ment, creating public-private consortia to work on critical technologies. "If you look at the way we have been investing, you could say that if you take the space station, the [Strategic Defense Initiative], and a few other big projects, that's our investment in technology as a public. And there are real questions as to whether that is an optimized investment," he says.

OSTP shares the pain. The reorganization plan that consolidated Gibbons' authority over science and technology components of the White House had a downside: It was part of a 25% White House staff cut. The plan leaves OSTP with about 40 full-time slots plus six staffers detailed from other agencies—about 14 fewer people than under Gibbons' predecessor, D. Allan Bromley. Gibbons, perhaps putting on a brave face, says that should be plenty of staff—especially if he can persuade Congress to relieve OSTP of the burden of producing many of the reports now required by law. And to help matters, Gibbons has achieved something of a coup. He has managed to bring OSTP under one roof for the first time in many years: All 46 staff members will be moving to a single office suite in the coveted Old Executive Office Building in the White House compound later this year, ending a tradition in which most of OSTP was relegated to offices down the street.

Now that he's got prime office space—traditionally fuel for the fiercest White House battles—over with, Gibbons can turn to who will occupy it. He says he hopes to appoint scientists well known in their disciplines to some of the top posts in OSTP. As for outside advice, Gibbons says he has not yet decided whether to retain the President's Council of Advisers on Science and Technology (PCAST), which was set up by Bromley. Current PCAST members' terms expire in June.

Over the next few months, as the Administration takes shape and settles down to the business of running the country, Gibbons' job will no doubt change. A continued strong focus on technology is likely to remain, however, since that is clearly Gore's key interest. Some clues to how basic research will fare in that environment will come when Clinton's first budget is unveiled next month.

–Christopher Anderson and Colin Norman

PARTICLE PHYSICS

A Worldly Approach to a New Accelerator

Particle physicists are learning to their discomfiture that for one country to plan a multibillion-dollar accelerator, then ask other countries to help build it, is a recipe for frustration. That's the lesson emerging from the struggles to build the Superconducting Super Collider (SSC), the mammoth accelerator that is now in limbo as officials wait to see whether Japan and other nations will pitch in. But a group of laboratory directors who are already planning the next-generation accelerator—a large linear collider that will address physics the SSC can't probe—is taking steps to ensure that it will be an international collaboration from day one.

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>
> **–Burton Richter**

So far, no country has formally committed itself to the new accelerator, and its design is still in flux. But a trio of physics lab heads has drafted a memo of understanding they hope will set the tone for the development effort now under way. As Burton Richter, director of the Stanford Linear Accelerator Laboratory (SLAC), puts it, "We're trying our damndest to see that we don't make the same kinds of mistakes that came up with the international collaborations for the SSC. So when we eventually decide to proceed, the path will have been prepared for real international collaboration and everybody will have felt part of the thing since the beginning."

Drafted by Richter, along with Hirotaka Sugawara of Japan's KEK laboratory and Bjorn Wiik, the incoming director of Germany's DESY, the memo proposes that the development effort be overseen by an international committee consisting of one representative from each of the laboratories involved, which may eventually number 20 or 30. The proposal was reviewed last month by the International Committee for Future Accelerators; a revised version will soon go out for comment to physicists and administrators—what Richter calls "some of the bigger players"—in Europe, Japan, the United States, and Russia.

The machine Richter and his colleagues are thinking about would be smaller than the SSC. Instead of an 87-kilometer oval, it would take the form of a high-tech dragstrip tens of kilometers long. Collisions in the new machine would be limited to about 1 trillion electron volts (TeV), in contrast to 40 TeV for the SSC. But while the proton-proton collisions of the SSC produce explosions of secondary particles, the electrons and positrons of the linear collider, being simpler particles, would produce very clean collisions. What's more, says Richter, "there are certain areas of physics you [could] do better with an electron machine," and certain predicted particles would be easier to find.

The technical challenges of building such a machine have spurred an international development effort that, Richter estimates, is already costing the governments involved $40 million to $50 million a year. One challenge is accelerating the particles: In rings like the SSC, the particles reach their high energies by circulating countless times through the accelerating cavities, but in a linear collider the particles make just one pass. Two international collaborations are already studying designs for radiofrequency cavities that would generate the powerful accelerating gradients. One group is focusing on superconducting technology, the other on conventional conductors. It's a bit of a horserace, says Richter. "The expectation is that one of these approaches will turn out to be better."

Meanwhile, European, Russian, Japanese, and American physicists are collaborating at SLAC to learn how to focus the electron and positron beams down to 60 nanometers in diameter, 1/33 that of the beams at SLAC's existing linear collider. Decreasing the diameter of the beams, says Richter, increases their density, or "luminosity"—a critical factor for detecting extremely rare events at high energies. And because a finely focused beam is easier to achieve if the beam is narrow to start, Japanese and American physicists are studying a next-generation damping ring that would supply the accelerator with extremely narrow beams.

Once the supervisory committee concluded that this R&D effort had answered key questions, it would oversee the development of a unified conceptual design for the accelerator. That next step, says Richter, would include coming up with "a reasonably reliable budget estimate," which is likely to be in the range of $2 billion or $3 billion. After that, Richter says, "you could start construction around 1998—if you were only technology limited. Of course, you then have to factor in politics."

Where would such a machine be built? The big island of Hawaii is rumored to be a contender. Steve Olsen, a University of Hawaii physicist who has collaborated on work at KEK, confirms that Hawaii has been mentioned, if for no other reason than its location halfway between the United States and Japan. But any such talk, he says, is premature. "Nobody really wants to bring up a subject like this when the SSC is on the table. These are pie in the sky dreams."

–Gary Taubes