Bulletin

of the Rutherford and Appleton Laboratories 16 Mar. 1981 No.5

Mrs Thatcher Visits SMM

SMM - The Brighter Side

Although the SMM Spacecraft is currently unable to point with sufficient accuracy, the Mission is still very much alive. The main aim on SMM has been to achieve joint sciences using the six instruments on board. To this end, each team has maintained a substantial scientific strength at the Operations Facility (EOF) at Goddard. Now that they are no longer pre-occupied with daily operations planning, these scientists are at last able to concentrate on the collaborative aspects, aiming to bring joint analysis to the extensive data sets so far obtained. Current plans are that the EOF should continue at full strength until 30 June 1981. Thereafter, it is planned to set up an SMM Data Analysis Facility at Goddard, where complete data sets are maintained, together with the equipment for joint display and analysis.

Parallel with this activity, some of the NASA engineers are looking at the problem of rescuing the damaged spacecraft. Schemes are being studied for carrying out repairs in orbit using the third or fourth flight of the Space Shuttle in about a years time. So, there is at least a chance that SMM may again be fully operational one day.

We are indebted to Dr Alan Gabriel for this information.

Chris, Rapley from the University College London team explaining features of the X-Ray Polychromator model to the Prime Minister.

The Prime Minister talking with Ken Phillips, RAL's Deputy Principal Investigator, during her visit to the SMM Operations at Goddard Space Flight Center on Friday 27 February 1981. *Photos: Goddard Space Flight Center*

Neutrino Mass

At the Cosener's House on 19-20 February, RAL organised a topical meeting bringing astro-physicists, astronomers, nuclear and particle physicists together. The subject was Massive Neutrinos. Several neutrinos are known and they all seem practically massless, but even tiny masses could have vast consequences; with a few millionths of the electron's mass, neutrinos from the Big Bang would carry most of the energy in the universe. They could be essential in the formation and stability of galaxies and clusters of galaxies, and could explain the invisible extra mass that these seem to contain. Their masses might be crucial in understanding the solar neutrino puzzle, double beta-decay, and other intriguing questions. What we need now are some direct mass determinations.

A Moscow group claims the electron neutrino has mass 14-44 eV from the tritium beta-spectrum; an Osaka group deduces 40 eV from the double beta-decay of Te isotopes; Stecker remarks that a 1700 Å background feature in UV astronomy could come from the decay of 15 eV neutrinos in the galactic halo; but none of these results are firmly established. In the last talk of the meeting, however, De Rujula described an exciting new idea to extract masses from the photon spectrum in radiative electron capture by heavy nuclei. This approach exploits the high accuracy of photon spectrometry and resonant enhancements in selected nuclei; great precision is hoped for and there could be results within a year.

INTERNAL Events

NIMROD LECTURES
R61 CONF. ROOM - 1400 hrs

23 Mar - Dr B R Webber/Cambridge
'Properties of Jets and Lepton Pair Production in QCD'

30 Mar - Wilson/Rebbi/Creutz/Wallace, etc.
'Lattice Gauge Talk'

(See Peter Scharback or David Morgan for details)

HEP SEMINARS
R61 CONF. ROOM - 1100 hrs

18 Mar - Dr R Marshall/RAL
'Neutral Current Effects in e^+e^-(JADE)'

ASTROPHYSICS SEMINAR
R61 CONF. ROOM - 1400 hrs

18 Mar - Dr Arthur Kingston/Belfast
'Atomic Processes in Solar Flares Revisited'

RAL LECTURE
LECTURE THEATRE - 1315 hrs

19 March - Sir John Adams, FRS
'CERN - Its Aims and Achievements'

FIBRE OPTICS
LECTURE THEATRE - 1515 hrs

18 Mar - John Hardaker/RAL
Chris Castro/Belling Lee
'The Practical Application of Fibre Optic Links in Digital and Analogue Communication'

All are welcome - for further details contact John Hardaker Ext. 6694.

EXTERNAL Events

NPD COLLOQIUM
CONF. ROOM H8 - HARWELL - 1500 hrs

26 Mar - Dr J B A England/Birmingham
'Recent Developments in Detector Systems for Charged Particles'

THEO. PHYS. SEMINARS
TPD 424.4 - HARWELL - 1400 hrs

24 Mar - Prof PCW Davies/Newcaslte
'Black Hole Thermodynamics'

31 Mar - Dr G Dearnaley/AERE
'Ion Implantation'

THEORY GROUP SEMINARS
DARESBURY - 1400 hrs

23 Mar - Dr R Brako/Imperial
'Atom-surface Scattering: Charge Exchange Processes'

30 Mar - Dr H Hasegawa/Imperial
'Theory of Spin-fluctuations of Itinerant Electron Systems'

THEOR. PHYS. SEMINARS
MANCHESTER - 1430 hrs

18 Mar - Dr A P Young/Imperial
'The Paramagnetic Phase of Iron'

'Cloud 9'

Somewhere in the Atlantic

It all started during a discussion on divisional reorganisations and by saying to my boss - "just because I've been involved with polarised targets for 'n' years don't think I would'nt have a go at something different if the opportunity arose". "Funny you should bring that up" he said.... So there were, a team of four, heading for the top of a mountain, 8000 feet high, in winter, to take readings of the water vapour content of the atmosphere. From some of the reports we had read about the place, we knew we could be in for a tough time. That was the bad news. The good news was that the mountain was on San Miguel de la Palma, in the Canary Islands.

Our brief was to take the necessary water vapour readings, make habitable the observatory point, the so called German Tower (a disused observatory at the top of the mountain), locate a suitable base camp, establish reliable radio communications and find out where any equipment necessary to do all these tasks could be obtained locally.

We knew we would need a four wheel drive vehicle to get up the dirt road to the mountain top with another one at the base camp in case of trouble. We also knew that life in the German Tower might be very spartan, to say the least, with temperatures down to -5°C and winds of high velocities (some said kph!). We went equipped for mountain walking in very cold weather just in case.

Our trip out was eventful. You don't seem to be able to get to La Palma in one day, so you go to Tenerife, land at Reine Sofia airport stay a night, change airports (only a 100 km drive) find the weather has closed in so your flight is cancelled, change airports (another 100 km) and finally arrive in La Palma a bit up tight to find your two vehicles, in spite of the delay, waiting for you at the airport. What a relief!

After some mad shopping for food, coaxial cable and tools we spend a night in a hotel (the hotel, sorry) and after picking up the radio equipment from the local RGO office set off for the base camp. This had been picked out prior to leaving as being in a location where good radio contact was a strong possibility. We knew it to be a holiday bungalow. We were right. Two bedrooms, two bathrooms, lounge, kitchen, sun terrace and a swimming pool. We thought we might just manage.

Two of us set out up the mountain early the next day, to see what we were in for. We found the road passable and more important we did'nt get lost on the way up. Once at the German Tower we got the diesel generator and the water system working and decided that even though the building was like living in a World War II Air Raid shelter, with power, hot and cold running water and gas cooking facilities, life would'nt be too bad. The radios however were a problem - no one seemed to know if they worked or not. After two fraught days building radio antennae and laying in cables we found we could contact the Institut de Astrophisics at La Laguna on Tenerife. Our SOS system at least was in a go state. A quick swap round of teams then ensued with the relieving team carrying on the observations and tower improvements and the "radio" team putting the other end of the communications system into the bungalow. We are happy to say the tower to base radio link worked first time. The radio antenae? When built from fencing wire, scaffold poles, a pick handle and jubilee clips as vital ingredients they work quite well.

After that it was the turn of the logistics to be sorted out. For instance, if you want something however unlikely where do you get it.? Don't look in the window and walk away they might have it inside. The

impression we got was that if the locals find a demand for anything they will sell it. Let me quote our classic example. Camping gas is bought in a furniture shop - which sells cars, bicycles and camping gas-in the basement where you can't see it. There is a logic in our logistics but it escaped us. We ended up doing a map of the local town, on foot, going into every shop to see what they had. Our feet hurt.

The island, you might ask, what was that like? Well it is described in the guide book as one of the leading contenders for the most beautiful island in the world. I can only say that that is a fair description. In scenery, one of our merry men told me, far surpasses anything the Grand Canyon USA can offer. I found the scenery fantastic. On the other hand clouds breaking over the mountain ridge like a slow motion storm at sea, on the other being able to look four miles across and one down inside the Callerade Taburiente (the inside of an extinct volcano). I am sorry to say my camera did nothing justice.

So if you want to buy a dustbin, or distilled water on La Palma we know where. We can fit you up with a villa with ensuite double bath! (I didn't believe it till I saw it). And the scenery - mind boggling not to be missed.

But on the other hand, the last I heard the German Tower has two inches of ice on the outside and the mountain is covered in a foot of snow.

D.C.

WHAT'S NEW?

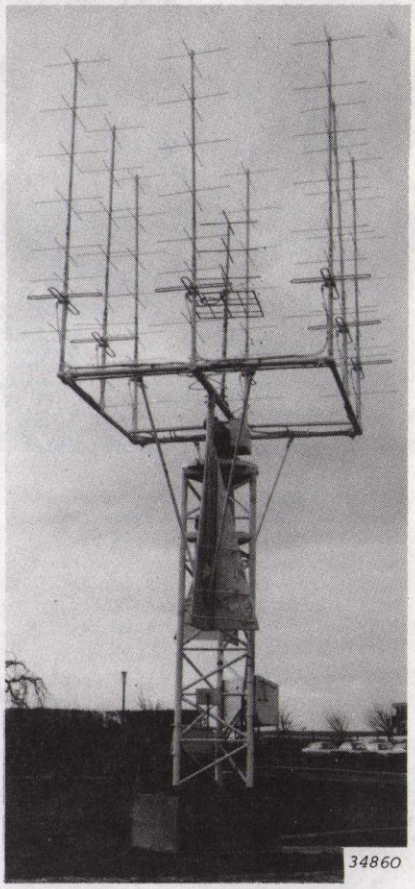
Lecture Theatre - 2 April - 3.15 p.m

DIFFRACTION, NEUTRONS AND MAGNETISM
by
J B Forsyth

Neutrons may be diffracted by crystals in much the same way as may x-rays or electrons. The diffraction effects can be likened to the scattering of light by a slit or grating. In the case of neutrons, the fundamental scattering objects in the crystal are the nuclei of the atoms and those electrons which exhibit a net magnetisation. Information from the nuclear scattering parallels in many cases the more numerous studies of crystal structure undertaken with x-rays. However, the neutron-magnetic interaction provides a unique tool for the study of the fundamental origins of magnetism, the orientation of atomic moments and the spatial distribution of magnetisation throughout a solid. The later, more detailed information bears on solid state effects such as the presence of conduction electron polarisation or covalency. In many cases it enables us to determine the ground state wave function of a magnetic ion as well as offering us fresh insight into the reason why the refrigerator door stays shut.

New ~ at Chilton

The mysterious device which has recently sprouted on the grass area to the North of the Restaurant is a steerable VHF aerial to be used for receiving telemetry data and for transmitting control commands to the Ariel-6 satellite. This is a satellite performing X-ray astronomy and cosmic ray research which was launched on June 2, 1979. It has been controlled since launch from the Operations Control Centre at the Appleton Laboratory Ditton Park and telemetry received and commands sent from the satellite ground station at Winkfield. Due to the closure of both the Ditton Park and Winkfield sites in 1981, a considerably simplified, combined control centre and ground station is being built at our Chilton site, to continue operations on the Ariel-6 satellite until the end of its useful scientific life. The aerial system, known as a 9-Yagi antenna, is steered to follow the satellite across the sky on the six or so occasions in each 24 hours when it is visible. The telemetry data are received at 137.56 MHz and after suitable processing are sent to the experimenters. The encoded commands are sent at 148.25 MHz to point the satellite X-ray telescopes at selected stars and to switch the experiments into the modes suitable for particular observations. It is planned to commence operations from Chilton on 1 April 1981. The work involved in setting up this Ground Station and Operations Control Centre (GSOCC) has been considerable and could not have been achieved without the co-operation of the staff at Appleton, Winkfield and the Council Works Unit at Chilton. Once we are an operational unit, we will



34860

be delighted to show people what we are doing but until then will you please excuse us if we do not have time to stop and talk - and please, no acrobatics on our command boom.

Trade Exhibition

There will be an exhibition by Hightech Components Ltd of servo components in the R12 Conference Room on Wednesday 1 April from 10.00 - 12.00 hours, including a seminar, "Servo Components for the 1980s" at 10.30 hrs.

CERN Awards

SUMMER COMPETITION 1981

These Awards are for suitable qualified scientists and technologists to enable them to work at the CERN Laboratory in Geneva.

Applications for the next Fellowship Competition, for awards that would normally be taken up during the Summer of 1981 must be completed before 17 April 1981.

For further information and application forms please contact Mr J D Walsh at SRC Central Office. Tie-line 74 Ext. 2271.

Film Badge Notice

It is Period 3 colour strip

YELLOW.

Please check that you are wearing the correct film and that all old ones are returned. The next film change - Monday 23 March.
All person needing a new film holder please contact Mrs J Coates Ext 430.

Cricket

There will be a meeting of all those interested in playing Cricket in R58 at 12.30 on Wednesday, 18 March.

The Cricket Club enters 2 local leagues as well as playing 'friendlies' with local village sides.

If you are interested in playing but cannot make the meeting, please ring ext. 6178 and leave your name with our Secretaries M Butler or R Jones.

And Now Where?

35158

All good Scots, it seems, have a generous streak that forces them to share their talents with the world. David E Gray is no exception, as we heard from Jack Butterworth at a crowded presentation ceremony held on 27 February to mark David's retirement.

David's wartime service was spent in the Middle East and Italy with the RAF Signals branch, and afterwards with Cable and Wireless/ Marconi Group he kept on travelling. He worked on the construction of Radio and Radar stations in Bermuda-Barbados, Cyprus, Iraq, Hong Kong, Rodesia, Artic Canada and even the UK! For some reason, in 1961 he decided to stay put. Nimrod was just getting under way and an RF man was needed in Ron Russells' group. David stayed for 15 years, concerning himself with the development and manufacture of Nimrod's synchrotron RF system, whilst at the same time being mainly responsible for the Control Room and its systems.

In 1965 the call of the wild was too much for him, and he left for Wallingford and the Hydraulic Research Station, where in his own words he "briefly became a scientist".

However, the study of water dampened his ardour for Wallingford and in 1966 he was back in the fold of Instrumentation Division, and it was there that 'Energy' intruded into his life and he became involved in the workings of the Energy Committee. "So well did he take to committee work that the Energy Research Support Unit had hung on to him as long as possible" said Jack Butterworth. "His surprising talent for understanding complicated figures has prevented us overspending, I'm sure. Now, sadly we have to say goodbye, and apart from our good wishes we would like him to have a more material expression of our regards", he concluded, and presented gifts of a carriage clock and Workmate bench, on behalf of all David's friends and colleagues.

'When we arrived in this area,' David reminisced, 'Nimrod was just building. We did'nt think we'd last 20 years, but the countryside is beautiful, I have enjoyed the job and the people, who always make a place. There is a tremendous amount of expertise on site which is offered freely both professionally and extramurally. Thank you for the magnificent gifts - the workmate will keep me amused and the clock will tell when it's coffee time. I wish you all well - Instrumentation in particular and the Labs in general!'

The ceremony ended happily with the presentation of a delightful basket of plants to David's wife Janet.

Thanks

Jocelyn Waring would like to thank all friends and colleagues for their good wishes and lovely gifts, and says 'au revoir' to those she was unable to see personally before leaving.

Congratulations

35155

Kevin Gillman of R18 has been awarded a prize for the best student in the Plumbing Section of the Department of Construction at the Oxford College of Further Education.

The Presentation of Prizes took place on Tuesday 17 February 1981.

We congratulate Kevin on this achievement and wish him equal success next year.

Recipe for Model Exhibit

35164

Take a large lump of expanded polystyrene, carve to suit. Mix together a spoonful of glue, a splash of paint, a handful of tea leaves, add water and a pinch of artistic flair. Stir well for one minute then cover polystyrene with the mixture.

Not a recipe for the Mad Hatter's Tea Cake but an explanation of the photograph. This shows members of the Model Railway Club hard at work. The feverish activity is due to part of the Club's layout which is to be shown as a static exhibit at the Abingdon & District Model Railway Club's Exhibition on Saturday 28 March at St Nicholas' Church Hall.

Great wonders have been performed from a large hill to an allotment (scale length of 6 rod, pole or perch long) being set down in one week.

Bulletin

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