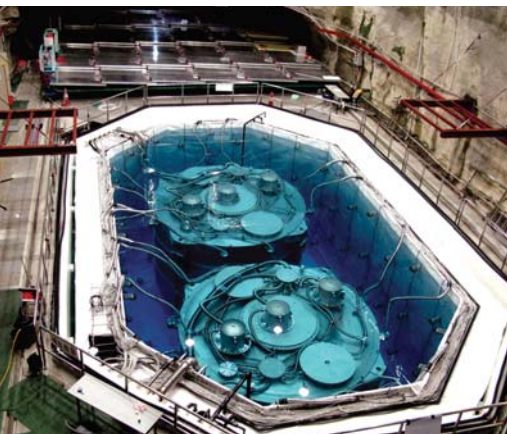


news notes

Daya Bay experiment revs up. The first pair of detectors (shown below) at the Daya Bay neutrino oscillation experiment in southern China came on line in August. By measuring the flux and energy distribution of electron antineutrinos from



DAYA BAY COLLABORATION

the Daya Bay and Ling Ao nuclear power reactors, the experiment is intended to determine the least-known neutrino mixing angle; observations close to and far from the reactors will be compared.

The Daya Bay experimental tunnels and the three experimental halls have been excavated. The two near underground halls are about 360 m and 500 m from the reactors, and the far hall is at roughly 1800 m. Four of the eight antineutrino detector modules have been built. "Getting the first experimental hall on line is significant," says the project's US scientific spokesman, Kam-Biu Luk of the University of California, Berkeley. "It will allow us to have a head start in evaluating the performance of the detectors." The full experiment is due to be up and running by next summer. The rival Double Chooz experiment in France could have first results by the end of the year. (See PHYSICS TODAY, November 2006, page 31.)

China covered the civil construction costs and half of the detector costs. The US put in \$35 million for the detectors, and Hong Kong, Taiwan, the Czech Republic, and Russia made smaller contributions. TF

Innovation hubs. NSF is committing a total of \$74 million over five years to create four new Engineering Research Centers (ERCs), the latest round of long-term university-industry collaborative networks. For the first time the Department of Energy is participating, by ponying up \$18.5 million to share the costs of two of them.

Innovation has always been at the

heart of ERCs, but the current generation of centers places more emphasis on partnerships with small firms, international collaborations, and cultural exchange. "Industry is not taking as many risks as it used to, so a lot of high-risk innovations are sitting idle and not moving into new commercial products," says NSF's Lynn Preston, who has been involved with ERCs from their inception more than 25 years ago. The newer centers, she says, are strengthening their commitment to innovation and commercialization.

According to a 2010 study, ERCs to date have spawned some 624 patents, 2097 patent and software licenses, and 142 spin-off companies with a total of 1452 employees. Among the many successful products highlighted in the study are prosthetic retinas, methods for reducing water use in the manufacture of integrated circuits, a tornado prediction system that outperforms current NOAA radars, and software to estimate the costs of earthquake damage.

Each ERC has multiple academic and industrial partners, including at least one from outside the US. This year's NSF centers are for Re-inventing America's Urban Water Infrastructure, led by Stanford University, and for Sensorimotor Neural Engineering, led by the Uni-

versity of Washington. The current batch also includes the joint NSF-DOE centers for Ultra-wide-area Resilient Electric Energy Transmission Networks, led by the University of Tennessee, Knoxville, and for Quantum Energy and Sustainable Solar Technologies, led by Arizona State University. TF

Record numbers of graduates. The class of 2010 logged three all-time records, with the highest-ever numbers of astronomy bachelors, physics bachelors, and physics PhDs produced by US colleges and universities.

In 2010 some 382 astronomy bachelor's degrees were awarded, 19% more than in the previous year and 89% more than a decade earlier; the number of astronomy PhDs awarded remained constant at about 150 a year over the past three years. In physics 6017 bachelor's degrees were awarded, a 65% increase over the number in 1999. And in 2010 the number of physics PhDs awarded was 1558, up 43% from a recent low six years earlier.

The data were collected as part of an annual survey by the Statistical Research Center of the American Institute of Physics. More information is available at <http://aip.org/statistics/catalog.html>. TF ■

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