

15-29 September

ONCE A MONTH: THE STANFORD SYMPOSIUM Bill Toner of the EPIC Group

reports on his recent visit to the Stanford Symposium on Lepton & Photon Interactions at High Energies

With one new particle a month since last November, and more to come, the 1975 Lepton-Photon Symposium held at Stanford last month could not avoid being an outstanding success. Apart from physics, the organisation was also excellent and the Stanford University campus site ideal for encouraging the relaxed discussions of physics and other things that make a

conference more than another set of lectures. There is no doubt that the $\psi_{\,3\,1\,0\,0}$ (or J) discovered last November independently by Richter and Ting is just one of a large family of new particles. Work carried out since then at SPEAR (Stanford) and DORIS (Hamburg) has so far led to the identification of at least eight states, which may be grouped as shown in the figure. This is a minimum number, since it has been assumed in some cases that two different reactions are just different decay modes of one particle, rather than two particles. The grouping of the states has a remarkable similarity to the spectrum of positronium, which is a hydrogen-atom-like combination of an electron and positron. This pleases the "charm" school, who had proposed that just such a combination might be formed by a charmanticharm quark pair, although there are some puzzles in the details.

The other major event of the conference was a discussion of Perl et al's analysis of anomalous events of the type e + e $\rightarrow \mu$ -e+ +? detected at SPEAR. No conventional source for these events can be found. The most popular explanation is that some of the unobserved

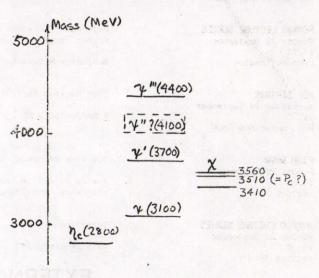
particles are neutrinos produced by either (a) e + e \rightarrow D + \overline{D} where D is a charmed meson and decays to $\mu \bar{\nu}_{\mu}$ and hadrons or eve and hadrons

 $e^+ + e^- \rightarrow U + \overline{U}$ where U is a heavy lepton, the next member in the series: electron, muon, ---, and decays to $\nu_{\mu} + \bar{\nu}_{\nu}$ or ν_{u} e $\bar{\nu}_{e}$. ν_{u} is a new neutrino to go with the U.

If (b) is the case, this work will rank with the discovery of the μ meson itself in 1939 and

with the 1961 proof that ν is not the same as $\nu_{_{11}},$ as a major step towards an understanding of why the μ meson should exist at all. The larger a family, the more clues there are to its nature.

For the last few years, the theorists have been encouraging experimenters with simple models using the ideas of quarks, partons, gauge theories, charm and so on. They were clearly delighted with all the new findings but showed some signs of alarm that we would now take the simple-minded picture as proved. We were warned that the evidence for quark fractional charges is not conclusive; that the observation of neutral weak currents does not prove that the gauge theories are correct; that even if the new particles do contain hidden charm, it might not be the same as the charm needed to suppress strangeness-changing



Minimum number of states SPEAR needed to explain and DDRIS data.

neutral weak interactions; that if we believe the ψ^1 , ψ^{11} , ψ^{111} are radial excitations of the ψ , we had better find similar series among the old particles. What were extremely plausible assumptions must now be tested, however attractive the synthesis given by the simpleminded picture.

On the last day, a TV cameraman came to a session on the much publicised "monopole" event at which Alvarez criticised the experimental technique and advanced the much more likely explanation that Price etal have just observed a heavy nucleus which fragments in their detector. Unfortunately Public interest in physics seems to be influenced more by the glamour of a discovery than by the likelihood of its being real.

If all these excitements had been missing, there would still have been a great deal of good and interesting new physics to discuss. The first results on diffractive photoproduction from FNAL were presented by Wonyong Lee. There is very clear evidence for the decay of the ρ^1 (1600) to $\pi^+\pi^-$ as well as to four pions, and for the diffractive production of a state at 2100 MeV decaying to six pions. Lederman discussed the inexplicable direct production of muons and electrons in hadronic reactions. There is now conflicting evidence at energies between 10 and 30 GeV, with two experiments claiming a definite signal and a third denying

Low energy electroproduction data from Daresbury, and other precise experiments in photo - and electro-production were welcomed as providing detailed tests (and some puzzles) for the old quark model. There was scaling and scale breaking in the deep inelastic, neutrino data (anomalous and otherwise), and much else.

INTERNAL EVENTS

TRADE EXHIBITION
Tuesday 16 September
10.00 - 14.00
Adjacent to R20

HEP SIMINAR
Wednesday 17 September
11.00
R61 Conference Room

NIMROD LECTURE SERIES Monday 22 September 11.30 Lecture Theatre

HEP SIMINAR
Wednesday 24 September
II.00
R61 Conference Room

FILM SHOW Friday 26 September 13.00 Lecture

NIMROD LECTURE SERIES Monday 29 September 11.30 Lecture Theatre

DARESBURY LECTURE SERIES Tuesday 16 September 14.00 Daresbury Lecture Theatre

AERE,THEOR.PHYS.DIV SEMINAR Tuesday 16 September 14.00 Conference Room, Building 8.9

AERE, NUCL.PHYS. DIV COLLOQUIUM Thursday 18 September 15.30 Conference Room, H.8 RADIALL Microwave Components Ltd will be demonstrating their full range of products including Coaxial Connection and Accessories, Low Frequency Connectors Multicontact Connectors, Precision Coaxial Devices, Waveguide Components and Coaxial Switching Devices. Engineering and sales staff will be in attendance.

Geometrical Scaling - a Property of the Inelastic Overlap Function?

P Kroll/Wupperal

Experiments Planned with 12 GeV Proton Synchrotron and Development of Spin Frozen Targets in Japan.

Professor A Masaike/KEK

Pion Nucleon Partial Wave Analysis

R Kelly/LBL & RL

New View of Space, a 28 minute, colour film. (plus a short cartoon film).

A wide selection from the vast amount of photographic material from the space programme, including satellite studies of terrestial problems.

Supersymmetry

Dr R Delbourgo/IC

EXTERNAL EVENTS

1975 Lepton and Photon Conference at Stanford, Part 2

R Marshall, J C Thompson/D.L. (Titles for 23 and 30 September to be announced)

Quantum Theory of Channelling in Thin Crystals

Dr P B Treacy/ANU, Canberra, Australia.

Photoelectron Spectroscopy (The development of photoelectron spectroscopy from the discovery in Rutherfords' Laboratory to its present status as a research tool for the study of surfaces).

Dr John Nelson

NIMROD SCHEDULE

CYCLE 5 2.9.75 - 23.9.75			MACHINE PHYSICS		PHYSICS
Team	Beam		Experiment		State
BRISTOL/SOTON/RL	KI5a	No 120:	K p differential cross-sections.	ALCOHOLD BY	Setting up
CAMB/RL	π12	No 114:	$\pi^- p \rightarrow K^0 \Lambda^0$ differential cross-sections and polarisation		Data
BIRM/SURREY/RL	KI7	No 113:	Experiments with stopping Kaons		Data
IMP. COLL/RL	π8а	No 128:	Meson production near threshold		Data
RL	πΗ	No 154:	Radiobiological Experiment		Data
OXF/ROME/RL	TI		Test beam facility		Tests

EPIC DISPLAY A prototype vacuum chamber for EPIC is being displayed in the R1 coffee lounge during the week beginning Monday, 15 September.

A General Meeting will take place on Thursday 18 September place on Thursday 18 Septe at 12.45 in the Club Room, RADIO CLUB Building R15. Everybody with an interest are welcome to attend.

YOUR BLOOD IS SOMEONE ELSE'S LIFE

The National Blood Tranfusion Service is

visiting the Labora-tory on Monday and Tuesday, 15 & 16 September It is not necessary to make an appointment, just go along to the R15 Recreational Hut, anytime between 10 & 12 or 1.30 & 3. Remember, a hospital patient somewhere is in need of blood every half minute of the day and night.

ROAD RECONSTRUCTION Some relaxation of the OUTSIDE ROMNEY GATE arrangements published in Bulletin No 18 have been announced and are shown below.

During the period of this work the following arrangements will apply to car pools contain-ing staff working on the Main Site and staff working at SRC, MRC, NRPD and on the Reactor

<u>During inmuster and outmuster</u> their drivers may enter by the <u>Library Gate</u> provided -

(1) they approach the Gate from Fermi Avenue through the Bus Park, and (2) They take great care to avoid pedestrians.

During inmuster only they may leave by the Library Gate provided they turn left into Library Road and do NOT drive through the Bus Park.

Construction work to connect the security fence SECURITY FENCE on the east side of Dido Road from the Harwell Reactor Area to the SRC Rutherford Laboratory will commence early in September. Access to the track adjacent to the Rutherford perimeter will be available for about two months until the Dido Police Lodge is unmanned.

ELECTRONIC DISPLAYS 75 Details have been received on the 3 day Electronic Displays 75 Exhibition and Conference to be held at the Royal Mount Hotel, London, 30 September - 2 October 1975. Conference booking forms and free exhibition tickets are available from the Editor.

LOST OR MISSING The following items of equipment have been reported missing by the Imperial College Group Stanley Electric Handsaw, AERE no. 18272 Embossing Tool 14/2397 Avometer Model 8, Ser no. 17098-565 Wolf Drill, Ser. no. 17222.

Anyone knowing their whereabouts or able to give any information leading to their recovery is aksed to contact J W Hiddleston, Ext. 6270/6359.

Would anyone in possession of stop watch Ser. no 62-711 please telephone G Stapleton Ext. 233.

P Swan-Taylor, R6 Workshop, Ext 6300 requests information on the present whereabouts of a Wee (500V) Megger, in leather case, Ser. No 1182397.

Lost, probably in the BLUE Car Park on Thursday, 28 August at mid-day, a gold Papermate biro. Would the finder please return it to G S Grossart, R2.

FILM BADGE NOTICE Period 10 commenced Monday, 8 September.
Colour Strip - YELLOW for By films and neutron packs. Please check that you are wearing the correct dosimeters and that all old ones are returned.

Six monthly TLD change for people with surnames commencing K, L, M & N.

Dr G C Stirling, to ILL, Grenoble, 14-17 Sept., to OVERSEAS VISITS carry out experiment. Mr D Cohen, to CERN, 14-24 Sept., to work on experiment. Dr R M Brown, to Yugoslavia, 14-21 Sept., to give two talks at Basko Polje Summer School. Dr K Green, to Grenoble and CERN, 15-20 Sept., for discussions with ILL staff and at CERN, discussions on PS Expt, 112. Dr M R Jane, to CERN, 17-24 Sept., to work on experiment. Mr D C Pickles & Mr P E Hatton, to CERN, 17-18 Sept., for discussions on helium dilution refrigerator. Mr B F Colyer, to Moscow, 19-24 Sept., to attend XIV International Congress of Refrigeration. Dr C J S Damerell, to CERN, 21-23 Sept., for EEC meeting and work on S120 analysis. Dr D H Reading, to Verbania Pallanza, Italy, 21-27 Sept., to attend Fifth Symposium on Microdosimetry. Dr R M Brown & Dr R J Ott, to Strasbourg, 23-24 Sept., for collaboration meeting for proposed experiment at the S.P.S.
Mr W Turner, to CERN, 24-26 Sept., to attend discussion meeting on rapid cycling bubble chambers. Dr J D Lawson, to CERN, 28-30 Sept., for discussions.

H F NORRIS RUTHERFORD LABROATORY BULLETIN Published by the Scientific Administration Group Editor: Room 42 Building R20 Rutherford Laboratory INTERNAL & EXTERNAL EVENTS Deadline GENERAL & SOCIAL NEWS Chilton Didcot Oxon for Abingdon 21900 Ext 484 Insertions Wednesday 1200 Tuesday 1600

In recent weeks we seem to have been DOT stumbling over vacation students at every turn. Most have now departed leaving the Lab a less colourful place and, perhaps a little quieter. Some no doubt would like to return, maybe some will as has happened in the past. Such was the case in 1964 when a vac. student, female, arrived from Westfield College to spend six weeks in the Radiation Protection Group.

On Friday, 5 September, that same young lady said farewell to the Lab; she came as Miss Dorothea Hargreaves and left as

Mrs Squier.

After the 1964 visit Dot returned to Westfield and, having taken her finals, reappeared the following year for just three weeks. She was 'boarded' for a post at the RL but decided to turn her back on the Chilton Downs and accept an offer from the Radiochemical Centre at Amersham where she spent the next eighteen months in the Physics Department. In April 1967, Amersham's loss was the RL's gain.

A large part of her work at the Lab has been on gamma spectrometry and at one time she was the proud possessor of a few grains of moon dust. Dot's work, her energy and her enthusiasm for music and singing brought her into contact with a large number of Lab staff so it was hardly surprising that the R2 conference room was bulging at the seams for her farewell 'do' on Friday the fifth of

September Norman Venn, Head of Nimrod Division, in a very amusing speech, remembered the first a very amusing speech, the brief visit of a young and charming vac. student from Westfield College, often to be seen dashing around the Lab. "She captured seen dashing around the Lab. "She captured many of our hearts on that brief visit, one glance around this room shows why I feel particularly honoured to be the spokesman for

SERVICE WITH HONOUR Although at first sight the connection between

a large research lab and the armed forces may seem rather tenuous, they do have something to enable them to carry out their specific tasks efficiently. It is hardly surprising that the Lab. has quite a number of old 'warriors' on its compliment, contributing a vast amount of experience and expertise in many branches of these 'services'.

We have just said farewell to Jack Plester who, for over ten years in the Bill Paying Section of Finance Group in R20 exemplified

this valuable service.

Jack joined the Army as a regular in 1940 and was commissioned later the same year in the Royal Army Ordnance Corps. Twenty-five years later be retired during which time he had served in the Near, Middle and Far East and had risen to the rank of Lt. Colonel. It is hardly surprising that he has strong views on a career in the Services which he considers to be interesting and challenging, with the additional bonus of lots of travel (free of course). He is naturally referring to peace time service; "of course in the time of war it's a bit different"!

John Jenkins, Head of the Lab's Finance Group, who on behalf of Jack's many friends and colleagues made the presentation, spoke of Jack's twenty-five years honourable service of Jack's twenty-five years honourable service in the Army. He had brought to the Rutherford Laboratory, honour and a degree of discipline which was highly commendable. John asked him to accept the parting gifts with the best wishes of all present, for a long and happy retirement with his wife and family. In reply Jack spoke of the pleasure of being present to receive the wishes and gifts. Only six



this occasion". After talking about her career and her achievement of an M.Sc. at St. Barts. Medical College, he went on to speak of another achievement - "the large number of friends she had made, from Librarians to Nimrod Duty Officers, both upwards, downwards and sideways". Norman said he was very sorry she was leaving but the reason was obvious.

Dorothea has sent the following message:-

"Thank you, everyone, for the beautiful "retirement" presents, and for all your good wishes. My apologies to those I wasn't able to see and thank personally before I left; however I do hope to be able to visit the Lab. from time to time, especially before getting too tied up with my new "job"."



months previously he had been told he only had a 50-50 chance of life. Thanks to excellent surgery and nursing he had made a good recovery although he was having to rethink his retirement plans. He particularly wished to thank everyone for their help and friendliness and, as he only lived a short distance away, in Chilton Village, all friends and colleagues would always be warmly welcomed.

We are sure that everyone will join with John Jenkins in wishing Jack a long and

happy retirement.

Supplement to Bulletin No 19. 15-29 September 1975

AN ADMIRER OF THE ENGLISH SCENE RETURNS HOME

By the time this edition of the Bulletin is published, Dr A J Van Horn will have left to return to his native USA. Andy joined the Lab in January 1973 as a Research Associate, working in both the Bubble Chamber Group and Counter Group 'B' concerned mainly with defining the properties of strong interaction resonant states. More recently he has been involved, with Brian Jones from the RL and Ian Blair from AERE in the organisation of the highly successful SRC Summer School on 'Aspects of Energy Conversion' held in Oxford during the second half of July 1975. He is one of the editors of the Proceedings which are to be published by Pergamon Press early next year.

Andy and his wife lived in West Hagbourne for the first twelve months before moving to the outskirts of Abingdon where they have been sampling the delights of living in an old

manor house.

The answer to the question, "have you and Carol enjoyed your stay in the UK" was a very definite and sincere YES. Such as? "Lots of things - Oxford, the theatre, village fetes, the visits to many parts of the British Isles and the opportunity to cross the Channel on a number of occasions to travel in Europe"

and the opportunity to cross the Channel on a number of occasions to travel in Europe".

Andy is an admirer of the British way of life, in particular the freedom to walk around anywhere and at anytime in safety, (a view expressed by other visitors to our shores), but a concern that this way of life, which we all take for granted may not last. He doubts that this would be desirable "progress" doubts that this would be desirable "progress".

Following a short burst of activity at Berkeley and the odd conference or so, Andy is going to Harvard and the Physics Department to work with Professor Richard Wilson on energy

and environmental problems.

Andy said he was sorry not to be able to say farewell to all his friends but owing to a late change in plans, time ran out. He hopes they will accept his best wishes and farewells via the columns of the Bulletin. We are sure his friends will join with us in wishing him and his wife 'bon voyage' and good luck.

SUPPER DANCE The next supper dance will be held on Friday 3 October. Dancing to 'TUDOR QUORUM' plus your usual good value supper.

Due to the ever increasing cost of food plus the cost of living entertainment, the price of tickets has had to go up to £1, now on sale from: -

Val Goodwin Ext 6256, R1 Peter Craske Ext 232, R2 David Evans Ext 297, R34

RECORD SOCIETY A number of enquiries have been received regarding the re introduction of lunch-time record concerts in the Lecture Theatre. Anyone interested in joining a small organising committee is asked to contact the Bulletin Editor.

CHRISTIAN FELLOWSHIP

18th September Derek Smaje of Bldg R18 will be leading a bible study on the prophet Nahum. He will compare God's wrath against Nineveh of the Old Testament and that of modern civilization at the end of this present age.

26 September. "And I saw the dead, small and great, stand before God". So reads the final chapters of Revelation which Ray Powell of Wages Section, will be concluding in a lunchtime bible reading.
Both meetings commence at 12.30 in the R12

Conference Room and all are welcome to come

along.

C.S.S.C. EVENTS The Civil Service Sports Council (Southern Region) are holding the following competitions in the near future. They are open to all members of the Science Research Council.

Mixed Hockey (4 males + 3 females). Sunday 28 September at RAE Farnborough. Team entries to be with P Craske by 18 September.

Rugby Sevens Sunday 28 September at RAE Farnborough. Team entries to be with P Craske by 18 September.

1975 Civil Service Billiard and Snooker National Championships (preliminary heats). Names to be with P Craske by 24 October. (For this competition, entrant must be a member of the Civil Service Sports Council, i.e. in the (For RL & Atlas Rec Soc.).

1975 Civil Service National Angle Championship 3 October, on the Thames between Tilehurst and Sonning, and open to all members at the SRC. Deadline for entries, 29 September.

For all these events contact Peter Craske, Ext 232 or Gordon Howard, Ext 6115 for further details etc.

The annual tournament, now in its minth year, is due to CHESS TOURNAMENT 1975-76 start on 6 October. As

before it will take the form of a Swiss tournament and matches will be played during lunch times. It caters for all levels of players. You do not have to be a "Grandmaster" to enter; mind you, if you are a "Grandmaster" you would stand a fair chance of winning it. All are welcome, including novices and Atlas players! Entries must be submitted to Peter Craske, R2, Ext 232 before 29 September.

Many readers will no doubt be pleased to LUNCH-TIME FILM SHOWS

hear that we have been able to collaborate with the Culham Music and Arts Club and the Harwell Film Society in presenting a fortnightly lunch-time film show. There will only be a single showing, either on a Thursday or a Friday and owing to Lecture Theatre commitments the showing time will vary from time to time. possible the programme will commence at 12.40 but please watch the Bulletin for details and the Lecture Theatre notice board for late changes. Whenever possible extra films will be slotted into the intervening weeks. See 'Internal Events' for the first film in a very Whenever possible extra films will be attractive winter season.

CSSA INTERDEPARTMENTAL OFFSHORE RACE

The CSSA is organising another Interdepartmental

Offshore Race for the weekend of the 10th to 12th October, 1975. This is the fourth such annual race, and the SRC has been represented each year. Last year nine departments entered a total of sixteen yachts, with the Exchequer and Audit Department winning first prize in an exciting race from Southsea to Cherbourg.

This year will again be from Southsea to

Cherbourg, subject to weather conditions, starting on Friday, 10th October at 1700 hrs. Alternative course will be sailed in the Solent area in the event of bad weather. Special leave and travelling expenses are available. The SRC Sailing Secretary would be glad to hear as soon as possible from anybody wishing to be in the SRC crew, and from anybody able to offer a suitable boat! If there are sufficient numbers, it may be possible to enter two crews.

Further information from G Howard, R 18, Ext. 6115