

CERN Courier Archive: 1974

A LOOK BACK TO CERN COURIER VOL. 14, OCTOBER 1974, COMPILED BY PEGGIE RIMMER

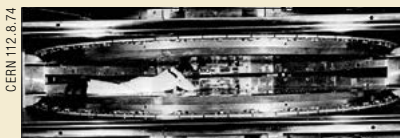
CERN NEWS

Synchro-cyclotron has protons again

On 1 October the refurbished CERN synchro-cyclotron (now known as SC2) accelerated protons to the full energy of 600 MeV in a very successful start to its recommissioning.

The SC was the first of CERN's machines, giving protons in 1957. By the early 1970s it had been overtaken, in terms of beam intensity, by several comparable machines in its energy range and had to confront the advent of the "meson factories" at Los Alamos, Vancouver and Villigen. To revitalize the experimental programme, by making higher intensity and better quality beams available, a series of improvements have been carried out during the past year.

Reassembly was completed in mid-September and acceleration tests began on the night of 29–30 September. Very quickly, protons were detected out to a radius



Final touches to the central region of the revamped 600 MeV synchro-cyclotron before it was buttoned up for the start of commissioning.

of 30 cm where a thermocouple probe was located. The central region of the machine was behaving as predicted. On 1 October, it was decided to go for acceleration out to the full machine radius, less well-known territory. However, the beam spiralled out without any problem.

There has, of course, to be something which did not go as expected. The probe was

pushed into the machine on a long cantilever arm so that it sat in the median plane at 30 cm radius. As it was withdrawn to greater radii, the signal disappeared despite two other detectors and the Dee voltage saying that all was well. This led to much head scratching.

The force of gravity is not highly regarded in high-energy physics labs because it seems to have very little effect on individual particles. It does, however, have considerable effect on a long arm close to Mother Earth. The arm bowed over to put the probe in the correct position at 30 cm radius but as it was shortened it lifted above the median plane and was no longer hit by protons. Alert men [*sic*] draw information even from the unexpected – the absence of the signal at larger radii said that the vertical spread of the beam was less than 1 cm, as had been hoped!

● Compiled from texts on pp334–335.

LOS ALAMOS

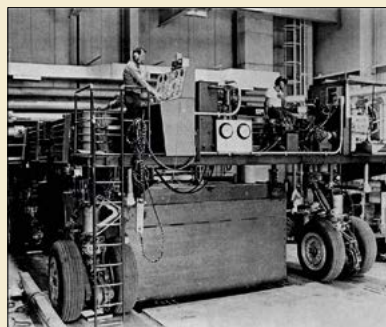
LAMPF preparing for second assault

In a similar way to Fermilab having the first crack at a new energy range for high-energy physics experiments, the Los Alamos Meson Physics Facility, LAMPF, has the first crack at a new range of nuclear physics experiments.

The 800 MeV proton linear accelerator achieved full energy in June 1972, with the predominant advantage of intense particle beams for the study of nuclear phenomena. It has recently been joined as a "meson factory" by the cyclotron of the Swiss Institute for Nuclear Research, and the Canadian TRIUMF cyclotron is not far behind. Now LAMPF is preparing for a "great shutdown" in which the accelerator will be tidied up ready for a second assault with still higher intensities. The shutdown is scheduled to begin at the end of this year with the experimental programme opening up again around June 1975.

The machine's major features are: twin pre-injectors so that protons and negative hydrogen ions can be accelerated at the same time, a 100 MeV Alvarez type linac, subsequent acceleration to 800 MeV in a Los Alamos-invented side coupled cavity linac, and a switchyard dividing accelerated particles into a variety of experimental areas.

The main problems holding back the climb



to higher currents are imprecise machine alignment, difficulties in achieving optimum settings for the r.f. amplitude and phase,

Servicing heavily irradiated components is a major problem at meson factories. LAMPF's answer is Merrimac. It rolls across the top of concrete shielding to the "hot" zone which needs attention, carrying a 200 tonne shielded box on its gantry. The box is lowered hydraulically through the opened up shielding and work can be carried out using a manipulator and a 5 tonne hoist. Aircraft buffs may recognize the B52 undercarriage.

and the inability, as yet, to handle much higher intensities in the experimental areas. They are all to receive attention during the great shutdown.

● Compiled from texts on pp349–351.

Compiler's Note



Los Alamos became an Historic Site of the American Physical Society (APS) in July 2013, one in a series of APS scientific heritage sites launched in 2004. In 2011, inspired by this initiative, the European Physical Society (EPS) followed suit and the CERN Synchrocyclotron, now a feature on CERN's visitor circuits, was declared an EPS Historic Site in June 2014.

The first joint APS–EPS site, dedicated in September 2015, was the Einsteinhaus, the apartment in Bern, Switzerland, where Einstein lived from 1903 to 1905, and in November 2016 the Institute for Advanced Study in Princeton, at which Einstein was a faculty member, became the first joint site in the US.

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The Federal Ministry of Education and Research (BMBF), together with CERN, will host the 13th Industrial Exhibition “Germany at CERN” in Building 500. Some 35 German companies will present their latest products, often specifically developed for CERN, along with their services to the scientists and buyers of CERN. Visitors can establish contacts and get informed about future purchasing opportunities.

Detailed information is available at:

home.cern/cern-people/announcements



DualTimer

DT993

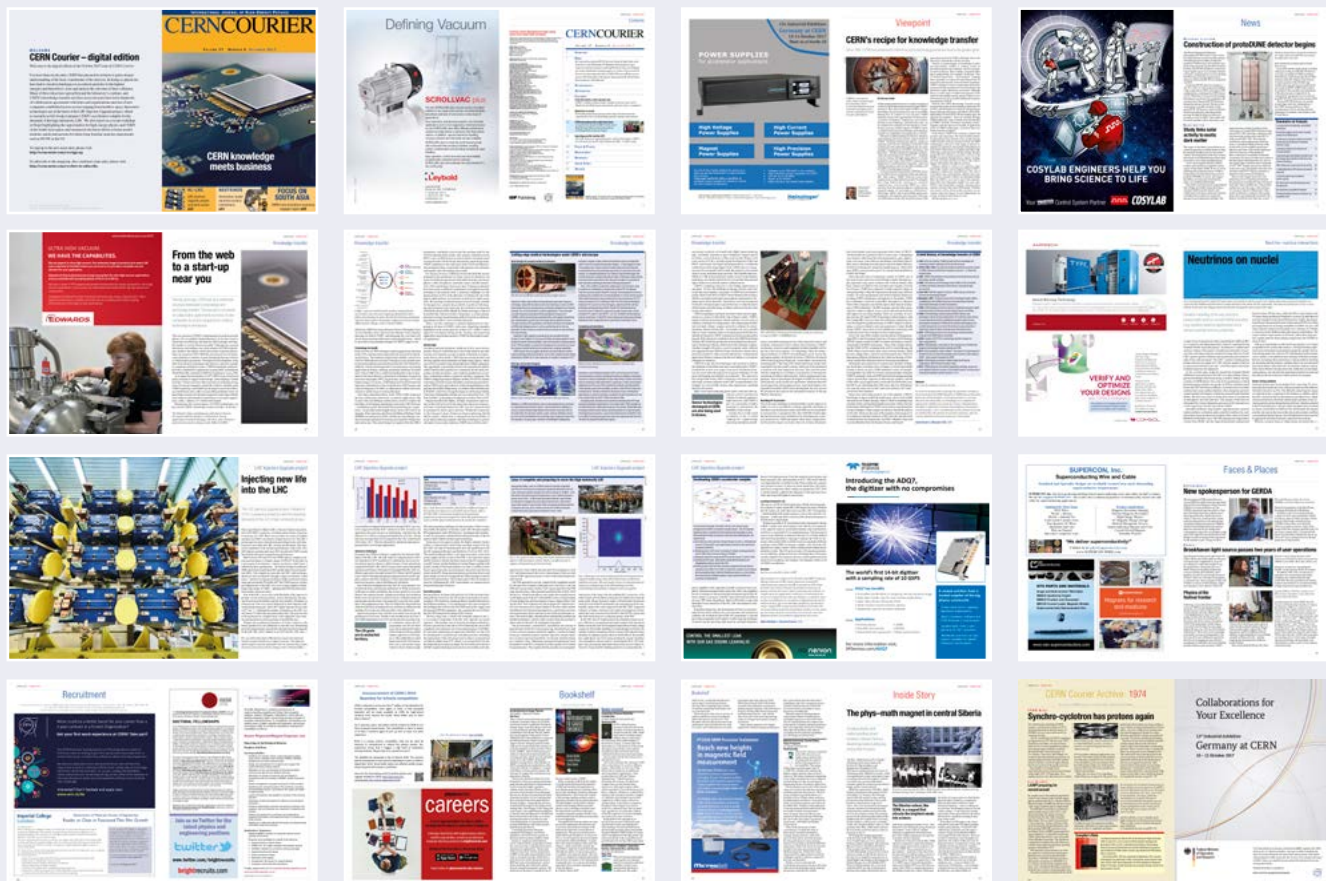
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CERN COURIER

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WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the October 2017 issue of *CERN Courier*.

For more than six decades, CERN has pursued its mission to gain a deeper understanding of the basic constituents of the universe. In doing so, physicists have had to invent technologies to accelerate particles to the highest energies and then detect, store and analyse the outcome of their collisions. Many of these ideas have spread beyond the laboratory's confines, and CERN's knowledge-transfer activities in recent years have led to hundreds of collaboration agreements with firms and organisations and tens of new companies established across sectors ranging from health to space. Innovative technologies are at the heart of the LHC Injectors Upgrade project, which is currently in full swing to prepare CERN's accelerator complex for the demands of the high-luminosity LHC. We also report on a recent workshop in Nepal highlighting the opportunities for high-energy physics and CERN in the South Asia region, and summarise the latest efforts to better model neutrino-nuclei interactions for future long-baseline neutrino experiments such as DUNE in the US.

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