

CERN Courier Archive: 1975

A LOOK BACK TO CERN COURIER VOL. 15, OCTOBER 1975, COMPILED BY PEGGIE RIMMER

CERN NEWS

Iron in the neutrino line



Inside the tunnel that will house the iron shielding for the neutrino beam-line. The photograph shows a 14-ton disc which has been carried to its position in the tunnel by a trolley on rails.

Work has started on the installation of shielding designed to filter out all particles other than neutrinos en route from the 400 GeV proton synchrotron to the 3.7 m European Bubble Chamber, BEBC, ready for the neutrino experiments which will be an important part of the SPS programme.

To produce neutrinos, protons from the SPS are directed onto a target near the accelerator ring, producing pions and kaons with an average energy around 40 GeV/c. A magnet will concentrate these particles into a 13 mrad cone and a second magnet, 90 m downstream, will further focus the beam. The pions and kaons will then enter a vacuum tube 1.20 m in diameter and 300 m long, in which most of them will decay, giving muons and neutrinos.

Once the neutrinos have been produced, all other particles, in particular the muons, have to be eliminated from the beam. This will be the task of shielding, comprising 170 m of iron (followed by 180 m of earth). Calculations show that this will reduce the muon flux from 10^{13} to 10 in each machine pulse.

The shielding is being erected in an underground tunnel with a 4% slope, since the neutrino beam climbs up from the underground SPS to BEBC at ground level. It consists of 425 iron discs, each 2.50 m in diameter, 40 cm thick and weighing about 14 tons. They are lowered down a shaft and run on a rail-mounted trolley to their desired location, at a rate of 10 per day. Positioning of the shielding will be complete by the end of the year.

● Compiled from text on p314.

Further contacts with China



In conversation at the National People's Congress Palace, left to right, Mme Charpak, Mrs Weisskopf, G Charpak, Mrs Jentschke, V F Weisskopf, W K Jentschke, Wu Lein-Fu, two Chinese interpreters, L Van Hove and Mme Van Hove.

In the summer of 1973 a delegation of physicists from the People's Republic of China, headed by Professor Chang Wen-Yu, made an extensive tour of high-energy physics laboratories in the USA, concluding with a week's visit to CERN.

In September 1975 there was a return visit by W K Jentschke (Director General of Laboratory I), G Charpak, L Van Hove and V F Weisskopf from CERN. The invitation for this visit proved to be much more than reciprocal hospitality. Discussions were wide-ranging and thorough, carrying contacts between the scientific communities a stage further.

The tour of the CERN group centred on Peking and Shanghai. The visitors saw work on controlled thermonuclear fusion at the Institute of Physics at Peking (involving laser technology and a mini-Tokamak), on computers at the University of Peking, on lasers, thin films and integrated circuits at Tsing Hua University, on reactor technology at the Institute of Atomic Energy in Peking, on nuclear physics involving the use of a cyclotron (including isotope production) at the Institute of Atomic Energy Shanghai, ...

Some very fine work was seen in instrumentation. This included integrated circuits, many electronic instruments, and multiwire chambers (a follow-up from a chamber passed by Charpak to the Chinese delegation in 1973).

Despite their achievements, the hosts insisted that China is a "developing" country in need of scientific and technical input from "developed" countries. However, they also insist that it must be the Chinese people themselves that do the work and apply the knowledge.

The highlight of the tour was a meeting with Wu Lein-Fu, Vice-Chairman of the Standing Committee of the National People's Congress. He said that China wishes to see contacts and exchanges with high energy physicists extended, particularly of CERN, and again stressed the readiness of China to learn from experience elsewhere. Concerning the exchange of people, we can finish with a typical Chinese proverb quoted by Wu Lein-fu – "One eye is better than a hundred ears".

● Compiled from text on p303.

Compiler's note



Whether or not China now considers itself to be developed or developing, the wishes expressed by Vice-Chairman Wu have already been amply fulfilled. By 2017, CERN had 12,236 users, 4322 coming from non-member states. Of these, 456 were from China, behind the US with 1143 and Russia with 1095. Between the years 2013–2017, the participation of the US and Russia in CERN's programmes and projects increased by 21% and 14% respectively, while that of China increased by 78%.

Looking to the future, China has recently completed a conceptual design report for a 100 km-circumference ring, initially to house a circular electron-positron collider, CEPC, and later a super proton-proton collider, SppC (CERN Courier June 2018 p21). To be built in China, this is foreseen as a facility for worldwide collaboration.



RE-EARTH-BASED HIGH TEMPERATURE SUPERCONDUCTORS

OUTSTANDING PERFORMANCE FOR DEMANDING APPLICATIONS

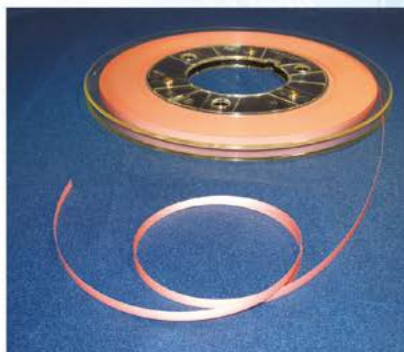
SUPERIOR IN-FIELD CRITICAL CURRENT

EXCELLENT MECHANICAL PROPERTIES

EXTREMELY UNIFORM CRITICAL CURRENT

MANUFACTURED USING OPTIMISED IBAD AND PLD PROCESSES

VOLUME PRODUCTION AVAILABLE NOW.



CONTACT
Japan and other areas
Phone: +81-43-484-3048
Email: ask-sc@jp.fujikura.com

CONTACT
Europe
Phone: +44 208 240 2011
Email: superconductors@fujikura.co.uk

Website: www.fujikura.com/solutions/superconductingwire

Visit us at the ASC Conference, stand number 32

CAEN, your highway to the Silicon Photomultiplier Land



Cosmic Rays Physics
HEP Calorimetry
Medical Imaging-PET
Photonics
Beta Spectroscopy
Radioactivity Monitoring
Educational Labs



Front-end



Power Supplies



Digitizers



Monitoring Systems



Educational



WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the October 2018 issue of *CERN Courier*.

Of all the particle colliders that have been built over the past half-century or so, one type stands out for its rarity: the electron–hadron collider. The only machine so far in this class is the 6.3 km-circumference electron–proton collider HERA, which operated at DESY in Germany between 1992 and 2007. Together with its four large detectors (H1, ZEUS, HERMES and HERA-B), HERA transformed our view of proton structure and led to major insights into other areas of quantum chromodynamics. This summer, the US Academy of Sciences positively endorsed a proposal for a high-energy, high-luminosity electron–ion collider that would go even further than HERA in precisely mapping the internal structure of nuclear matter and determining how nucleon properties emerge from quark and gluon interactions. Two pre-conceptual designs have evolved at Brookhaven National Laboratory and Jefferson Laboratory, setting in motion the process towards approval and eventual construction. Other topics featured in this issue include: the African Institute for Mathematical Sciences; a background-free dark-matter experiment called DarkSide; proton-driven plasma-wakefield acceleration at CERN; Hyper-Kamiokande’s green light for construction; and the 50th anniversary of the European Physical Society, whose role in bridging political divides is more important than ever.

To sign up to the new-issue alert, please visit:
cerncourier.com/cws/sign-up.

To subscribe to the magazine, the e-mail new-issue alert, please visit:
cerncourier.com/cws/how-to-subscribe.