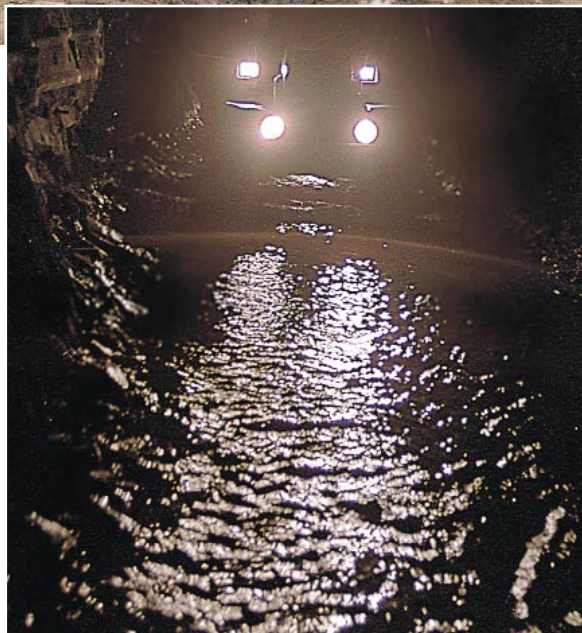




This composite panorama of the Homestake mine near Lead, South Dakota (top), shows the "open cut" on the right and the mine buildings on the left. Headlights from a tractor transporting miners deep in the mine in 1998 reflect off water that sometimes accumulated during normal operations. Pumps that kept the water under control have been shut off.

derground lab at Homestake, then Rounds said Barrick may turn over control of the mine to the state. Once the state has the mine, dewatering and reconditioning will begin, he said. Barrick is insisting on the reconditioning, he said, because then the state becomes liable for any accidents. Scientists won't be allowed in the mine until the reconditioning is complete.

Political intrigue

While Rounds is trying to fast-forward the process, NSF officials are warning that it could be "many months to many years" before a final decision is made on whether or not to develop an underground lab, how to do so, and whether it should be located at Homestake. Although NSF has received Haxton's site proposal and detailed project book, that is just the beginning of the process, said Curt Suplee, NSF's director of legislative and public affairs. A more detailed engineering and planning study would likely be necessary, he said. Once that is done, the plan has to be judged "feasible, accu-

rate, and affordable," he added, noting that the mine conversion is estimated at \$500 million or more. Even if the laboratory is a good idea scientifically, cost is a real factor for NSF.

If a proposal cleared those hurdles, it would go to an NSF panel that reviews proposed major research equipment and facilities construction (MREFC). Homestake would be stacked up against other big-ticket project proposals. If it passed that review, it would go to another review board for further scrutiny. Then the NSF director would decide if the project should be submitted to the National Science Board for approval. The NSB has to approve such

proposals on their merits, then approve each for funding. After that, NSF officials would have to convince the administration to include the funding in its budget request, and then Congress would have to approve

that funding amount and then actually allocate the money.

"The shortest time in which that could happen would be many, many months," Suplee said. NSF officials are aware of the push for the lab from South Dakota's governor and from the neutrino science community, "but none of this will change anything about the way we do business."

What may change the normal NSF process is the politics of South Dakota. Governor Rounds is a Republican and has the strong support of the congressional Republicans from the state. He also has the backing of Senator Tom Daschle (D-S.Dak.), the senate minority leader. In last year's congressional elections, both parties tried to use support of the Homestake conversion as leverage in the election, and that approach will likely continue as Rounds pushes to get a commitment from NSF. Some congressional staff members who deal with science issues fear that political pressure could force funding of Homestake at the expense of other physics projects. As the political intrigue develops on Capitol Hill, Rounds will continue pushing his timetable. "We would like to see the lab being created in 2006 and scientists in doing science in 2007. It's going to require a lot of people doing their part," he said.

Jim Dawson

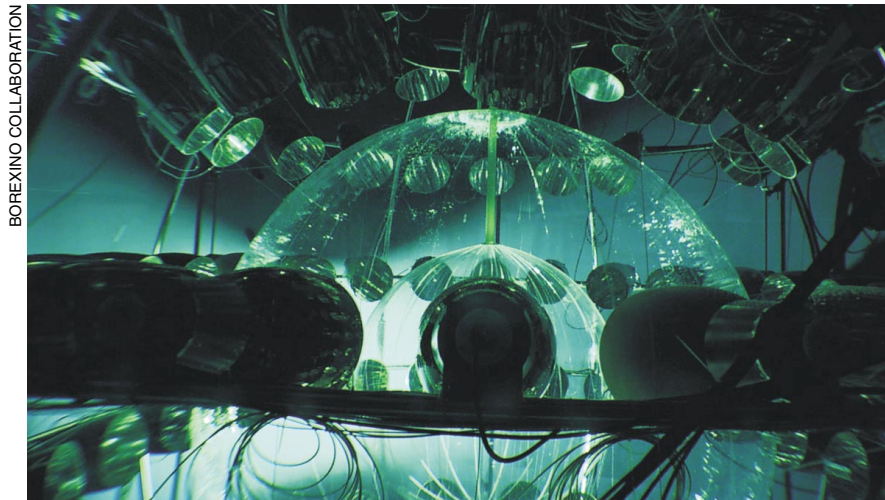
Italy's Underground Lab Recuperates From Toxic Spill, Gets New Director

I think the worst moment is in the past," says Eugenio Coccia, his feet barely wet as new director of Gran Sasso National Laboratory in the Apennines, northeast of Rome. Coccia joined the world's largest underground lab on 16 June, the same day that a court lifted a restriction that had brought the lab to a near standstill in the aftermath of a small chemical leak.

The leak occurred a year ago, when scientists who were testing the purity of the scintillator pseudocumene (1,2,4-trimethylbenzene) for Borexino, a solar neutrino detector, turned a reverse-

oriented valve the wrong way. About 50 liters escaped. Picnickers smelled pseudocumene's gasolinelike odor in a stream, says Frank Calaprice, the principal investigator for US participation in the experiment. "They found one dead fish. The incident was minor in terms of environmental damage, but major in terms of political implications for the lab."

Indeed, the matter might have ended with an investigation into the mishap and improvements to Borexino, but environmentalists, with whom the lab has long had strained relations, took the lab to court. Safety



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