SSC AFTERMATH

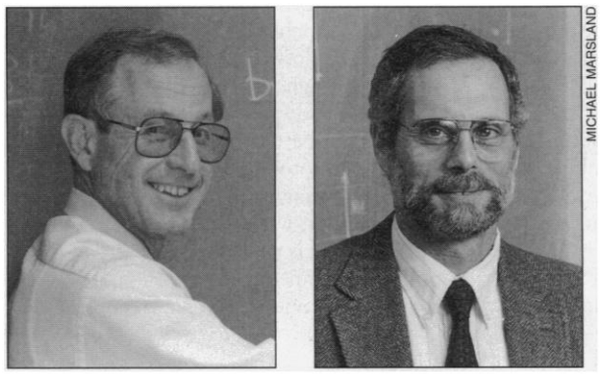
# Physicists Struggle for Consensus About the Future

When many high-energy physicists in the United States think of the future, their thoughts turn eastward, toward CERN's Large Hadron Collider (LHC), the megaproject that would have rivalled their planned Superconducting Super Collider (SSC). Now that the SSC has been killed, the LHC represents their best hope for extending their current picture of matter and forces. The LHC is still awaiting final approval from CERN's governing council, but a contingent of U.S. physicists is clamoring to be part of the action—and some of them are worrying that the entrenched interests of U.S. physics laboratories may stand in their way.

Their concern stems from the fact that if the United States buys into the LHC, something may have to give at one of the physics labs back home. And some rank and file physicists don't trust the High-Energy Physics Advisory Panel (HEPAP)—the chief mechanism for advising the Department of Energy (DOE) on funding decisions—to recommend the necessary sacrifices. The reason: "[HEPAP] represents the directors at the Department of Energy labs," says Irving Lerch, director of international scientific affairs for the American Physical Society (APS). Notes Yale University physicist Michael Zeller, who chairs the APS division of particles and fields, "There is a concern that there is not enough community input [to HEPAP's decisions]."

HEPAP chairman Stanley Wojcicki, of the Stanford Linear Accelerator Center (SLAC), rejects this criticism, noting that his panel is canvassing the community through a subpanel led by SLAC's Sidney Drell. Nevertheless, the APS's division of particles and fields is also working to articulate the community's view. And Lerch and others agree that a consensus is developing to push for U.S. participation in the LHC as a top priority.

The problem facing high-energy physics was laid out 2 weeks ago in the testimony of a panel of physicists before the House science subcommittee. The witnesses estimated the cost of buying into the European experiment at $60 million to $100 million a year—a range CERN director-general Christopher Llewellyn Smith confirms (see box). At the same time, DOE's annual budget for high-energy physics ($622 million in 1994) isn't even enough to fund existing U.S. experiments. Nor does the Administration's budget request for 1995, released last Monday, offer any relief; it includes no increase for high-energy physics.



MICHAEL MARSLAND

**Looking ahead.** HEPAP's Wojcicki *(left)* and Zeller of APS.

These physicists' fondest hope is that Congress will eventually appropriate additional money for participation in the LHC. The physicists at the hearing did make a compelling case for U.S. participation, says one committee staffer, and they got a sympathetic ear from SSC foes, such as Rep. Sherwood Boehlert (R–NY). But even if the science subcommittee recommends additional funds, the staffer foresees trouble getting the full appropriations committee to go along with the recommendation.

Without extra funds, the community will face a hard choice. On the one hand, as Frank Merritt of the University of Chicago puts it, "[LHC] will define what high-energy physics [will be] after the next decade." On the other hand, says Harvard theorist Mitch Goldin, taking money from a U.S. project could cost people their jobs. "It comes down to finances and people's livelihood versus science. Something has got to give somewhere."

Officially, it's HEPAP's job to recommend what, if anything, should give. By May, the panel is charged with presenting DOE with a strategy for keeping high-energy physics alive without the SSC. To gather community input, the Drell subpanel is holding a series of four open "town meetings" in the coming months, to take place in Berkeley, Chicago, Dallas, and Boston.

Lerch, Zeller, and others involved with the division of particles and fields, however, want to give the funding agencies an additional source of advice. As a result, the division has organized 11 working groups in different areas of physics to come up with their vision of the future and the experiments required to realize it. Eventually their findings will go into a report that these researchers hope will carry their message to the APS executive council, DOE, and Congress.

But the history of disagreement and strife among high-energy physicists worries Princeton physicist William Happer, who used to be in charge of energy research at DOE. Only with a united front, he says, will physicists be able to make the sacrifices needed to free up money for the LHC. Existing projects tend to get entrenched, he adds, noting that thousands of people are still employed "doing nothing" at weapons plants. "The high-energy physics labs suffer from a less severe form of the same disease."

At the same time, Happer and other physicists are convinced that Congress will ultimately respond to the physicists' pleas and fund a U.S. share in the LHC. "It's still the last frontier of physics," says Happer. "As a nation that has prided itself on attacking every frontier, I can't believe we would back out of this."

**–Faye Flam**

## The Message From CERN: Help Wanted

While the SSC was in its death throes, afflicted by rising costs, CERN's Large Hadron Collider looked like a marvel of economy. Now that the pricey SSC is dead and the LHC stands as the last hope for physicists hoping to push back the energy frontier, LHC is suffering from a milder version of the SSC's disease. An unofficial price tag of $4.2 billion, including labor costs, exceeds earlier estimates. That figure—one-third the projected cost of the much larger SSC—is making CERN as eager as many U.S. physicists (see main text) to see the United States buy into the experiment.

"Having squeezed everything, we can't make it on our own resources—not without delaying [the LHC] several years," says CERN director-general Christopher Llewellyn Smith bluntly. Without a U.S. contribution, CERN would have to push its completion date beyond 2003. In return for an estimated $60 million to $100 million a year, the project could accommodate as many as 400 U.S. physicists, he says. Llewellyn Smith adds that the United States would also get decision-making power in the building and running of LHC. "We don't want taxation without representation."

–F.F.