frustration," says Jim Strait, LBNE project director. "You could get a lot more science for an incremental amount of money." Putting the detector underground would add about $130 million.

The LBNE team's plan is to seek non-DOE and international partners to build a near detector, increase the far detector size, and put the far detector underground. "We are beating the bushes to find other resources," Strait says. For starters, scientists in India have submitted a proposal to their funding agencies to build a near detector, which would help the LBNE oscillation physics studies and be used to make precision measurements of neutrino cross sections and electroweak parameters and to search for new physics.

**Toni Feder**

# Good news for space research in massive defense package

A new law authorizing the Department of Defense and the nuclear weapons operations of the Department of Energy for the current fiscal year includes provisions that loosen controls on international scientific cooperation in space and that encourage establishment of US production sources for a key medical radioisotope. The National Defense Authorization Act (NDAA) also orders DOE's National Nuclear Security Administration (NNSA) to resume construction of a new plutonium pit fabrication plant at Los Alamos National Laboratory, a project the Obama administration had wanted to delay for at least five years. The law authorizes $70 million in FY 2013 for the project, known as the chemical and metallurgy replacement facility, sets a deadline of 2026 for its completion, and caps its cost at $3.7 billion.

But the final version of the 680-page NDAA signed into law by President Obama on 3 January did not contain House-passed provisions that would have ordered major changes to the NNSA's oversight of the nuclear weapons laboratories and a major reduction to the NNSA workforce. Those measures, authored by Representative Michael Turner (R-OH), chairman of the Armed Services Committee's strategic forces subcommittee, were aimed at reducing the NNSA's perceived micromanagement of the labs (see PHYSICS TODAY, May 2012, page 26). In their place, the act ordered establishment of a congressional commission to study and report on the relationships among the NNSA, the national laboratories, and their contractors and to recommend fixes if deemed necessary.

## Space R&D eased

Space scientists and universities applauded a provision that will remove nonmilitary satellite technology from the International Traffic in Arms Regulations (ITAR), the government's most restrictive export-control regime. Since 1999 all satellite and launch-system hardware, including that used for commercial and research purposes, has been included on the ITAR munitions list, and foreign nationals have been barred from working with or even receiving information about such hardware. US higher education associations have complained that the restrictions hamper US universities' and scientists' participation in many space-related research projects, collaborations, and classes (see PHYSICS TODAY, October 2010, page 23).

Following recommendations from a two-year review by the Defense and State departments, the NDAA directs that space hardware not used for military purposes be removed from the munitions list. As a result, such items as communications satellites, low-resolution remote sensing satellites, and other unclassified components are expected to be moved to the Commerce Department's less restrictive export regime, the Commerce Control List. Although licenses are still required for the export of all or most hardware on the Commerce list, licenses aren't needed to permit foreign nationals engaged in fundamental research to use those devices.

A significant caveat is that ITAR restrictions on space hardware will still apply to China, North Korea, and nations designated by the US as state sponsors of terrorism. The restrictions are problematic for universities because a large proportion of graduate students in the technical fields are Chinese nationals. Thomas Zurbuchen, professor of space science and aerospace engineering at the University of Michigan, says that in one class he teaches, fully half of the students are foreign nationals and one-third of those are Chinese.

"The real worry I have is that the issues related to China will affect some of us," he says. Otherwise, Zurbuchen welcomes the NDAA change: "It will address a tremendous ambiguity. I taught space systems and [the question was] what can I talk about and what can I not? When everything is so broadly covered under ITAR, it is really difficult."

## Fostering US isotope output

Separately, the NDAA incorporates a new provision to encourage the development of a US production source for molybdenum-99, the precursor to the most widely used medical isotope, the metastable form of technetium-99. Currently, all the $^{99}$Mo the US consumes comes from foreign sources, and nearly all of it is manufactured with the use of highly enriched uranium. With twin goals of ending all commercial use of HEU and stimulating domestic production of $^{99}$Mo, the NNSA has established cooperative agreements with four US firms, each developing a different technology for producing $^{99}$Mo without the use of HEU (see PHYSICS TODAY, December 2011, page 32). Besides specifically authorizing the NNSA effort, the NDAA adds a new inducement to prospective domestic $^{99}$Mo producers by offering to take back for disposal the uranium waste used in the isotope's manufacture. That service will not be free but will ensure a disposal route for the nuclear waste.

The authorization act also stipulates that shipments of US HEU to foreign $^{99}$Mo producers end in 2019, although the cutoff could be extended for another six years if the NNSA determines that the amount of the isotope from suppliers that don't use HEU is insufficient to meet demand. But Parrish Staples, director of the NNSA's European and African threat reduction office, says the phaseout of foreign HEU shipments is on track to be completed in three or four years. Another provision in the new law explicitly allows the use of HEU-fueled research reactors, such as the University of Missouri's high-power research reactor, to produce $^{99}$Mo until low-enriched uranium fuel is developed for those reactors and as long as their operators are working with DOE to convert to low-enriched uranium. The university currently produces multiple radioisotopes and radiochemicals but not $^{99}$Mo.

**David Kramer**

## CERN gains observer status at United Nations

"We can take the floor," says CERN Director-General Rolf Heuer. His remark refers to the observer status his organization was granted in a 14 December 2012 resolution by the United Nations General Assembly. Observers can participate in the work of the General Assembly, attend sessions, and sponsor and sign resolutions, but cannot vote on resolutions. Rather than appoint an ambassador, CERN will send people who can best represent the lab at specific UN sessions, Heuer says.

CERN's observer status "raises the visibility of science" and affords the opportunity to show the political community "what science can bring to mankind," Heuer says. "Many parts of the world are in economic crisis—or at least talk about economic crisis," he continues. "Research cannot avoid crisis, but it can moderate crisis. Research is one of the building stones for the future."

Heuer also expects CERN's UN observer status to convey more influence in capacity building and education. The laboratory already collaborates with UNESCO on training programs for teachers and librarians in Africa. Now, he says, "We can take a leading role to show how important [such programs are], and how much return you get through little investment."

CERN's association with the UN goes back to the lab's founding by UNESCO in 1954. Several factors came together to make now a good time to become a UN observer, Heuer says. He notes that UN Secretary-General Ban Ki-moon (seen here with Heuer on 17 December 2012) has placed science high on his agenda, and Heuer points to the worldwide visibility CERN has enjoyed since the Large Hadron Collider turned on a few years ago, and especially since a Higgs-like boson was discovered last summer (see PHYSICS TODAY, September 2012, page 12). "It's a good occasion to stay in the minds of politicians," he says.

CERN is the first scientific organization to join the ranks of observers. Other nonstate observers include the International Olympic Committee, the International Committee of the Red Cross, the League of Arab States, and the International Seabed Authority, to name a few.

**Toni Feder**

UNPHOTO/EVAN SCHNEIDER

# Italy axes flavor-physics facility

A 27 November 2012 decision by the Italian government not to fund SuperB effectively killed the asymmetric-energy electron–positron collider that was to be built near Rome. Designated a flagship project by the Italian government just two years earlier, SuperB was canceled because its estimated cost grew from about €650 million (roughly $860 million) to nearly €1 billion and its schedule slipped by about three years. Ground had not yet been broken for SuperB.

The loss to science is likely to be small because of the similar Belle II experiment under construction at SuperKEKB in Japan. Both colliders were designed to produce large quantities of B mesons, D mesons, and tau leptons to study rare decays and to test mixing and *CP* violation among mesons bearing the charm quark.

One feature that would have been unique to SuperB was a polarized electron beam, says Caltech's David Hitlin, a member of the SuperB team. "That opens up a number of improved studies of tau decays, such as searches for