University of California, San Diego

California Institute for Telecommunications and Information Technology - Cal-(IT)^2

- Gross square footage - 215,000
  Assignable square footage - 127,000
- Groundbreaking - May 31, 2002
- Projected occupancy - Fall 2004
- Building designed by NBBJ, San Francisco
- Construction by Gilbane Construction, San Francisco
- Total project cost (estimate) - $102.5 million
- Economic impact - More than 45 local subcontractors including 450 trades people working more than 400,000 person hours

The Cal-(IT)^2 building is designed to foster teams of faculty, students, visiting scholars, and industrial partners to make fundamental discoveries and address complex societal problems more creatively and comprehensively. These teams are already being drawn from the physical, biological, and social sciences, the arts, and the humanities. For example, on the ground floor, physicists, chemists, and materials scientists in the clean room and materials characterization lab will be co-located with artists and computer scientists in the New Media Arts facilities, which we expect to foster new collaborations.

The facility has been designed to help the public understand how technology is conceived, studied, developed, and implemented, especially in integration with other technologies, such as in Cal-(IT)^2's "living laboratories." Visitors will be able to explore an exhibit gallery, look down from a catwalk to watch scientists at work, and stroll through a rooftop "antenna garden" to learn about wireless technology.

www.calit2.net
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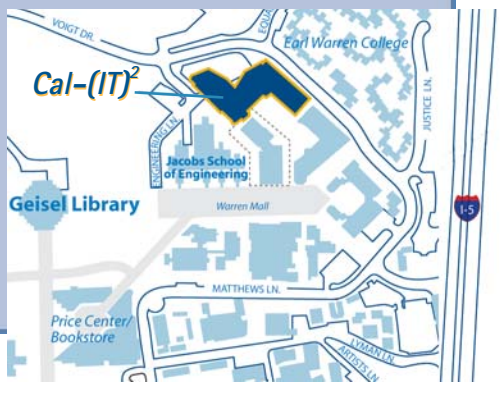

Location of new Cal-(IT)^2 building on the UCSD campus.

- **Clean room**, including nanoscale fabrication lab supporting optical lithography, state-of-the-art e-beam lithography, mask-making, metalization/thin film deposition, back-end processing, reactive ion etching, and wet processing.
- **Materials characterization lab** with structural and chemical probes, supporting scanning probe microscopy, diffraction, and surface characterization. A state-of-the-art femtosecond laser lab will support optical characterization of photonic materials.
- **Wireless communications/network laboratories:** These labs will support research to implement and evaluate real and hardware-simulated wireless communication systems, including research on novel circuit technologies; algorithms and architectures for coding, modulation, and signal processing; and network access protocols. The labs will be equipped to support real-time wireless network studies addressing electromagnetic modeling and measurement, signal propagation and multipath effects, antenna design, and applications of micro-electro-mechanical systems.
- **Circuits laboratory:** Full network characterization to 40 GHz will enable measuring noise figure, dynamic range, and distortion of complex radio frequency (RF) and baseband analog and mixed-signal systems. An automated load-pull system will perform robust frequency tuning of RF and micro wave devices. On-wafer microwave probers will provide immediate feedback on circuit performance.
- **Optical networking laboratory:** This lab will enable multi-disciplinary research in optical networks, testing novel photonic network devices and subsystems, modeling the optical communication channel, and testing various data and channel-coding algorithms in a realistic network environment. It is part of the wave-division multiplexing metropolitan-area network being established by Cal-(IT)^2.
- **System-on-chip laboratory:** This lab will support research and development of highly programmable and reconfigurable networking and communications systems. The facilities will include a diverse set of advanced-processor, signal-processing, and next-generation communication IP components, system design tools and methodologies for co-design of software-hardware, domain-specific system platforms, and prototyping/testing environments for rapid development of a chip-a-day from the programmable platforms. To complement this facility, Cal-(IT)^2 partners will provide access to the most advanced ultra-deep, sub-micron technology libraries, tools, and fabrication facilities. These design and prototyping environments will be integrated with flexible network simulators and next-generation, local-area, and broadband networks to enable network-aware development, rapid deployment, and characterization of systems-on-chip.
- **New Media Arts facilities:** These facilities will enable research, production, and exhibition related to virtual reality, spatialized audio, advanced audio and video synthesis, motion capture, streaming media, and interactive, distributed performance. They include
  - ~**An immersive visualization lab:** This interactive display space, including a six-walled, two-story virtual-reality CAVE theater, will be used to envision new ways to work, communicate, and play. Research is expected to enable new forms of scientific investigation, visualization of ever-more-complex data sets and tasks, richer forms of tele-presence, and new types of artistic expression, as well as lead to development of new methodologies and technologies.
  - ~**A 3-D fabrication and scanning lab:** Researchers will apply tools and approaches to manipulate virtual space, representations of real physical objects, and the objects themselves, then create real physical objects as output.
- **Reconfigurable research neighborhoods** to support the specialized needs of individual research teams as projects emerge. As projects reach completion, their space will be reconfigured to address the needs of new teams.
- **Exhibit gallery.**
- **150-seat auditorium** for conferences, workshops, symposia, and performances.
- **Rooftop antenna garden** to enable experimental studies of space-time signal processing and coding techniques to increase the reliability and capacity of wireless communication networks.

The building design is optimized for wireless communications. Large "propagation windows" rendered in clear glazing, and insulated curtainwall material and Trespa paneling were chosen for the building exterior to allow transmission of line-of-sight communication signals.

Building that will house Cal-(IT)^2 activities on our partner campus at UC Irvine. The 120,000-square-foot facility was designed by Johnson Fain Partners with occupancy scheduled for Spring 2004.