

CERN Courier Archive: 1973

A LOOK BACK TO CERN COURIER VOL. 13, NOVEMBER 1973, COMPILED BY PEGGIE RIMMER

CERN NEWS

Computers

After a running-in period which was expected to last about a year, the new central computer, the CDC 7600, can now handle more work than all the other computers at CERN put together.

A sector now giving cause for concern is that of magnetic tapes. Difficulties arise because they are so numerous and differ in format. The large quantity poses problems in machine operation, because the mass of information they transmit can saturate the information transfer channels. The diversity of format creates software problems, since each type has to be processed in a different way.



However, a solution seems to be emerging. Magnetic discs will help to deal with the tape bottleneck. At the end of October a

This is just part of the stock of 40,000 tapes which has been moved to CERN's new computer building. It illustrates the problem of data storage, one of the present headaches in high-energy physics.

third large capacity disc was connected to the 7600. It will be used to store the data from several tapes in frequent use and will considerably lighten the operators' task. Furthermore, the load on the channel linking the tape units and central memory is considerably reduced.

● Compiled from texts on p333.

DESY

Meeting on Storage Rings

In Spring 1974 the first experiments are scheduled to start at DORIS (Doppel-Ring-Speicher), the electron-positron double storage ring at DESY. While the last preparations for the 3 GeV storage rings were still in progress, some of its initiators discussed further possibilities for developing the machine's physics potential. They concluded that the amount of money needed for a normal high-energy physics experiment would be sufficient to add the ability to carry out electron-proton collisions within the rings.

The original plans were to have a 1 GeV proton booster but it has now been decided to do the main acceleration of the protons in the DESY electron synchrotron. Protons will be injected into the synchrotron at 4 MeV by a Van de Graaff accelerator. In one second about 10^{11} protons will be accelerated to an energy of 2 to 4.5 GeV and stacked in the storage ring. It should be possible to accumulate up to 3×10^{13} protons. At the two intersecting regions they will collide with 5×10^{12} electrons circulating in the second storage ring, resulting in luminosities as high as 10^{31} per cm^2 per s.

This will be an excellent opportunity to study machine physics problems which will be important for the next generation of e-p storage rings. Given the importance of these topics, from 8 to 12 October experts were invited to DESY from all of the laboratories in Europe and the United States where storage rings are being planned, are under construction, or are already operating.

The meeting confirmed that



Some well-known faces from the accelerator world, brought together by the DESY meeting (clockwise from top left): Gustav Weber (DESY), Wolfgang Panofsky (SLAC), Bjørn Wiik (DESY), Kjell Johnsen (CERN), Herwig Schopper (CERN), Burton Richter (SLAC), and Kurt Hübner (CERN).

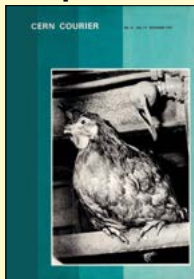
multi-laboratory discussions on the different machine problems are a necessary and stimulating exercise to exchange information and to check the practicability of future projects. The local stimulation at DESY may



have been responsible, a few days after the meeting, for bringing the first electrons and positrons from the DESY synchrotron to the injection points of DORIS.

● Compiled from texts on pp314–342.

Compiler's Note



archiving medium is still magtape. It is inexpensive and durable, and one of today's compact cartridges can hold up to 5 TB, exceeding CERN's 1970s data headache.

Each nine-track magtape used for data storage in the 1970s could hold about 100 MB, so CERN's 40,000-tape headache measured around 4 on the TB (10^{12} bytes) scale. Today's LHC experiments produce more than 3 GB of data per second, creating that headache every 20 minutes. Together, they generate more than 30 PB (30×10^{15} bytes) per year, which are distributed to 170 computing centres in 42 countries connected by the Worldwide LHC Computing Grid. The centres are ranked in tiers, from 0 (largest) to 4 (smallest). The two Tier-0 centres, the CERN Data Centre in Meyrin and the Wigner Data Centre in Budapest, are responsible for the long-term safekeeping of the first copy of the raw data. While all centres store a fraction of the data on disc for fast access during analysis, the

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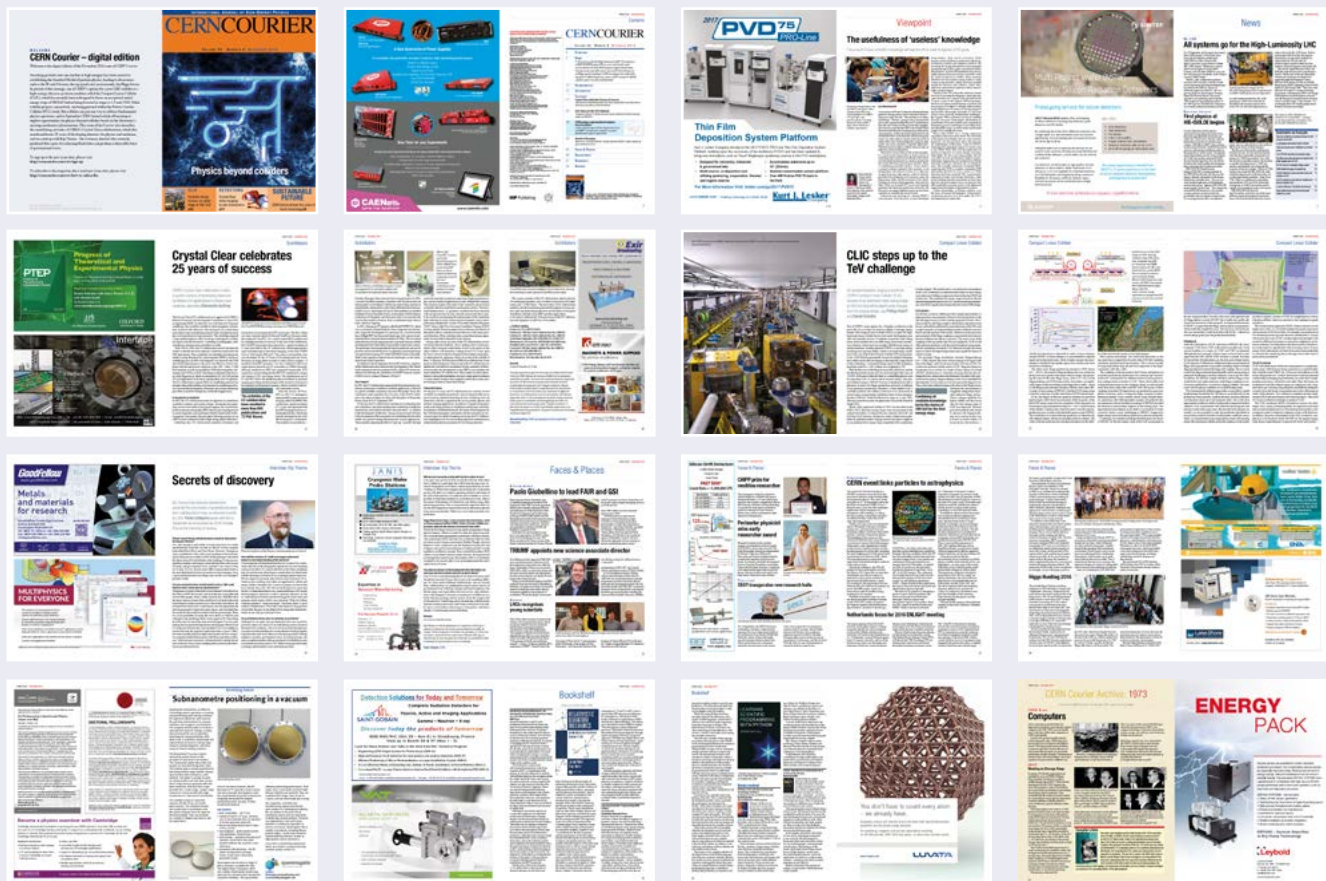
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Small details... Great differences



CERN COURIER

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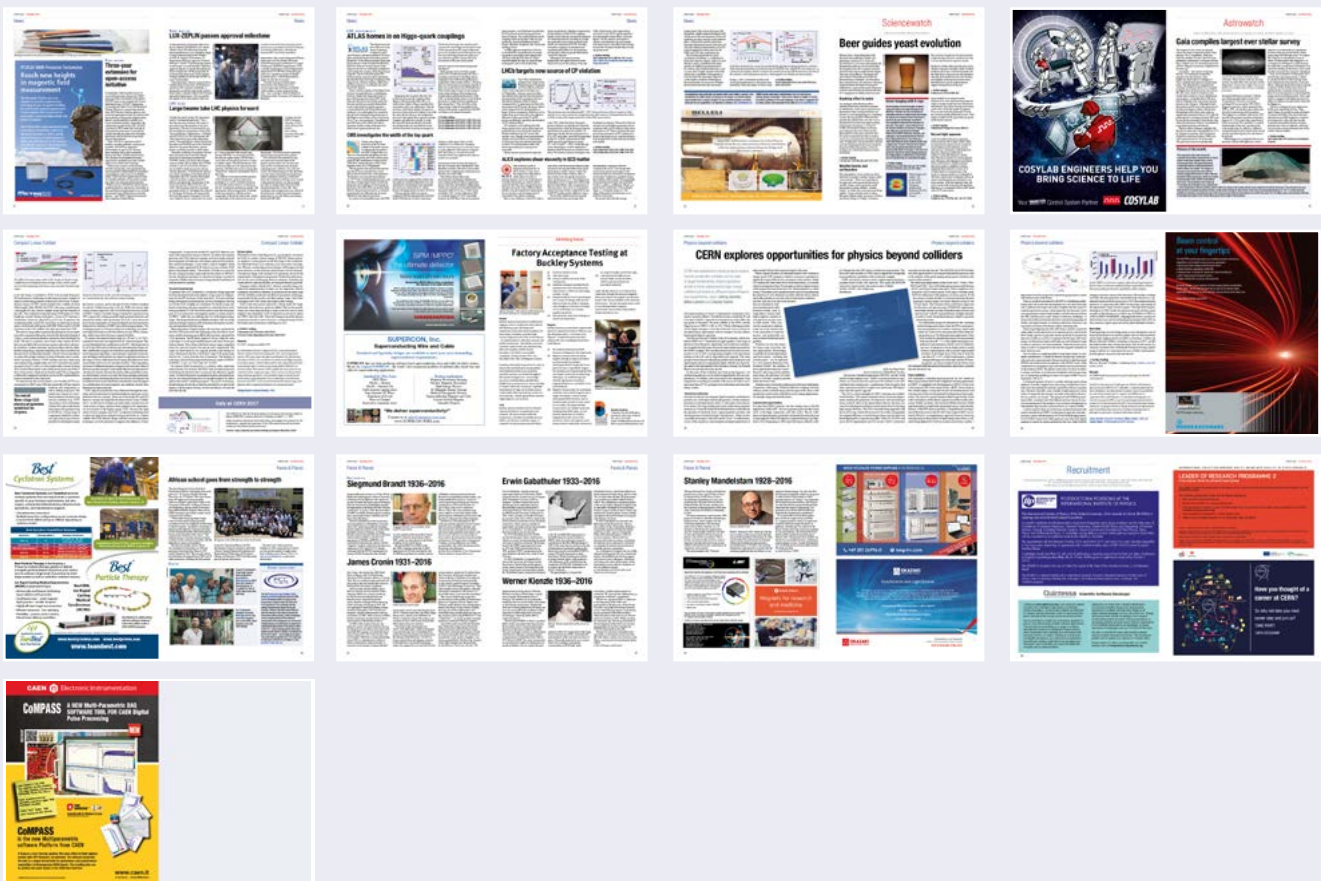
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WELCOME

CERN Courier – digital edition

Welcome to the digital edition of the November 2016 issue of *CERN Courier*.

Smashing particles into one another at high energies has been crucial in establishing the Standard Model of particle physics, leading to discoveries such as the W and Z bosons, the top quark and, most recently, the Higgs boson. In pursuit of this strategy, one of CERN's options for a post-LHC collider is a high-energy electron–positron machine called the Compact Linear Collider (CLIC), which has recently been redesigned to focus on an optimal initial energy stage of 380 GeV before being boosted in stages to 1.5 and 3 TeV. Other collider projects, meanwhile, are being pursued within the Future Circular Collider (FCC) study. But colliders are just one way to address fundamental physics questions, and in September CERN hosted a kick-off meeting to explore opportunities for physics beyond colliders based on the laboratory's existing accelerator infrastructure. This issue of the *Courier* also describes the scintillating activities of CERN's Crystal Clear collaboration, which this month celebrates 25 years of developing detectors for physics and medicine, and we catch up with Kip Thorne – the visionary theorist who correctly predicted that a pair of coalescing black holes can produce a detectable burst of gravitational waves.

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