Seminar/Room 129 - 14.00 hours.
17 July: Nuclear Physics with Lasers - ***Prof. G W Greenlees/Minnesota.***

NIMROD SCHEDULE

CYCLE 5 9.7.74 - 30.7.74 — MACHINE PHYSICS — HIGH ENERGY PHYSICS

Team	Beam	Experiment	State
CERN/ORSAY/OXFORD	P8I	Hadron-Proton Spin	Data
RUTHERFORD LABORATORY	πII	Beam Measurements	Tests
IMPERIAL COLLEGE/RL	π8A	Experiments on Narrow Bosons X^0 (958) S^* and Cross-Section Measurements	Data
BEAM DETECTOR GROUP	KI5A	Parasitic Running	Tests
COUNTER GROUP B/ CAMBRIDGE UNIVERSITY	π12	$\pi^-p \rightarrow K^0\Lambda^0$ in the Range 1.4 - 2.0 GeV/c	Setting up
RUTHERFORD LABORATORY	π9	Polarisation in $\pi^-p \rightarrow \pi^0n$, nn	Setting up
BIRMINGHAM/SURREY/RL	KI7	Stopping Kaons	Data
OXFORD - ISIS	P7I	Chamber Tests	Tests

EXOTIC ATOMS On Wednesday, 19 June the Rutherford Laboratory was host to a half-day meeting of the Particle Nuclei Interactions Group of the Institute of Physics. The topic of the meeting was "Exotic Atoms" and these notes attempt to provide some background material and to report briefly on the meeting itself.

We are all used to the usual classical picture of an atom as consisting of a small positively charged nucleus composed of neutrons and protons around which electrons orbit. Normally the electrons occupy the orbits closest to the nucleus but if an electron is able to "jump" from one orbit to another one of smaller radius then an X-ray will be emitted. In an exotic atom one of the electrons has been "replaced" by a much heavier negatively charged particle such as a π-meson, K-meson, antiproton or Σ-hyperon. Because of their greater mass these particles will travel in orbits much closer to the nucleus than the electron orbits. Also because there is only one heavy particle in orbit around the nucleus, all the heavy particle orbits except one are empty and the particle can jump from one orbit to the next, emitting X-rays at each step and also steadily getting closer to the nucleus. Eventually it will get so close that it will be captured by the nucleus and the exotic atom "dies".

To produce exotic atoms, high intensity beams of π-mesons, K-mesons or antiprotons are needed. In the first talk of the meeting Dr Jim Riddle described the KI7 stopping K-meson beam now being set up on Nimrod in Hall 3 by the Birmingham/Rutherford/Surrey Collaboration. The beam appears to be working well and one of the first experiments to be carried out will look for γ-rays emitted by the nucleus after the death of the exotic atom. In this way it is hoped to learn something of the details of this final capture process.

Next followed a wide ranging Review talk by Dr H Koch from the University of Karlsruhe who is now working at CERN. It is currently thought that the general features of the X-rays emitted by K-mesonic atoms are reasonably well understood and that certain discrepancies in the data can be explained as being due to the effects of the "Y^{0*} resonance" which can occur in the interaction of K-mesons with protons. However similar discrepancies now seem to be found for antiprotonic atoms and in this case there is no handy resonance to explain the effects. Further X-ray measurements are in progress by the CERN group.

Dr R Seki from California State University discussed information which can be obtained from exotic atom experiments on the distribution of neutrons in heavy nuclei. Here there seemed to be a discrepancy with a π-meson scattering experiment (π10) carried out on Nimrod by the Birmingham/Rutherford/Surrey team but it is now thought that the use of a more realistic description of the density distribution will resolve the problem. Dr Seki is staying at the Rutherford Laboratory for 3 months to complete these calculations.

Finally Dr Lee Roberts who has recently joined the Rutherford Nuclear Physics Group from the College of William and Mary in Williamsburg described exotic atom experiments to measure the magnetic moment of the antiproton and of the Σ-hyperon. These experiments are technically very difficult but the value measured for the Σ-hyperon does seem to disagree with current theoretical predictions. Again more experimental results and theoretical calculations are awaited.

Perhaps one of the most striking features of the meeting was the great range of topics covered. The esoterics of quark theory and SU(6), the interactions of elementary particles with nucleons and nuclei, the detailed properties of nuclei and the atomic cascade of a particle orbiting around a nucleus were all discussed during the afternoon. From comments afterwards it seemed that the meeting had been well worth while.

RUTHERFORD LABORATORY LECTURE The next talk is entitled 'Communicating Science'. Two simple words but what problems they set. This particular lecture should be of interest to many people at the Laboratory as apart from those who have to communicate with fellow scientists or students, the ordinary mortals wherever they work around the Lab, so often are faced with this problem. Relatives and friends alike quite reasonably will ask such questions as 'what research is done at your place' and any attempt to explain in the simplest form is invariably followed by innumerable 'why's' or 'what's'. The end result being glazed eyes on both sides.

David Wilson, BBC Television Science Correspondent for many years, a past master at this difficult task, will be talking on 'Communicating Science', on Tuesday 16 July in the Lecture Theatre at 15.15 hours. In the following summary he picks out some salient points, one of which does so often cause difficulties - 'examples of words with several meanings'.

The greatest problem in communicating science is the problem of "translation", or ensuring that the recipient of the communication knows the meaning of the words used. Some figures on vocabulary sizes and some examples of words with several meanings will be given.
It is important to design the communication to reach the particular audience, this is made difficult by the lack of homogeneity in audiences of "mass media". How do scientists deal with this problem when communicating with each other?

CIVIL SERVICE COLLEGE COURSES 1974-1975 The following Civil Service College booklets (or copies of relevant information) have been received and have been distributed as shown:-

Senior & Middle Management Courses and Seminars - ***Division Heads, Group Leaders, DAOs, Library, Training Section.***
Introductory Courses for Graduate Specialists - ***Group Leaders, DAOs, Library, Training Section.***
Management Training at HEO level - ***Administration Division Group Leaders and Training Section.***
ADP Training Courses - ***Group Leaders of Computer Operations Group & Finance & Accounts Grp; Library; Training Section.***
Instructional Techniques and Training Methods Courses - ***Training Section.***
Small Groups Training Unit Courses - ***Administration Division Group Leaders, DAOs, Library and Training Section.***
Management Services and Accountancy Courses - ***Administration Division Group Leaders, DAOs, Library and Training Section.***

Further information from Training Section, Bldg R20, ext. 555.

OVERSEAS VISITS Dr K Sumorok, to Sicily, 12 July - 6 August, to attend International School of Subnuclear Physics at Erice.
Dr G G Ross, to Dublin, 14-20 July to attend seminar on current problems in particle physics.
Dr M R Jane, to CERN, 20 July - 30 August, to prepare for neutron counter collaboration experiment.
Dr S F Biagi, to Italy, 21 July - 3 August, to attend Enrico Fermi Summer Physics School at Varenna.
Dr G Manning, to the U.S.A., 24 July - 6 September to attend a study meeting on PEP and to visit various Laboratories for discussions.

RUTHERFORD LABORATORY BULLETIN *Published by the Scientific Administration Group*

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

Dr J Guy, to the U.S.A., 25 July - 16 August to visit ANL and LBL.
Dr N H Lipman, to CERN, 28 July - 16 August, to work on neutrino experiment for SPS.

NIMROD AND THE 2nd RF SYSTEM

We made our last report on the 2nd RF project in Bulletin No. 37 at the end of 1973 when we reported that beams had been successfully accelerated to 7.9 GeV/c with a circulating beam intensity of around 4×10^{12} protons per pulse. There was insufficient time available prior to the winter shutdown to allow tests on the extraction of the enhanced circulating beam.

Since Nimrod started up again in mid-April the progress made with the 2nd RF system has been consolidated and for the period 18 June - 9 July, the 2nd RF was used for a whole cycle of HEP. During this cycle extracted beam intensities in the X3 beam line of 1.8×10^{12} protons per pulse were achieved. This compares with a best of 1.3×10^{12} protons per pulse extracted last year.

CHRISTIAN FELLOWSHIP

Friday 12 and 19 July - In the sixth chapter of Pauls letter to the Ephesians we are recommended to "put on the whole armour of God'. This armour is spiritual and includes a shield of faith and the helmet of salvation. Is it possible for anyone to wear this or is it only for special people? David Heaven of Didcot will be leading a meeting and discussion on this on the above dates at 12.30, Conference Room, R12. All are welcome.

SRC SPORTS DAY 19 JUNE

Another successful Sports Day has come and gone, 150 sportsmen and women left Rutherford and Atlas on that day to do battle at Chiswick. We went as proud holders of the football, chess and both bowls cup (Rutherford) and the netball cup (Atlas). We returned with the football, both bowls cups and the cricket cup (Rutherford) and the netball cup again (Atlas). The weather was again kind to us although cloudy it remained fine.

CRICKET As usual a long day for the cricketers, the final match finishing at 7 o'clock in the evening. Rutherford dispatched Daresbury in the first semi-final, scores: Rutherford - 100 for 8, Daresbury - 59, with Bob Blowfield and Mike Yates getting amongst the runs. In the final they met the holders R.G.O. who had accounted for Atlas and Appleton earlier in the day. Final scores: Rutherford 70 all out, R.G.O. - 62 for 7. A close game, once again Bob Blowfield holding theRutherford innings together with a fine innings. R.G.O. could never quite master the Rutherford attack with Brian Goodenough, Martin Donald, Steve Hancock and Bob Blowfield all bowling really well.

NETBALL It was clear early on that the two outstanding teams were going to be Rutherford and Atlas, and sure enough these two teams met in the final late in the afternoon. A thrilling see-saw match developed with Atlas just getting home by the odd goal late in the game. Well done girls.

THE CRANE MAN WITH A DELICATE TOUCH

On Friday, 21 June, at a gathering of colleagues and friends, Mr Brooks presented Vic Blackford with a pair of binoculars and a wallet to mark the occasion and to wish him a happy retirement.

Vic graduated via the bakery trade ('24-'54), docks and timber yard foreman ('54-'61) to NIRNS in 1962. He has worked ever since then as a plant attendant with the Nimrod magnet power supplies and ancillary plant. His experience and ability have been a great asset. Mr Brooks made particular reference to the precision with which Vic could thread the large 75 ton rotors into the alternator stators - an operation fraught with considerable risk to Nimrod, both in operating time as well as in financial terms.

Vic has been noted not only for his interest in cranes but also for his interest in large cars. Not only did he have a new Mercedes on order but he used an Austin Princess for towing purposes.

Unfortunately, ill health forces him to retire a year early. He plans a short tour via Bideford and Southport before finally retiring to Kirkcudbright, where the climate suits his health. This locality should also cater well for his two main interests of photography and bird watching.

Vic, we would like to join with your many friends and colleagues in wishing you much improved health in your new home; a long and happy retirement and many enjoyable hours of bird watching - the feathered variety of course!

BOWLS This year Rutherford again dominated the Bowls tournament with Roy Price, Paul Griffiths and Ron Hogan winning the 'Triples' and Norman Ferguson, Peter White, Alec Goode and Alan Slater the 'Fours'.

In the other events Rutherford finished 2 3 and 4 in mens doubles tennis and third in the chess tournament.

Owing to lack of space the Sports Day report will be continued in the next Bulletin.