UCSD takes lead in proposal to NSF for new era in computational science

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A blueprint for how high-performance computing will be conducted nationwide into the next century is being proposed under a new round of competition to the National Science Foundation (NSF) by the University of California, San Diego.

The proposal will strengthen the role played by the San Diego campus in the future of computational science by creating a physical and intellectual partnership between UCSD and some of the leading computational research centers in the nation. The goal of that partnership is to support the needs of the national research and educational communities.

"What we have is a vision that addresses the needs of the nation, the state of California, and San Diego," said Robert Dynes, senior vice chancellor for academic affairs at UCSD.

Sid Karin, founding director of the San Diego Supercomputer Center (SDSC), will lead the effort for UCSD and serve as director of the new enterprise. Karin, an adjunct professor of computer science and engineering at UCSD, is recognized as an international expert on high- performance computing and its applications to advancing scientific research.

"This enterprise offers to me an exciting new challenge to work with the full support of the University of California system, partnering with other major research institutions in leading the nation into a new era of high-performance computing," said Karin, who stepped down as SDSC director last month. "I am thrilled by this opportunity."

Under the current NSF supercomputer centers program, SDSC is operated by General Atomics of San Diego. Citing differences over the direction of the UCSD-led proposal, GA has decided to submit its own preliminary proposal to the NSF. Preliminary proposals are due April 15. However, it's still possible that GA and UCSD eventually will work together when final proposals are submitted by September 1. Talks between the two organizations will continue until that time. The NSF is expected to decide in March 1997.

SDSC is one of four national supercomputer centers established and funded by the National Science Foundation since 1985. In December, the agency's governing board, the National Science Board, decided to replace the current program with a broader one called Partnerships for Advanced Computational Infrastructure, slated to begin in fiscal 1998.

Two or three "leading edge" sites are expected to be selected in this new competition, which is open to all U.S. institutions. In addition to the center at UCSD, there are currently three other current NSF supercomputer centers located in Urbana-Champaign, Illinois; Ithaca, New York; and Pittsburgh, Pennsylvania.

Dynes said the UCSD-led proposal would serve as a model for advancing the nation's computational resources in support of scientific research and economic progress. Among other things, that means having

the ability to combine and balance the power of sometimes vastly different computational resources over long-distance networks, and moving huge amounts of data among several sites for rapid viewing and manipulation.

The proposal will include partnerships with the nine UC campuses and other leading institutions across the nation. Together with their collaborators, the new enterprise will be charged with aiding research and experimentation with new hardware and software, including appropriate support technologies such as visualization and mass storage; provide resources for applications and applications development for scalable high-end systems; create access to unique experimental systems and facilities; and promote education and training in the use of computational resources.

Dynes added that those in the industrial community in need of high-performance computing prowess to solve their design and engineering problems will be able to find a home in the proposed partnership. Many already participate in similar collaborations with SDSC.

"We welcome industry, new businesses and people with innovative ideas to our partnership," he said.

Under Karin's 10-year stewardship, SDSC achieved an impressive list of scientific accomplishments in a broad spectrum of disciplines, including medical research, environmental studies, the development of applications software and high-speed networking, and the creation of new tools for advanced scientific visualization. About 5,100 researchers in the United States, working at 240 academic, government, and industrial organizations are using the resources of SDSC. Its list of industrial partners includes firms involved with drug design, banking, aerospace engineering, computer hardware and software. Several successful businesses also trace their origins to SDSC.

NSF funding for the current NSF Supercomputer Centers Program totals about $65 million per year and provides about 50 percent of the funding for the four supercomputer centers. Funding for the new computational partnership, also expected to be $65 million per year, is slated to cover a five-year period beginning in fiscal 1998.

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