the number of participating foreign physicists. And they're betting that the timing of their machine's startup will be a plus. In the global particle-physics community, the Large Hadron Collider (LHC) will be in the spotlight once it goes on line at CERN next year. But other accelerator experiments, including those at SLAC's BaBar, Fermilab's Tevatron, and Cornell's CESR-c, are winding down.

"It's a very opportune time," says SLAC's Wolfgang Panofsky, a longtime adviser to the Beijing collider, "because there is expected to be quite a gap, in particular for young people, in the time frame between 2008, when most American machines will shut down, and the startup of the International Linear Collider [ILC], at the earliest maybe in 2017. So during this time, opportunities for the younger generation are pretty scarce." Collaborations on the LHC may have 2000 members or so, adds Harris. "They're huge and socially potentially harder to work with. BES 3 is a relatively small collaboration."

Over time, the Beijing Spectrometer team has included scientists from the US, South Korea, Japan, Russia, and Europe, but they made up a small fraction of the collaboration, which remains predominantly Chinese. Joint work in high-energy physics, says Panofsky, "is possibly the oldest collaboration between China and the US in basic science." It goes back, he recalls, to the US–China science and technology cooperation agreement signed in 1979 by President Jimmy Carter and Premier Deng Xiaoping, and "has been enduring and quite productive, and established lots of personal linkages."

At a June workshop in Beijing, scientists and funding-agency representatives gathered to explore expanding US–China collaborations through the BEPC II, a proposed neutrino experiment at Daya Bay in southern China, and astrophysics and astronomy projects. Gilman, who with Chen organized the workshop, says the turnout for the BEPC II was small, "but people from several [US] universities are interested, and we're hoping that the collaboration will start to gel." Discussions with NSF and the Department of Energy are starting, he adds. "We need to get their interest, to see on what level they'll want to support this collaboration." Says Chen, "We should work together to share technology, share the cost, share the manpower, share the experience. That is the intrinsic nature of a particle-physics experiment."

High-energy physicists widely see increased international collaboration

Shanghai builds topflight light source

After several years of the Chinese government's wavering over whether to fund a major upgrade of an electron–positron collider or a new state-of-the-art synchrotron light source, China's scientists are getting both facilities.

In going ahead with both the collider in Beijing (see the story on page 22) and the Shanghai Synchrotron Radiation Facility, the government was helped by China's scientists having convincingly argued that the country has enough scientists to build and use both facilities, says Zhao Zhentang, head of accelerator construction for the SSRF. But perhaps most important is that the local Shanghai government is donating land plus ponying up about a third of the $150 million tab for the SSRF; the Chinese Academy of Sciences and the central government are splitting the balance. The price of the SSRF is "relatively cheap," says Zhao, "because we can build the linac, magnets, vacuum chambers, and power supplies here in China." Other components, such as superconducting RF cavities, klystrons, and some software, are imported.

SHANGHAI INSTITUTE OF ARCHITECTURAL DESIGN

WEICHENG HU, SHANGHAI INSTITUTE OF APPLIED PHYSICS

The synchrotron light source under construction (below) in Shanghai will be housed in a spiral-shaped building. An architect's conception of the completed facility is shown at left.

The SSRF will be a 3.5-GeV machine that, with the help of undulators, will provide x rays spanning 0.1 to 40 keV. Its above-ground storage ring is 432 meters in circumference, and at first will have seven public beamlines plus a few dedicated to universities and industry; eventually it will have as many as 60 beamlines. Expected research areas include biological crystallography, materials science, environmental science, physics, chemistry, and medical imaging. "It's the first third-generation light source in mainland China," says Zhao. "It will play a very important role in the nation's cutting-edge research of fundamental and applied sciences. It is comparable with Diamond [in the UK] and Soleil [in France]."

The building housing the synchrotron "looks like a nautilus shell," says Stanford University's Bob Hettel, an adviser to the SSRF project. "From what I understand, the Shanghai municipal government wants the building to have artistic merit, to be the technical jewel in the crown of the Shanghai region." Located on the east side of Shanghai in Pudong, a technical corridor that only a few years ago consisted of villages, vegetable gardens, and rice paddies, the SSRF will be easily accessible from the airport by magnetically levitated train, and the hope is to attract international users.

The SSRF is scheduled to go on line in spring 2009.

Toni Feder