SUPERCOMPUTING

Illinois, San Diego Centers Win Renewed NSF Funding

The National Science Foundation (NSF) has decided to concentrate its $65-million-a-year supercomputing program at two university-based megacenters and to phase out support for two other centers. Last week's announcement gives the winning proposals—the existing supercomputing centers at the University of Illinois and the University of California, San Diego, which teamed up with dozens of regional partners—a leg up in the race to develop the next generation of high-end computing hardware and applications for U.S. researchers. But officials at the two centers that lost out, the Pittsburgh Supercomputing and Cornell Theory centers, have pledged to remain in business after their NSF funding dries up. And they say the agency's decision could jeopardize the country's preeminence in the field by limiting the number of scientists with access to the powerful machines and latest applications. Next week, Congress will wade into the debate with a hearing that is expected to raise questions about the selection criteria and the choice of partners.

The new program, called Partnerships for Advanced Computational Infrastructure (PACI), is the successor to a network of five NSF supercomputing centers (one center was later dropped) created in 1986 to provide access to supercomputers for researchers around the country. That mission has largely been accomplished, according to a 1995 report from an outside task force, which said that the next challenge, in addition to providing greater computing power, is to find ways to manipulate and distribute massive electronic databases and broaden access to such technologies. "Our goal was to achieve high-bandwidth networking, more distributed data collection, and new software for parallel computation," says Paul Young, a former senior NSF official who oversaw the PACI competition. "The [winning] proposals extend our vision beyond what we had even hoped for."

Although the winning entries had been an open secret for weeks (*Science*, 7 March, p. 1412), the formal decision was nearly delayed by a procedural glitch. The National Science Board, NSF's oversight body, lacked a quorum because eight members nominated last summer are still awaiting Senate confirmation and several sitting members had recused themselves because of ties to universities in the competition (*Science*, 8 November 1996, p. 907). In late February, NSF asked the White House for waivers so that two members with apparent conflicts could vote—director Neal Lane, formerly of Rice University, and board president Richard Zare of Stanford. But the request wasn't approved until just 2 hours before the end of the board's 3-day meeting. Even with the waivers, the board was so depleted that it had to act through its five-member executive committee. It unanimously approved the Illinois and San Diego proposals and agreed to phase out the Cornell and Pittsburgh centers over the next 2 years.

Each new center is scheduled to receive $29 million in the first year, beginning 1 October, and up to $170 million over 5 years. That is several million dollars less annually than each had requested, although NSF expects to provide only half of each center's overall budget. Later this month, NSF will negotiate such details as the roles for regional partners and how the megacenters will adjust to the fiscal constraints. The Pittsburgh and Cornell centers will receive $11 million each for operating costs but not new equipment.

The Illinois center, formally known as the National Computational Science Alliance (NCSA), will develop software and other technologies customized to the needs of researchers, particularly in the physical and computational sciences. "Scientists will define what is not there, and computer scientists will come up with answers, which will be tested by the scientists," explains NCSA's director, Larry Smarr. At the same time, says Smarr, the center will acquire new and faster hardware that can serve an estimated 50% more researchers. The new center's principal partners include pharmaceutical maker Eli Lilly & Co., Argonne National Laboratory, and 10 major research universities.

The San Diego center, led by Sid Karin and officially titled the National Partnership for Advanced Computational Infrastructure (NPACI), will cater to high-end users in such areas as digital libraries and the manipulation of large data sets. Medical researchers, among others, will benefit from San Diego's strengths in biology and chemistry. "For example, you can generate a petabyte of data [10^{15}] with the latest brain-imaging techniques," says Peter Taylor, NPACI's associate director for science. "Although just storing it is a challenge, our goal is to give neuroscientists and other non–computer experts the tools to analyze it and share it with others." NPACI's proposal involves 10 major research university partners and a total of some three dozen institutions and national laboratories. General Atomics, which now manages the center, will also retain a role.

Not included among the partners are the Cornell and Pittsburgh centers, both of which expressed their "disappointment" in NSF's decision. A panel reviewing the six PACI applications had urged NSF to make the Pittsburgh center part of the Illinois proposal. But University of Pittsburgh officials, in a letter to NSF last month that was first reported in the *Pittsburgh Post-Gazette*, said that they have decided to go their own way after being told that NSF could not afford to keep both centers running. NSF never offered to extend help to the Cornell center, says director Melvin Kalos, who adds that he has had "significant discussions with other entities" interested in supporting the center's ongoing projects.

Next week, NSF will be asked to justify its decision at a hearing before the House Science Committee, two members of which expressed their unhappiness with the planned reduction in centers 3 weeks before it became official. And Pennsylvania's senior senator, Arlen Specter (R), has warned NSF about the consequences of terminating a program in his state. In a 20 March letter to Lane, Specter noted that NSF's budget rose in 1997 "at a time when so many federal agencies faced reductions," implying that NSF needs all the friends it can get.

But don't expect NSF to back away from its decision. Zare says he believes the board's action was "fair, thorough, and based on peer-based merit review." And even the losers say they have no plans to appeal.

–Jeffrey Mervis