

University of California, Irvine



*California Institute for Telecommunications  
and Information Technology - Cal-(IT)<sup>2</sup>*



- ï Gross square footage - 120,000  
Assign square footage - 70,000
- ï Groundbreaking - January 9, 2003
- ï Projected occupancy - Early 2005
- ï Building designed by Johnson Fain  
Partners, Los Angeles

- ï Construction by PCL Construction Services,  
Southwest Region Office, Los Angeles
- ï Total project cost (estimate) - \$45 million
- ï Leo A. Daly, Executive Architect,  
Los Angeles Office

The Cal-(IT)<sup>2</sup> facility will provide faculty, students, visiting scholars, and industrial partners with a technologically advanced environment to conduct research in communications and information technologies and their social implications. Research teams from engineering, computer science, physical, biological, and social sciences and the arts will be together in a common working space—an unusual occurrence in academia but central to the mission of The Cal-(IT)<sup>2</sup>.

The building has been designed to accommodate research projects by industrial and government partners and to hold public events. Fundamental research in this building will lead to Living Laboratory applications. A core concept of the institute, the "Living labs" will give industrial partners the opportunity to test new products and systems in a real-world setting.

Design emphasis is placed on maintaining open and undivided spaces to encourage interaction between departments. The research spaces in the building are designed to be reconfigurable as new projects emerge. Space within the building is assigned to general research approaches and to active research groups, not to individuals or departments. Among other features, the building will house:

[www.calit2.net](http://www.calit2.net)  
(949) 824-6900

- ï A clean room providing a filtered-air environment suitable for nanoscale fabrication, including optical lithography, e-beam lithography, mask-making, metallization/thin film deposition, back-end processing, reactive ion etching, and wet processing. The clean room will be connected to (and managed jointly with) the clean room in the adjacent Engineering Gateway building. The emphasis of the UCI effort is on designing and producing integrated devices that perform several related functions.
- ï A materials characterization lab, with instruments designed to determine the structural and chemical properties of matter at the extreme – such as scanning electron microscopy, atomic force microscopy, and laser spectrometry.
- ï Networking laboratories, to design and evaluate real and simulated communication systems, including network protocols for distributed computation, security, access, and quality of service.
- ï Laboratory space for research on wireless communications, including novel algorithms and architectures for coding, modulation, signal processing, signal propagation and multi path effects, antenna design, and applications of wireless micro-electro-mechanical systems (“MEMS”).
- ï An optical devices laboratory, to enable multi-disciplinary research in optical networks, testing novel photonic network devices and all-optical subsystems, and testing various data and channel-coding algorithms in a realistic wave-division multiplexing metropolitan-area network.
- ï A studio and lab for the new media arts, that will enable research, production, and exhibition related to computer-mediated interactive projects in music, dance, theater, and visual arts. Here artists, engineers and computer scientists will perfect techniques for virtual reality, spatialized audio, robotics, motion capture, streaming media, game networks, and new human-computer interfaces — advancing artistic perceptions as well as technological capabilities.
- ï An immersive visualization lab, including a display environment that surrounds the viewer with four 10' x10' surfaces, as well as other projection capabilities on all walls, will create new ways to work, communicate, and play. Research in this space will include work on human-computer interactions, algorithms for presenting virtual reality, sonification of data as well as visualization of data, improved telepresence, and visualization of massive multidimensional data sets.
- ï An engineering classroom specially equipped for enhanced visualization, with a 8' x 18' screen, smart boards, multiple projectors, and computer support.
- ï A wet lab space for biomedical engineering applications of IT. Here scientists will develop novel materials and devices, on the micro- or nano-scale, that can act as sensors or actuators within the human body.
- ï A lab for studying the application of IT to civil structures — sensors to measure strain or motion, satellite imagery to view whole systems, detector systems for nondestructive evaluation.
- ï A nanotechnology measurement area, where the properties of nanowires, carbon nanotubes, and molecular sensors can be measured with extreme sensitivity.
- ï Three levels of networks for the scientists to use, encompassing: Internet access and UCI's first Voice-Over-IP phone system; additional cables and connectors at every workstation for ad hoc in-house networks (at 10/100/1000 Mb/s); and high capacity fiber connections up to 40 Gb/s at several locations.
- ï Exhibit areas for participative and interactive displays of new technologies, new data, and new perspectives including public events, special presentations to industry, or experiments for one of the Living Laboratories. These spaces, such as the atrium, the auditorium, the lobbies, the arts studio, and the conference rooms, will be fully networked for internal and external communications.
- ï Rooftop antenna locations, including a central antenna mast, for both long-distance and on-campus communications. Scientists will be able to conduct experimental studies such as space-time signal processing and coding techniques, ultra-wide band communications, satellite links, wireless protocols, and local networking.
- ï Wireless access in all working spaces.
- ï Two central server rooms, capable of network connections to all parts of the building.
- ï An 80-seat auditorium for conferences, workshops, symposia, and performances.
- ï Workstations, offices, and informal meeting areas for over 200 personnel — grad students, postdocs, faculty, staff, and visiting scholars.