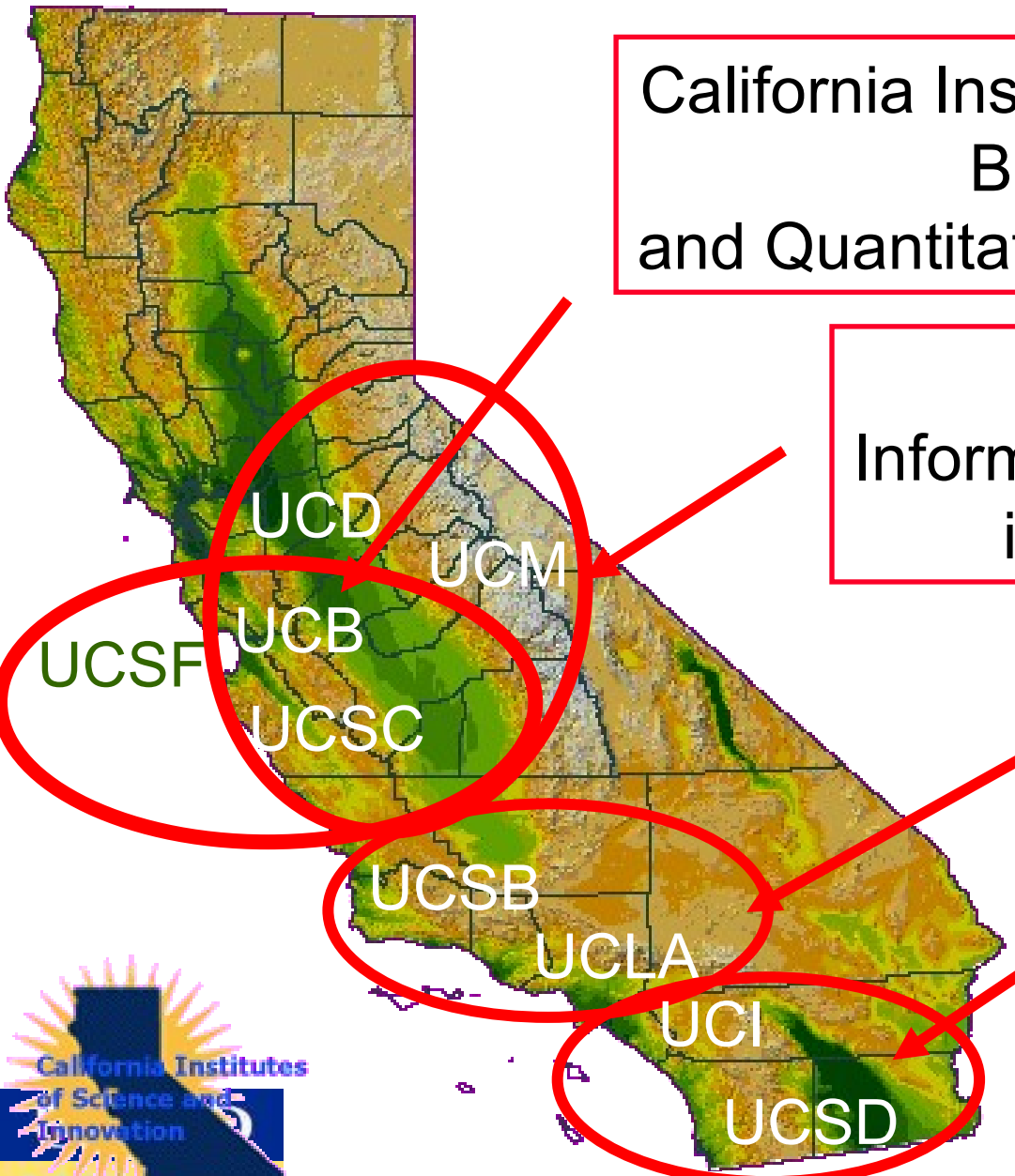
Calit2:
Past, Present, and Future

University Librarian's Advisory Board
Luncheon Seminar
UC San Diego Library
January 4, 2012

Dr. Larry Smarr
Director, California Institute for Telecommunications and Information Technology
Harry E. Gruber Professor,
Dept. of Computer Science and Engineering
Jacobs School of Engineering, UCSD
http://lsmarr.calit2.net

UCSD
UCIrvine

California's Institutes for Science and Innovation: A Bold Experiment in Collaborative Research



California Institute for Bioengineering, Biotechnology, and Quantitative Biomedical Research

Center for Information Technology Research in the Interest of Society

California NanoSystems Institute

California Institute for Telecommunications and Information Technology

California Institutes of Science and Innovation

UCHV

www.ucop.edu/california-institutes

it²

Calit2 is one of the Governor Gray Davis Institutes of Science and Innovation



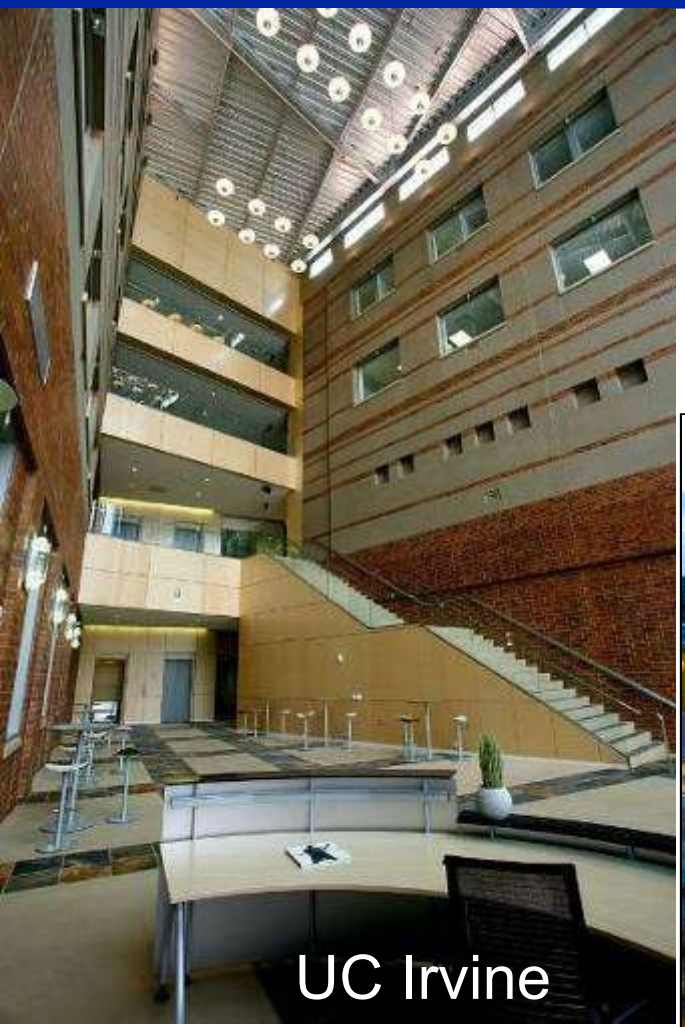
May 31,2002

UCSD
UCIrvine

Naming Approved by UC Regents March 2008

it²

In 2005, the Two Calit2 Buildings Are Occupied-- Creating Laboratories for "Living in the Future"



- **Over 1000 Researchers in Two Buildings**
  - **Linked via Dedicated Optical Networks**
  - **International Conferences and Testbeds**
- **New Laboratories**
  - **Nanotechnology**
  - **Virtual Reality, Digital Cinema**



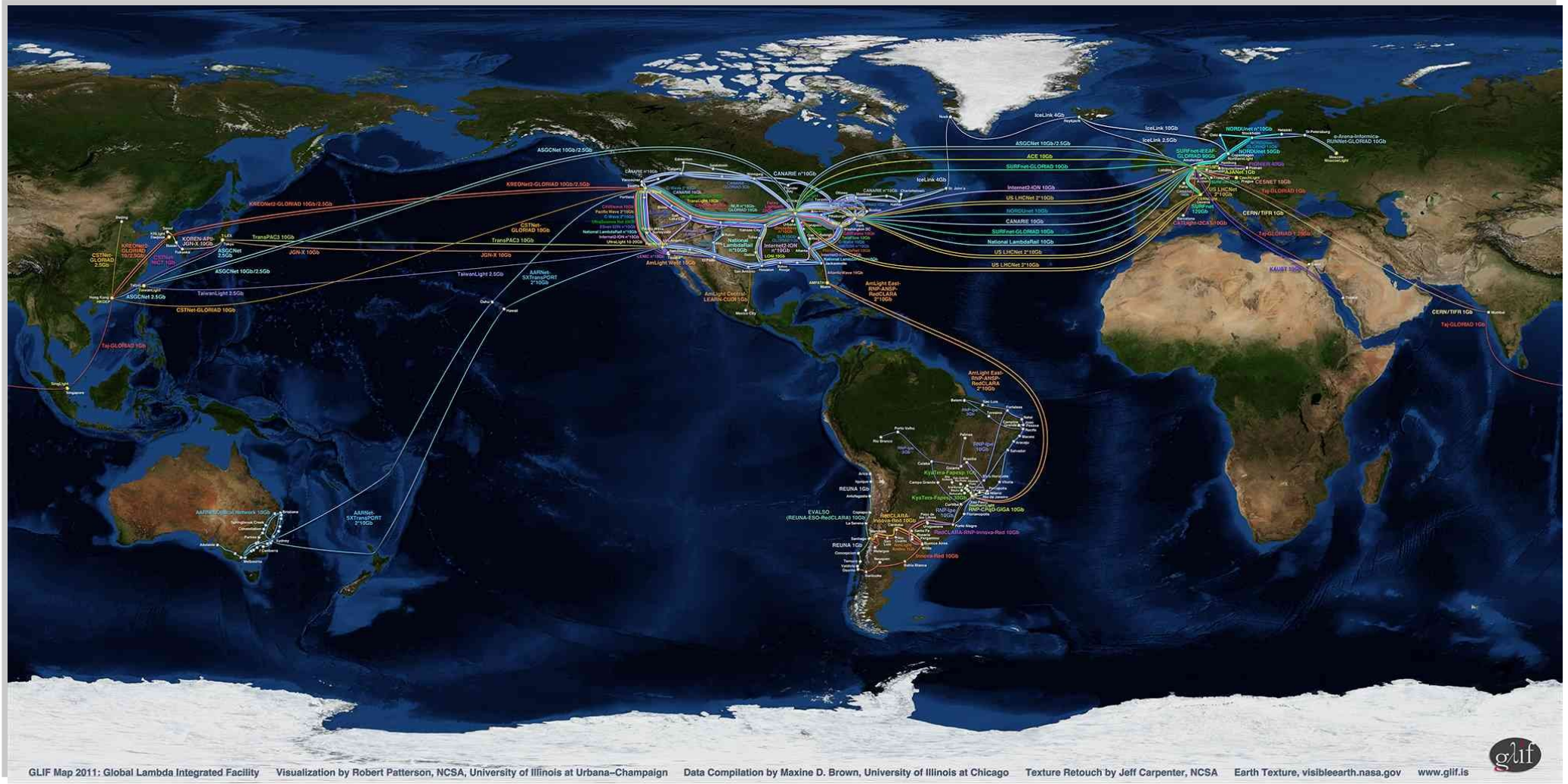
www.calit2.net

UCSD
UCIrvine

Preparing for a World in Which Distance is Eliminated…

The Global Lambda Integrated Facility--
Creating a Planetary-Scale High Bandwidth Collaboratory

Research Innovation Labs Linked by 10G Dedicated Lambdas

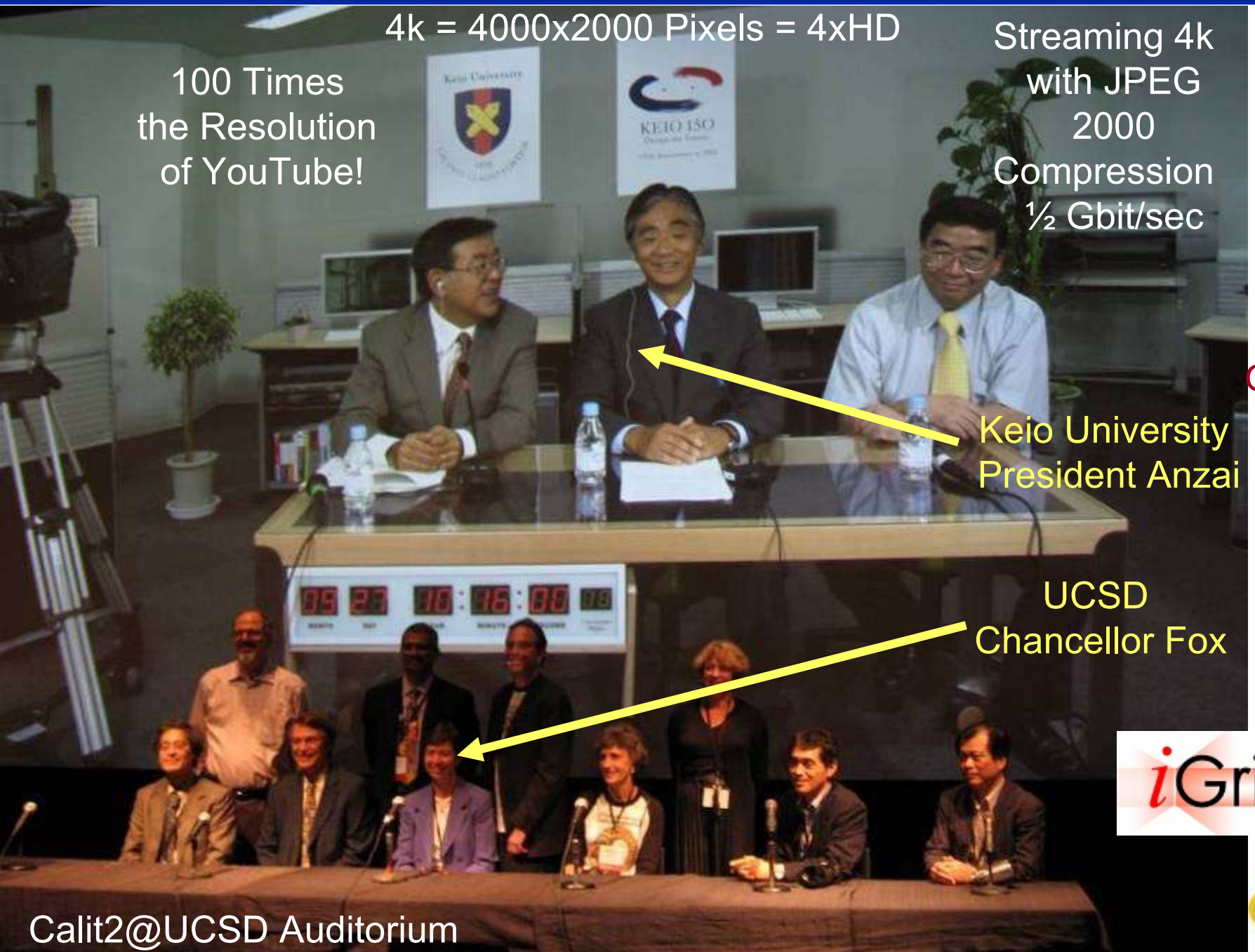


UCSD
UCIrvine

www.glif.is/publications/maps/GLIF_5-11_World_2k.jpg

it2

Telepresence Meeting
Using Digital Cinema 4k Streams



CineGrid

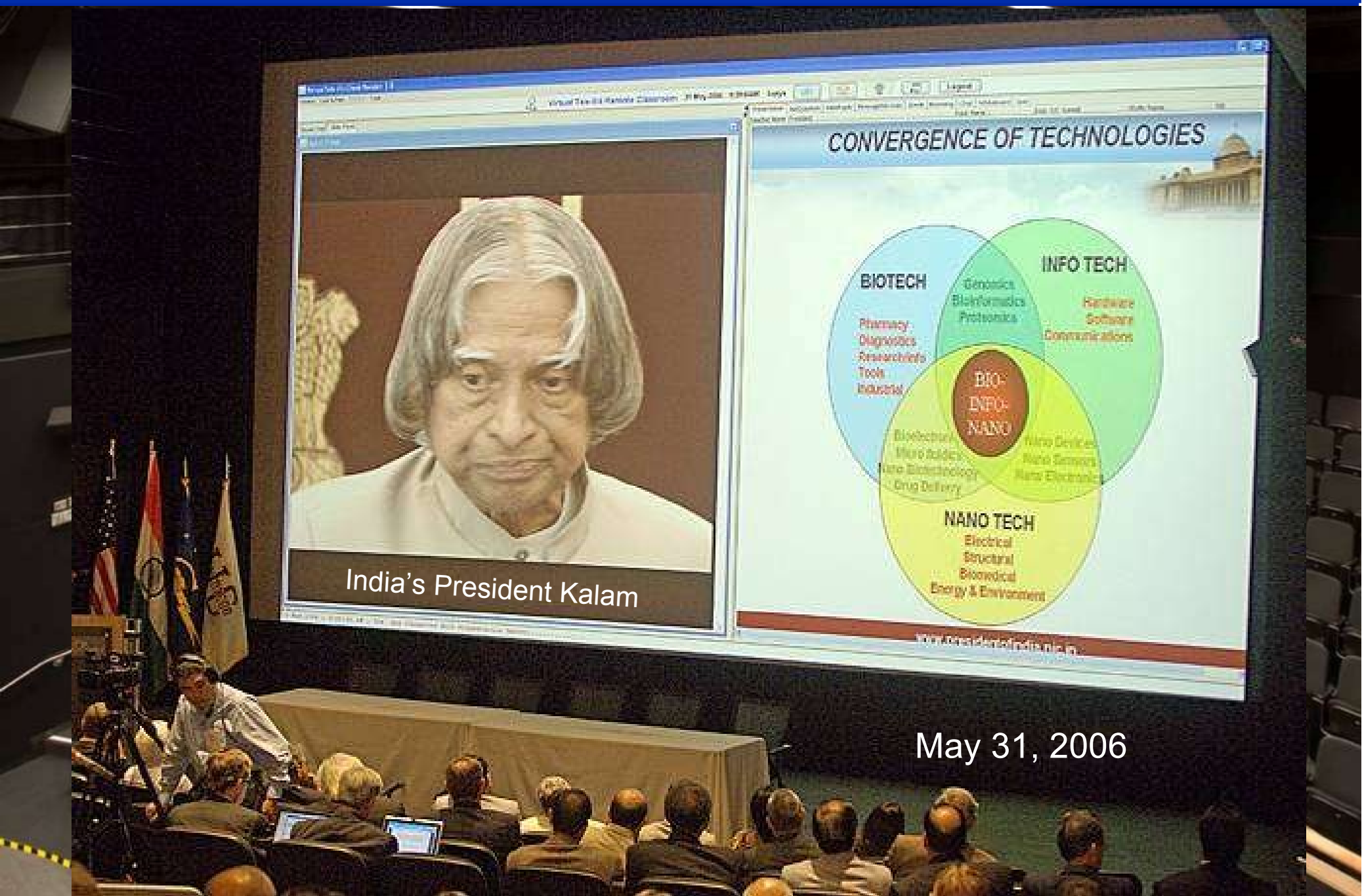
Lays
Technical
Basis for
Global Digita
Cinema

Sony
NTT
SGI

iGrid 2005

it²

Building a Global Collaboratorium: India's President Kalam Gives Lecture to Calit2

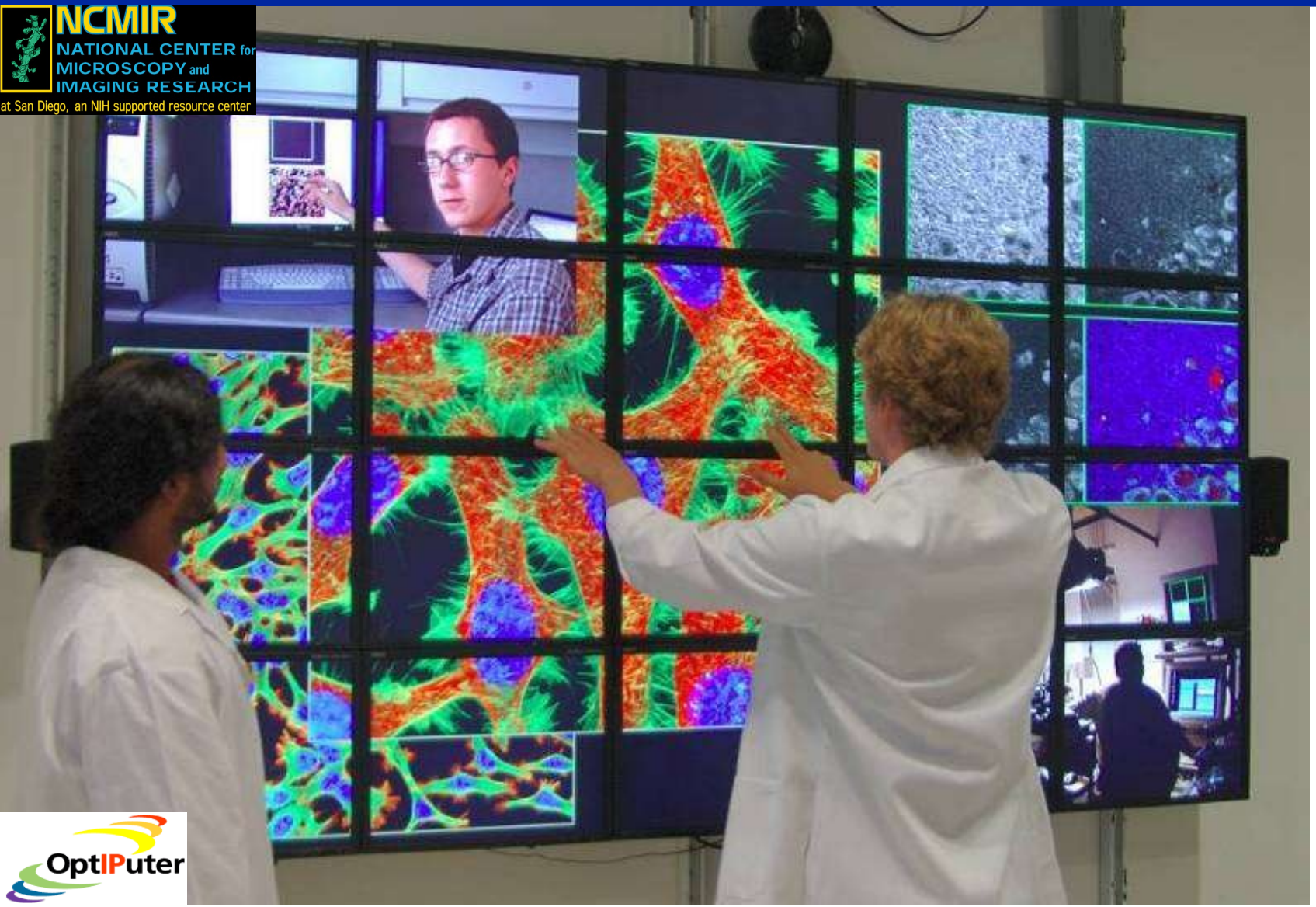


Calit2 10th Anniversary Class Photo
UCSD/UCI Partnership



The OptIPuter Project: Creating High Resolution Portals Over Dedicated Optical Channels to Global Science Data

NCMIR
NATIONAL CENTER for MICROSCOPY and IMAGING RESEARCH
at San Diego, an NIH supported resource center



Scalable Adaptive Graphics Environment (SAGE)

evl electronic visualization laboratory

NSF

$13.5M Over Five Years

Picture Source: Mark Ellisman, David Lee, Jason Leigh

OptIPuter

UCSD
UCIrvine

Calit2 (UCSD, UCI) and UIC Lead Campuses—Larry Smarr PI

Univ. Partners: SDSC, USC, SDSU, NW, TA&M, UvA, SARA, KISTI, AIST

Industry: IBM, Sun, Telcordia, Chiaro, Calient, Glimmerglass, Lucent

it2

Lev Manovich on High Performance Cultural Analytics



UCSD
UCIrvine

www.youtube.com/watch?v=xtbzVuDqSas

it²

High Definition Video Connected OptIPortals: Virtual Working Spaces for Data Intensive Research



LifeSize HD

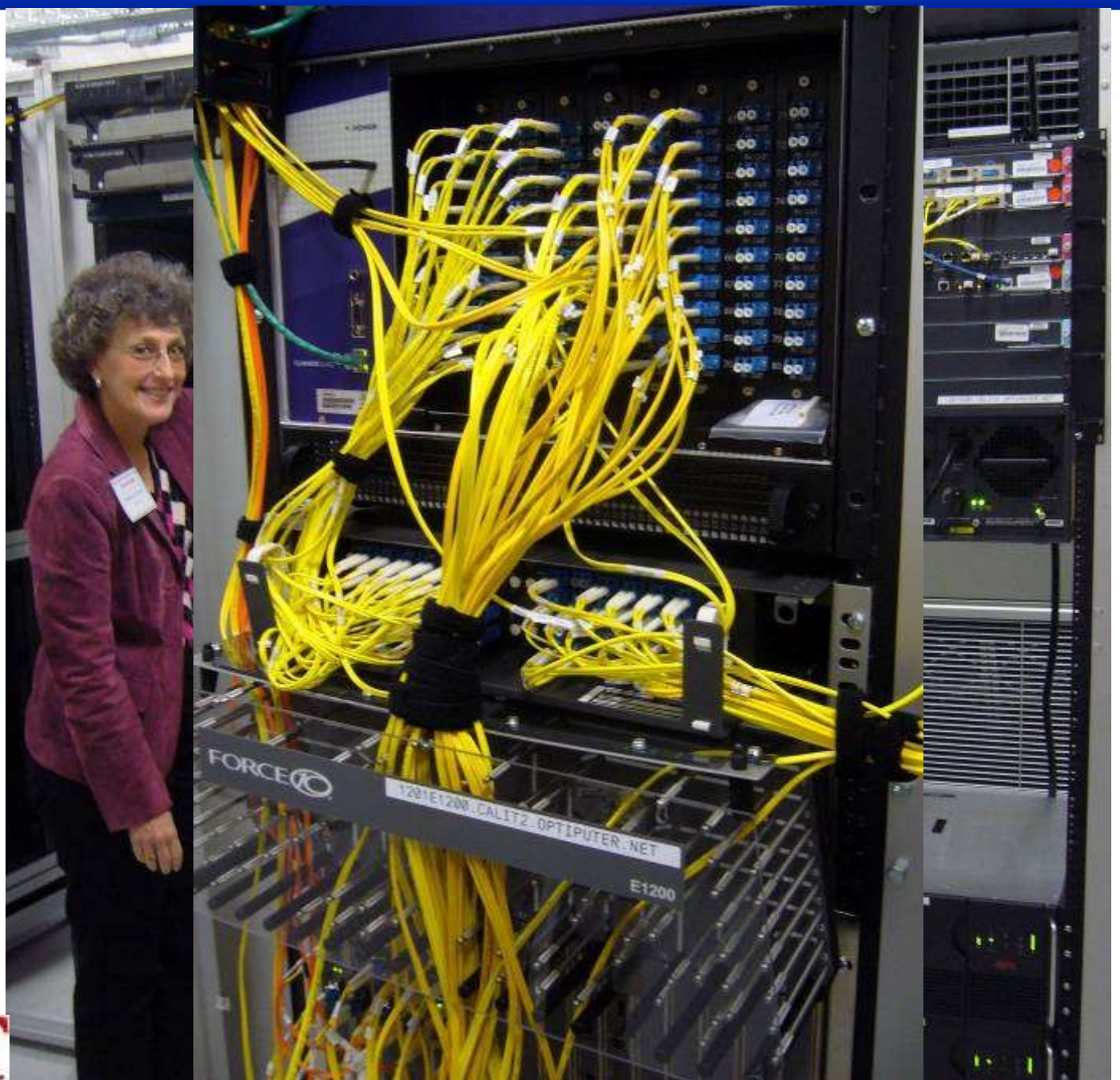
NASA Ames
Lunar Science Institute
Mountain View, CA

NASA Interest
in Supporting
Virtual Institutes

UCSD
UCIrvine

Source: Falko Kuester, Kai Doerr Calit2; Michael Sims, NASA

Calit2 Sunlight OptIPuter Exchange Connects 60 Campus Sites Each Dedicated at 10Gbps

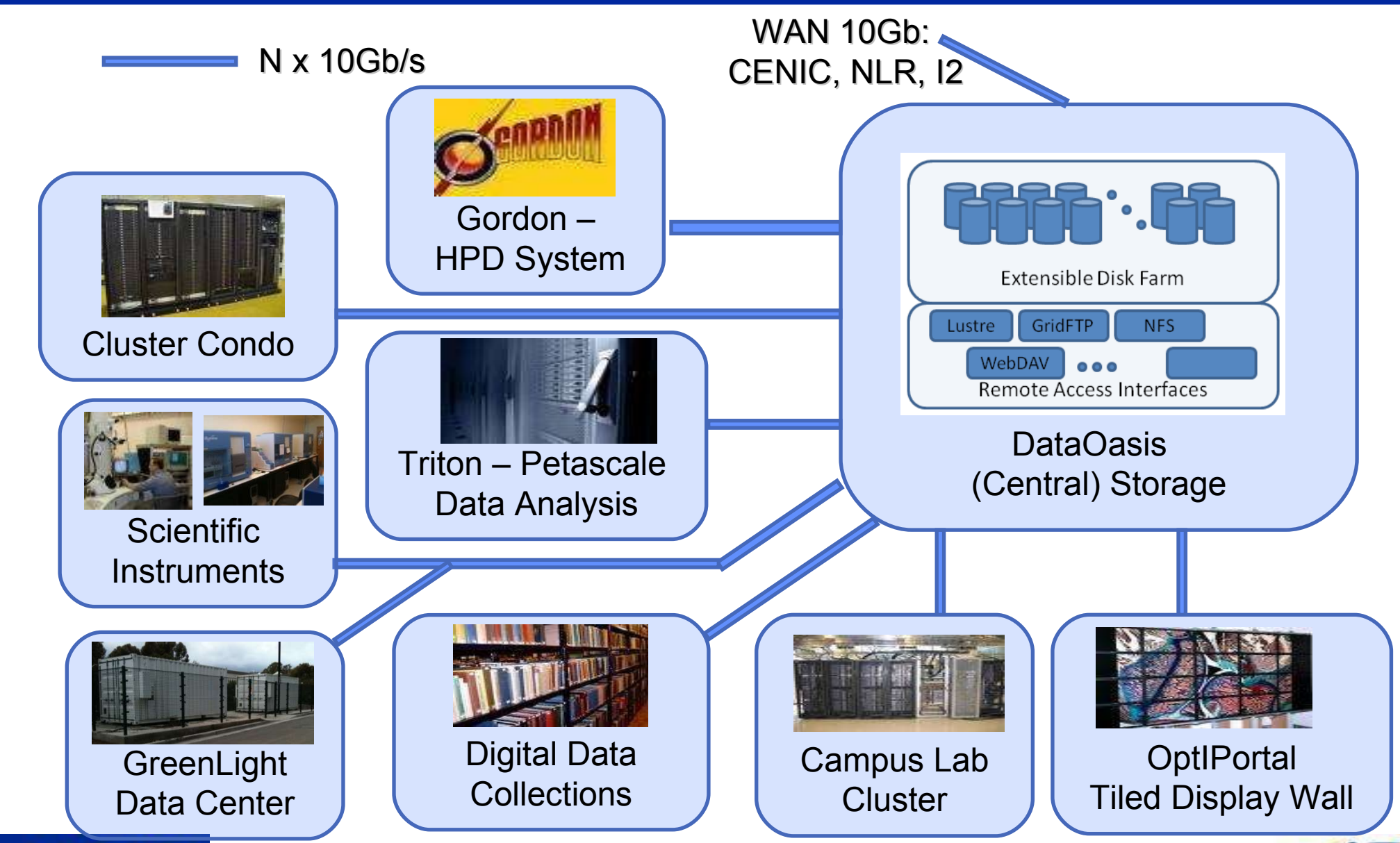


Maxine Brown, EVL, UIC OptIPuter Project Manager

UCSD SDSC

it²

UCSD Campus Investment in Fiber Enables Consolidation of Energy Efficient Computing & Storage



Source: Philip Papadopoulos, SDSC, UCSD

Calit2 at Ten Years



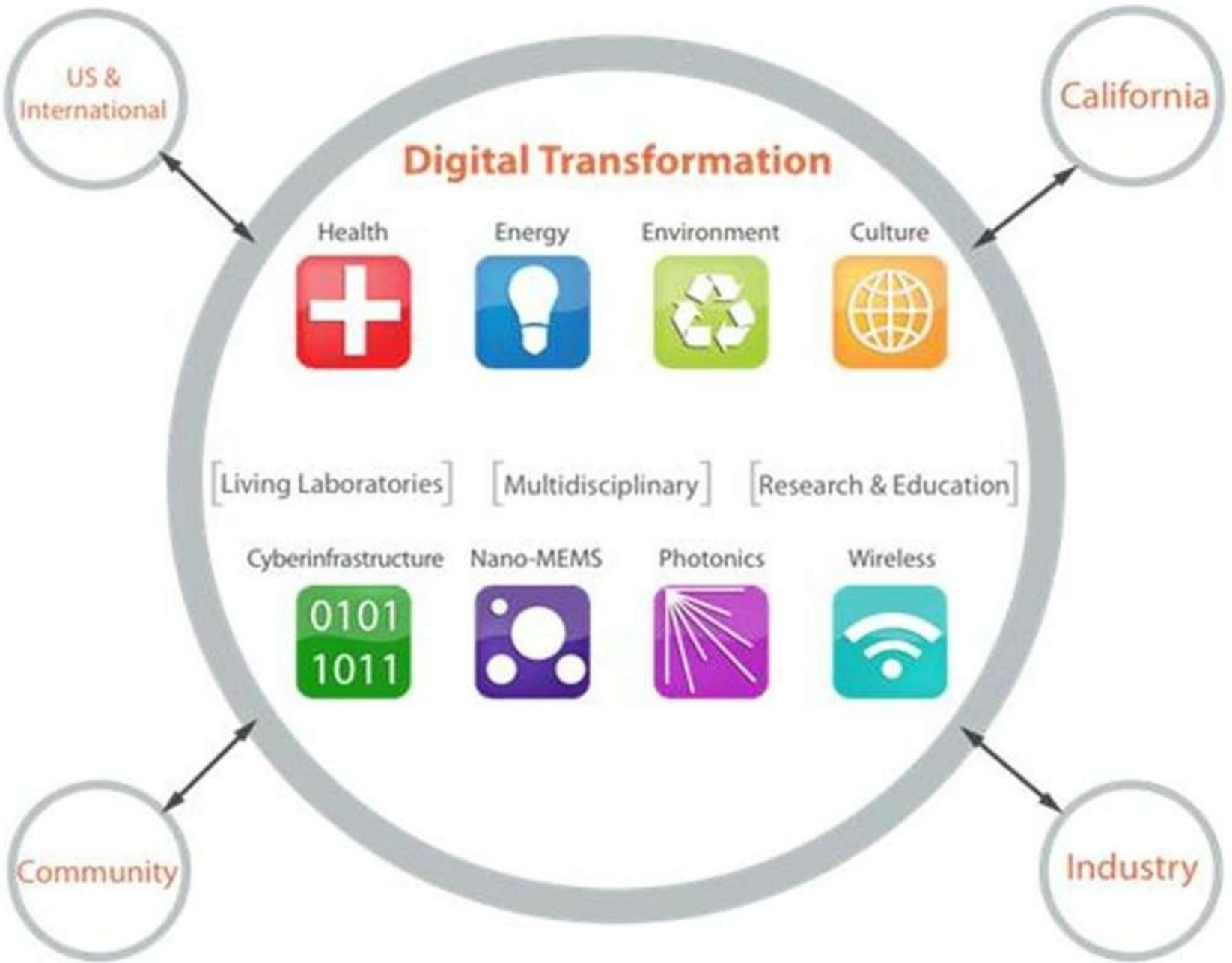
Ten-Year Review Report
from the
California Institute for Telecommunications
and Information Technology (Calit2)

to the
UC Office of the President
August 29, 2011

UC San Diego UC Irvine

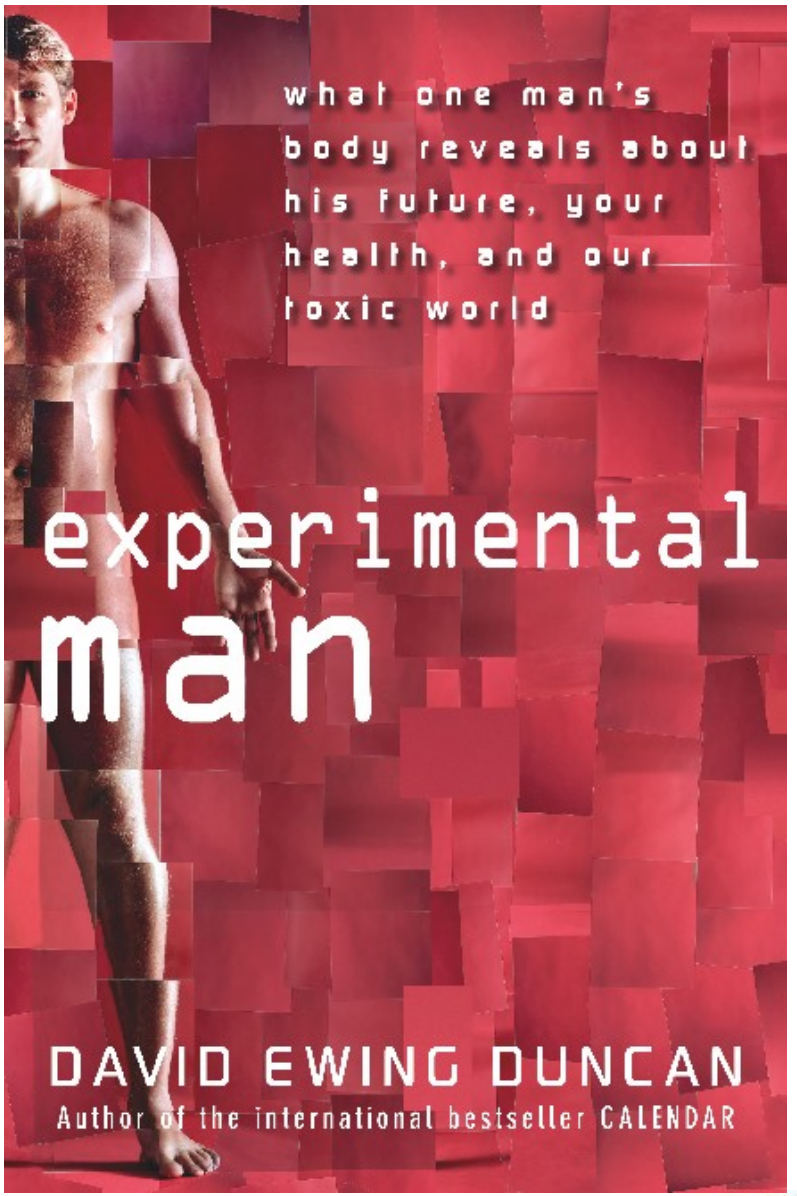
- **600 Faculty from 24 Departments on Two UC Campuses**
- **1000 Federal, State, Not-For-Profit, Industrial, and International Grants**
- **Engaged 300 companies & Interacted with 1,000 More**
- **Involved Over 1,000 undergraduates and 700 Graduate Students**

Calit2:
the Next Decade's Path Forward



Personal Time Series Tracking is an Emerging Trend

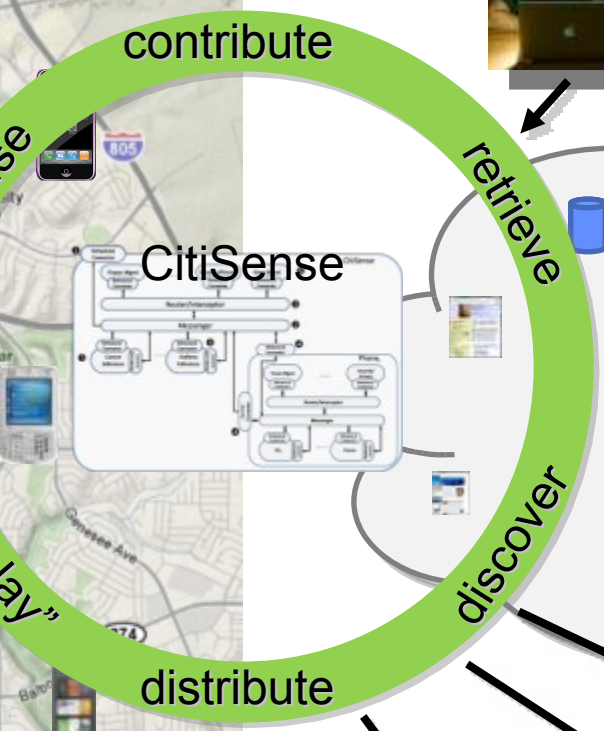




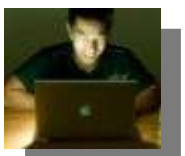
UCSD
UCIrvine

CitiSense –New NSF Grant for Fine-Grained Environmental Sensing Using Cell Phones

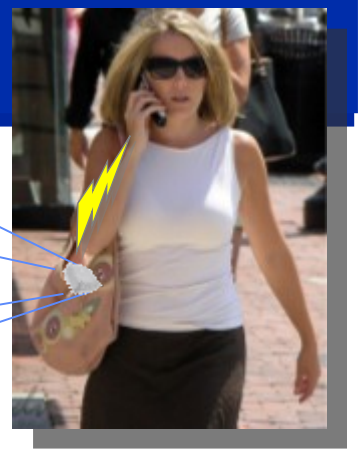


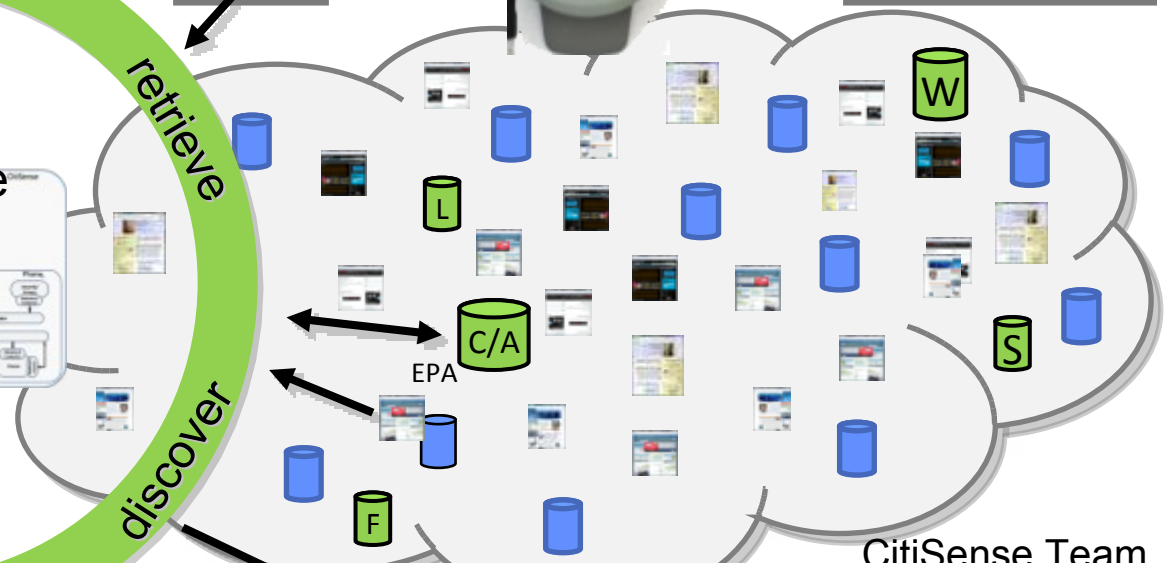


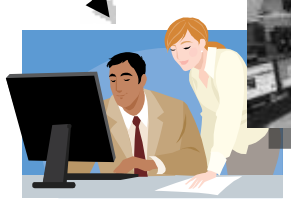
4oz
30 compounds









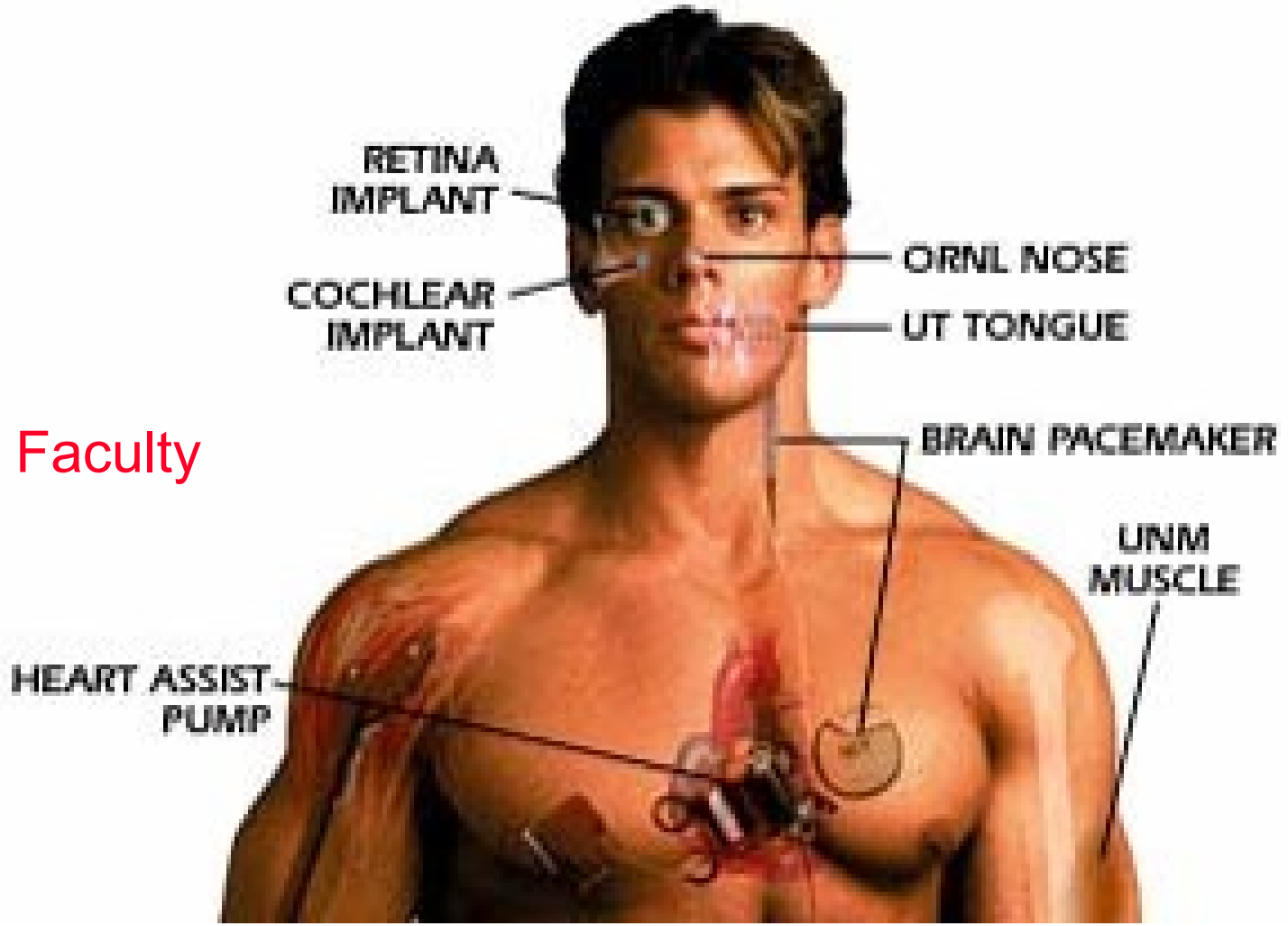




<u>CitiSense Team</u>
PI: Bill Griswold
Ingolf Krueger
Tajana Simunic Rosing
Sanjoy Dasgupta
Hovav Shacham
Kevin Patrick

Lifechips--Merging Two Major Industries: Microelectronic Chips & Life Sciences

65 UCI Faculty

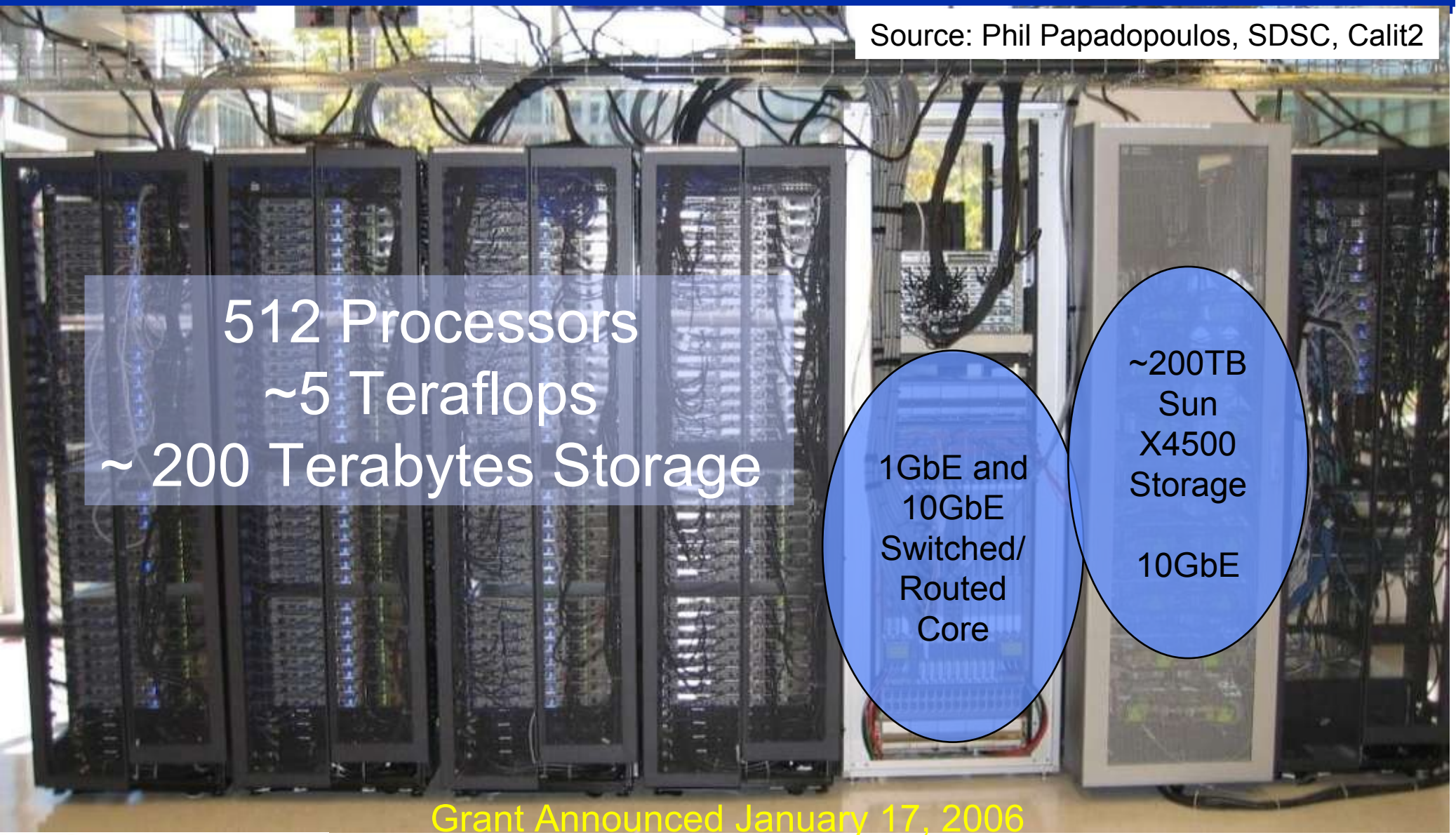


UCSD
UCIrvine

lifechips
university of california, irvine
www.lifechips.org

it²

Calit2 Microbial Metagenomics Cluster- Next Generation Optically Linked Science Data Server



Grant Announced January 17, 2006

camera Marine Microbial Ecology

Gordon and Betty MOORE FOUNDATION

ROCKS

SDSC

J. Craig Venter INSTITUTE

it²

Calit2 CAMERA:
Over 4000 Registered Users From Over 80 Countries

Community Cyberinfrastructure for Advanced Microbial Ecology Research and Analysis



Gordon and Betty MOORE FOUNDATION

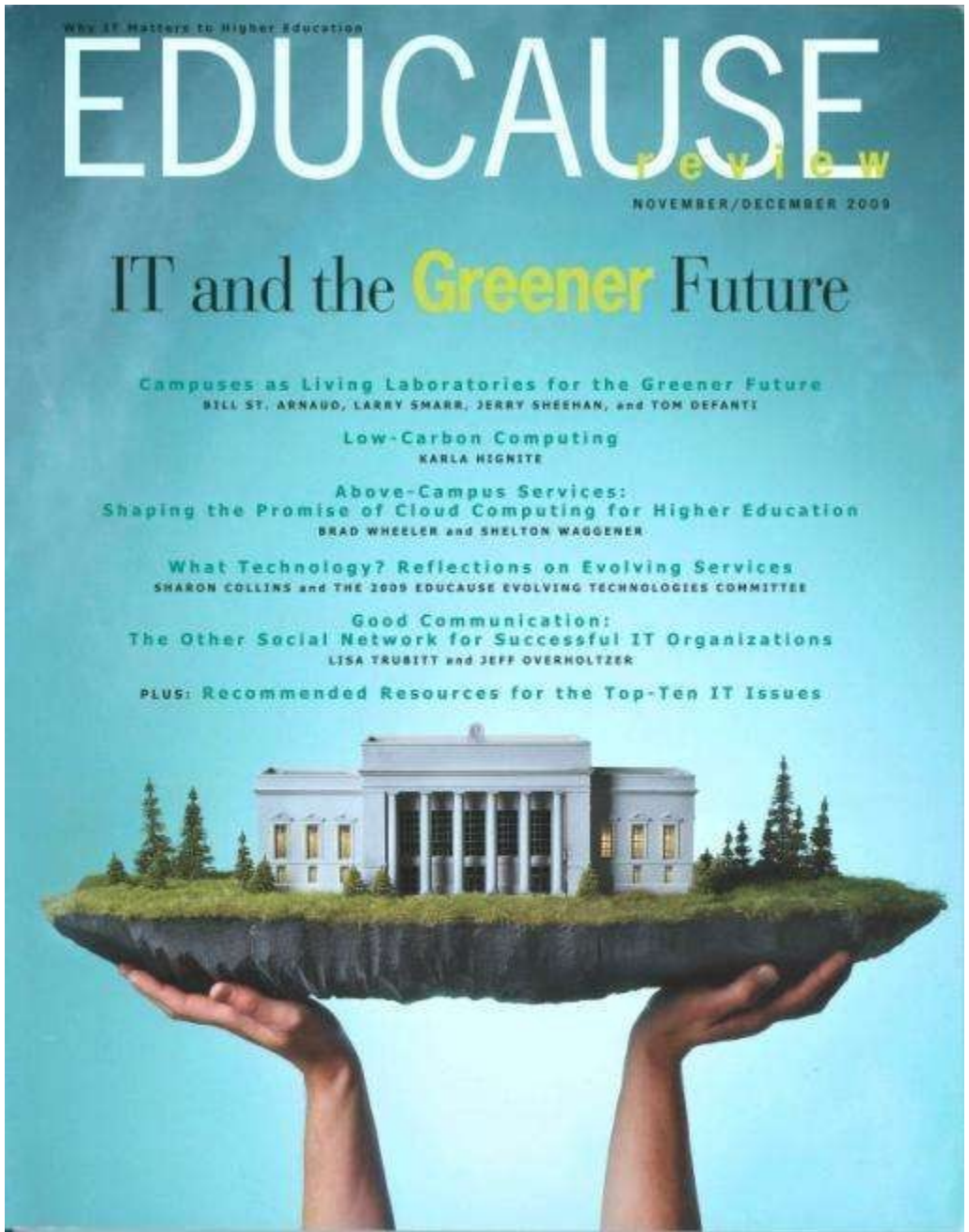
camera Marine Microbial Ecology

http://camera.calit2.net/

it2

Making University Campuses Living Laboratories for the Greener Future

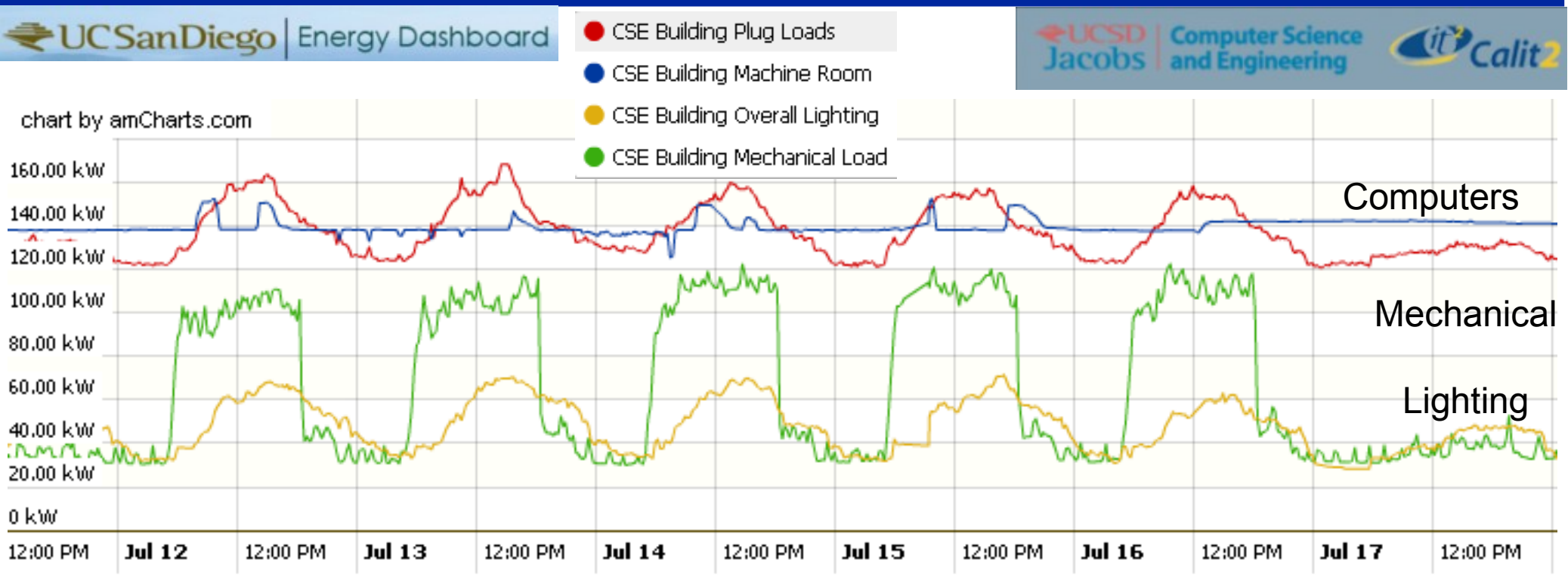
www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume44/CampusesasLivingLaboratoriesfo/185217



UCSD
UCIrvine

it²

Contributors to Base Load
UCSD Computer Science & Engineering Building



- **IT Loads Account for 50% (Peak) to 80% (Off-Peak)!**
- **Using IT to Save Energy:**
  - **SleepServer: 50-70% Savings on Plug Load and Machine Room**
  - **Estimated 40% HVAC Savings if Deployed Across Entire CSE!**
  - **LED Savings on Lighting**

UCSD UCIrvine

Source: Yuvraj Agarwal, Thomas Weng, Rajesh Gupta, UCSD

http://energy.ucsd.edu

Calit2 Has Introduced Innovative Wireless Systems to Support SoCal First Responders





















Aug. 22, 2006 MMST Disaster Drill at Calit2@UCSD Involved Over 200 First Responders

SoCal's Santa Anna Wildfires: A Growing Challenge to Our Region

Calit2, SDSU, and NASA Goddard Used NASA Prioritization and OptIPuter Links to Cut time to Receive Images from 24 to 3 Hours



Moderate Resolution Imaging Spectroradiometer (MODIS)

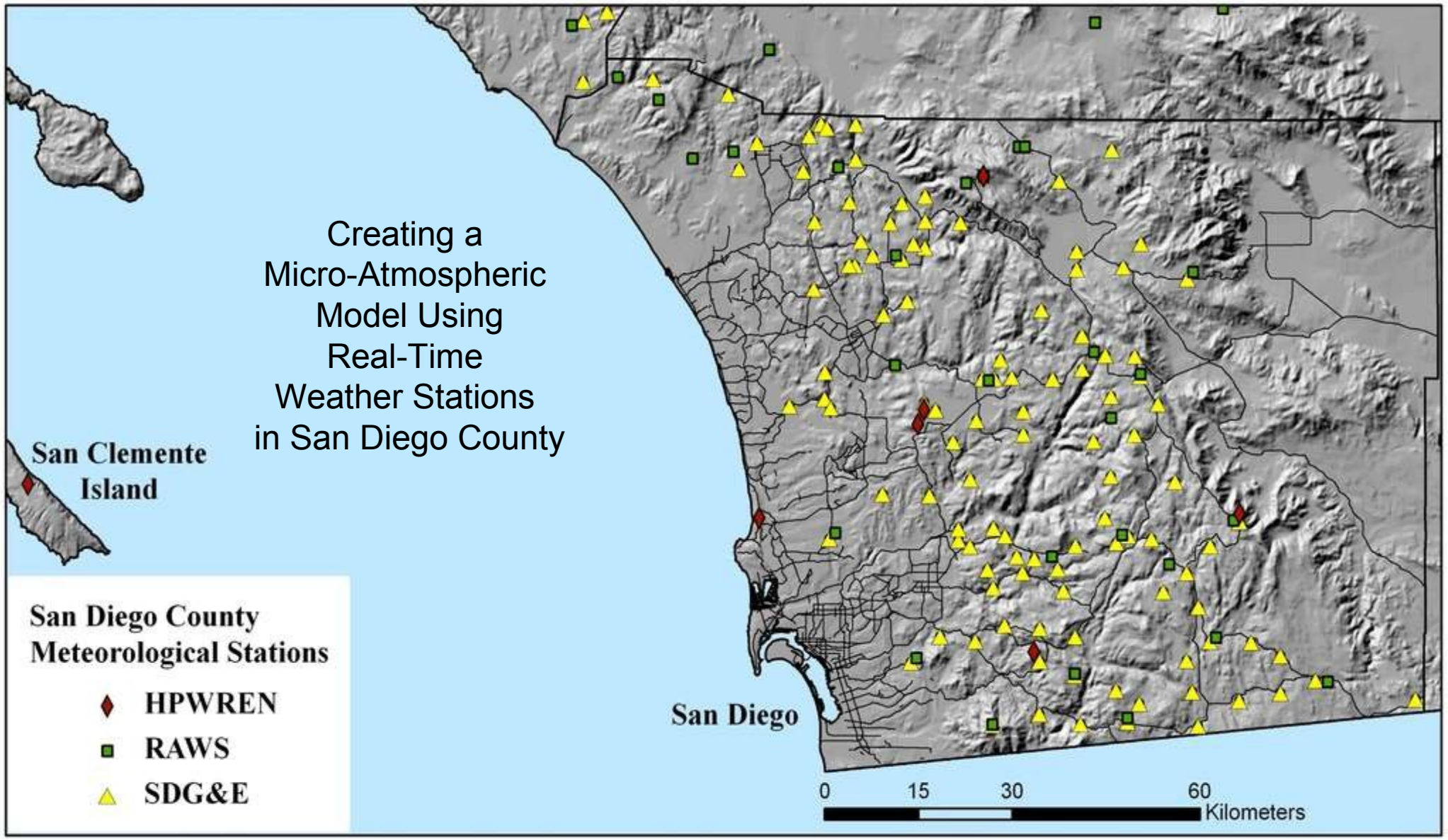
UCSD
UCIrvine

NASA/MODIS Rapid Response

www.nasa.gov/vision/earth/lookingatearth/socal_wildfires_oct07.html

it²

Creating a Digital "Mirror World": Interactive Virtual Reality of San Diego County



UCSD
UCIrvine

0.5 meter image resolution.
2 meter resolution elevation

it²

Situational Awareness for Wildfires: Combining Satellite Images, Live Cameras, HD Video

Ron Roberts, San Diego County Supervisor





Howard Windsor, San Diego CalFIRE Chief

UCSD
UCIrvine

Powered by Rocks ROCKS

Source: Falko Kuester, Calit2@UCSD

CGLX

it²