

uses the photosensitive gas TMAE in a low pressure wire chamber which amplifies and collects the photoelectrons produced by the fast ultra-violet light.

This type of readout offers many advantages over phototubes. First, TMAE is totally blind to the slow component and only picks up the fast light output. Second, low pressure wire chambers are very fast and work well at high rates. In addition, they are essentially blind to charged particles which can act as a source of background and lead to poorer energy resolution. Finally, the wire chamber readout makes for easy segmentation, giving tracking capability, and will work inside a magnetic field.

This technique has undergone considerable development in recent years. A Brookhaven group was mainly interested in using a detector of this kind as photon veto in a high intensity rare kaon decay ex-

periment and developed a detector using large (15 cm long) crystals read out with cathode pads. Fast electronics and pulse shaping gave an output pulse from the wire chamber with a baseline width of 20 ns and rates up to  $10^7$  Hz per readout element. Even narrower pulses, as short as 10 ns, should be possible at higher energies.

At CERN, a barium fluoride and TMAE detector with good longitudinal and transverse segmentation has been tested with electrons at energies up to 10 GeV. It achieved good energy (1.5 per cent), time (0.5 nanosecond) and position (few millimetres) resolution. The next step is to build a large detector using a few thousand crystals and study its performance in a real physics environment (see page 16).

TMAE is to be used in several large Ring Imaging Cherenkov (RICH) detectors in a number of new experiments, and increased

understanding of its basic properties could pay dividends.

Could there be better materials than barium fluoride and TMAE for fast calorimetry? So far barium fluoride is unique for its fast light emission and radiation hardness, and is the only scintillator emitting ultra-violet light energetic enough to photoionize TMAE. However it would not be surprising if other crystals showed similar properties. Work has really just begun toward improving our understanding of the underlying physical mechanisms for scintillation and radiation damage in these materials.

Other substances could also be better than TMAE with barium fluoride or with other crystals. Research in both areas will lead to new and better detectors for future experiments.

*From Craig Woody*

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## People and things

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### *Isidor Isaac Rabi 1898-1988*

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*Isidor Isaac Rabi died in January. In addition to his significant scientific contributions, he was an eloquent communicator of the values of science and played a leading role in the creation of major scientific Laboratories.*

*Born in Galicia and educated in America, his postgraduate studies took him back to Europe, where he worked with Bohr, Pauli and Heisenberg. Following this period*

*came his best known scientific contribution – the invention of the beam resonance method for measuring the magnetic properties of nuclei. This led to greatly improved precision and opened up a deeper interpretation of nuclear behaviour. Rabi was awarded the Nobel Prize in 1944 for this work.*

*After the war he was among the first to realize the need for larger collaborations in nuclear and particle physics. He promoted the establishment of the Brookhaven National Laboratory in the US and,*

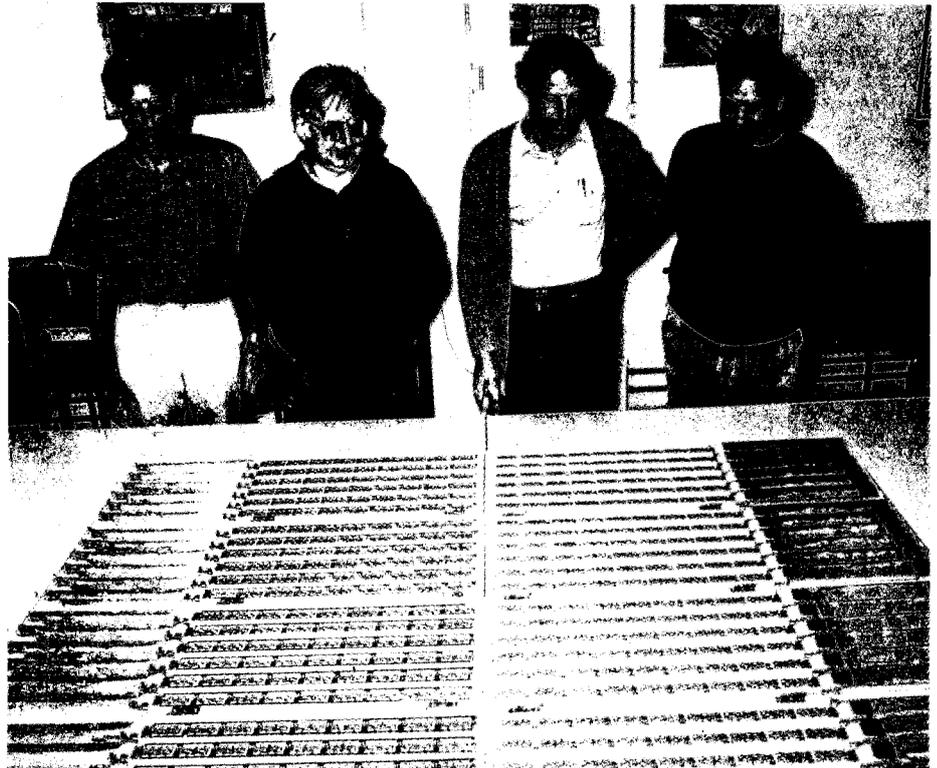
*from this experience, went on to play a seminal role in the creation of CERN.*

*At the 5th General Conference of UNESCO in Florence in June 1950, Rabi put forward a resolution which gained unanimous support. It authorized the UNESCO Director General 'to assist and encourage the formation of regional centres and laboratories in order to increase and make more fruitful the international collaboration in the search for new knowledge in fields where the effort of any one country*

The revamped UA2 detector performed creditably in the proton-antiproton collider run at CERN at the end of last year. The detector was redesigned to exploit the increased antiproton levels expected from the new ACOL antiproton source, including the AC Antiproton Collector ring. One feature is the square metre of silicon pads wrapped inside the inner detector. Admiring the unwrapped silicon are (left to right) George Sanier, Bogdan Lisowski, Claus Gossling and Trivan Pal.

(Photo CERN X164.8.87)

Isidor Isaac Rabi, 1898-1988.



in the region is insufficient for the task.'

The importance of this resolution in the evolution of CERN was well appreciated by Europe's scientists. When CERN formally came into being several years later, a letter to Rabi from representatives of European States said, 'We have just signed the Agreement which constitutes the official birth of the project you fathered in Florence. Mother and child are doing well, and the doctors send you their greetings.'

It was because of this vital contribution to European science that Rabi was one of the invited speakers at CERN's 30th anniversary ceremony in 1984.

Another Rabi incident which has become part of science history is his legendary remark 'who ever ordered that?' on hearing of the discovery of the muon.

CERN Research Director Pierre Darriulat (who is also the Chairman of the CERN Courier Advisory Panel) receives the degree of doctor honoris causa of the University of Pavia from the rector. Looking on (left) is G. Goggi of Pavia and CERN.



On the bonny banks of the River Aare in Switzerland. In the foreground is what used to be called the Eidgenössisches Institut für Reaktorforschung (Swiss Federal Institute for Nuclear Research), with the former Schweizerisches Institut für Nuklearforschung (SIN) on the far bank. The two research centres have been amalgamated under the name Paul Scherrer Institute, in honour of the distinguished Swiss physicist Paul Scherrer (1890-1969) who signed the 1952 provisional agreement for the establishment of CERN on behalf of Switzerland. Below, Scherrer is seen (right) with Niels Bohr.

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### On people

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Cosmologists Stephen Hawking of Cambridge and Roger Penrose of Oxford receive the Wolf Prize. Their joint work twenty years ago showed the existence of gravitational singularities – black holes – in general relativity.

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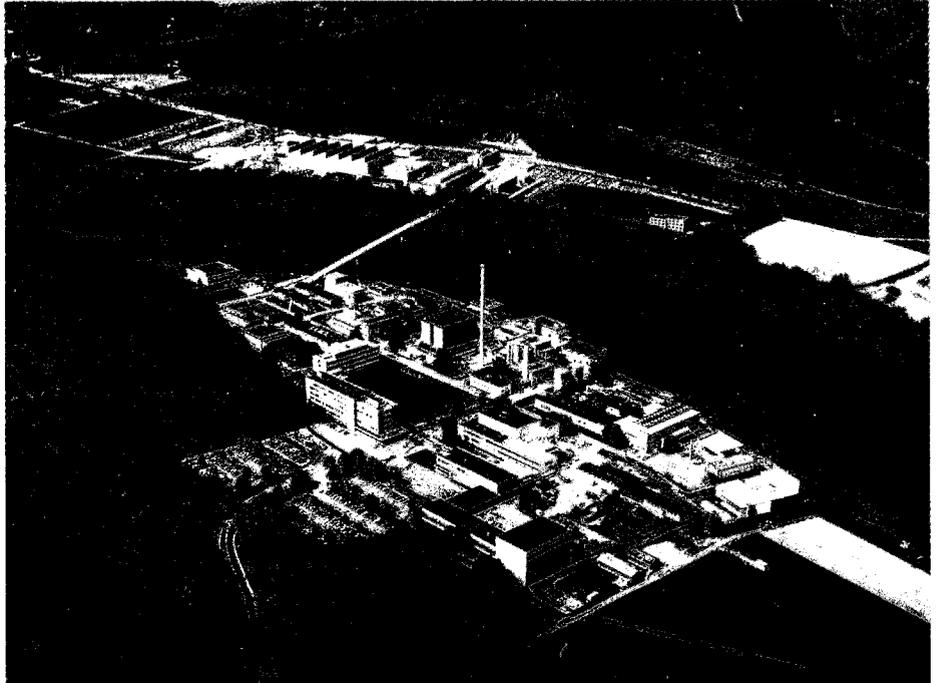
### Retirements

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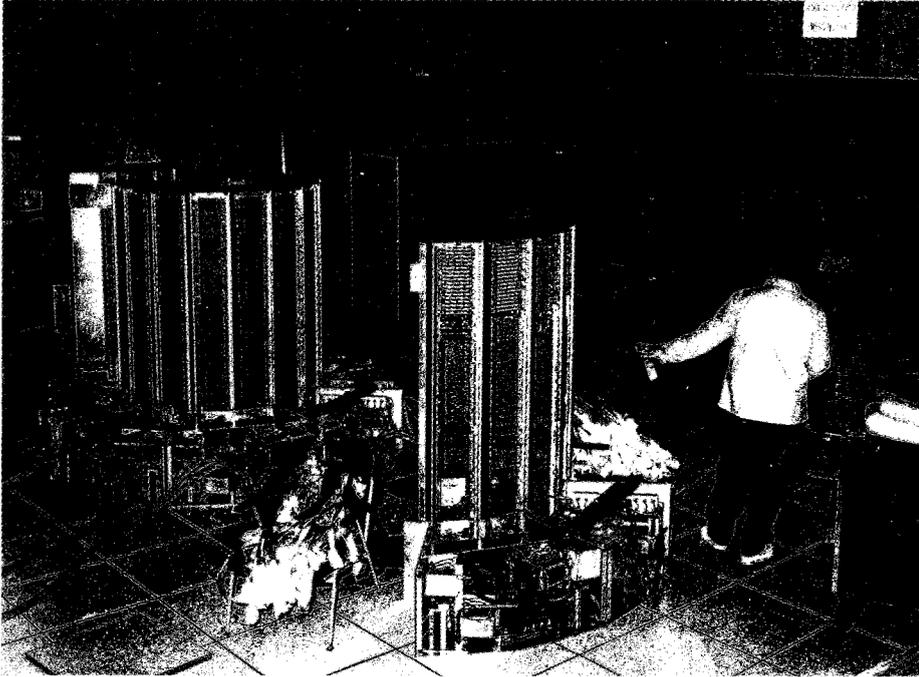
The CERN accelerator physicist who might well be called Mr. Magnets passes a retirement milestone. Lorenzo Resegotti came into the spotlight as the leader of the group that built the remarkable magnets of the Intersecting Storage Rings. Never before had over 400 magnets been strung together to such a peak of perfection, paving the way for the ISR's success as the world's first proton-proton collider.

He also supervised the design and construction of superconducting quadrupoles to squeeze the colliding ISR beams, the first industry-built superconducting magnets to operate in an accelerator environment. More recently, he had the brainwave of pouring concrete around the widely spaced laminations of the magnets to bend the beams in CERN's new LEP electron-positron collider, making for substantial savings. Throughout his distinguished career, his knowledge and thoroughness have contributed substantially to CERN's acknowledged accelerator prowess.

Robert Levy-Mandel is formally retiring from CERN after sixteen years. When he arrived in the early 1970s to join the team building the



CERN's new Cray X-MP/48 supercomputer arrives.



Harwood Academic Publishers (translated from Russian) is the result of the author's numerous popular physics lectures, and describes the present state of the subject rather than its history. 'The money spent on high energy physics is like the money spent on our children: neither is the best investment for immediate financial return. Nevertheless, the world is unthinkable without children and the future of science is unthinkable without particle physics', writes Okun.

Another useful new Harwood book, this time in the Contemporary Concepts in Physics series, is 'Gauge Fields and Strings' by A.M. Polyakov of Moscow's Landau Institute for Theoretical Physics. In many cases, the book goes into areas which have never been completely understood, this in the hope to stimulate deeper study.

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#### Meetings

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The third conference on Intersections between Particle and Nuclear Physics will be held in Rockport, Maine, US, from 14-19 May. As with previous meetings in the series, it will stress cooperation between particle and nuclear physics in science, technology and facilities. Further information from Terry Murphy, TRIUMF, 4004 Wesbrook Mall, Vancouver, BC, Canada V6T 2A3.

SPS Super Proton Synchrotron, he was already well known in the field of accelerators, having played a key role at Saclay on the Saturne synchrotron. He oversaw SPS civil engineering (ranging from tunnel construction to buildings, electricity supplies and water cooling). There followed a period in the CERN Directorate and he has made important contributions to getting LEP off the ground with the preparation of the huge environmental impact study and in handling relations between CERN and its host States, France and Switzerland.

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#### Books

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'Alpha, beta, gamma.....Z, A Primer in Particle Physics' by L.B. Okun of Moscow's Institute of Theoretical and Experimental Physics from

In January, a series of lectures at CERN by Carl-Friedrich von Weizsäcker on the philosophy of science and the meaning of quantum theory drew large audiences.

The 7th Topical Workshop on Proton-Antiproton Collider Physics will be held at Fermilab from 20-24 June. Further information from Phyllis Hale, Fermilab Users Office, PO Box 500, MS 103, Batavia, Illinois 60510. Telex 910-230-3233, fax 312-840-4343, earn/bitnet PBARP7 at FNAL.

