Calit2
The First Five Years

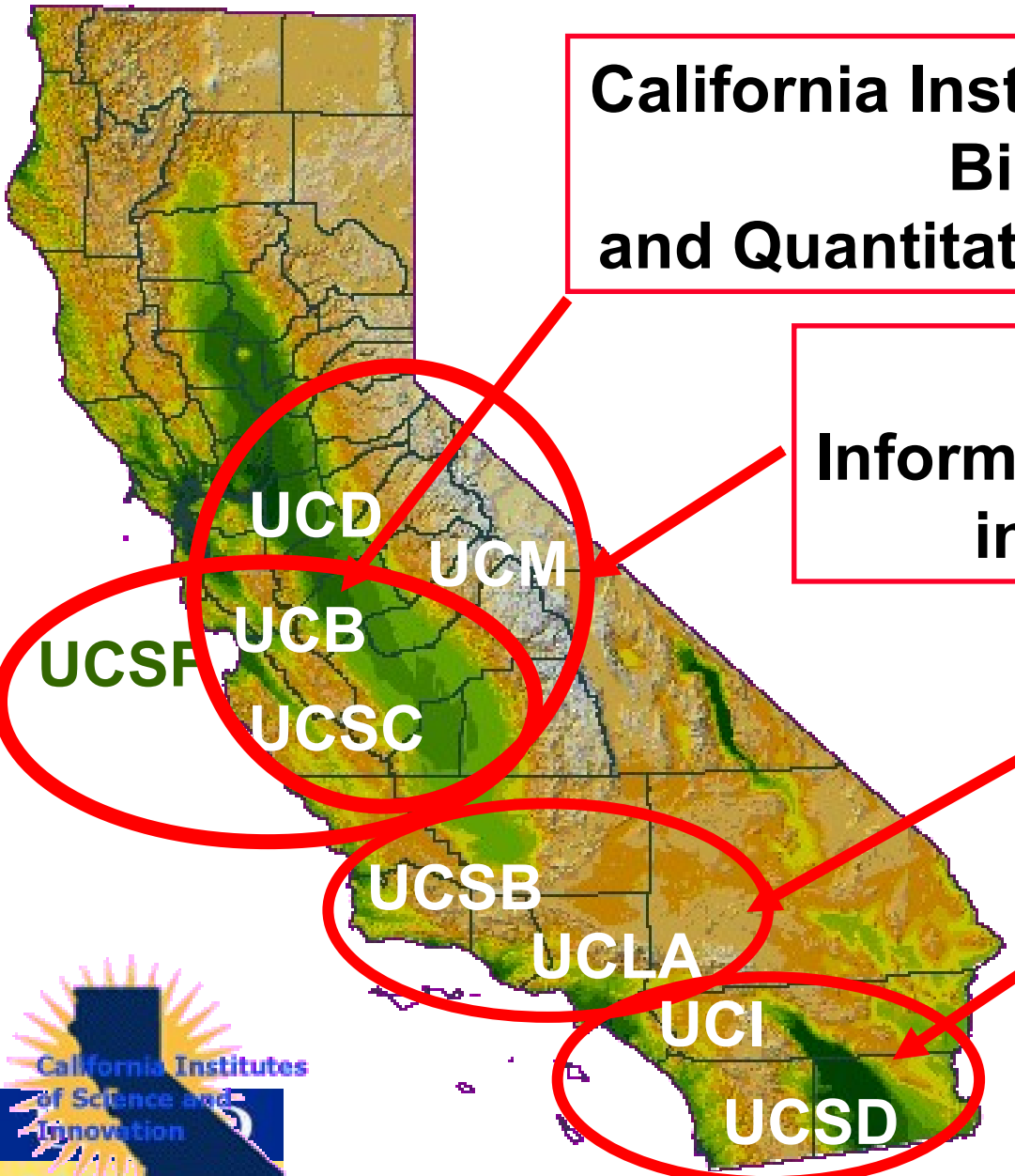
Invited Talk
UC Regents
San Francisco, CA
July 19, 2006

Dr. Larry Smarr
Director, California Institute for Telecommunications and Information Technologies
Harry E. Gruber Professor,
Dept. of Computer Science and Engineering
Jacobs School of Engineering, UCSD

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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

UCHVR

www.ucop.edu/california-institutes

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Calit2 Phase I: 2001-2005
~8,000 GSF, ~25 People, and No Facilities



Room 416 Engineering Tower
Calit2@UCI Division

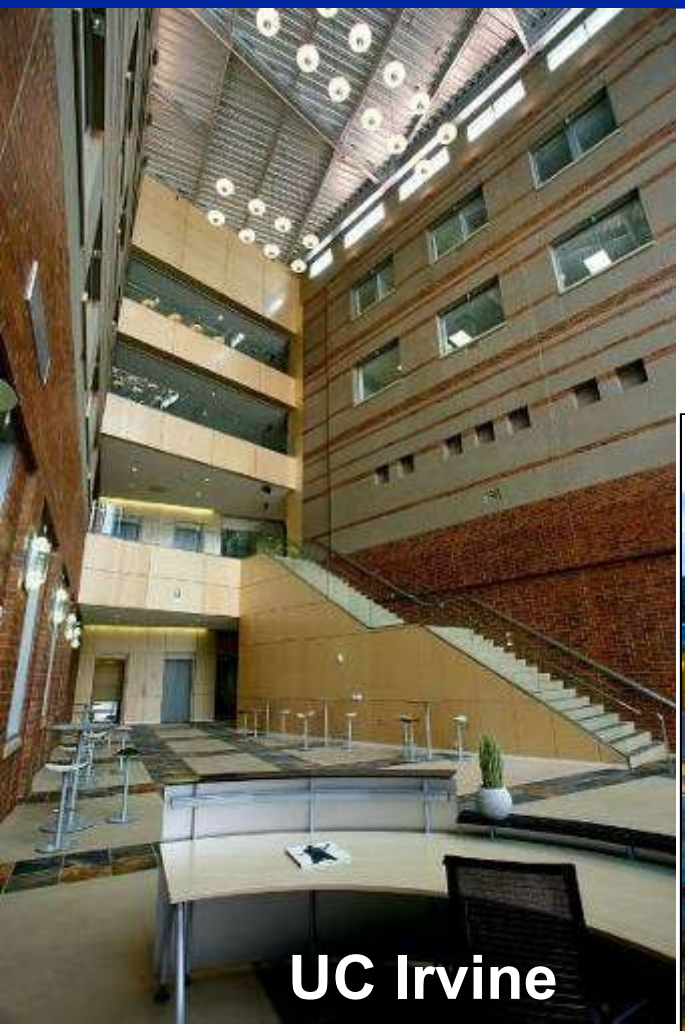


Triple Wide Trailer
Calit2@UCSD Division

From Incubation to Full Scale Operations
2005-2006

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Phase II:Two New Calit2 Buildings Provide ~340,000 GSF and New 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

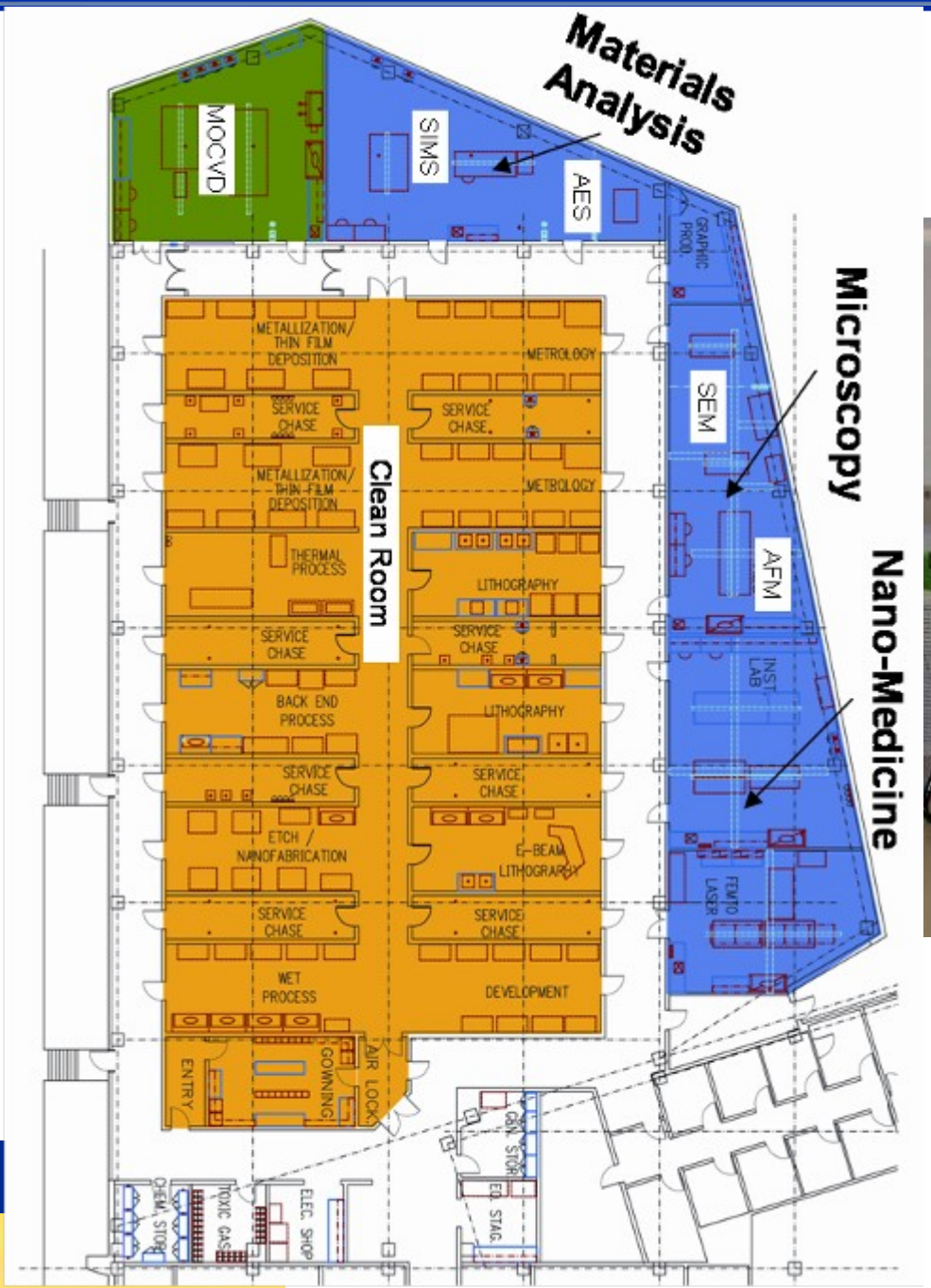


www.calit2.net

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State Funded $100M in Capital for Calit2 Buildings

Calit2 Materials and Devices Laboratory: "Nano3"–NanoScience, NanoEngineering, NanoMedicine



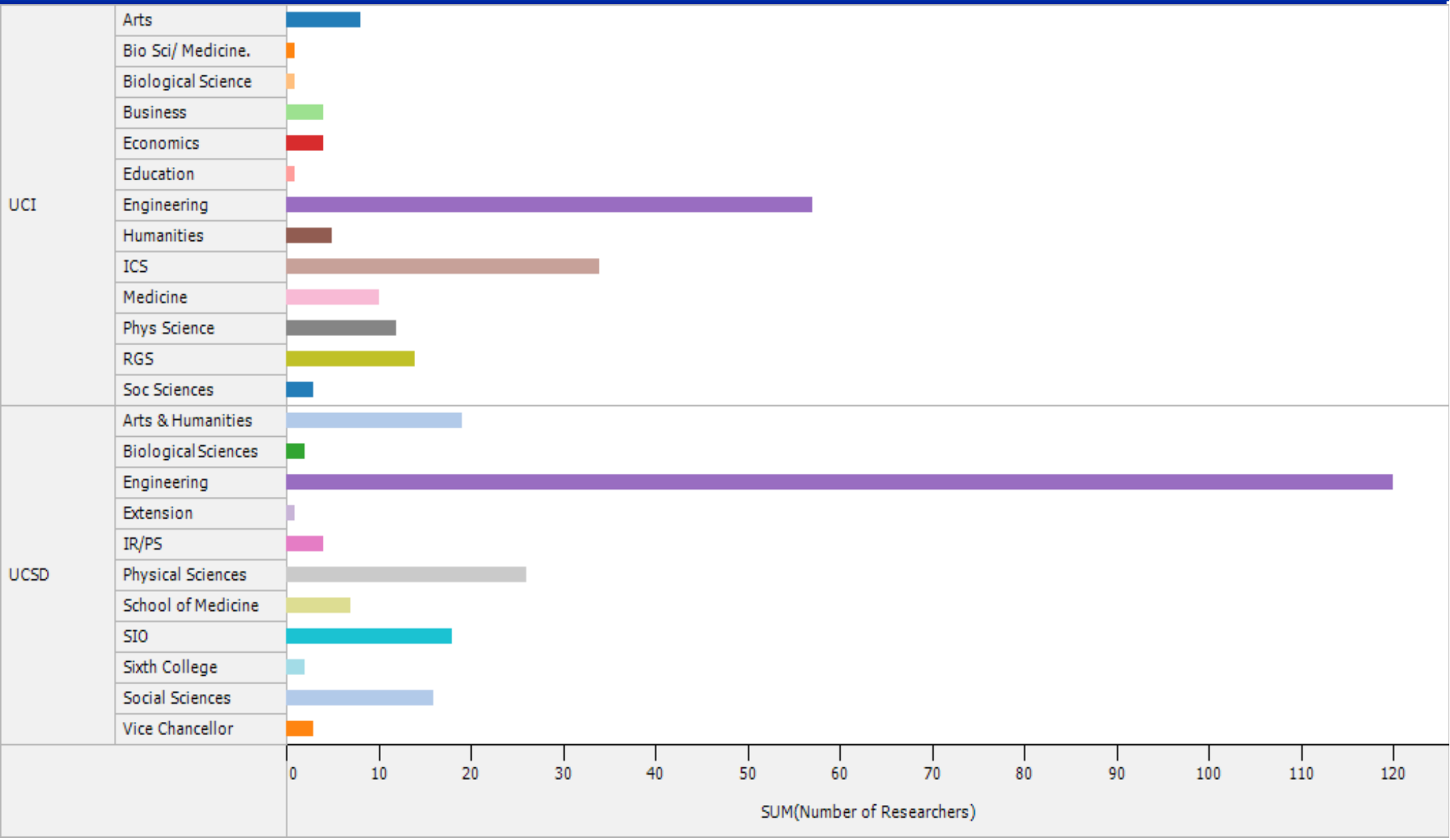
10,000 sq. feet State-of-the-Art Materials and Devices Laboratory



Similar Clean Rooms at UCI

Source: Bernd Fruhberger, Calit2

Calit2 Works with Over 300 Faculty in Over Two Dozen Departments Per Campus



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Calit2 Undergrad Research
Summer Research Programs on Both Campuses

Calit2@UCSD
UGRAD RESEARCH SCHOLARSHIP
FEB. 27th DEADLINE



SURF-IT
CALIT2 IRVINE

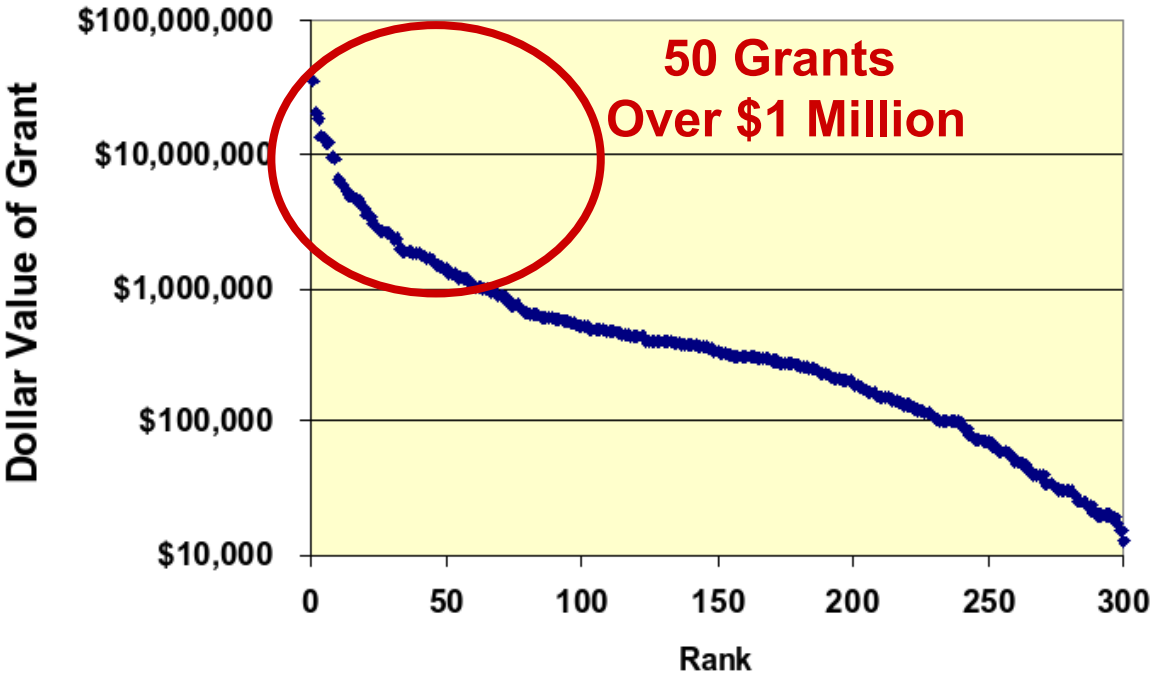




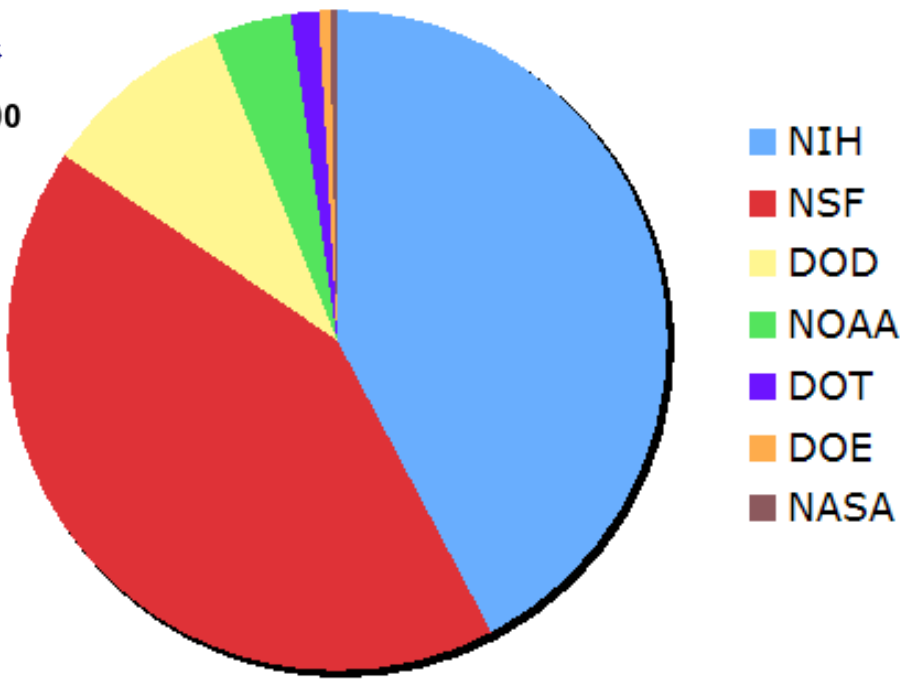
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Bioengineering, Chemistry, Chemical Eng., Cog Sci, CSE, ECE, IR/PS, Music, Physics, SIO, Visual Arts

Federal Agencies Have Funded $350 Million to Calit2 Affiliated Grants



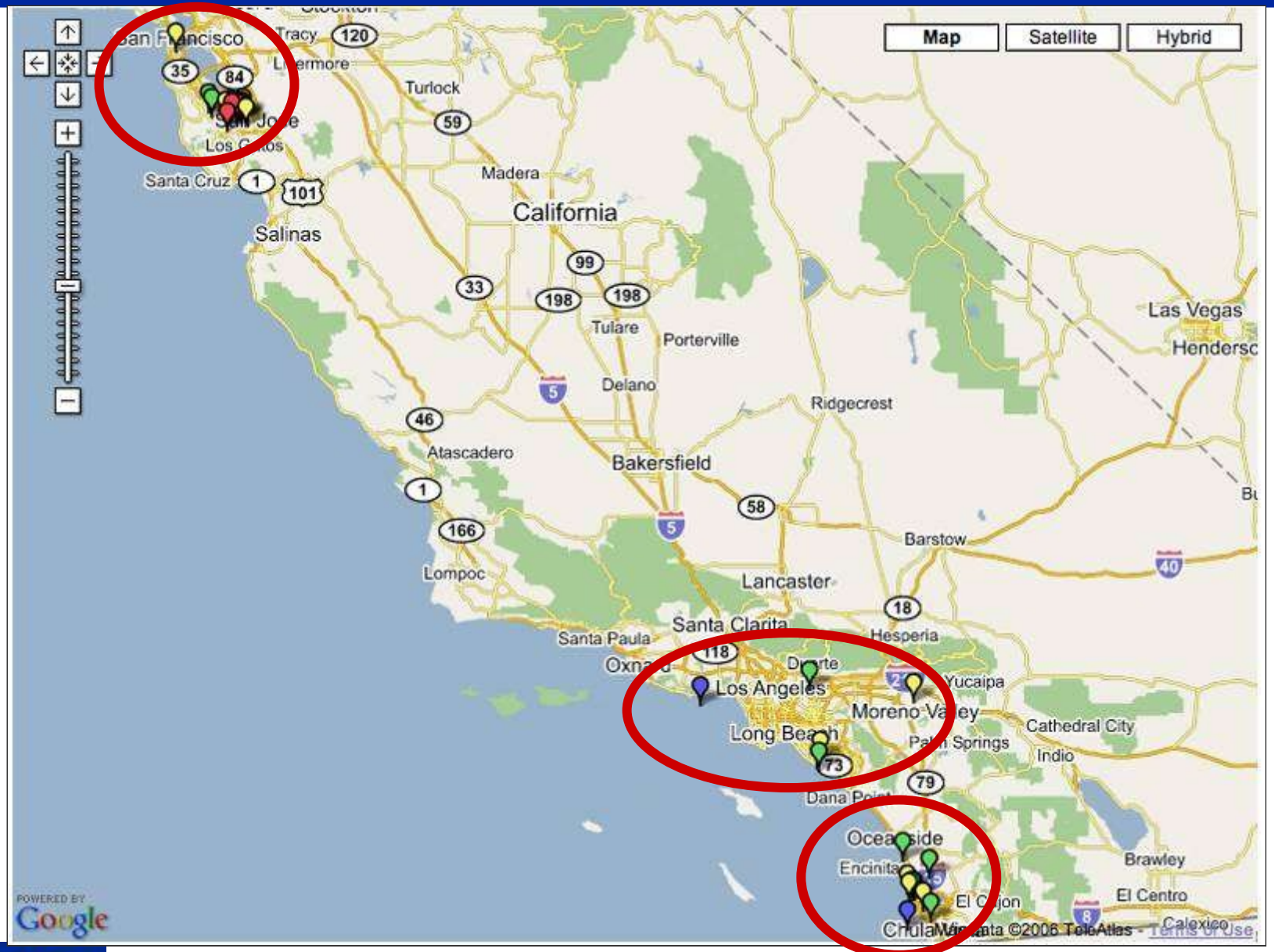
Federal Agency Source of Funds



Over 300 Calit2 Affiliated Grants

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Calit2 Industry Partners: Driving Public-Private Innovation Throughout California

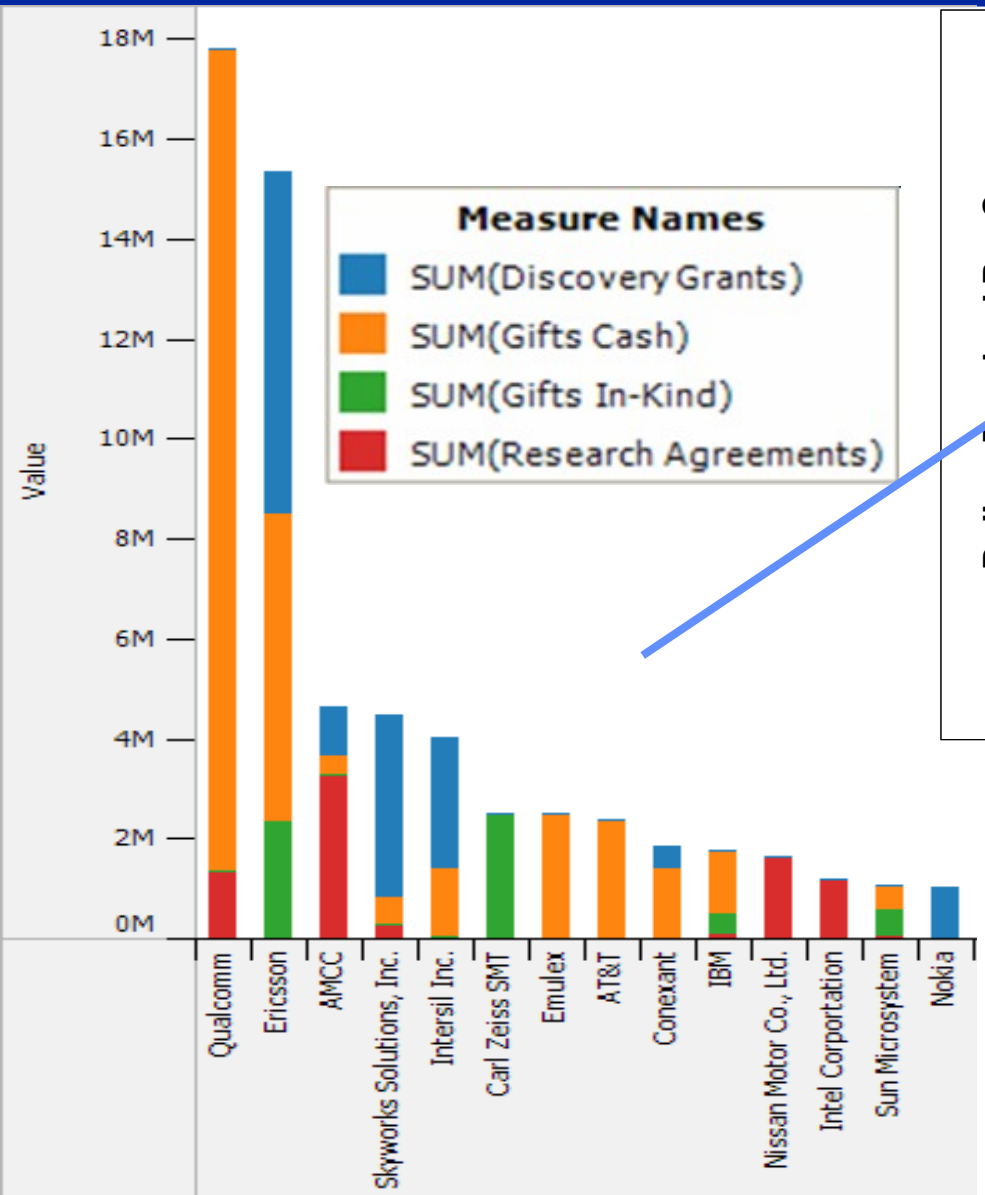


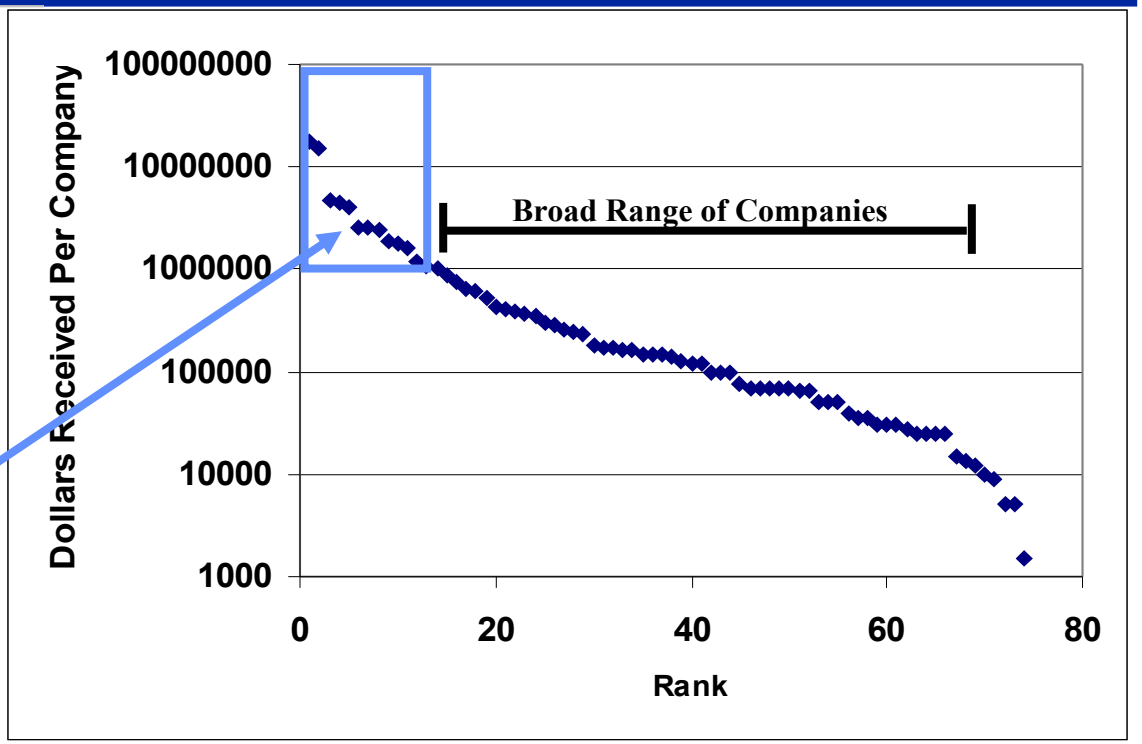
Source: Jerry Sheehan, Calit2

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Calit2 Has Partnered with over 100 Companies, More Than 75 Have Provided Funds or In-kind





$72 Million From Industry So Far

Industrial Partners > $1 Million

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Collaborating with City, County, State Agencies
A Classic "One-Institute, Two-Campus" Grant

- **Project RESCUE**
  - Five-Year $12.5 Million Award-Started Oct 1, 2003
- **Transforming Data Collection, Management, Analysis, Sharing, and Dissemination to Improve Crisis Response**
  - Twenty-Five Researchers and Professors
    - UCI PI: Sharad Mehrotra, ICS
    - UCSD PI: Ramesh Rao, ECE
    - Univ. Maryland, Univ. Of Illinois, BYU, Univ. Colorado
  - Industrial Partners
    - ImageCat, Ericsson, HNS, HP, Intersil, Parity, SAIC, SBC, Symbol, Qualcomm





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RESCUE Community Advisory Board

Ellis Stanley – Chair
General Manager, City of Los Angeles
Emergency Preparedness Department

Jim Watkins (retired)
Governor's Office
Emergency Services

Bob Garrott
Los Angeles County
Office of Emergency Mgmt.

Paulette Murphy
Space and Naval Warfare
Systems Command
(SPAWAR)

Dawna Finley
Tom Hume
Eileen Salmon
City of Irvine

Karen Butler
Program Manager
Communications Division
San Diego Police Department

William Maheu
Assistant Chief of Police
City of San Diego

David Rose
Lieutenant Officer
UC San Diego Police Department

Linda Bogue
Emergency Mgmt. Coordinator
Environmental Health and Safety



NSF RESCUE Strongly Coupled with NIH WIISARD Grant

Wireless Internet Information System for Medical Response in Disasters

Calit2 is Working Closely with the First Responder Community



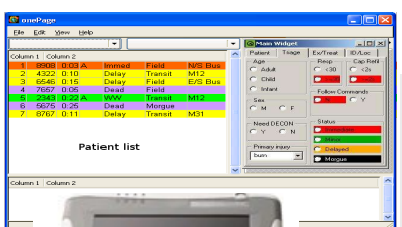




Triage

First Tier





Patient list



802.11 pulse ox







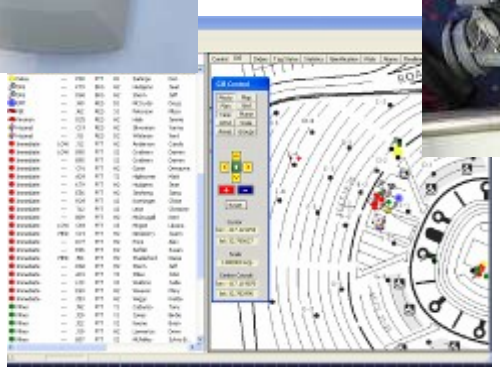
Reality Flythrough
Mobile Video



Mid Tier



Wireless Networks



Command Center

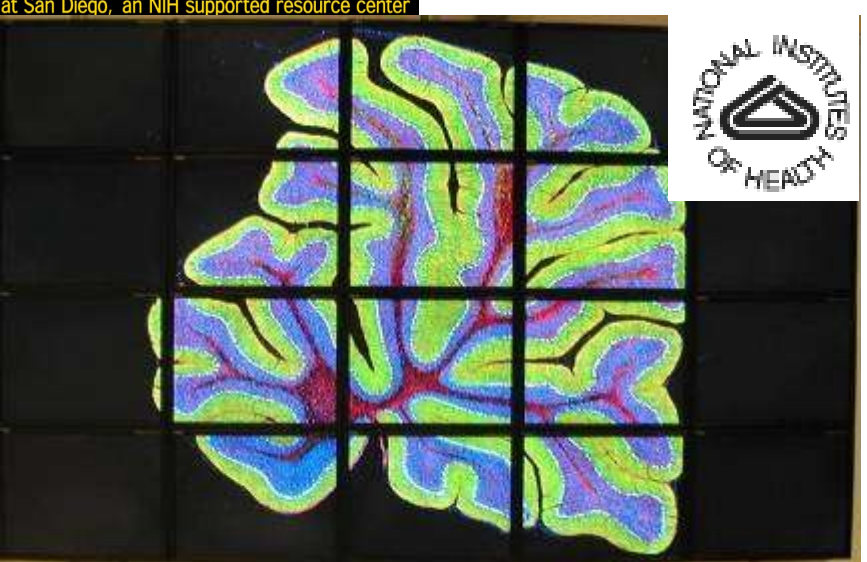
The OptIPuter Project – Creating a "SuperWeb" for Science Researchers

- **NSF Large Information Technology Research Proposal**
  - Calit2 (UCSD, UCI) and UIC Lead Campuses—Larry Smarr PI
  - Partnering Campuses: SDSC, USC, SDSU, NCSA, NW, TA&M, UvA, SARA, NASA Goddard, KISTI, AIST, CRC(Canada), CICESE (Mexico)
- **Industrial Partners**
  - IBM, Sun, Telcordia, Chiaro, Calient, Glimmerglass, Lucent
- **$13.5 Million Over Five Years—Now In the Fourth Year**

NSF

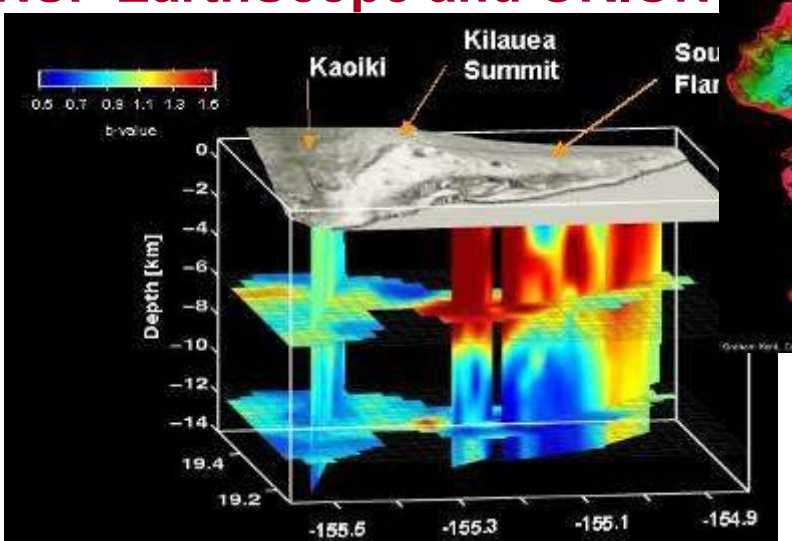
NIH Biomedical Informatics Research Network

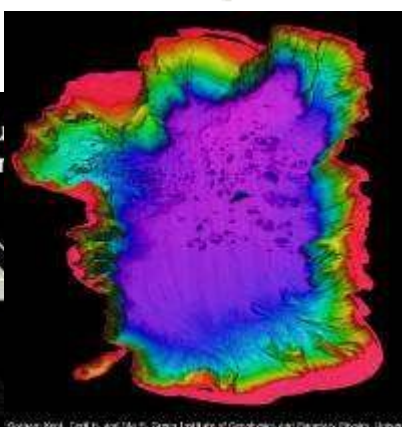
NCMIR
NATIONAL CENTER for MICROSCOPY and IMAGING RESEARCH
at San Diego, an NIH supported resource center



NATIONAL INSTITUTES OF HEALTH

NSF EarthScope and ORION



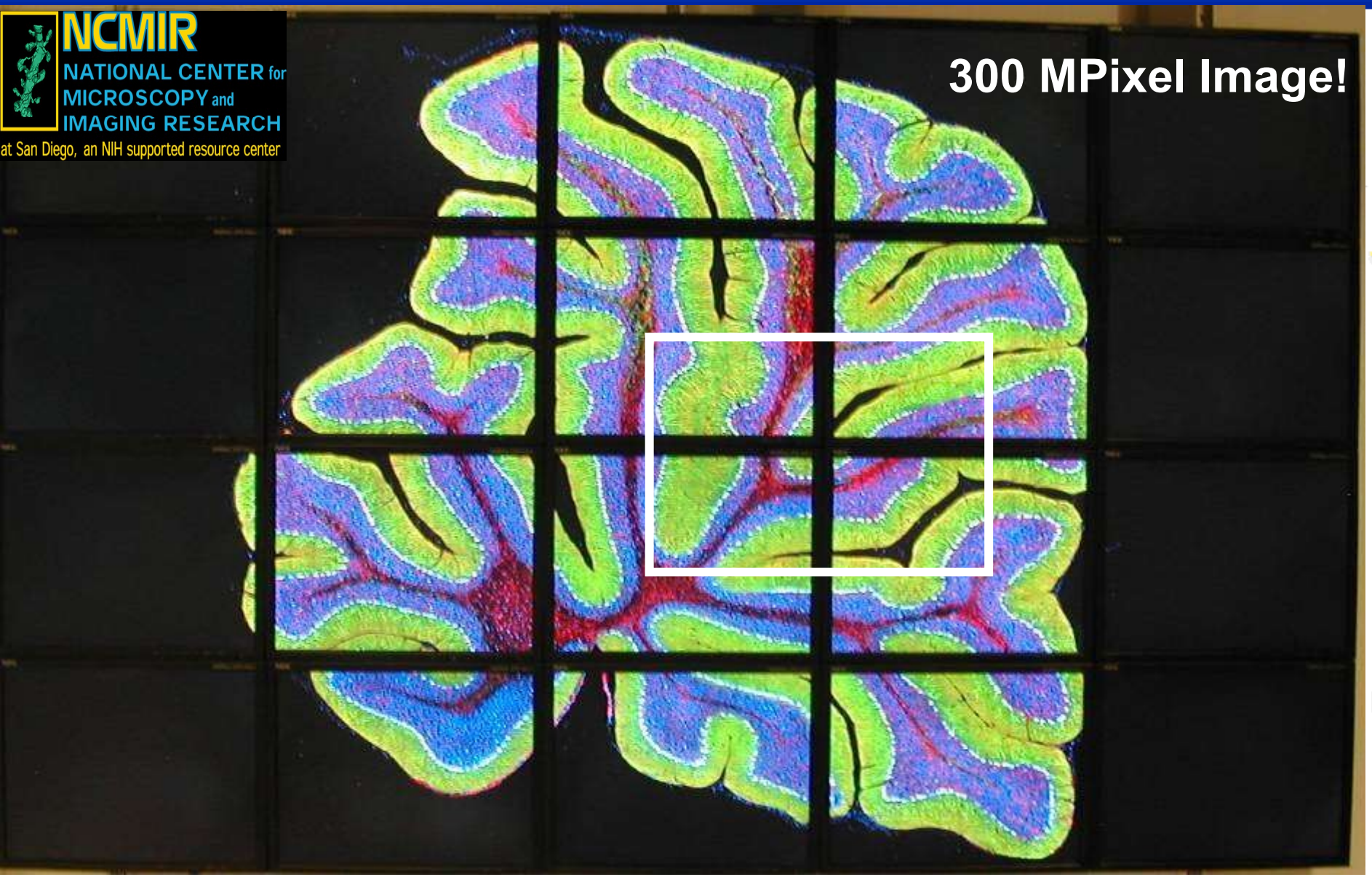


SCRIPPS INSTITUTION OF OCEANOGRAPHY

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The OptIPuter -- Creating High Resolution "Windows" Over Dedicated Optical Channels to Global Science Data

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

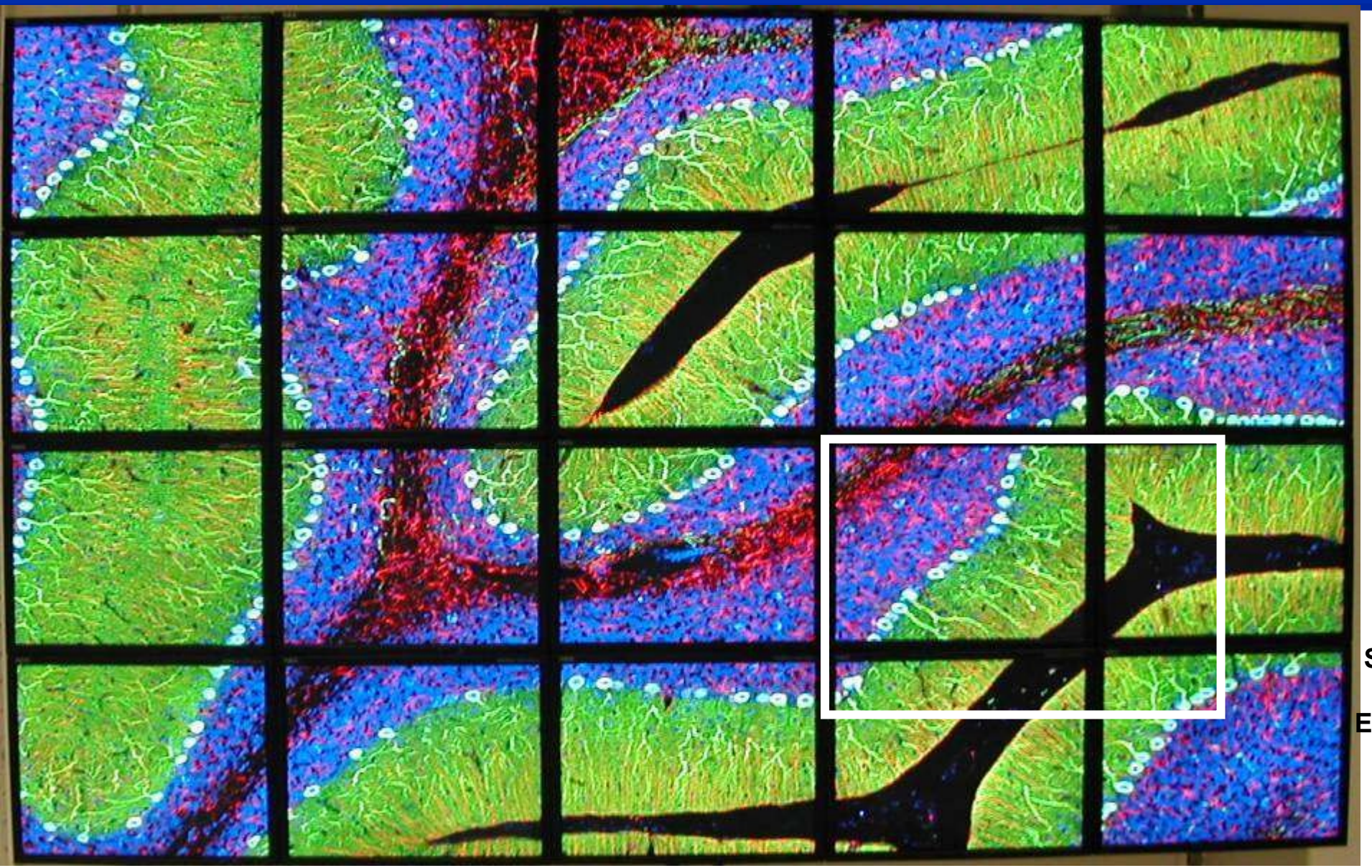


Source: Mark Ellisman, David Lee, Jason Leigh

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Calit2 (UCSD, UCI) and UIC Lead Campuses—Larry Smarr PI
Partners: SDSC, USC, SDSU, NW, TA&M, UvA, SARA, KISTI, AIST

Scalable Displays Allow Both Global Content and Fine Detail



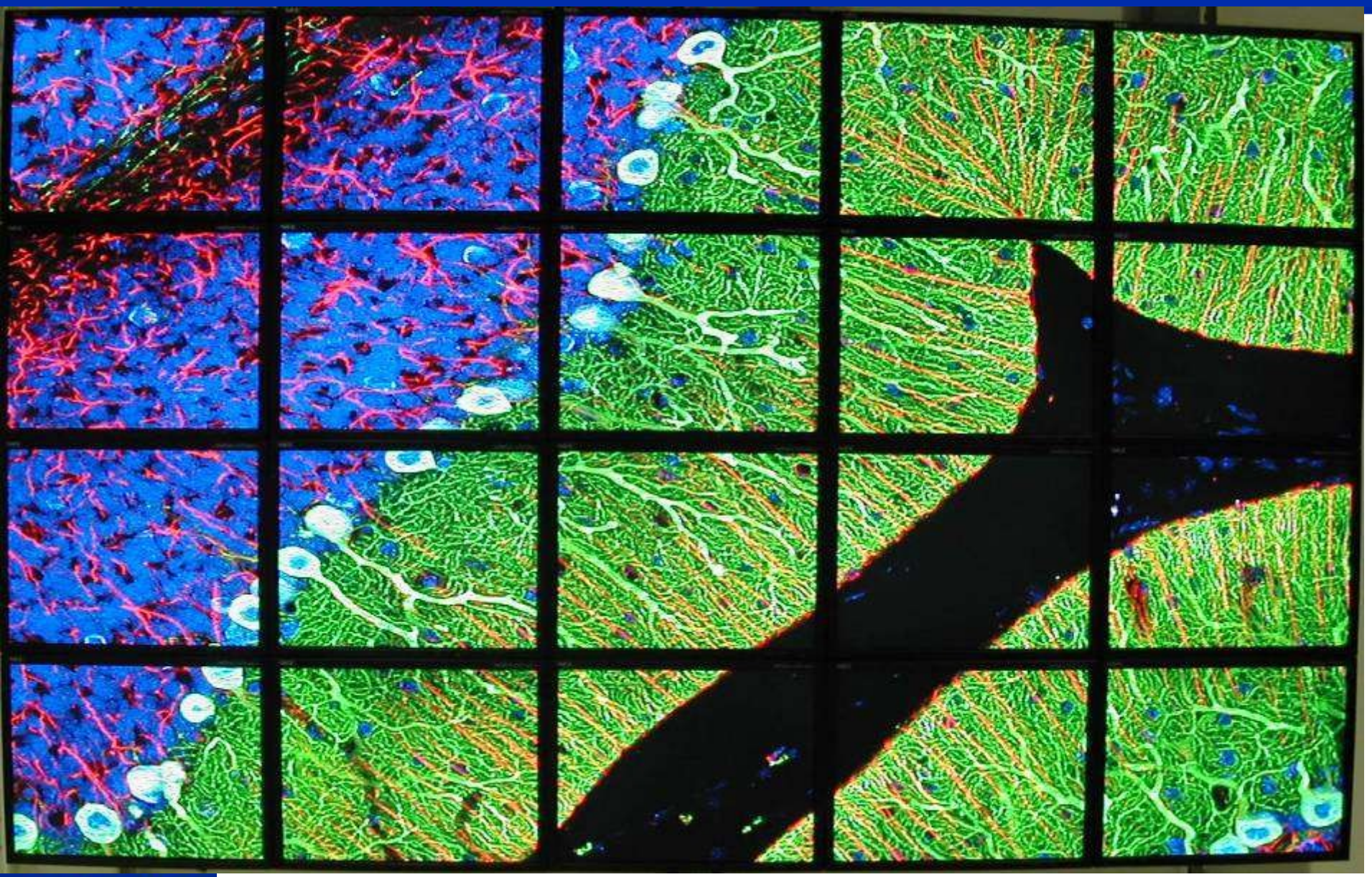
Source: Mark Ellisman, David Lee, Jason Leigh

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30 MPixel SunScreen Display Driven by a 20-node Sun Opteron Visualization Cluster

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Allows for Interactive Zooming from Cerebellum to Individual Neurons



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Source: Mark Ellisman, David Lee, Jason Leigh

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The World's Largest Tiled Display Wall—Calit2@UCI's HIPerWall



Calit2@UCI Apple Tiled Display Wall
Driven by 25 Dual-Processor G5s
50 Apple 30" Cinema Displays
200 Million Pixels of Viewing Real Estate!

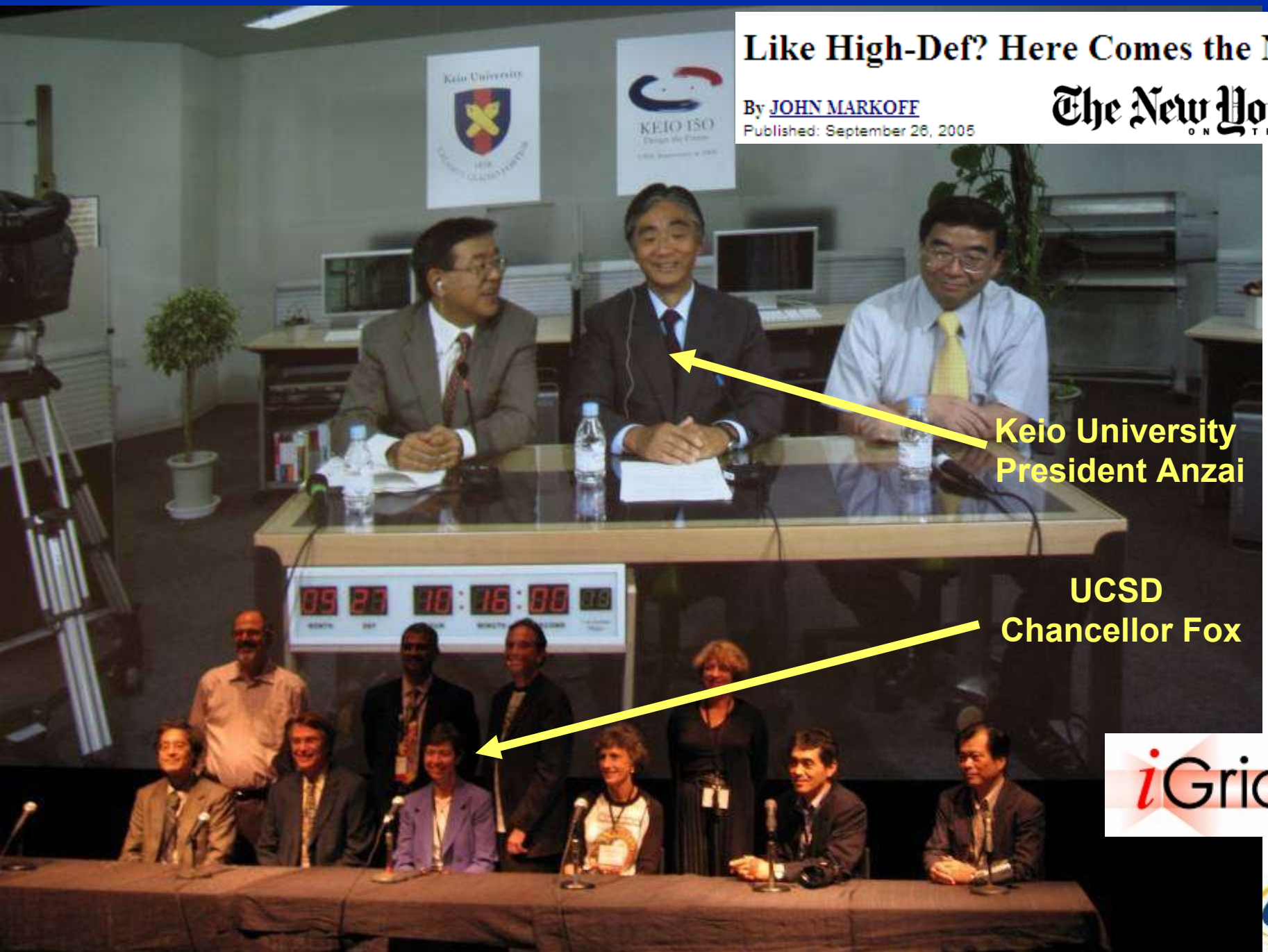
Zeiss Scanning Electron Microscope Center of Excellence in Calit2@UCI
Albert Yee, PI



Falko Kuester and Steve Jenks, PIs Featured in Apple Computer's "Hot News"

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First Trans-Pacific Super High Definition Telepresence Meeting in New Calit2 Digital Cinema Auditorium



Like High-Def? Here Comes the Next Level

By JOHN MARKOFF
Published: September 26, 2005

The New York Times ON THE WEB

Keio University President Anzai

UCSD Chancellor Fox

Lays Technical Basis for Global Digital Cinema

Sony
NTT
SGI

iGrid 2005

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Calit2 is Partnering with CENIC to Connect Digital Media Researchers Into CineGrid™

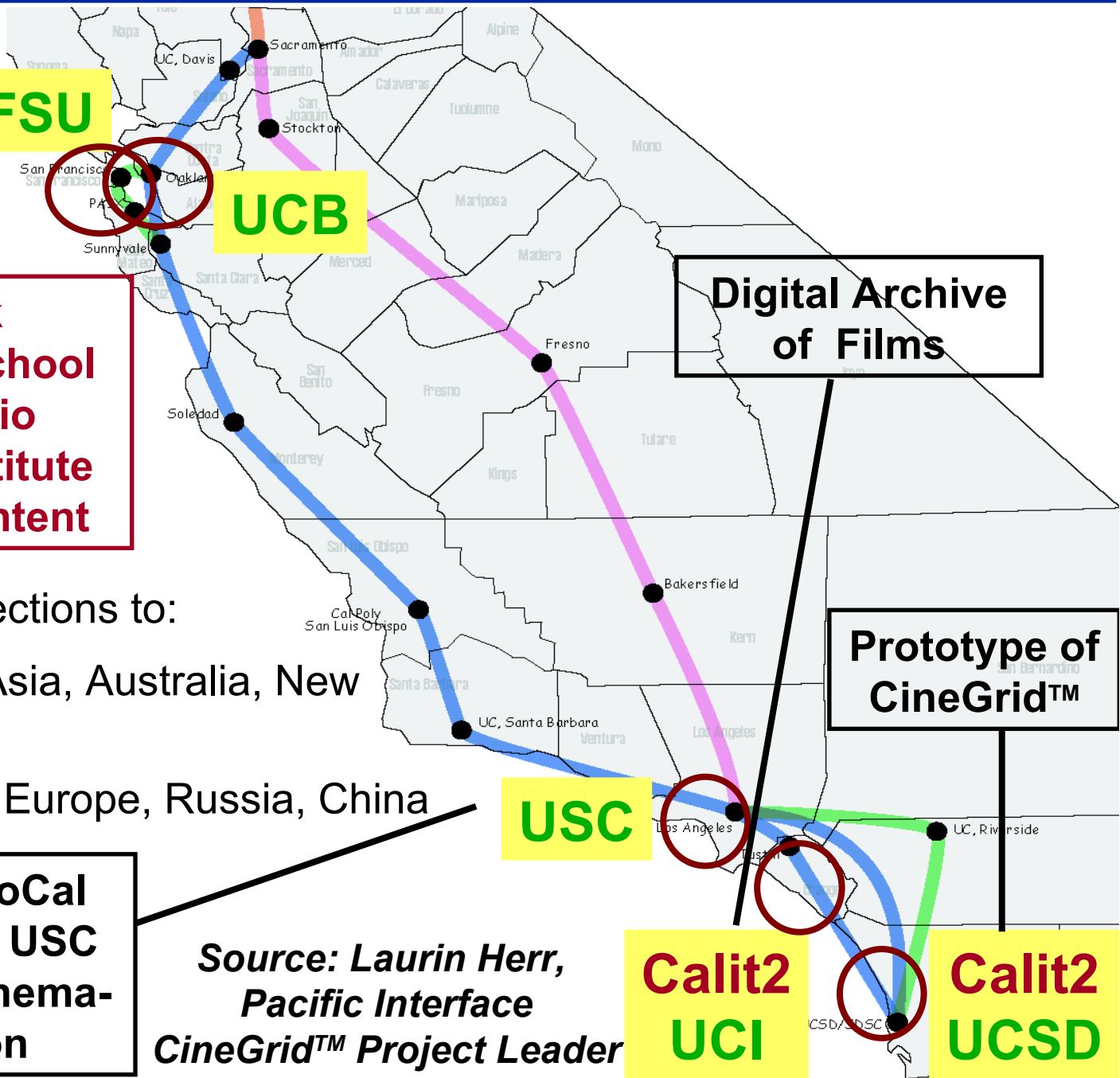
Partnering with SFSU's Institute for Next Generation Internet

CineGrid™ will Link UCSD/Calit2 and USC School of Cinema TV with Keio University Research Institute for Digital Media and Content

Plus, 1Gb and 10Gb Connections to:

- Seattle, Canada, Japan, Asia, Australia, New Zealand
- Chicago, Canada, Japan, Europe, Russia, China
- Tijuana

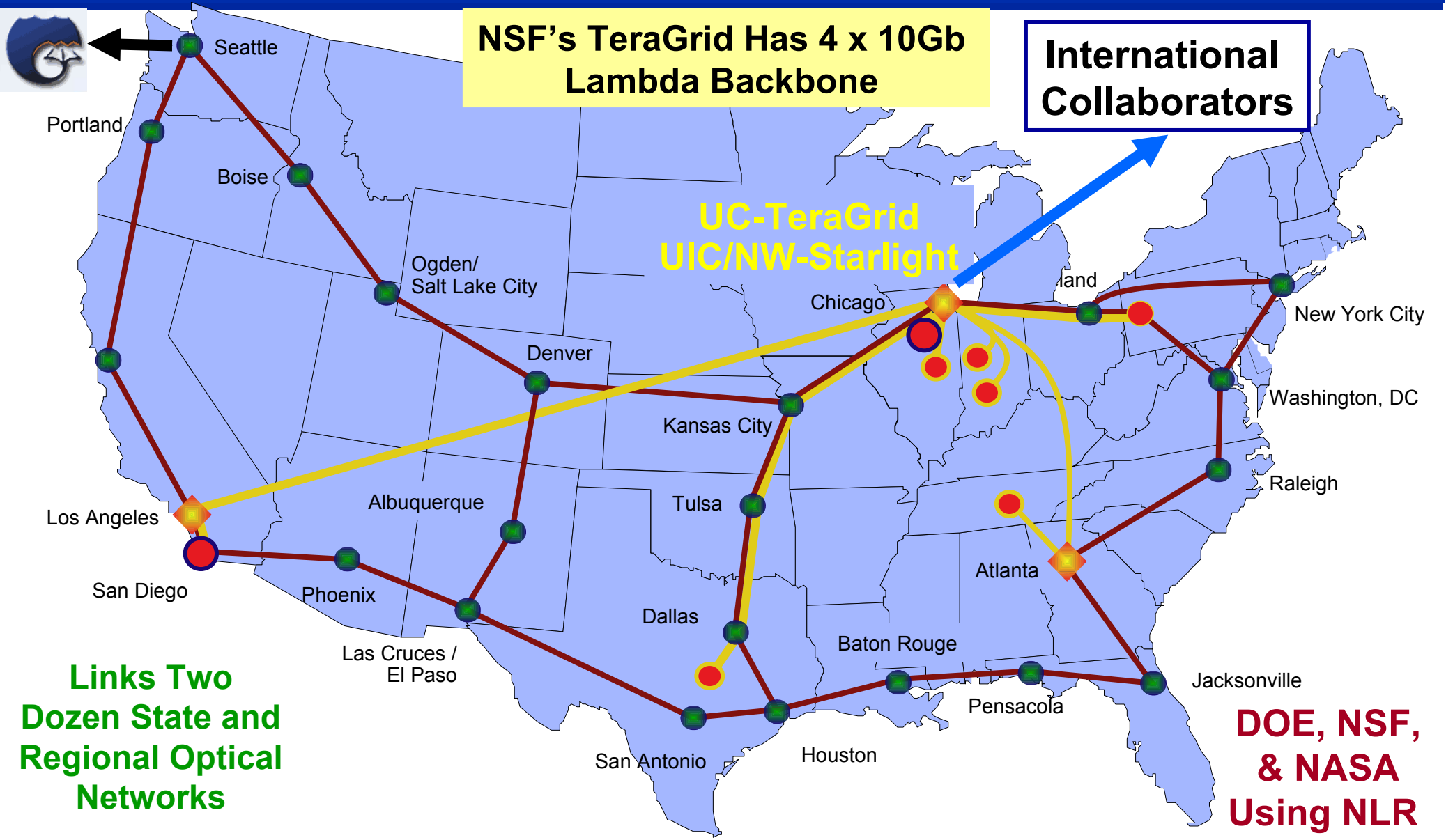
Extended SoCal OptIPuter to USC School of Cinema-Television



Source: Laurin Herr, Pacific Interface CineGrid™ Project Leader

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National Lambda Rail (NLR) and TeraGrid Provides Cyberinfrastructure Backbone for U.S. Researchers



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CAMERA: Community Cyberinfrastructure for Advanced Marine Microbial Ecology Research and Analysis



National LambdaRail Direct Connect Computation and Storage Complex

PI Larry Smarr

Funded by: Gordon and Betty Moore Foundation

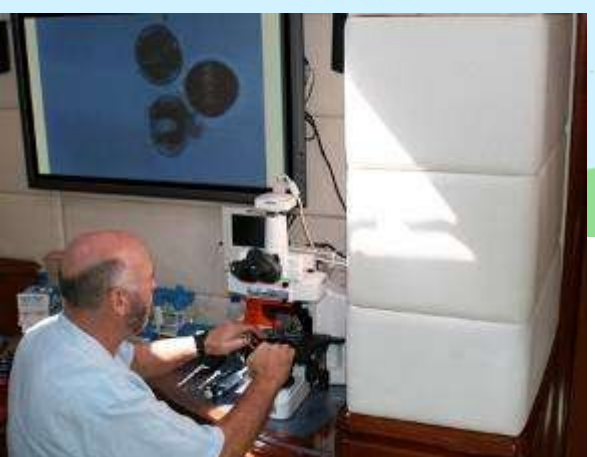
Joint Partnership of:

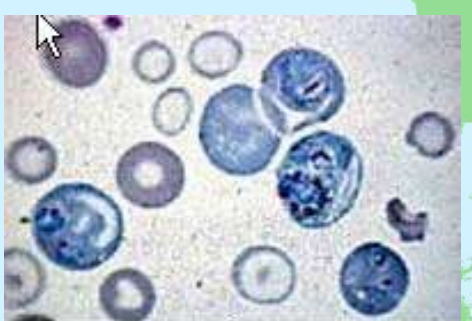
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Announced January 17, 2006
$24.5M Over Seven Years

Marine Genome Sequencing Project
Measuring the Genetic Diversity of Ocean Microbes







Canada
United States
Mexico
Puerto Rico
Honduras
Costa Rica
Panama
Galapagos Islands
x 10 samples
Tanzania/
Zanzibar
x 7 samples
Seychelles
Madagascar
South Africa
Cocos-
Keeling Is.
Vanuatu
x 17 samples
Fiji
Tonga
French
Polynesia
Cook
Islands
Australia
New Caledonia
x 8 samples
Analyzed
Sampled, but not Analyzed

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MARINE MICROBIOLOGY INITIATIVE

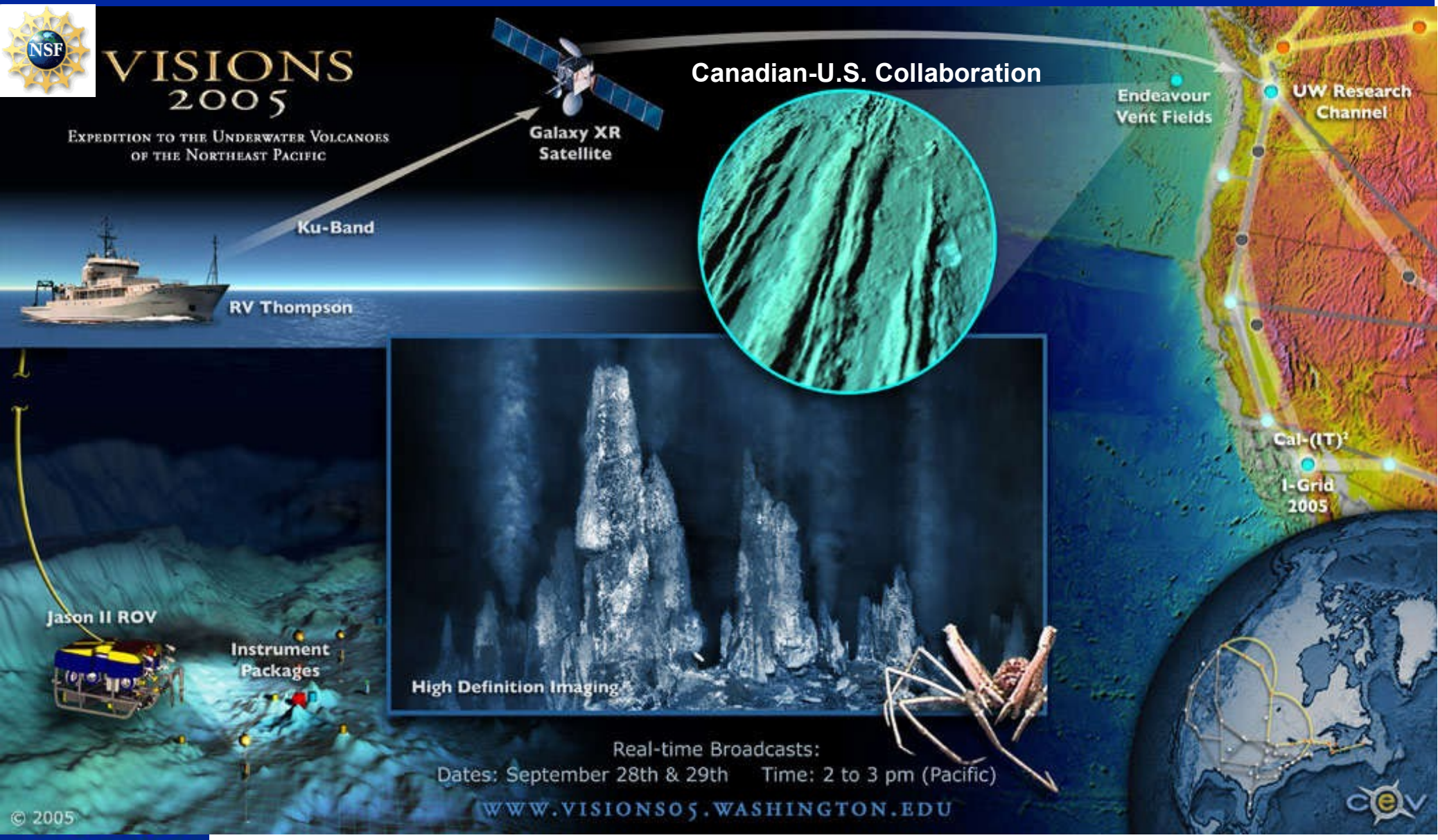
Gordon and Betty MOORE FOUNDATION

CAMERA's Sorcerer II Data Will Double Number of Proteins in GenBank!

J. Craig Venter INSTITUTE

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First Remote Interactive High Definition Video Exploration of Deep Sea Vents



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Source John Delaney & Deborah Kelley, UWash

High Definition Still Frame of Hydrothermal Vent Ecology 2.3 Km Deep



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White Filamentous Bacteria on 'Pill Bug' Outer Carapace

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