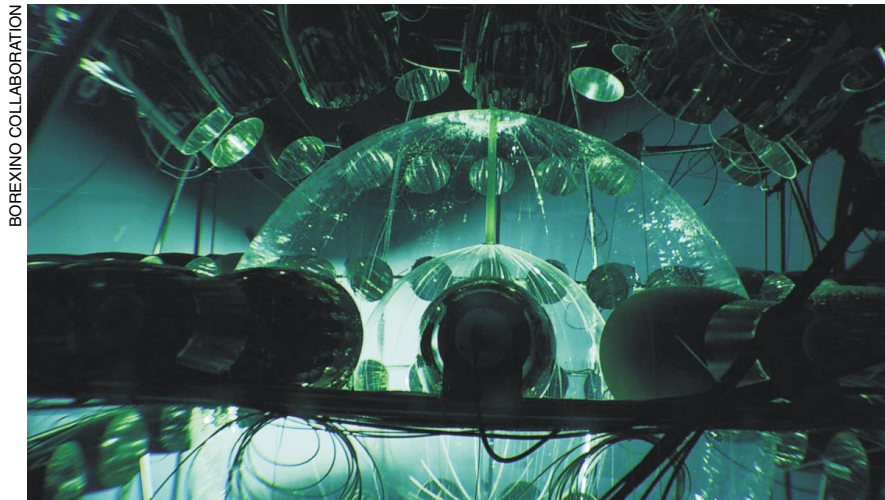




BOREXINO COLLABORATION

A Borexino test facility containing 4 tons of pseudocumene—the full solar neutrino detector will use 300 tons—leaked a small amount of the scintillator, triggering environmental concerns at Gran Sasso National Laboratory.

inspections revealed that the drainage system was not tight; a future leak could potentially contaminate drinking water.

That news prompted the court, in late May, to seal off Hall C, where the leak originated. The National Institute for Nuclear Physics (INFN), which oversees the underground lab, suspended activities involving liquids across the whole lab. “This is a caution,” says INFN President Enzo Iarocci. “We wanted to show the maximum regard for the population. We

understand that they should not have doubts about the water quality.” The ban encompasses cryogenic fluids. “We made the message very simple,” says Iarocci. “That’s why liquid helium got caught up in the issue.”

INFN’s preemptive actions, combined with petitions from scientists, apparently helped. On 16 June, the court relaxed its restriction, which had crippled not only Borexino, but other experiments in the same hall, notably the Oscillation Project with Emulsion-tracking Apparatus (OPERA), a detector that will look for oscillations in neutrinos beamed from CERN, some 730 kilometers away. Then, on 27 June, the Italian government declared the lab and the surrounding area to be in a state of “socioeconomic and environmental emergency,” a move lab officials say should speed up the investigation and repairs of the drainage system.

Meanwhile, the labwide no-liquids ban stands, but Borexino scientists have resumed setting up the experiment, which will be the first to count, in real time, low-energy neutrinos from beryllium-7 interactions in the Sun.

Research Workforce Will Weaken Without Focus on Homegrown Talent

Calling science and technology “the engines of US economic growth and national security,” the National Science Board (NSB) has released a report that says the future of the country’s research and engineering workforce is seriously imperiled by increasing global competition for science talent and by a lack of federal support for US-born science students.

It is “imperative that the federal government reassess its role in the preparation of the nation’s S&E [science and engineering] workforce,” the report says. The federal government has the “primary responsibility to lead the nation in developing and implementing a coordinated, effective response to our long-term needs for science and engineering skills . . . in ways unlikely to be addressed by market mechanisms or . . . at the state and local levels.”

The report recommends a “national policy imperative” that calls on the federal government to “step forward to ensure the adequacy of the US science and engineering workforce.” The goal of the imperative should be to “mobilize and initiate efforts that increase the number of US citizens pursuing science and engineering studies and careers.” The report was written by the

“The months of delay do tremendous damage,” says Borexino spokesman Gianpaolo Bellini of the University of Milan. Given enough time, Kamland, a reactor neutrino experiment in Japan, could match Borexino’s low background and become competitive, he says, “and it’s difficult to keep a collaboration together when an experiment is on hold.” Among the other experiments that could be affected, depending how long the ban lasts, are OPERA, the Gallium Neutrino Observatory, for which data analysis requires periodic liquid extractions, and Cuoricino, a double beta-decay and dark-matter detector.

“We know that the lab is not polluting the environment, but we have to communicate better that the lab is doing high-level scientific activities, and that it’s safe,” says Coccia. “I hope that Gran Sasso will be back to normal in a few months.”

Coccia, a gravitational physicist from the University of Rome, succeeded Alessandro Bettini of the University of Padua as director.

Toni Feder



Coccia

MARCO GALEOTI/NGS/ITALY

NSB’s task force on national workforce policies for science and engineering, chaired by chemist Joseph Miller, the executive vice president and chief technology officer of Corning Inc, Corning, New York. The NSB is the governing body of NSF.

“US employers have grown increasingly dependent on the global S&E workforce to meet needs in industry, government, and academia,” the report says. In 1999, it notes, one-third of all workers with S&E PhDs in US industry were foreign born. “Among computer scientists, the proportion was half, and among engineers it was more than half.” In the federal government, 16% of those with PhDs were foreign born, the report notes, and “in academia, about 20% of the yearly job openings for college and university faculty in S&E are being filled by permanent residents or temporary-visa holders.”

The report makes recommendations in five specific problem areas where the board feels federal action is needed to avert an “unfolding crisis.”
► Undergraduate education in S&E. The federal government must direct substantial new support to students and institutions in order to improve success in S&E study by US undergraduates, the report says. Suggested

steps include more scholarships and other financial assistance to qualified students, incentives to schools to expand their S&E programs, and more support for community colleges to increase the number of high-ability students who transfer to S&E programs at four-year schools.

► **Advanced S&E education.** Federal support for research and graduate education should respond to the economic needs of students, and promote a wider range of education options aligned with the skills the US needs, the report says. Pointing to a "general consensus that the physical sciences, engineering, and mathematics are not attracting domestic students in the numbers that will be required in the near future," the report says students are not choosing S&E for financial and lifestyle reasons. The report recommends that the federal government ensure that stipends for graduate and postdoctoral students come with benefits and be competitive with other academic fields.

► **Precollege teaching workforce for mathematics, science, and technology.** The government should act now to retain an adequate cadre of well-qualified precollege teachers in S&E, the report says. Such teachers should be paid similarly to professionals in other fields, and the government should expedite teacher certification for professional scientists who wish to become teachers.

► **US engagement in the international science and engineering workforce.** To retain a significant number of foreign researchers, the US must overcome antiterrorism-related visa problems. "In light of growing international competition for high-skilled students and professionals in S&E, the US needs visa and immigration policies that provide a clearly understood and straightforward set of options," the report says.

► **The knowledge base on the S&E workforce.** The report says the government needs better data on the current S&E workforce and the technical skills that will be needed in the near future. The government also needs to "substantially raise its investment in research [about] . . . international workforce dynamics," the report says.

"The evidence is unambiguous," the report concludes. "The federal government has a primary responsibility to lead the nation in developing and implementing a coordinated, effective response to our long-term needs for science and engineering skills. US global leadership and future national prosperity and security depend on meeting this challenge."

Jim Dawson



The world leader in magnetic measurement presents our family of Gauss/Tesla Meters for laboratory and industrial applications.



7000 SERIES
The Most Advanced
Magnetic Measurement
Instrument Ever Produced!



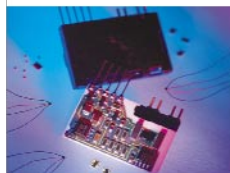
6010
Laboratory Bench Top and
Portable Gauss/Tesla Meter



5000 SERIES
Field Ready - Hand Held
Gauss/Tesla Meter



4000 SERIES
Extremely Low Frequency
EMF/ELF Meter



OTHER F.W. BELL PRODUCTS

In addition, Sypris also provides F.W. Bell voltage sensors, and four-terminal, solid state Hall sensors; open-loop, closed-loop, and magneto-resistive current sensors.



For more information and to order,
call Sales Department direct: 107-678-9718
800-239-3290 (USA) Fax: 107-677-5765.
Or visit our Web site at www.fwbell.com;
or e-mail us at fwbell@sypris.com

MENTION CODE: PT083 FOR A SPECIAL OFFER

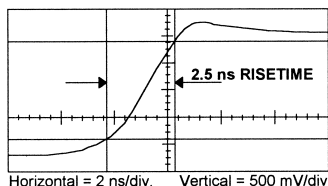
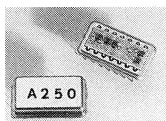
Circle number 10 on Reader Service Card

CHARGE SENSITIVE PREAMPLIFIERS

If you are using Solid State Detectors, Proportional Counters, Photodiodes, PM Tubes, CEMs or MCPs and want the best performance, try an **AMPTTEK CHARGE SENSITIVE PREAMPLIFIER**

STATE-OF-THE-ART

A250



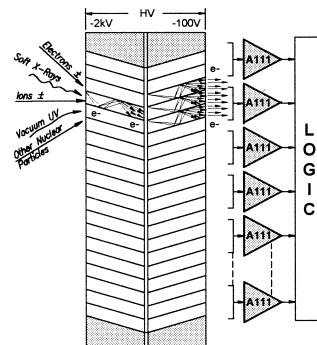
External FET
FET can be cooled
Noise: <100 e⁻ RMS (Room Temp.)
<20 e⁻ RMS (Cooled FET)
Gain-Bandwidth $f_c > 1.5$ GHz
Power: 19 mW typical
Slew rate: >475 V/ μ s

APPLICATIONS

- Aerospace
- Portable Instrumentation
- Nuclear Plant Monitoring
- Imaging
- Research Experiments
- Medical & Nuclear Electronics
- Electro-Optical Systems

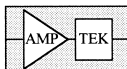
THE INDUSTRY STANDARD

A111



A Microchannel Plate (MCP) Array
Connected to Multiple A111s

Visit us now
www.amptek.com



AMPTTEK INC. 6 DeAngelo Drive, Bedford, MA 01730 U.S.A.
Tel: +1 (781) 275-2242 Fax: +1 (781) 275-3470
e-mail: sales@amptek.com www.amptek.com

Circle number 11 on Reader Service Card