

Bulletin

of the Rutherford and Appleton Laboratories

28 May 1980 No.9

Open Days 1980

The Rutherford and Appleton Laboratories are holding a series of Open Days at the Chilton site on 8-12 July 1980. Following the merger of the Laboratories in September last year, it presents an opportunity to demonstrate the capabilities of the Combined Laboratories.

The Open Days will commence on Tuesday 8 July with a special day for Schools and Colleges of Further Education. The Right Honourable Mark Carlisle, Secretary of State for Education and Science has accepted an invitation to attend on Wednesday 9 July, which will be a day for invited guests and the Press. Thursday and Friday are planned as invited guests days and Saturday will be a less-formal afternoon gathering for Families and Friends of Staff.

A Decade of Progress

It is about 10 years since the last major Open Day was held (1969 at Ditton Park and 1970 at Chilton). Since then there had been extensive diversification, especially at Chilton. With the merging, the Rutherford and Appleton Laboratories' work extends from particle physics, through laser plasma studies and neutron beam research, to geophysics and radio, and on to astrophysics and space research. Our support for engineering research includes, for example, the Electron Beam Lithography Facility and Interactive Computing Facility.

Open Days Theme

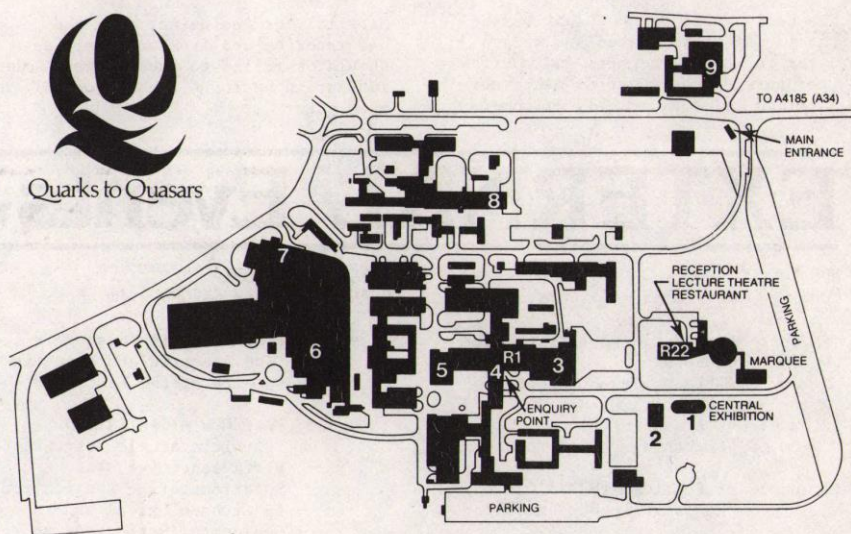
Since our scientific interests span a wide range of basic research in many fields, we have chosen the title

"Quarks to Quasars"

as the Open Days theme, to cover the range of investigations from the smallest particles ("quarks") inside the nucleus through to those compact sources of enormous energy ("quasars") located near the edge of the observable universe. A logo has also been created for the occasion.

Exhibition Areas

Many areas of interest within the theme will be on display throughout the Open Days, covering the major scientific interests, support for technology and engineering, and the extensive computing resources. There will be nine exhibition areas, as indicated on the plan.



1. The Central Exhibition will highlight the Laboratories' activities, related to the theme: "Quarks to Quasars". It serves as a brief introduction to the other exhibition areas.

2. Radio and Space Centre: The displays will include solar-terrestrial physics, communications, remote sensing of the Earth and Planets and space astronomy.

3. Several topics will be on display, including the design and fabrication of microelectronic circuits, the Control Centre for the Infra-Red Astronomical Satellite project, a laboratory for scanning bubble chamber film in particle physics research, careers information and a display of architecture and engineering projects.

4. The foyer of Building R1 will display the role of the Science Research Council and on the first floor, in the Main Library, there will be a display of publications and a demonstration of computer-aided information retrieval.

5. The Central Laser Facility will exhibit the fabrication of micro-balloon targets, the high power laser and two experimental areas. A high current electron beam device, used to develop new high power laser systems, will also be on show.

6. A technology exhibit will highlight various projects at low and high

temperatures and recent advances in materials and structures. A stabilised balloon platform used in space research will be on display. An exhibit on neutron beam research will demonstrate the development of new instruments and techniques in this field, particularly for use with the Spallation Neutron Source. The preparation work for this powerful source of neutrons, currently under construction on site, will be highlighted.

7. The 70 MeV linear accelerator, which is the injector for the Spallation Neutron Source, will be open for inspection.

8. Particle physics and special apparatus. Several of the major international experiments in particle physics research will be on show, including some examples of the sophisticated apparatus and electronics required for this work and in other fields. The Laboratories' work in support of energy research will be on view.

9. Computing. The exhibits within the Atlas Centre will outline the extensive computing facilities available and the wide range of applications in the fields of science and engineering. There will be demonstrations involving communications and interactive computing techniques.

Got It in One

Yes, the Bulletin has changed its masthead again, - from today it takes on a new role as house magazine of the combined Rutherford and Appleton Laboratories.

Former Ditton Park based colleagues, have already made something of a take-over bid for space in the Bulletin in the past few months, as have some of our Culham based astrophysicists, and the articles resulting have been of much interest to all. Now we are looking forward to hearing from colleagues on all sites about the programmes of work they are pursuing, their latest discoveries, and triumphs great and small. (Major triumphs rate front page.)

The social life of the Laboratories should not be forgotten and we are eager to include reports and notices of future events etc from everywhere -- Falkland Isles especially welcome!

Forthcoming lectures to be given on all sites and in relevant disciplines at universities are also included in the Bulletin.

The Editor will be delighted to receive information on every aspect of the life of the Laboratories, and with the help and guidance of Geoff Gardiner as correspondent for the Ditton Park site hopes that the Bulletin will continue to fulfill its function of introducing the work of the Laboratories to the Laboratories.

Copies of the Bulletin are delivered to all offices at the various sites of the Laboratories. If you are not on a site but would like a copy to be mailed to you, please send a note to the Editor.

Material for inclusion, from the Laboratories and from universities, should be mailed to the Editor at the address to be found at the foot of the back page.

Rutherford Laboratory Lecture

The next lecture in this series will be held on Thursday 12 June at 15.15 hrs in the Lecture Theatre.

THE NEW ASTRONOMY
by
Professor R E Jennings
University College, London

The last part of the electromagnetic spectrum to be thoroughly explored by astronomers is the Infrared. Contrary to original ideas, the results obtained in this region proved to be extremely interesting. For instance, it is here that protostars can be detected before they are visible or start sending out radio waves and it is here that many systems radiate most of their energy which can amount to many million times that of the sun.

At infrared wavelengths longer than about forty times the visible, the atmosphere is opaque and measurements have to be made from high flying aeroplanes, balloons or rockets. In August of next year an Infrared Astronomical Satellite (IRAS) is due to be launched to make an all sky survey. In this project the Rutherford and Appleton Laboratories are playing a very important role.

For your diary:-

The next lecture will be on 3 July by Prof G D Sims (Vice-Chancellor, Sheffield University).
'Lessons from the Past'.

Obituary

It is with deep sorrow that we announce the sudden death of Mr I H Payne on Monday 5 May at the John Radcliffe Hospital. He was aged 50.

"Joe" Payne joined AERE Harwell in 1955 having previously served in the Army for 10 years, rising to the rank of Staff Sergeant. He came to the Rutherford Laboratory site in 1959 to work on the Nimrod Injector. Later he was to become Duty Officer on Nimrod, and with its closure joined SNS to work on the extraction system power supplies.

Joe was greatly esteemed and respected by all who knew him. He will long be remembered by his friends and colleagues, as a man who was always as good as his word and whose even temper was a calming influence in times of stress. To his Group especially, his loss is a bitter blow.

Our deepest sympathy is extended to his wife, Barbara, and to his daughters, Linda, Carolyn and Louise.

Library Notice

1. P Richman - "Characteristics and Operations of MOS Field-effect Devices"
2. R H Crawford - "MOSFET in Circuit Design"
3. J T Wallmark and H Johnson - "Field Effect Transistors"

Please return these books to the Library.

EXTERNAL Events

NPD COLLOQUIUM
CONF ROOM H8 - AERE - 1530hrs

- 5 June: Prof Sir Ernest Titterton/
Canberra
Title to be announced
- 12 June: Dr A Hansen/Culham
"Lightning Damage Phenomena"
- 19 June: Mr P Goldsmith/Met Office
"Man's Influence on Climate"

This last lecture will take place in the Cockcroft Hall at 1515hrs.

THEOR PHYS SEMINARS
LECTURE THEATRE 424.4 - AERE - 1400hrs

- 3 June: Dr M Berry/Bristol
"Quantum Mechanics of
Classically Chaotic Systems"
- 10 June: Dr C R A Catlow/UCL
"Statistical Mechanical
Theories of Disorder in
Reactor Fuels and Superionic
Conductors"
- 17 June: Prof J E Enderby/Bristol
"Structural Properties of
Ionic Liquids"

ELEM PART PHYSICS SEMINARS
NPD LECTURE THEATRE - OXFORD - 1430hrs

- 30 May: Prof C Heusch/Cal Tech
"Elastic and Inelastic
Photon Scattering at
Fermilab"

- 5 June: Dr J Stirling/Seattle
"The Transverse Momentum
Distribution of Drell-Yan
Lepton Pairs"

PHYSICS COLLOQUIA
CLARENDON LAB - OXFORD - 1615hrs

- 30 May: Prof K F Smith/Sussex
"The Electric and Magnetic
Moments of the Neutron"
- 13 June: Prof K W Allen/Oxford
"Particle Accelerators as
Ultra-sensitive Mass
Spectrometers - Applications
to Archaeological and
Geological Dating and to
Other Fields"

THEOR PHYSICS SEMINARS
CLARENDON LAB - OXFORD - 1615hrs

- 29 May: Dr C H Llewellyn Smith/Oxford
"How to Calculate the Proton
Lifetime"
- 5 June: Dr D ter Haar/Oxford
"Spontaneous Generation of
Magnetic Fields in Plasmas"

PARTICLE PHYSICS SEMINARS
BIRMINGHAM - 1615hrs

- 30 May: Dr T McMahon/Birmingham
"Highlights of 'Rencontre de
Moriend 80'"

ELEM PART THEORY SEMINAR
NPD LECTURE THEATRE - OXFORD - 1430hrs

- 6 June: Mr S J P Duane
"Phase Transitions in
Non-linear Field Theories"

SHEP SEMINARS
SOUTHAMPTON - 1430hrs

- 30 May: Dr P West/King's, London
"Realising the Supersymmetry
Algebra"

It's a Winner

The largest single award to an individual under the Rutherford Laboratory's Suggestions Award Scheme, has been made to John Mackerness of SNS Division. The Award of £400 was presented to John by Dr Geoff Manning (Director Rutherford) in the R2 Electrical Workshop Mess Room on Friday 2 May.

John's suggestion was direct and simple - a modification to the Branch Terminators being used on the SNS Camac controls system. In its original state, this consisted of a module containing twenty resistors across 40 multiplexer dataway lines. The module was linked into the system via

twenty-five twisted pairs cables. Suffice it to say, it was combersome.

John threw away the module - likewise the cable, and put the resistors across the back of the plug! This has cut down assembly time from 2 days to 1 hour, saves money and space, and is reliable.

This was John's first suggestion, and as Geoff Manning remarked "It's a winner". He was very pleased to be able to make the presentation, he said, as he was always happy to spend money to save money.

"I'd rather have given it to you in dirty one pound notes", he joked, "but here you are; I hope it encourages everyone else to put forward ideas".



More Charm in the Scanning Lab.

The diligent scanning and measuring by the team of ladies in the High Energy Physics Division at the Rutherford and Appleton Laboratories has led to the first observation of a new charmed particle. The event in the picture has been found in the film analysed at the Laboratories from the Big European Bubble Chamber at CERN fitted out with a Track Sensitive Target. Pictures were taken with an intense beam of neutrinos aimed at the bubble chamber. The film is now being scanned by a truly European collaboration of 7 groups including Birmingham University and University College, London. Each group has 70,000 pictures of the bubble chamber which must be scanned to find 400 real neutrino interactions in the target. Finding and measuring these is careful work indeed. However the new on-line VAX computer takes the tedium out of measuring: instant 3-D reconstruction results allow the measurer to know how well she's done within a minute or two.

The existence of the quantum number called charm was predicted some years ago by last year's Nobel Prizewinner, Sheldon Glashow, and others. The lightest charmed baryon (baryon \equiv like a proton or neutron with 3 basic quarks inside) is similar to the better known Λ^0 . One of the quarks in the Λ^0 has strangeness = -1 and charge = -1/3. If this quark is replaced by one with charm = +1, charge = +2/3 then one obtains a charmed baryon, the Λ_c^+ . This was first seen at Brookhaven in 1975. The next charmed baryons are expected to form a triplet (Σ_c^{++} , Σ_c^+ , Σ_c^0), but until now only the Σ_c^{++} has been seen, originally at Brookhaven and confirmed elsewhere last year.

The event found at Chilton has all the hallmarks of a gold plated example of the first Σ_c^+ decay to be seen. The story begins with the Λ_c^+ produced in a rare neutrino interaction as follows:

(neutrino hits proton) giving
(μ^- and Σ_c^+ and π^+)

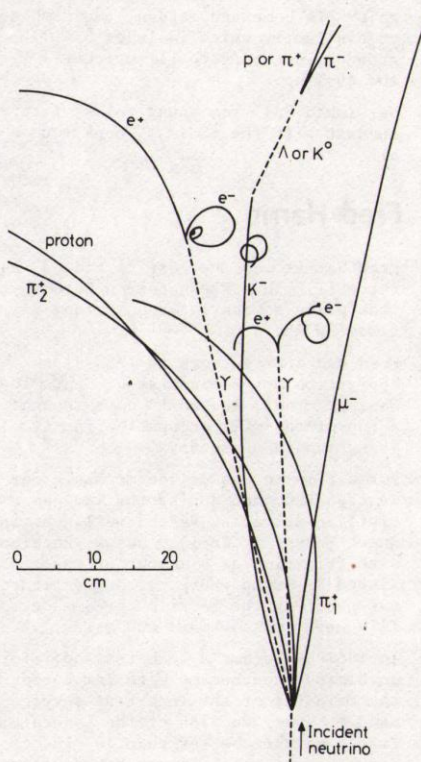


Figure 1

The Σ_c^+ then decays (falls to bits) to give a Λ_c^+ and a π^0 . The Λ_c^+ in turn decays to the seen proton, K^- and π^+ , while the π^0 decays to the two detected gammas.

When more charmed baryons can be identified then their precise masses tell us more about how the basic quark building blocks of matter are arranged in a baryon. So the hunt is on for more, who will be the first to find the missing Σ_c^0 ?

Another First for the Labs

In their third season in the Berkshire Downs League the Laboratories Cricket Team has at last had its first win! Due to some spirited efforts in the field Peasmore were restricted to 67 runs. Our innings started slowly, and the tight Peasmore bowling gave little away. Then mid-way through the allotted 15 overs, our batsmen finally got going and in the gathering gloom, at last the winning hit was made - the crowd threw his beer can in the air with joy.

Congratulations to John Cully on this season's first hat-trick and to Mike Watson and Jay Nanagakkara for steadying the innings. It is a pity that the NGA dispute prevented Michael Parkinson's full match report appearing in the Sunday Times.

Our next match is at home versus Metal Box Co. It is rumoured that they issue a free one to each incoming batsman!

Film Badge Notice

It is Period 6. Colour strip YELLOW. Please change your films promptly and check that all old ones are returned.

Next Film Change: Monday 16 June.

Trade Exhibition

There will be an exhibition of fibre optic recorders suitable for trace recording and video imaging by Medelec Ltd in Conference Room 7, Building R12, from 1000-1600hrs on Tuesday 10 June.

Missing

Would anyone having knowledge of the whereabouts of MICROSCOPE LP 4269 (make unknown, but probably Cooke, Troughton and Simms), please contact F R Jacob, R1, Ext 246.

John Magraw would also like to know where Stopwatch Serial No 60/0380 is now residing. Please contact him on Ext 351/6634 if you can help.

Farewell to Four

Connoisseurs of the Laboratories Retirement Presentations have often remarked on the surprising breed of individuals that the Labs attract. Sadly, we have had to say goodbye to four more such men from the Chilton site in the last few weeks.

Dave Holland

On Friday 25 April Dave Holland and Bob Carr were given Presentation Ceremonies. At 9am in the R12 Workshop Gordon Walker wished farewell to Dave Holland, from Physics Apparatus Group.

Dave arrived to join AERE Harwell from Ferranti Ltd in 1961 and in 1969 came to the Rutherford Laboratory to work first in Nimrod Division in the R2 workshop, and subsequently on the RF system of the 70 MeV injector. He will always be remembered for the great job he did aligning the Nimrod beamline. There is an apocryphal story that a 6'3" tall, he aligned them to a mark on his forehead! Since joining Instrumentation Division in 1976 he has worked both at DESY and CERN on the hyperon and muon chambers, and has had a hand in many other projects.

Gordon, on behalf of Dave's friends and colleagues, presented him with a car radio, thanked him for all his devoted efforts and wished him all the best of luck in his new promotion to PTO IV at Culham.

"I have enjoyed working at the Lab, and have made many good friends. It's been good fun - and a memorable 50 years (he joked)!"

Bob Carr

At 10.30 in the R12 Conference Room, it was the turn of Bob Carr, to be feted by his colleagues. Geoff Manning officiated at this friendly gathering. Bob, he told us, already had a large amount of engineering design experience when he came to work at Harwell in 1955. He had started in 1937 at Vickers Armstrong, Newcastle, as an apprentice, served with the Royal Artillery during the war, completed his apprenticeship afterwards and had joined the 'Vickers' drawing office, when in 1949 he joined Donkin & Co as a senior draughtsman working on ships' hydraulic steering gear. From 1950-55 Bob worked for C A Parsons Ltd as a design draughtsman on gas turbines.

In 1961 Bob started on the construction of Nimrod, where he helped successfully to solve problems with the high power RF cavity. He then worked in the experimental area during the intense period of use of Nimrod for experiments,

where he "did the impossible" to help the physicists. Bob became Group Leader in charge of the mechanical workshops, responsible for mechanical installation and maintenance on Nimrod which included the installation of the 70 MeV injector. He saw the close down of Nimrod and the start of the SNS.

"We are sorry to see you go, and hope you enjoy your retirement" said Geoff, as he presented Bob with a bicycle, an AA book, and some brandy glasses, on behalf of all those present. "Now you know where to go, have a vehicle to get there, and a brandy to forget the effort!" Mrs Carr was presented with a gorgeous bouquet of flowers.

Bob replied that he had enjoyed his 25 years on site. It had been a considerable challenge. Nimrod, though a monster, had been a great success, with 100 scientists experimenting at one time or another. He was proud to have worked on Nimrod, and had enjoyed the job and especially the people. He was now going to enjoy his home and garden, the company of his family which includes 3 grandchildren, football, cricket - and cycling.

He wished "all you young folks" future success with the SNS. "Thank you all".

Fred Harris

Fred Harris was the next to bid us farewell. His Presentation Ceremony took place a week later on Friday 2 May in R8.

Fred had started work in 1930 as an apprentice motor engineer at Kents in Wantage - not, one would have thought, a run-of-the-mill occupation for a young man in those days!

For a time he was driver/mechanic for Wantage RDC, and during the war was a civilian driver at RAF Harwell, driving Queen Marys. In 1959 he was back on site, this time as a member of the Nimrod RF Group where his suggestions for handling the ferrite cores made life much less awkward and messy.

In 1961 he became a leak test operator on Nimrod, and became with Tom Burson the mainstay of the leak-test service used by every section of the Laboratory. Fred's mark of better than 10^{-5} lusecs has been put on equipment now scattered throughout the world - and flying in space.

David Gray expressed his appreciation on behalf of the Rutherford Laboratory for all the good work he had done, and wished him all the very best in his retirement. He then presented Fred with a very handsome clock under a glass dome, remarking that he'd been told not to touch it - he might drop it.

Fred thanked everyone for the beautiful present which was very unexpected. "You've all been very good mates" he said, "always ready to help out. Thanks".

Jim Morris

Finally on Tuesday 6 May Jim Morris bade farewell to all his friends in R2. Working life for Jim had started at the pit top, but being small he soon decided that it was not for him and had become an apprentice jockey, riding two winners in France. After his apprenticeship he had worked for several leading trainers before deciding to become a trainee signalman. This idea was foiled by a short illness, and he returned to racing, this time at the stables of the Duke of Norfolk at Arundel, where he was involved in the training of the Grand National winner "Battleship". Jim's wartime experiences were also eventful. While serving with the Royal Corps of Signals in Egypt he was captured near Tobruk and sent to Italy as a POW, eventually to escape - through a minefield!

Back in England he was awarded the Military Medal, got married and in 1955 joined Harwell. In 1966 he became a 'Nimrod' man as a plant attendant on the power supply and ancillary plant, until the close down in 1978, when his allegiance turned to SNS.

As David Gray, who was making the presentation, commented, "Jim has had a varied and interesting life. I would like to record the Laboratory's appreciation of his work and to wish him the best in his retirement."

Jim was then presented with a whole heap of photographic equipment. "Talk about 'This is Your Life', he said, "You know more about me than I do! Friends are the most important thing in life, and I thank you all for my enjoyable time at the Lab. The very best of luck to you all," he finished.

Art & Craft Exhibition

The exhibition of work by staff of the Laboratories will take place in the R12 Conference Room from 12 noon - 2 pm on the following dates:

Tuesday	17 June
Wednesday	18 June (also 5.15 - 8 pm)
Thursday	19 June

May we remind you that all entry forms should be submitted by 3 June to Myra Gilbert, Room 2.73, Building R1. Enquiries about the exhibition can be directed to a committee member:

Jenny Coates	Ext 430
Myra Gilbert	Ext 6143
Jan Aird	Ext 439
Pauline Gammon	Ext 360
Sarah Hallowell	

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