

# High-powered supercomputer to boost Rocky Mountain research

By Anne Ju Manning

A supercomputer that can cut day-long computations down to seconds is coming to Colorado State University.

Colorado State's Information Science and Technology Center (ISTeC), in collaboration with the University of Colorado at Boulder, has received a \$2.73 million National Science Foundation grant to purchase a state-of-the-art, high-performance computing (HPC) system. Colorado State and University of Colorado will share the purchase and support of the system, which totals \$3.9 million. The system will be available to faculty, students and staff at both institutions to advance research and education.

"By far, this will be Colorado State's most advanced computing system ever," said H.J. Siegel, Abell Endowed Chair Distinguished Professor of Electrical and Computer Engineering at Colorado State. Siegel also has a joint appointment in the Department of Computer Science, and is the principal investigator on the grant.

## Fast performance

The planned HPC system will have more than 10,000 cores, or processing units, with an aggregate computing capacity of approximately 500 teraflops, which are a measure of a computer's processing performance. That makes it very, very fast.

"If a scientific application that takes one day to execute on a high-end desktop can exploit the parallelism of our new system, its execution can be reduced from one day to 10 seconds," Siegel said.

High-performance computing supports research in a range of disciplines, including physics, engineering, materials science, earth science and bioinformatics. What's more, the new system will utilize the universities' combined resources to ensure users access to software, consulting, best practices, HPC courses and data management services.

"The architectural features of this next-generation, many-core supercomputer will enhance student learning as they design, develop, deploy, and execute applications," Siegel said.

## Multidisciplinary collaborations

The system will be housed at CU in Boulder, and accessed through a fiber connection so it will perform as if it were on CSU's local network. Other members of the Rocky Mountain Advanced Computing Consortium, various universities and research centers in several states, will also be able to access the new system, which promises to facilitate research collaborations across many disciplines.



Colorado State grant principal investigators H.J. Siegel, Pat Burns, Edwin Chong and Jessica Prenni illustrate the evolution of computer processing power leading up to the university's latest supercomputer. Siegel is holding a 1950s magnetic core memory board; Burns, a computer punch card; Chong, a keyboard; and Prenni, a 1980s processor board. Photo by CSU Photography.

"We are pleased that, as a result of our successful collaboration with the University of Colorado, ISTeC can provide high-performance computing for the Colorado State campus," said Patrick Burns, vice president for information technology and a co-

principal investigator.

Other co-principal investigators on the grant at CSU are Edwin Chong, professor of electrical and computer engineering with a joint appointment in the Department of Mathematics; and Jessica Prenni, director of research

core facilities in the Office of the Vice President for Research with a joint appointment as an associate professor in the Department of Biochemistry and Molecular Biology. The principal investigator at CU is Thomas Hauser, CU's director of Research Computing.

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