

Researchers Look to Create a Synthesis of Art and Science for the 21st Century



Sandy Huffaker for The New York Times

Atkinson Hall is the new home of the California Institute for Telecommunications and Information Technology at the University of California, San Diego.

By [JOHN MARKOFF](#)
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SAN DIEGO, Oct. 29 - As an actor and a founder of the politically active Electronic Disturbance Theater, Ricardo R. Dominguez is an unlikely faculty member at the nanoscience, wireless and supercomputing laboratory that opened its doors here on the campus of the University of California, San Diego, on Oct. 28.



Sandy Huffaker for The New York Times
Larry Smarr, center, with Ramesh R. Rao, left, and Albert F. Yee in front of Atkinson Hall.

However, Mr. Dominguez and an eclectic group of computer musicians, computer game designers and nanotechnology artists are very much a part of the futuristic research "collaboratory" being assembled by the astrophysicist Larry Smarr, director of the California Institute for Telecommunications and Information Technology, or Calit2, a \$400 million research consortium assembled over the last five years.

Mr. Smarr's idea can be discerned even in the architecture of the new Atkinson Hall, which is connected via 155 fiber-optic cables to the rest of the campus and to a smaller partner laboratory 75 miles away at the University of California, Irvine, as well as to research centers around the world.

The six-story Calit2 laboratory, which overlooks the Pacific Ocean, is designed for 900 faculty and student researchers. Two separate wings extend from the main building. On one side is an ultrasterile set of nanotechnology clean rooms designed for making devices like sensors for detecting pollutants, biological warfare agents and cancer cells. On the other side is a new digital media arts center composed of auditoriums and computer visualization laboratories, where the Calit2 scientists, engineers and artists can display their projects.

For Mr. Smarr - who as director of the National Center for Supercomputing Applications in the 1990's oversaw the development of Mosaic, the first World Wide Web browser - this

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synthesis of art and science is vital in light of the role he expects artists to play in designing the future.

"Part of the artist's insight is to be able to interpret the future earlier than anybody," he said during an interview in the small hideaway conference room adjacent to his office. "We regard the artist as fully equal with any scientist at Calit2."

That idea, which is anathema to some in the engineering-driven world of science and technology, influenced the thinking of the building's designers in the San Francisco office of NBBJ, the international architectural and design firm.

"We put the clean room and the media artists as close as possible so we could see the artists talking to the physicists and telling them what to do," said Mark Whiteley, an NBBJ director in San Francisco.

Artist-scientist collaborations include work being done by the neuroscientist Mark H. Ellisman and Sheldon Brown, who is in charge of the New Media Arts group at Calit2. Dr. Ellisman's group was involved in the construction of a wall-size tiled computer capable of displaying 100 million pixel images of the brain, making it possible to view vastly more information than on a standard monitor.

However, the group found that it needed to design a new control language to deal with the huge amounts of visual information, and the scientists and artists are cooperating on ideas for visualizing scientific information.

Natalie Jeremijenko, who refers to herself as an "artist experimenter," is a former member of the engineering faculty at Yale interested in how society interacts with and uses toys. A current project is to create a pack of "feral" robotic dogs with artificial intelligence capabilities and let them loose in a San Diego neighborhood. The robots could be assigned some socially useful function, like searching for or "sniffing out" pollution.

Last year Ruth West became the first artist in residence linking the biological sciences and the arts here. As part of the Calit2 Research in Computing and the Arts project earlier this year, she unveiled a collaborative project, Ecce Homology, to explore the relationship between genetics and culture. Named after Friedrich Nietzsche's "Ecce Homo," the project explored human evolution by visually comparing genes from humans and rice plants. The installation was interactive, tracking the hand gestures of visitors standing in the gallery and allowing them to interact, using body movements, with an enormous projected wall display screen. They were able to discover similarities between the portions of the rice and human genomes stored in a computer database.

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