

Physics Prizes

The Italian Physical Society has awarded the 'Ettore Majorana' prize for 1965 to T. Massam of Nuclear Physics Division. The French Academy of Sciences has awarded the 'Prix Louis Bonneau' to M. Borghini also of Nuclear Physics Division for work on the physics of polarized targets.

Visits in 1965

A total of 9197 visitors were received at CERN during 1965. This figure is 20 % higher than that for 1964 and 9½ % higher than the previous 'record year' in 1963.

About three-quarters of the visitors took part in the Saturday guided tours which have now become a regular feature of CERN life. Many of them came from near by and the Saturday visits remain one of the most effective links with the local population. A number of CERN staff members with their families and friends also took part in these guided tours and this trend will continue to be encouraged in 1966. For groups coming from outside CERN, the initial contact is with the Public Information Office. For CERN staff, details of forthcoming visits are given each week in the 'Bulletin'.

32 CERN staff members, with a broad knowledge of the site and its equipment, can be called upon to help with the reception of these visitors by giving introductory talks and by guiding groups round the site.

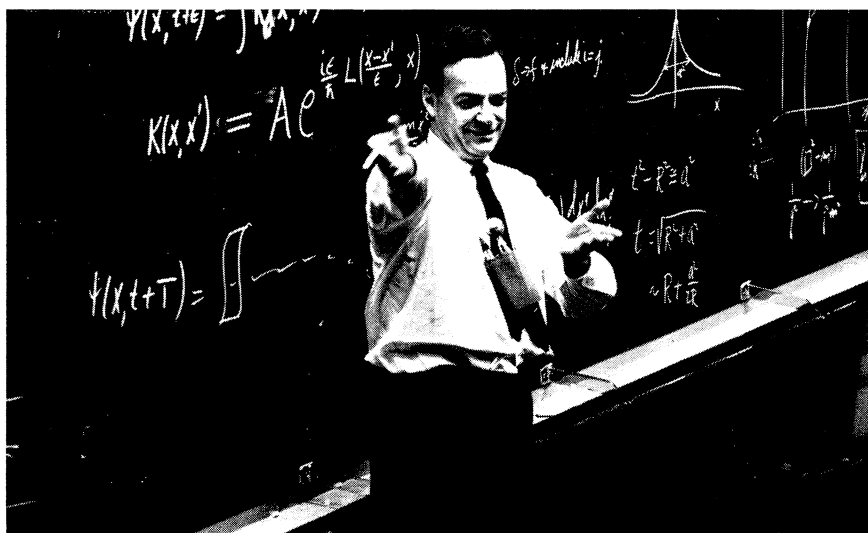
Another category of visitors, who usually have a close professional interest in the work of the Laboratory, come to CERN on mid-week visits. Among them in 1965, there were many 'VIP's' and a number of specialists seeking detailed information on their own field of work. There were also about 100 representatives of information media: newspaper and periodical reporters, scientific authors, radio and television teams and several film units.

Yet another category of mid-week visitors to CERN comprises groups from universities or technical colleges, whose aim in visiting CERN is to study sub-nuclear physics at first hand. These visits arouse great interest and enthusiasm, because they provide the opportunity not only of seeing the complex apparatus and the associated experimental techniques in action but also of meeting experts in the various fields of CERN's work. It is possible that many of the students taking part in these visits will return to CERN in the future as members of the CERN staff or of visiting scientific teams.

One of these visitors conveyed his appreciation of a day spent at CERN as follows: 'It was of great value for all of us to gain new knowledge and impressions, which lie outside the normal scope of a technical college. We saw and learnt much that was new and several of us glimpsed new possibilities for our future careers'.

The success of the visits owes much to the generous help and encouragement given especially by the panel of guides, and by all those called upon for assistance.

The 1965 Nobel Prize in Physics was awarded to Schwinger, Tomanaga and Feynman for their fundamental work in quantum mechanics on the theory of the interaction of charged particles with the electro-magnetic field. Richard Feynman, from the California Institute of Technology, visited CERN while in Europe to receive the Nobel prize. He fascinated a packed auditorium, on 17 December 1965, with a brilliant and entertaining lecture on his Nobel prize work.



CERN/P1 169.12.65

News from abroad

Brookhaven

The United States 'Joint Committee on Atomic Energy' in their Report of February 1965 recommended, 'Conversion of the Brookhaven AGS to a high intensity facility'. The Atomic Energy Commission has requested funds for this conversion of the 33 GeV proton synchrotron, to take place over the next five years.

The present intensity is around 10^{12} protons per pulse at a repetition rate of 1 pulse/2.5 second. It is intended to improve this to 10^{13} protons at 1 pulse/second (with the possibility of a slower repetition rate to allow for longer beam spill). The main limitation on the present intensity is space charge effects at injection and the original conversion plans included the construction of a 500 MeV injector. This has now been modified to 200 MeV with provision for a further 300 MeV stage at a later date.

The magnet power supply (now 35 000 kVA) will be doubled in size to cope with the increased repetition rate. The number of r.f. accelerating cavities in the magnet ring will be reduced from 12 to 8 to release straight sections for beam extraction etc... The r.f. equipment will also be moved outside the ring so that servicing will be possible while the machine is in operation.

Special measures will be needed to cope with the radiation problems which increased intensity will bring (levels of up to 400 R/hour are predicted for the target areas). These measures will include adding another 10 foot of earth shielding around the AGS tunnel.

It is hoped to restrict the 'down time' which the conversion will involve, to eight months. Some of this time will be for the installation of shielding in the second year of the conversion programme, and the remainder at the end of the five years to bring in the injector, etc...

Serpukhov

In the first week of December, four Russian scientists — Prof. Logunov (Director of the High Energy Physics Institute at Serpukhov), Prof. Prokoshkin, Dr. Selivanov and Mrs. Samokhvalova — visited CERN. They had spent two previous weeks at CEN, Saclay. The following information on the 70 GeV proton synchrotron, now under construction, was given in a talk by Prof. Prokoshkin, Director of Experimental Physics at Serpukhov.

The design intensity is 10^{12} protons per pulse at the maximum energy of 70 GeV with a repetition rate of about 8 pulses per minute. The injector is a 100 MeV linac and space charge effects at 100 MeV injection will be the limiting factor on the machine intensity.

The magnet ring is 470 metres in diameter; there are 600 magnets (maximum field about 12 kG) in the ring, with straight sections 5 metres long and 53 accelerating stations. Acceleration time is 3.8 second with a 0.5 second flat top available. The cross-section of the vacuum chamber is 17×11.5 cm.

One large experimental hall with no internal supports straddles the ring and has an office and laboratory block on each side. The main items of experimental equipment at present under construction are a $4.5 \times 1 \times 1.5$ metre heavy liquid bubble chamber and a 6 metre magnetic spectrometer. The 2 metre hydrogen chamber being built at Dubna may be used at Serpukhov and there is also a possibility of using a hydrogen chamber from Saclay.

About 1000 people are now involved in the Serpukhov project. It is hoped that the first full energy beams will be achieved at the end of 1967 and that high energy physics experiments will begin a year later. The Russian machine will then take over from the Brookhaven and CERN machines as the highest energy accelerator in the world.

The magnet tunnel of the Serpukhov 70 GeV proton synchrotron. Several of the magnet blocks can be seen in their aligned positions. The ring of magnets is now almost complete.

Orsay

The following information was released from the Linear Accelerator Laboratory of the University of Paris, at Orsay, on 16 November 1965 :

'On the 25 October 1965, the first attempt was made to inject electrons into the storage ring (A.C.O. - Anneau de Collisions d'Orsay). The storage ring is designed for electron-positron collisions with each particle beam having an energy up to 500 MeV. Several hundreds of particles were stored at the first attempts.

From one pulse it is now (16 November 1965) possible to inject several millions of electrons and to store them for a lifetime of half an hour. This has enabled the first measurements to be made of closed orbits in the storage ring, of the number of oscillations per turn, of resonances and of the beam shape in regions of weak and strong focusing.

No important difference has been observed between the experimental results and the theoretical predictions.'

Rutherford Laboratory

The 7 GeV proton synchrotron, Nimrod, is back in action. At the time of writing, one of the two alternators from the magnet power supply has been returned to the Laboratory after modifications at the manufacturers. It is being used to pulse Nimrod, though not yet up to full energy. The second alternator is due to return at the end of 1965.

A 1.4 metre heavy liquid bubble chamber operated for the first time on 29 October. The bubble chamber was designed by engineers and physicists from University College, London, and the Laboratory. The capacity of the chamber is 450 litres; the magnetic field strength is 21.5 kG. The first experiments using the chamber will begin early in 1966.

Progress is also being made on the construction of an 80 centimetre helium bubble chamber. This will be the largest helium chamber in the world and will be used especially for studies on light hypernuclei. The refrigerating system, which is required to hold the helium temperature down at 3 to 4° K for up to 30 days, has been successfully commissioned.



CERN/SIS 25 491

Stanford

In November, 1965, successful acceleration of a beam of electrons in a superconducting cavity was achieved at Stanford. The cavity was a copper cylinder 4 inches long coated inside with lead, which becomes superconducting near absolute zero, cooled by liquid helium to 1.8° K. Acceleration equivalent to 4 MeV/ft was obtained.

With the conventional cavity, energy losses in the copper walls are considerable and they restrict operation to a duty cycle of 0.1 % or less to avoid overheating the walls. The superconducting cavity has very small losses and holds out the prospect of continuous rather than pulsed operation. One of the main problems concerns the refrigeration down to the very low temperatures involved. The Stanford workers are now planning larger superconducting accelerators.

DESY

In the first week of December, 1965, it was announced that the production of antiprotons in the interaction between gamma rays and protons had been observed at DESY. This is the first time that antiproton production in this way has been detected. 30 examples of the event, in which gamma rays of energy around 3 GeV, from the electron synchrotron, interacted with protons in a liquid hydrogen target, were recorded.

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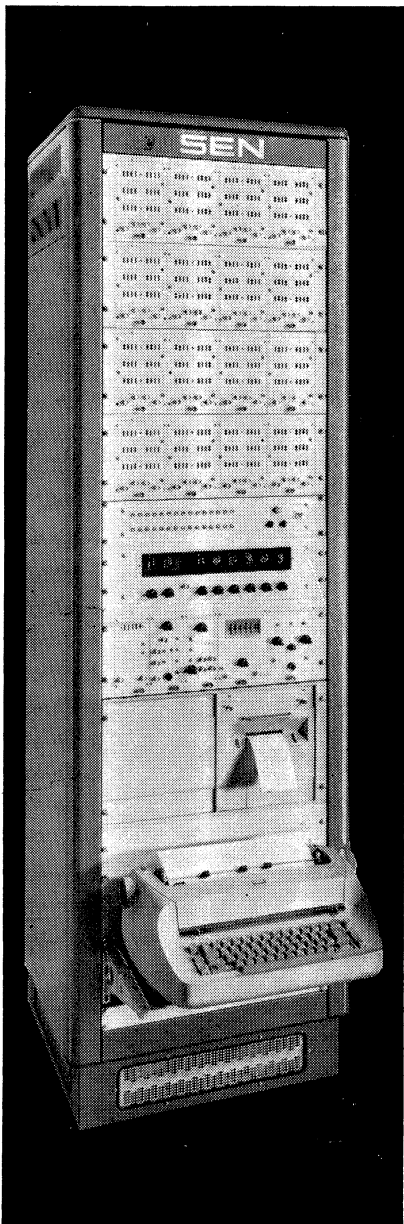
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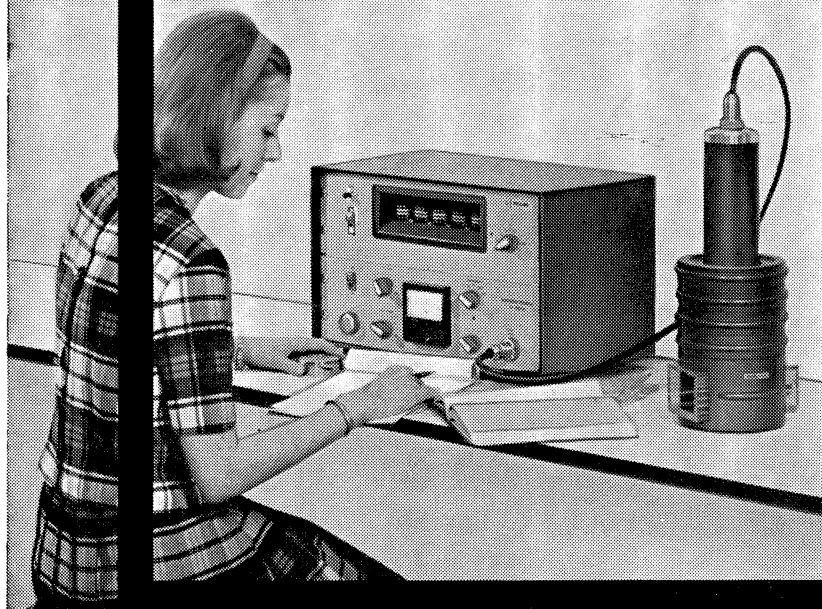


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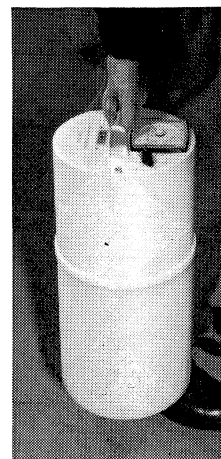


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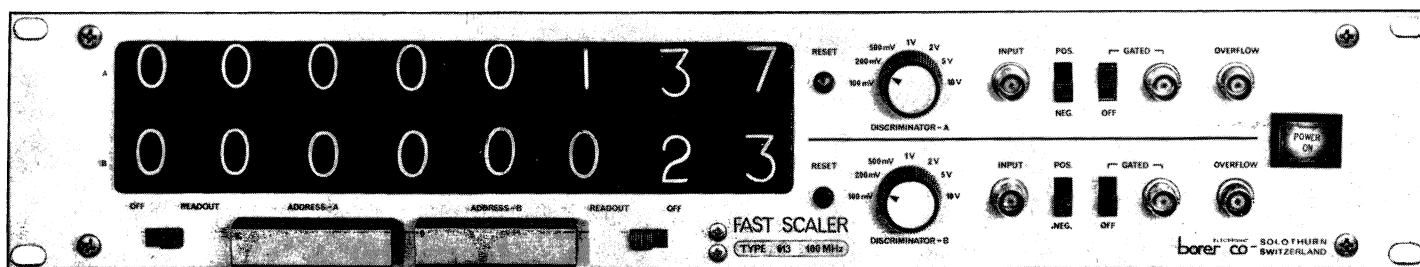
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