

several Russian institutes, notably the Moscow Institute of Nuclear Research and the universities of Moscow, Irkutsk and Tomsk, as well as DESY-IfH in Zeuthen, Germany, and KFKI Budapest.

In neutrino studies, detector size is all important. The newest entry into the underwater field is NESTOR (November 1992, page 16), where a major array will be deployed by an international team (Athens/Moscow/Florence) off historic Pylos, S-W Greece.

They also plan an atmospheric neutrino oscillation experiment, and enjoy the fortunate geographic coincidence that CERN, the Italian Gran Sasso underground Laboratory and Pylos lie in a straight line! NESTOR's location on the other side of the globe to DUMAND will make for complementary sky coverage.

With 1994 seeing deployment of detectors at all three sites, next year might turn out to be the turn of the tide for deep underwater neutrino detectors.

Not strictly underwater is AMANDA, a project to locate detectors in the deep clear ice at the South Pole, where existing infrastructure can handle the drilling, although the diameter of the shafts might limit the size of the photomultipliers used.

Surface arrays provide another route to water-based neutrino detection, where a number of proposals are being groomed.

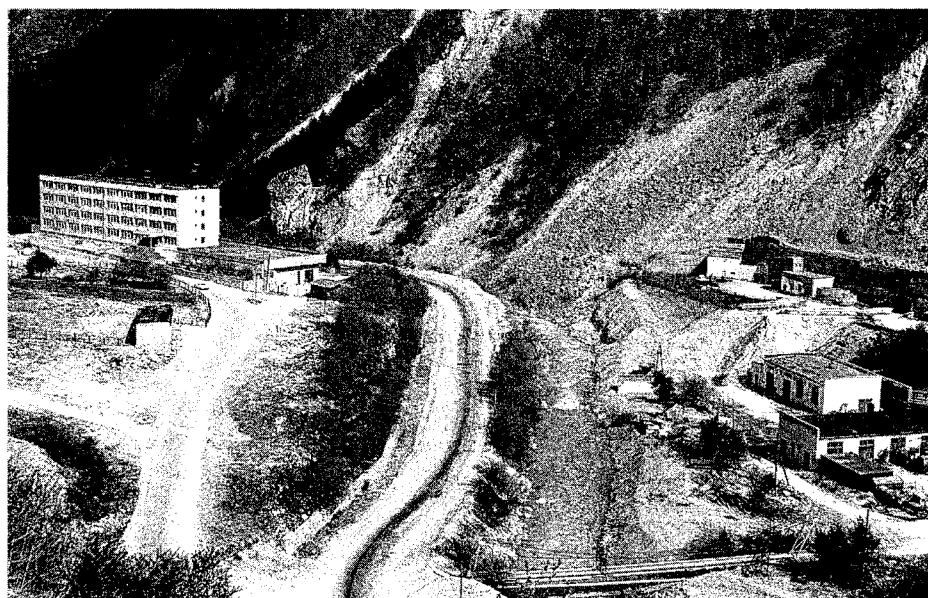
UNDERGROUND

Cossetted deep underground, sheltered from cosmic ray noise, has always been a favourite haunt of neutrino physicists. Already in the 1930s, significant limits were obtained by taking a geiger counter down in Holborn 'tube' station, one of the deepest in London's underground system.

Since then, neutrino physicists have popped up in many unlikely places - gold mines, salt mines, and road tunnels deep under mountain chains. Two such locations - the IMB (Irvine/Michigan/Brookhaven) detector 600 metres below ground in an Ohio salt mine, and the Kamiokande apparatus 1000m underground 300 km west of Tokyo - picked up neutrinos on 23 February 1987 from the famous 1987A supernova.

Purpose-built underground laboratories have made life easier, notably the Italian Gran Sasso Laboratory near Rome, 1.4 kilometres below the surface, and the Russian Baksan Neutrino Observatory under Mount Andyrchi in the Caucasus range. Gran Sasso houses ICARUS (April, page 15), Galléx, Borexino, Macro and the LVD Large Volume Detector, while Baksan is the home of the SAGE gallium-based solar neutrino experiment.

Elsewhere, important ongoing underground neutrino experiments include Soudan II in the US (April, page 16), the Canadian Sudbury Neutrino Observatory with its heavy water target (January 1990, page 23), and Superkamiokande in Japan (May 1991, page 8).



The Baksan Gorge in the Caucasus mountains, Russia. On the right is the entrance to the four-kilometre tunnel leading to the Baksan Neutrino Observatory experimental area, thousands of metres under Mount Andyrchi.

External correspondents

Argonne National Laboratory, (USA)
D. Ayres

Brookhaven, National Laboratory, (USA)
P. Yamin

CEBAF Laboratory, (USA)
S. Corneliusen

Cornell University, (USA)
D. G. Cassel

DESY Laboratory, (Germany)
P. Waloschek

Fermi National Accelerator Laboratory, (USA)
J. Cooper, J. Holt

GSI Darmstadt, (Germany)
G. Siegert

INFN, (Italy)
A. Pascolini

IHEP, Beijing, (China)
Qi Nading

JINR Dubna, (Russia)
B. Starchenko

KEK National Laboratory, (Japan)
S. Iwata

Lawrence Berkeley Laboratory, (USA)
B. Feinberg

Los Alamos National Laboratory, (USA)
C. Hoffmann

Novosibirsk, Institute, (Russia)
V. Balakin

Orsay Laboratory, (France)
Anne-Marie Lutz

PSI Laboratory, (Switzerland)
R. Frosch

Rutherford Appleton Laboratory, (UK)
Jacky Hutchinson

Saclay Laboratory, (France)
Elisabeth Locci

IHEP, Serpukhov, (Russia)
Yu. Ryabov

Stanford Linear Accelerator Center, (USA)
M. Riordan

Superconducting Super Collider, (USA)
N. V. Baggett

TRIUMF Laboratory, (Canada)
M. K. Craddock

Bruno Pontecorvo 1913-1993

Academician Bruno Pontecorvo, one of the outstanding physicists of our times, died on 24 September 1993 at the age of 80. He was born on 22 August 1913 in Pisa, Italy. As a student he was noticed by Enrico Fermi and admitted to his world-famous group in 1933, where he participated in the classical investigations of slow neutrons which paved the way for practical applications of nuclear power.

In 1936 Pontecorvo joined Joliot-Curie's group in Paris, again participating in research which laid a foundation for modern nuclear physics, and making significant discoveries of his own. From 1940-42 he worked in the USA, where he devised and introduced a neutron logging technique which is still used in oil prospecting. Then he worked in Canada, the UK (Harwell), and in 1950 moved to the Soviet Union, immediately joining the research at the world's then most powerful synchrocyclotron, which had just been put into operation at Dubna.

Pontecorvo had an impressive ability to generate profound ideas and show how they could be applied. From the middle 1940s he concentrated on weak interaction physics, especially neutrinos. In 1946, while still at Chalk River, he proposed the chlorine-argon method for radio-chemical detection of neutrinos which went on to become a powerful tool in the discovery and subsequent study of solar particles.

In 1947, following the discovery of the muon, he proposed the idea of a 'universal' weak interaction for electrons and muons. Ten years later, when he was in residence in the Soviet Union, came another outstanding neutrino contribution -



his idea to look for muon neutrinos. This involved using high energy accelerators to produce pions, which decay predominantly into muons and neutrinos, and so obtain an artificial beam of high energy neutrinos. This led to the classic experiment at Brookhaven by Leon Lederman, Jack Steinberger and Mel Schwartz which showed that such accelerator-produced neutrinos gave muons rather than electrons. Pontecorvo's suggestions were acknowledged when the trio received their 1988 Nobel physics prize. Later came a third major Pontecorvo neutrino suggestion, the idea of oscillations.

He was also an influential personality and teacher. For some 20 years he headed the elementary particle physics section at Moscow State University. His presence during discussions of new ideas or results created fertile ground for new research challenges. Especially significant was his fruitful contribution to the creative atmosphere and development of research fields at the Joint Institute for Nuclear Research in Dubna, where he worked, and at the

Institute of High Energy Physics in Protvino, with which he had close contact.

His outstanding ability brought international recognition. He was awarded the State Prize and the Lenin Prize, became a Corresponding Member of the USSR Academy of Sciences in 1958 and a Full Member in 1964. He was elected a foreign member of the Italian

Accademia dei Lincei.

Those who knew him were charmed by his friendliness and consideration, and impressed by his dedication to science and his clear and critical mind, and by his great tact in relations with people, his modesty and his culture.

As well as being a brilliant scientist, he was also exceptionally gifted in other spheres, from sport to writing.

He was a man with a high sense of duty who had a difficult but vivid life. Our memory will always be of a great scientist and a remarkable person.

(From a contribution by his Dubna colleagues)

Ruhr-Universität Bochum

in der Fakultät für Physik und Astronomie ist eine

Professur (C3)

für Experimentalphysik

wieder zu besetzen.

Es wird vorausgesetzt, dass sich die Stelleninhaberin oder der Stelleninhaber angemessen an der Physikausbildung von Haupt- und Nebenfachstudenten beteiligt und insbesondere die Kern- und Schwerionen-Physik vertritt. Das Forschungsgebiet soll die Kernphysik im Mittlerenergiebereich sein, insbesondere an Beschleunigern wie COSY (Jülich) und ELSA (Bonn). Erfahrungen und Experimenten an Grossgeräten sind erwünscht. An der Universität selbst stehen die Niederenergiebeschleuniger des Dynamitron Tandem Laboratoriums für Forschungszwecke zur Verfügung.

Habilitation oder gleichwertige Qualifikation werden vorausgesetzt. Bewerbungen mit Lebenslauf, Schriftenverzeichnis und Angabe der bisherigen Lehrtätigkeit werden bis zum 30. November 1993 an den Dekan der Fakultät für Physik und Astronomie der Ruhr-Universität Bochum, Postfach 10 21 48, D - 44780 Bochum, erbeten.

Die Ruhr-Universität Bochum bemüht sich um die Förderung von Frauen in Forschung und Lehre. Die Bewerbung Schwerbehinderter ist erwünscht.

UNIVERSITY OF OXFORD Department of Physics

Professorship of experimental physics

The electors intend to proceed to an election to the Professorship of Experimental Physics, with effect from 1 October 1994 or such later date as may be arranged. The stipend of the professorship is currently £34,984; a pensionable allowance (currently £6,090) will be added in respect of the duties as head of the Sub-department of Particle and Nuclear Physics for any periods during which these are assigned to the professor. Professor R.J. Cashmore has been assigned the headship until 30 September 1996. A non-stipendiary professorial fellowship at St. Catherine's College is attached to the professorship.

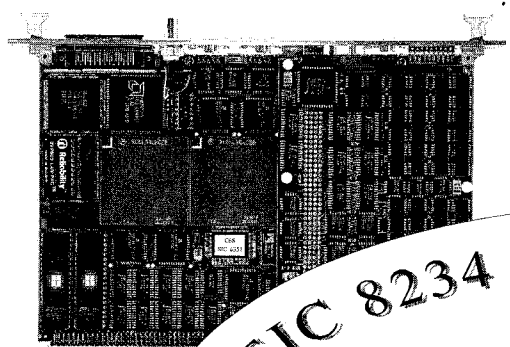
Applications (ten copies, or one from overseas candidates), naming three referees, should be received not later than 29 November 1993 by the Registrar, University Offices, Wellington Square, Oxford OX1 2JD, from whom further particulars may be obtained.

The University is an Equal Opportunity Employer.

CES PRESENTS:

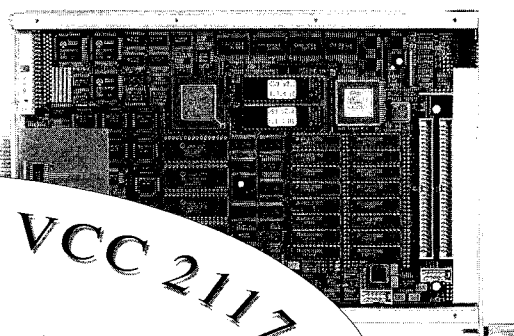
The industry standard modular system for test and data acquisition

- Fastest VME processor
- 80 Mbytes/s on VME
- Single or twin 68040 CPUs
- OS-9, Lynx-OS, VxWorks



+

- CAMAC to Ethernet / VIC interface
- Fast CAMAC cycles
- 68030 CPU
- CAMAC ESONE library & CAMAC List processor
- OS-9, Lynx-OS, VxWorks



FIC 8234

=

VCC 2117

All you need to start

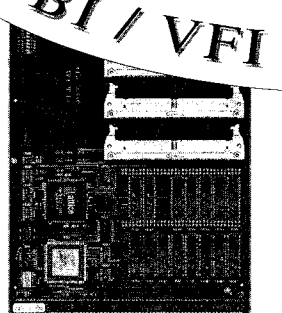
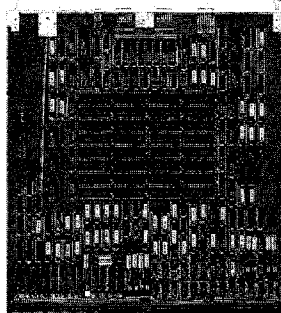
- Quickly: Turnkey system delivered as a complete package
- Safety: No hardware or software "guru" required
- At minimum cost: Cheapest combination Hardware / Software / Maintenance

+

+

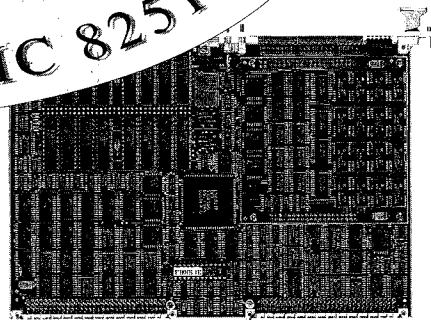
FVSBI / VFI

VIC 8251F



- FASTBUS Master/Slave + VIC Slave interface
- FASTBUS / VIC dual port memory
- FASTBUS C library

+



- Transparent VME / VME interface (VIC IEC standard, 16 crates on 100 meters)
- Synchronous or asynchronous transmission
- VME / VSB / VIC triple port data memory
- Standard or reflected memory operation

Included

- Free advice and support from CES application engineers
- Free training on **your** system in Geneva
- All required software delivered in source form with the system
- Maintenance **guaranteed** for the **lifetime** of your experiment
- ... and CES open minded tradition



At CES, tomorrow's systems are available today !

For any additional information about these products or our complete VIC, VME, CAMAC and FASTBUS lines, do not hesitate to contact us.

CES Geneva, Switzerland Tel: +41-22 792 57 45 Fax: +41-22 792 57 48 Email: ces@lancy.ces.ch
 CES.D Germany Tel: +49-60 55 4023 Fax: +49-60 55 82 210 Telex: 41 84 914 siwi-d
 CES Creative Electronic Systems SA, 70 Route du Pont-Butin, P.O. Box 107
 CH-1213 PETIT-LANCY 1 SWITZERLAND

