

South Dakota Going Underground to Lure Research Dollars

The South Dakota legislature, at the urging of Republican Governor Mike Rounds, has authorized \$19.9 million to create a state-run science laboratory 4850 feet deep in the Homestake mine. The authorization brings to more than \$45 million the amount the state is risking to create an operating underground science lab by 2007.

The push by the governor to quickly make the mine available for research is part of a complex legal and political process designed both to improve Homestake's chances of being selected by NSF as the site for the proposed federal underground science center and to bring research dollars to South Dakota regardless of the final NSF decision.

Homestake is also the centerpiece of a broader effort by South Dakota officials to invest in science and research in hopes of improving the state's education system and economy. South Dakota, known primarily for Mount Rushmore, the Badlands, and vast expanses of grass-covered prairies, wants to build a reputation as a strong supporter of research and technology by the end of the decade, said Mark Johnston, a spokesman for Rounds.

Johnston admits the state has a long way to go to realize that goal. "South Dakota is dead last in federal research money when measured against the 49 other states and the 4 US territories," he said. "That has to change." The goal is to put South Dakota in the top 30 states in terms of federal research dollars received by 2010, he said, and the Homestake mine project is central to that change.

Homestake, located near the town of Lead in the Black Hills, is a 125-year-old gold mine with 374 miles of shafts that reach down 8000 feet. Barrick Gold Corp closed it in 2001 and the lower 2000 feet of the mine have since flooded with water. Homestake is in competition with Henderson mine, an operating molybdenum mine 50 miles west of Denver, Colorado, to become the site of the federal Deep Underground Science and Engineering Laboratory. In July, NSF named the two mines as the finalists in the competition for the DUSEL site and gave \$500 000 to each of the projects to develop cost and design estimates by June 2006. Cost estimates are in the \$200 million-plus range.

The Homestake facility has been

sealed shut for two years, and some members of the science community are concerned that the mine is in such a state of disrepair that it would be difficult and expensive to rejuvenate it as the DUSEL site. Officials with the Homestake project say the mine is in relatively good shape and the best way to prove that is to open it up and start operating a science lab.

"With this allocation [\$19.9 million] the state will be able to take title to the mine [from Barrick], resolve any indemnification problems, and enter the mine and start working on it," said Lawrence Berkeley National Laboratory physicist Kevin Lesko, the principal investigator for the Homestake DUSEL project. With the age and condition of the mine an issue, he said, "the hope is to get in there early and deal with the water and the lifts and other infrastructure. If you've done all of that, you've done enough to get the science in there, so why not do it? Why not make use of it in the interim?"

The only caveat is that none of the money will be spent until there are commitments from scientists to do research in the facility. To move that process along, Lesko sent e-mails in early November to scores of scientists, soliciting letters of interest for doing research in Homestake. The South Dakota Science and Technology Authority "plans to open the 4850-foot level and some higher levels ... in early 2007 for scientific and engineering experiments and other technical uses," Lesko wrote. "The funds available from [South Dakota] will cover rehabilitation and basic laboratory operations into 2012."

"In some ways what they are doing [at Homestake] is bold and risky," said Stony Brook University physicist Chang Jung, the principal investigator for the Henderson mine science collaboration. "They are saying if they open a lab, people will come. I believe they feel they need to do this to compete."

Jung said the Henderson project scientists are holding workshops on the research that would be done in deep laboratories at the Colorado mine, and core drilling is under way to make certain the rock is suitable for laboratory development at deep levels of about 6000 feet.

An NSF spokesman said the foundation will review the proposals from the mines when they are submitted and said he didn't believe South Dakota's independent move to establish a lab in Homestake would bias the DUSEL process one way or the other.

Jim Dawson

Industrial Physics Forum Focuses on Innovation

Scientists from across the country got an in-depth look in early November at NIST's research and laboratories in Gaithersburg, Maryland, as the institute hosted two days of lectures and tours as part of the 2005 Industrial Physics Forum. Titled "Advancing Infrastructure for Innovation," the forum included talks on such topics as NIST's role in measuring the economic impact of technological innovation and the institute's participation in setting standards for equipment used in homeland security.

The meeting, sponsored by the corporate associates of the American Institute of Physics, also focused on nanotechnology and included presentations on a wide range of nanotech projects being developed at NIST, NSF, and the departments of Defense and Energy. The tours of NIST's labs included facilities where scientists are working on optical tweezers, quantum computers, and nanomagnetism.

Details of NIST's investigation of the burning and collapse of the World Trade Center towers after the September 11th terrorist attacks were presented by William Grosshandler, chief of NIST's fire research division. Grosshandler said that the lessons learned from the World Trade Center attacks can make future buildings stronger and easier to evacuate in the event of explosions and fires.

The 2006 forum will be held 13–14 November in San Francisco in conjunction with the AVS Science and Technology Society's international symposium.

Jim Dawson



NIST scientist Carol Johnson shows forum participants her work on a tunable rainbow light source that allows better calibration of satellites doing climate-change-related measurements.

JIM DAWSON