Uses of the OptIPortal

Presentation to the Minority Serving Institutions Cyberinfrastructure Empowerment Coalition

Calit2@UCSD

June 10, 2010

Dr. Larry Smarr

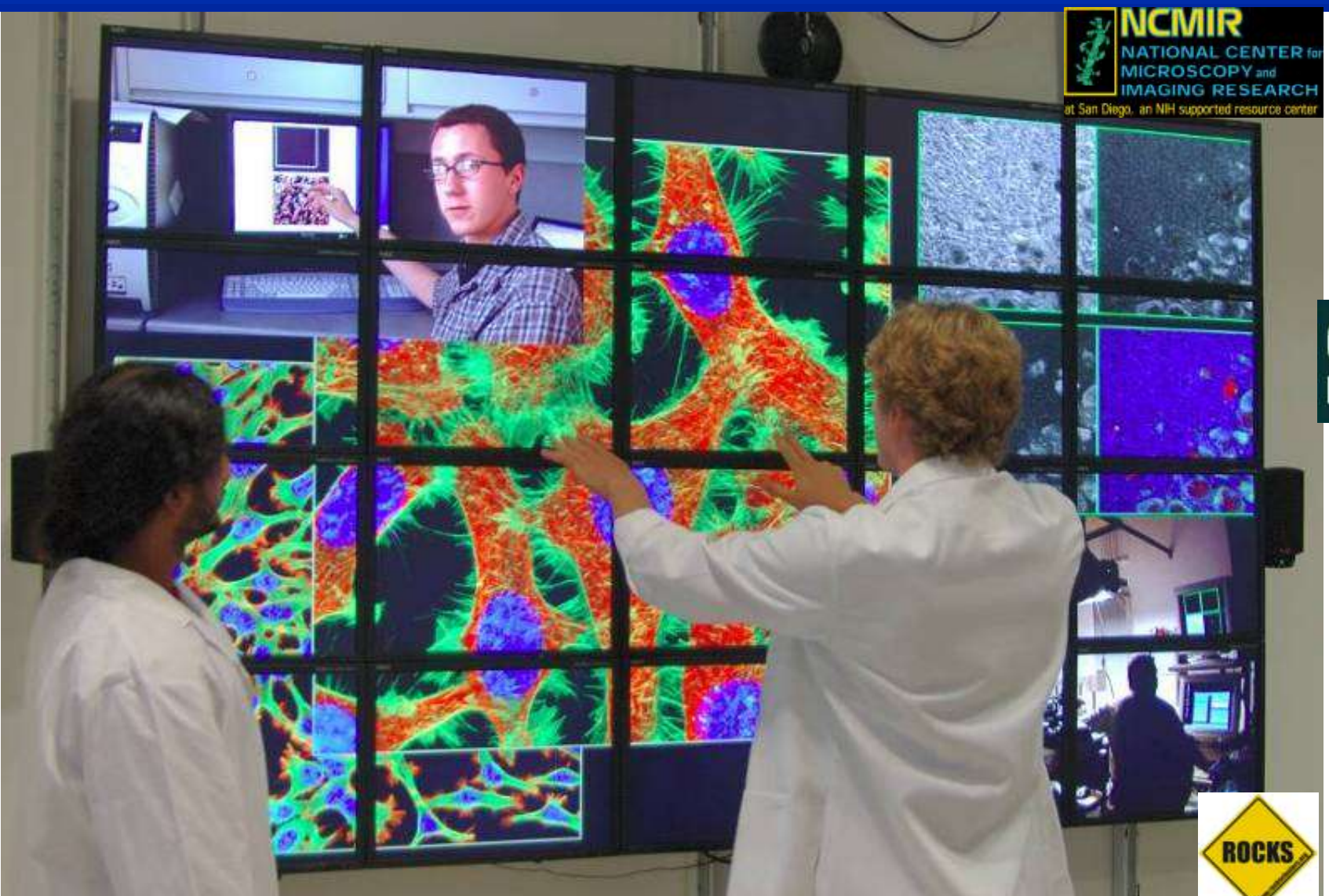
Director, California Institute for Telecommunications and Information Technology

Harry E. Gruber Professor,

Dept. of Computer Science and Engineering

Jacobs School of Engineering, UCSD

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



Scalable Adaptive Graphics Environment (SAGE)

SAGE

evl electronic visualization laboratory

NSF

Picture Source: Mark Ellisman, David Lee, Jason Leigh

Calit2 (UCSD, UCI), SDSC, and UIC Leads—Larry Smarr PI

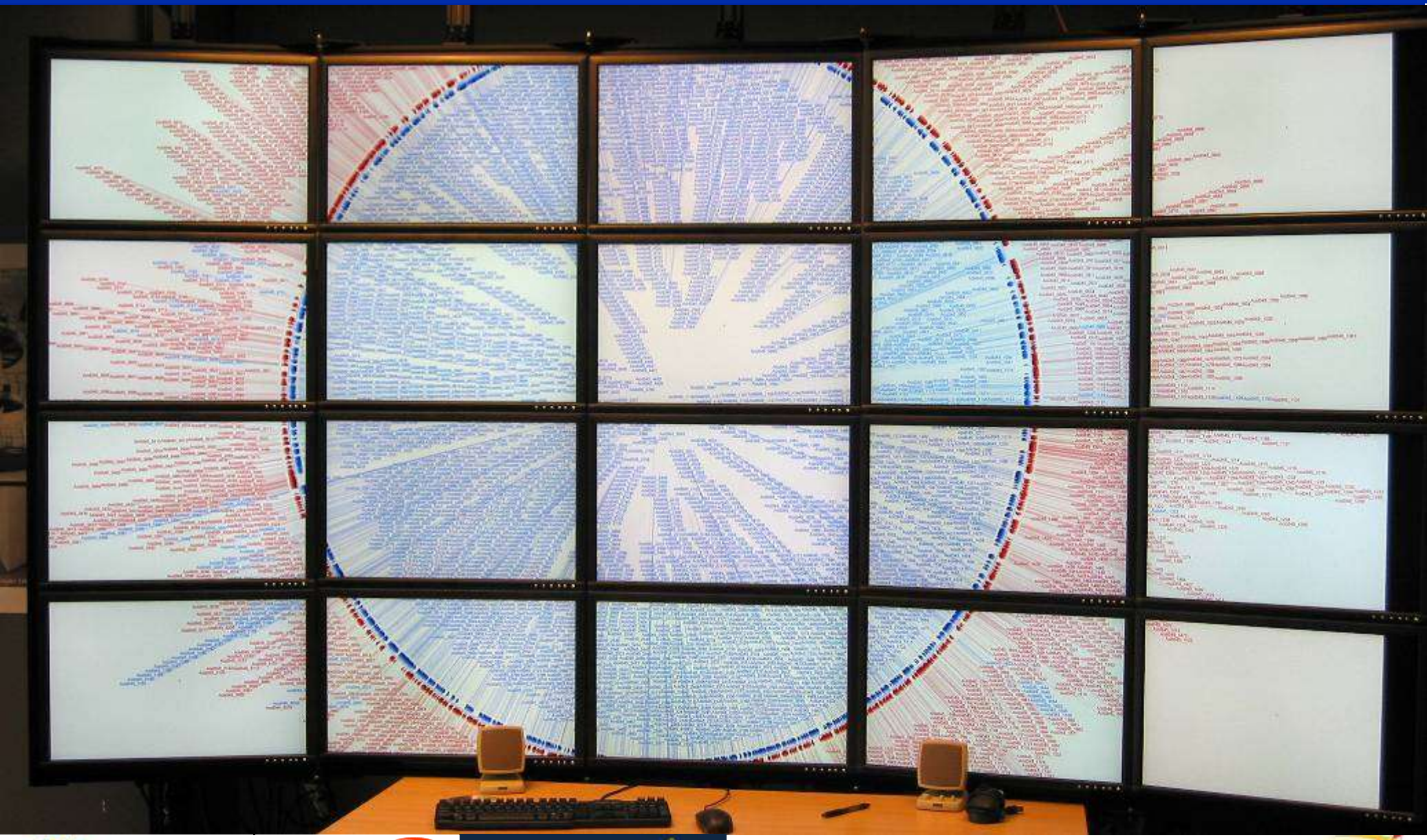
Univ. Partners: NCSA, USC, SDSU, NW, TA&M, UvA, SARA, KISTI, AIST

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

it2

OptIPuter

Visual Analytics--Use of Tiled Display Wall OptIPortal to Interactively View Microbial Genome (5 Million Bases)



camera Marine Microbial Ecology

OptIPuter

Powered by Rocks ROCKS

Acidobacteria bacterium Ellin345 Soil Bacterium 5.6 Mb; ~5000 Genes

Source: Raj Singh, UCSD

OptIPuter

Use of Tiled Display Wall OptIPortal to Interactively View Microbial Genome



camera Marine Microbial Ecology

OptIPuter

Powered by Rocks ROCKS

Source: Raj Singh, UCSD

OptIPuter

Use of Tiled Display Wall OptIPortal to Interactively View Microbial Genome



camera Marine Microbial Ecology

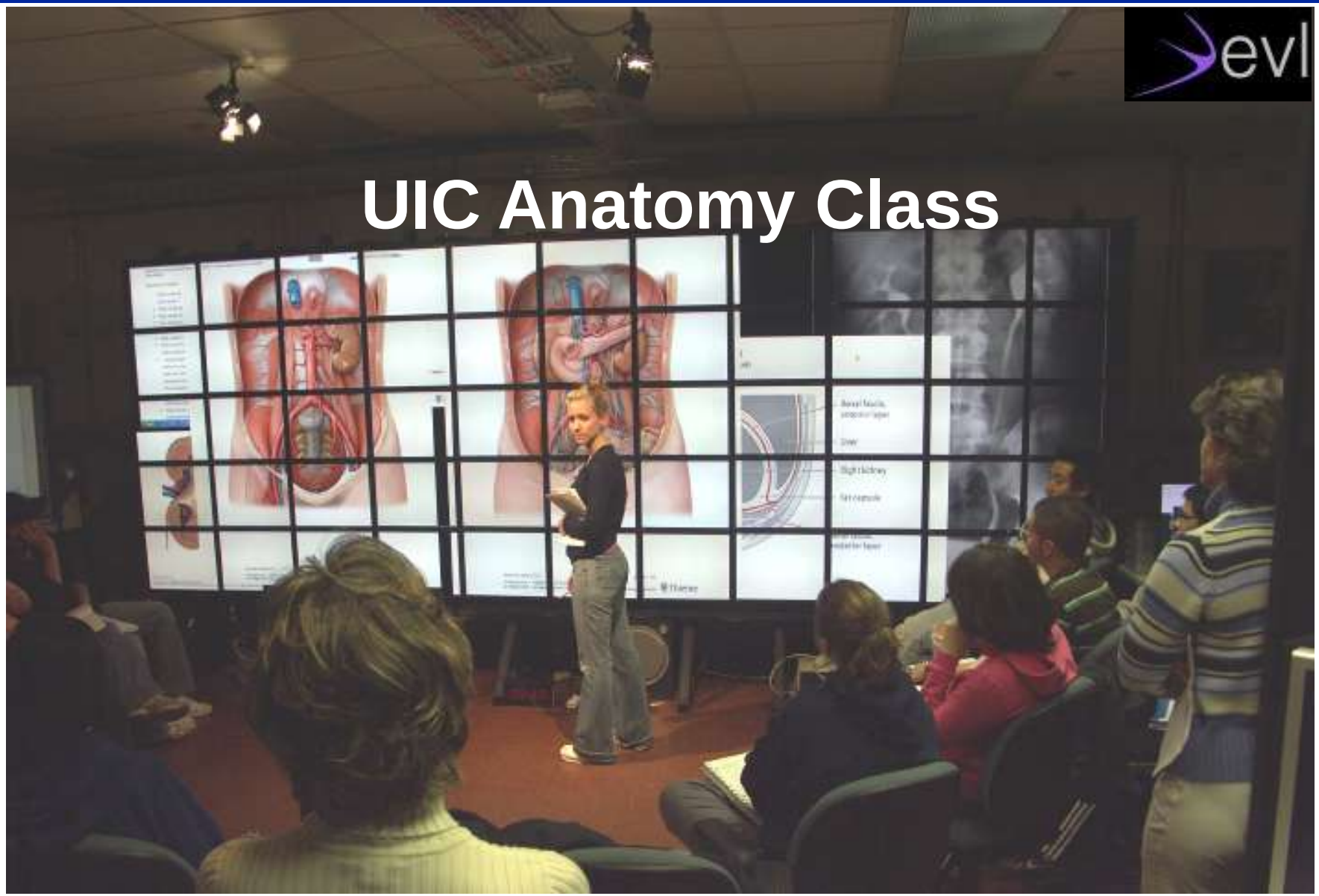
OptIPuter

Powered by Rocks ROCKS

Source: Raj Singh, UCSD

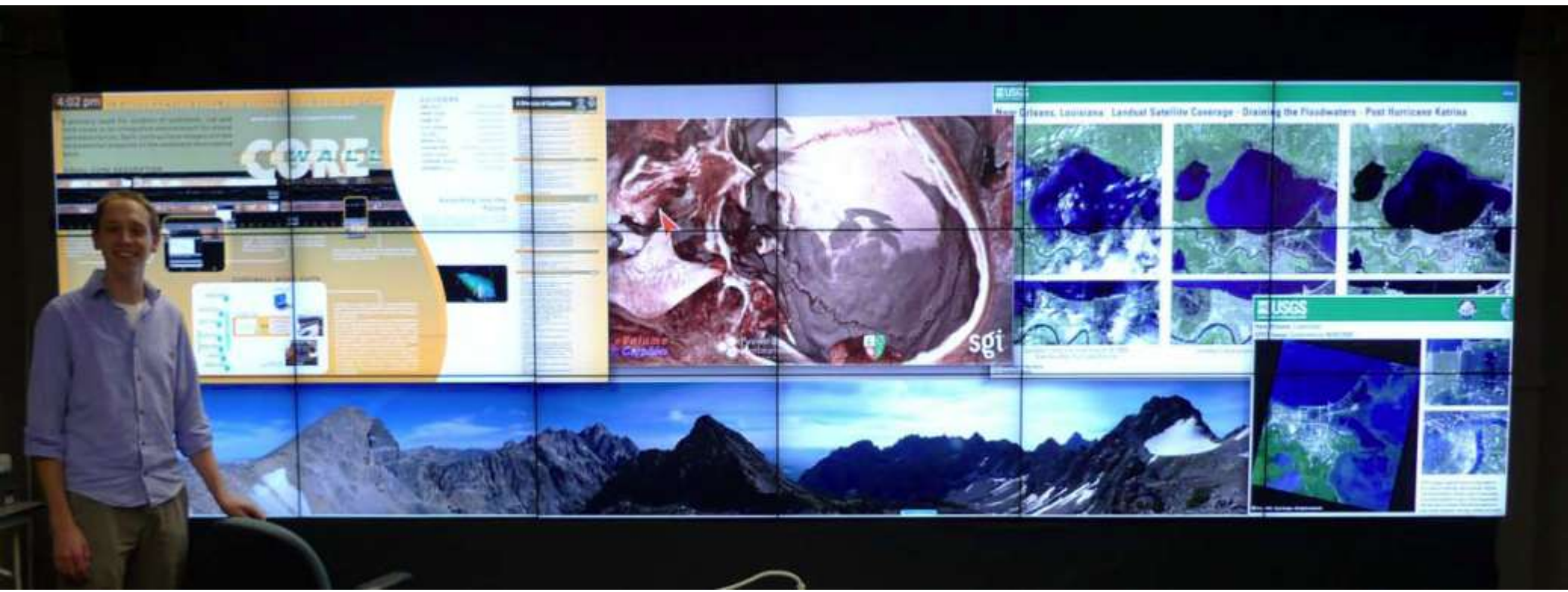
OptIPuter

Students Learn Case Studies in the Context of Diverse Medical Evidence



the AESOP Nearly Seamless OptIPortal

46” NEC Ultra-Narrow Bezel 720p LCD Monitors



Source: Tom DeFanti, Calit2@UCSD;

Commercial Spinoff from Calit2@UC Irvine: hiperwall, inc.



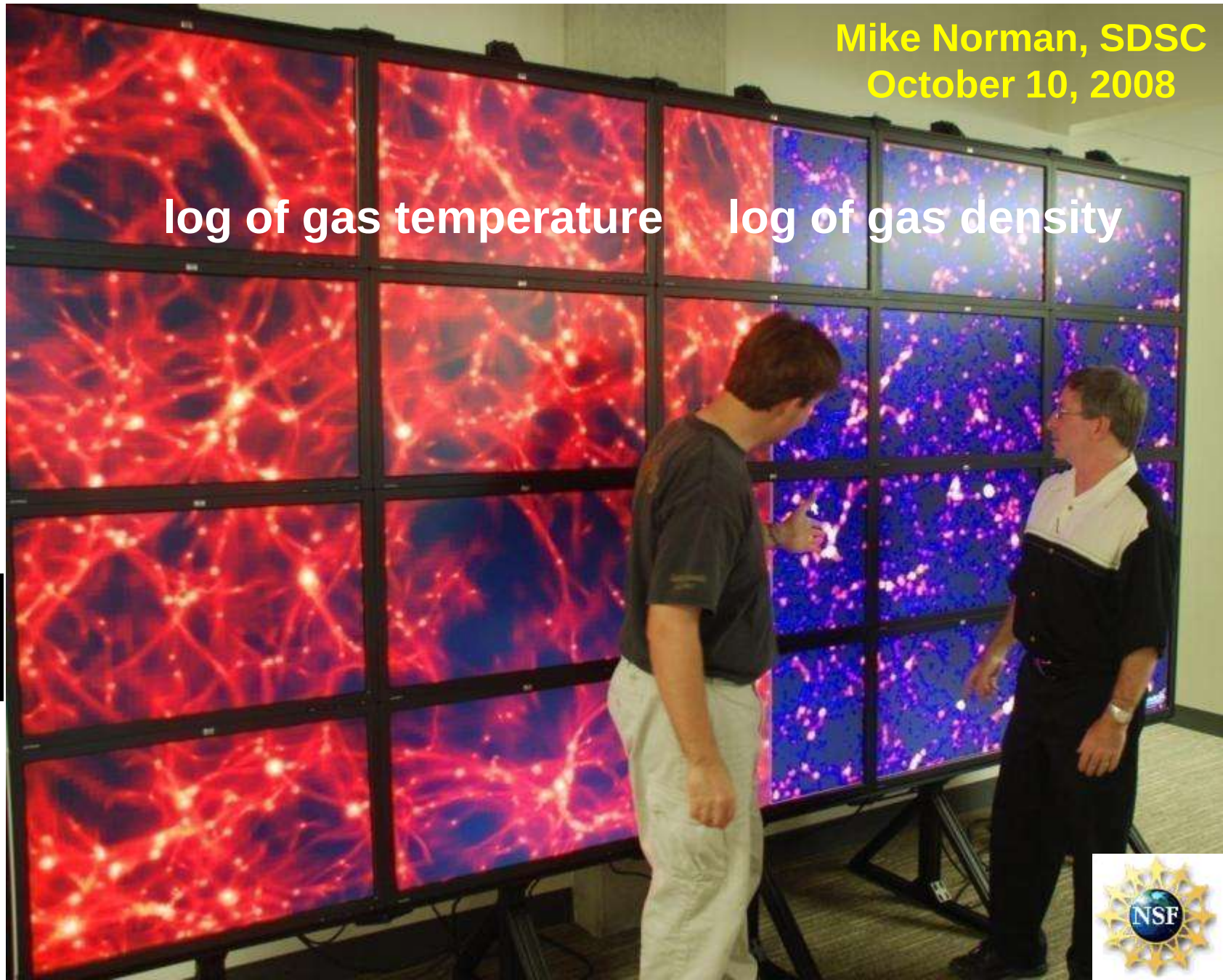
UCI Chancellor Drake and Others Watch "Our Students Speak" on hiperwall at Calit2@UCI

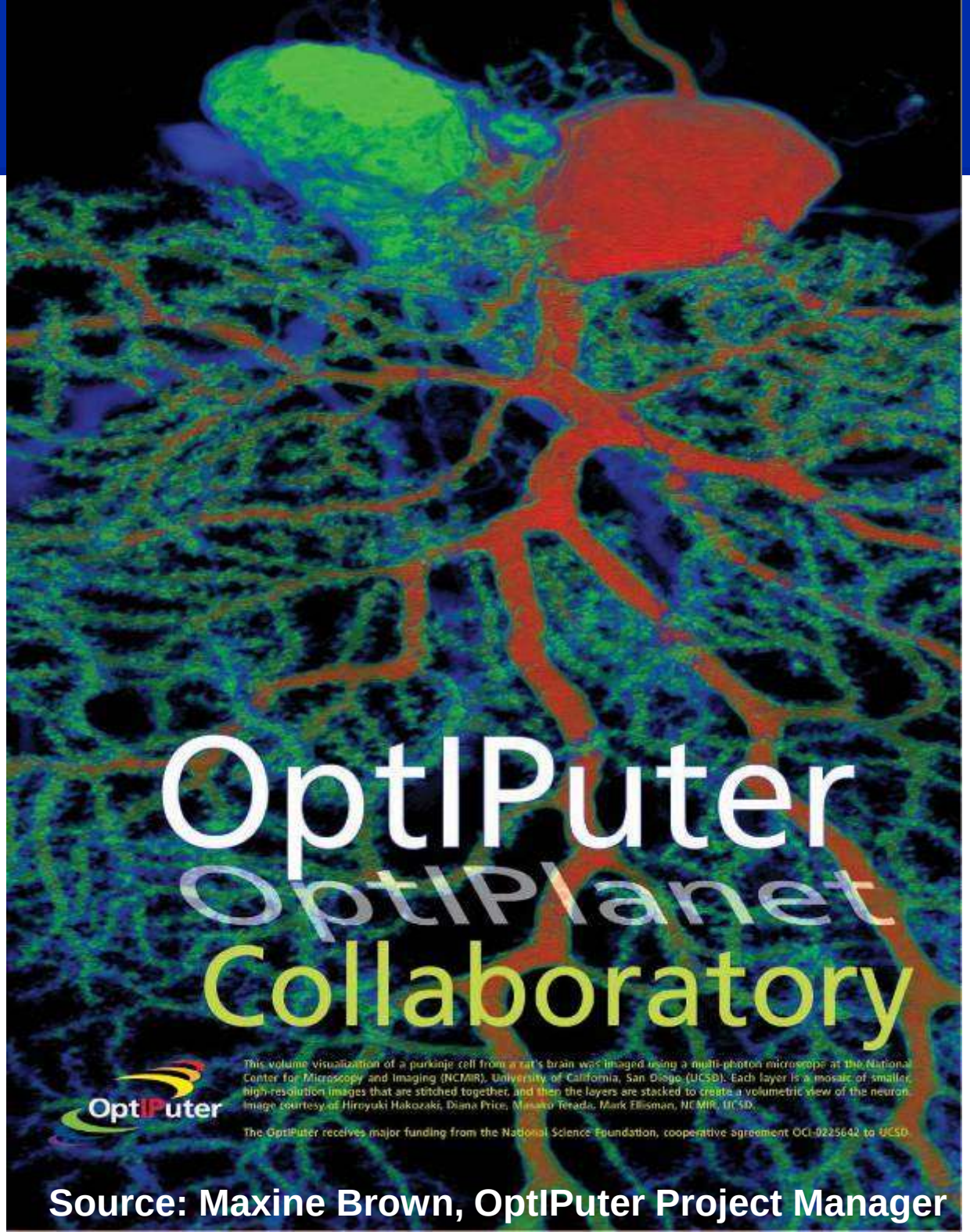
Samsung is a Hardware Integration Partner

http://hiperwall.com/

Providing End-to-End CI for Petascale End Users

Two 64K Images From a Cosmological Simulation of Galaxy Cluster Formation



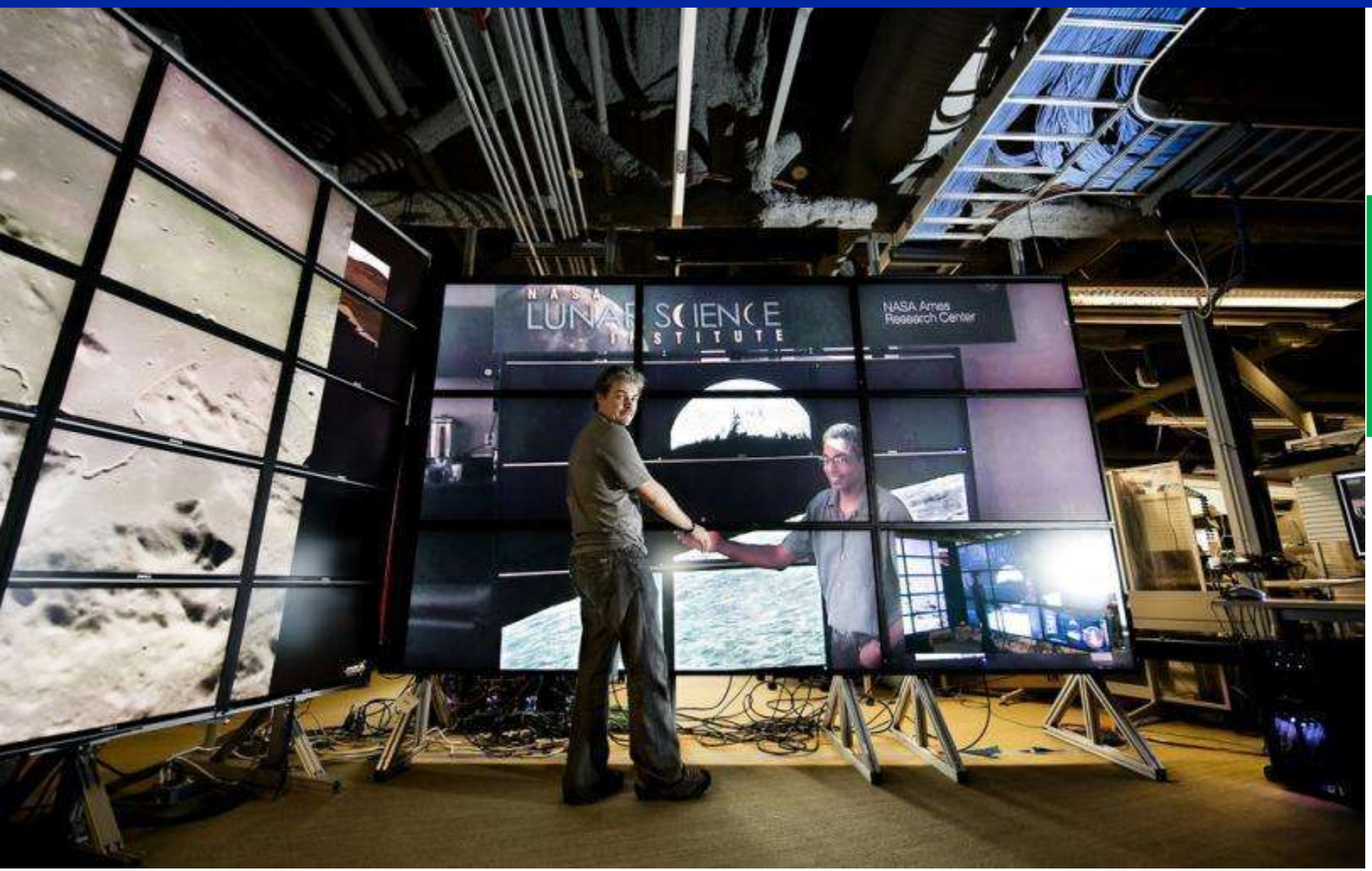


Source: Maxine Brown, OptIPuter Project Manager

Green Initiative:

Can Optical Fiber Replace Airline Travel for Continuing Collaborations ?

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



NASA Interest in Supporting Virtual Institutes

LifeSize HD

NASA Ames
Lunar Science Institute
Mountain View, CA

Extend Throughout MSI-CIEC?

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

OptIPuter Establishes Room-to-Room Telepresence on a Global Scale



No Calit2 Person Physically Flew to Australia to Bring This Up!

Covise, Phil Weber, Jurgen Schulze, Calit2
CGLX, Kai-Uwe Doerr , Calit2
www.calit2.net/newsroom/release.php?id=1219

OptIPuter Persistent Infrastructure Enables Calit2 and U Washington CAMERA Collaboratory



OptIPuter

Ginger Armbrust's Diatoms: Micrographs, Chromosomes, Genetic Assembly

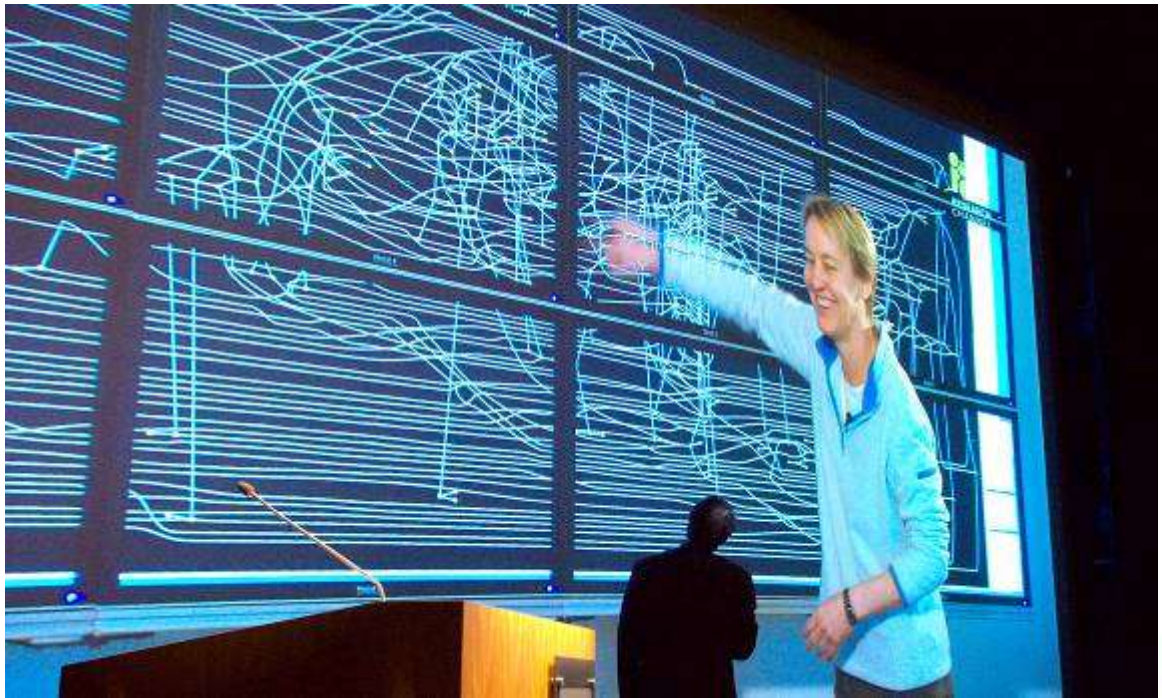
ROCKS



Gordon and Betty MOORE FOUNDATION

camera
Marine Microbial Ecology

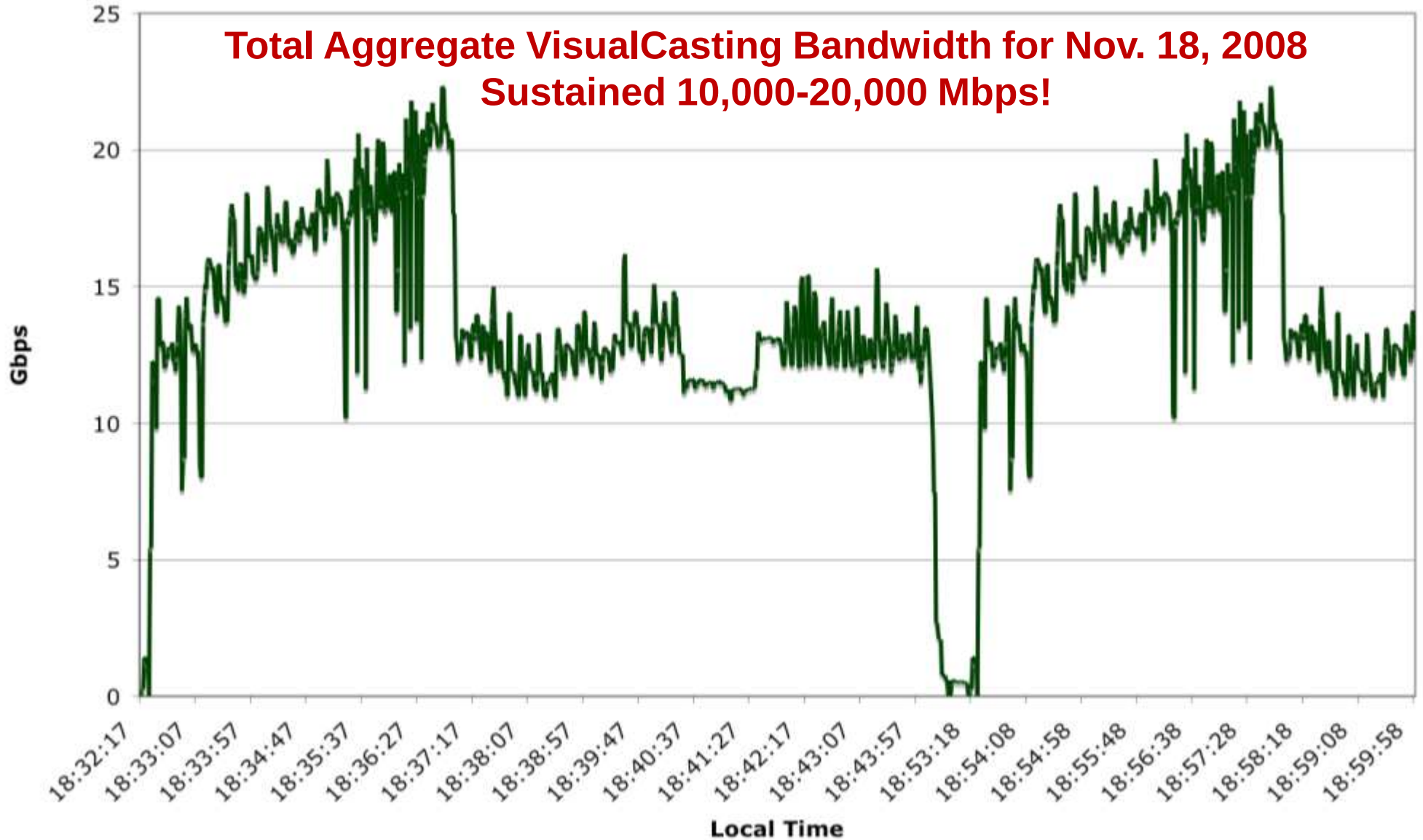
it²



NSF

OptIPuter

EVL's SAGE OptIPortal VisualCasting Multi-Site OptIPuter Collaboratory



Source: Jason Leigh, Luc Renambot, EVL, UI Chicago

3D Stereo Head Tracked OptIPortal: NexCAVE

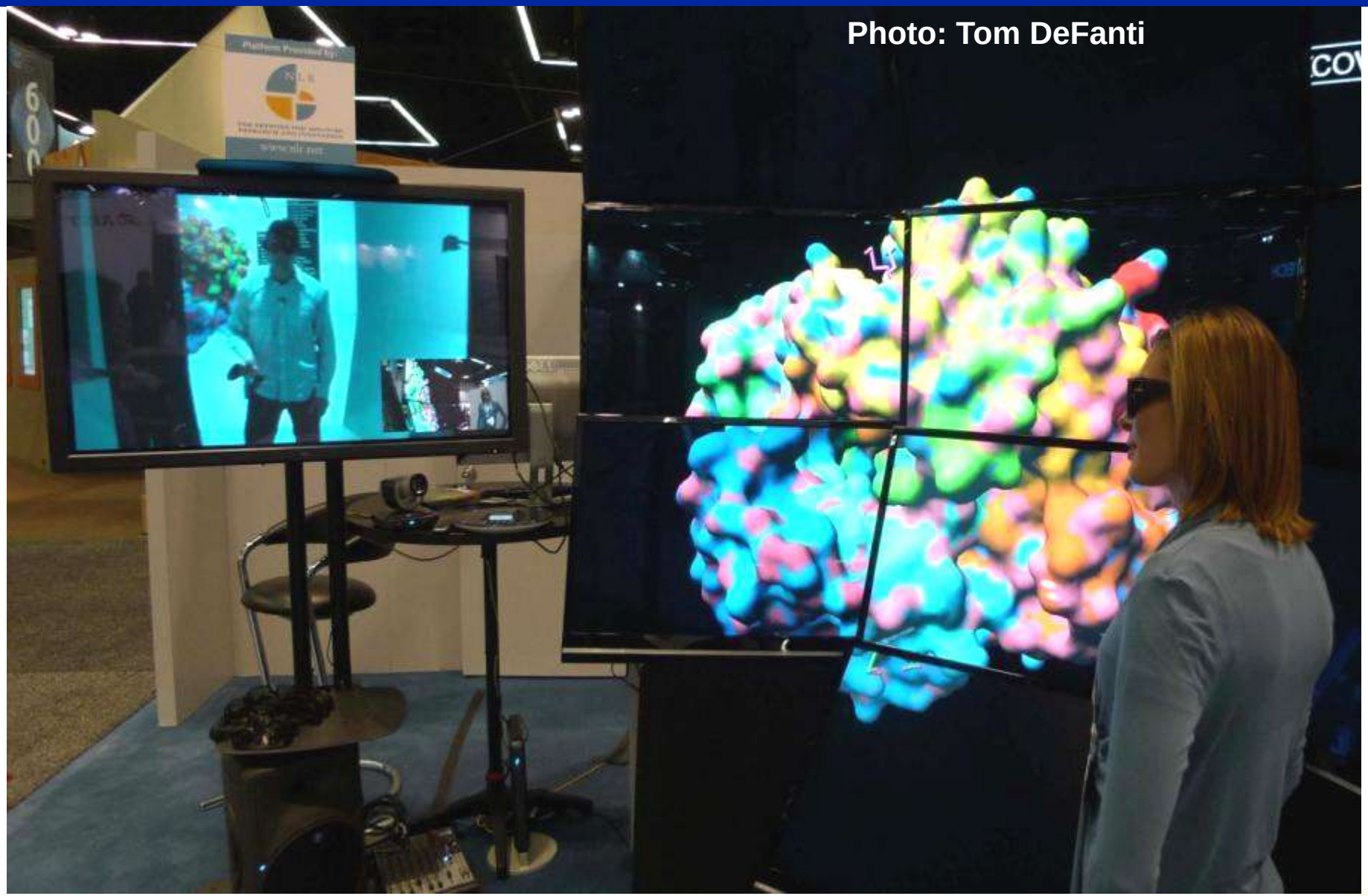


Array of JVC HDTV 3D LCD Screens
KAUST NexCAVE = 22.5MPixels

www.calit2.net/newsroom/article.php?id=1584

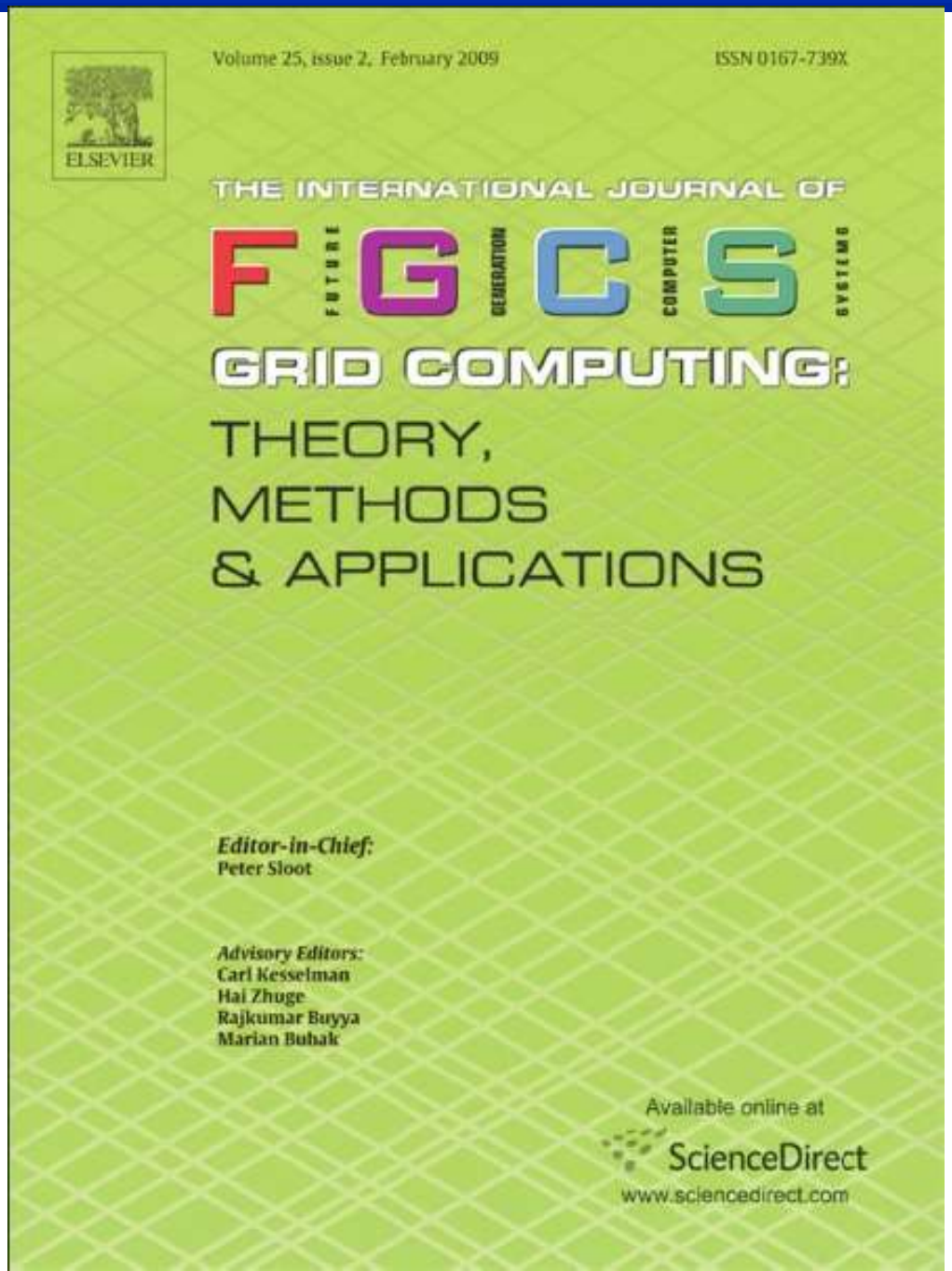
Source: Tom DeFanti, Calit2@UCSD

3D CAVE to CAVE Collaboration with HD Video



Calit2's Jurgen Schulze in San Diego in StarCAVE and Kara Gribskov at SC'09 in Portland, OR with NextCAVE

For Technical Details
On OptIPuter Project and OptIPortals

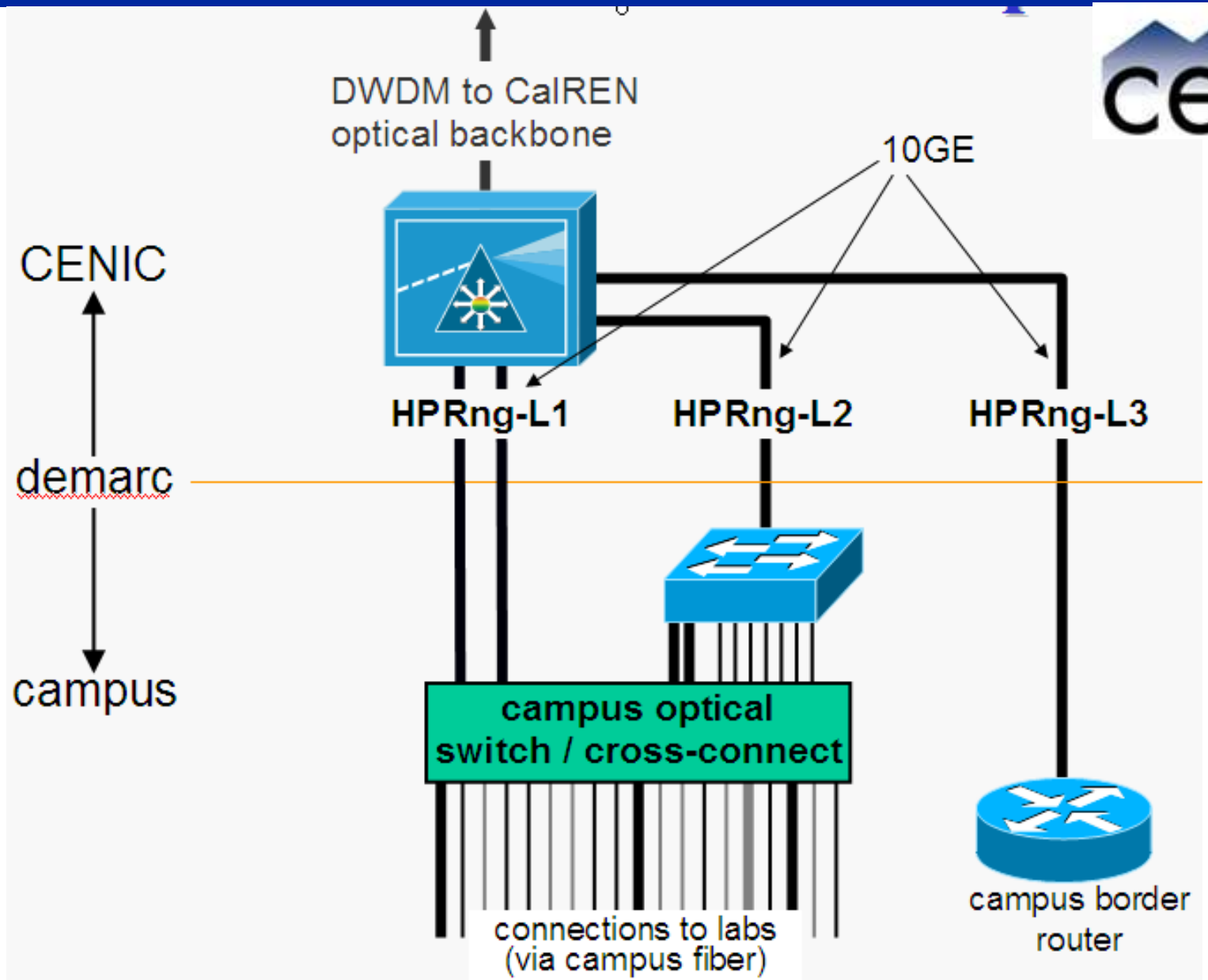


"OptIPlanet: The OptIPuter Global Collaboratory" –

Special Section of Future Generations Computer Systems,

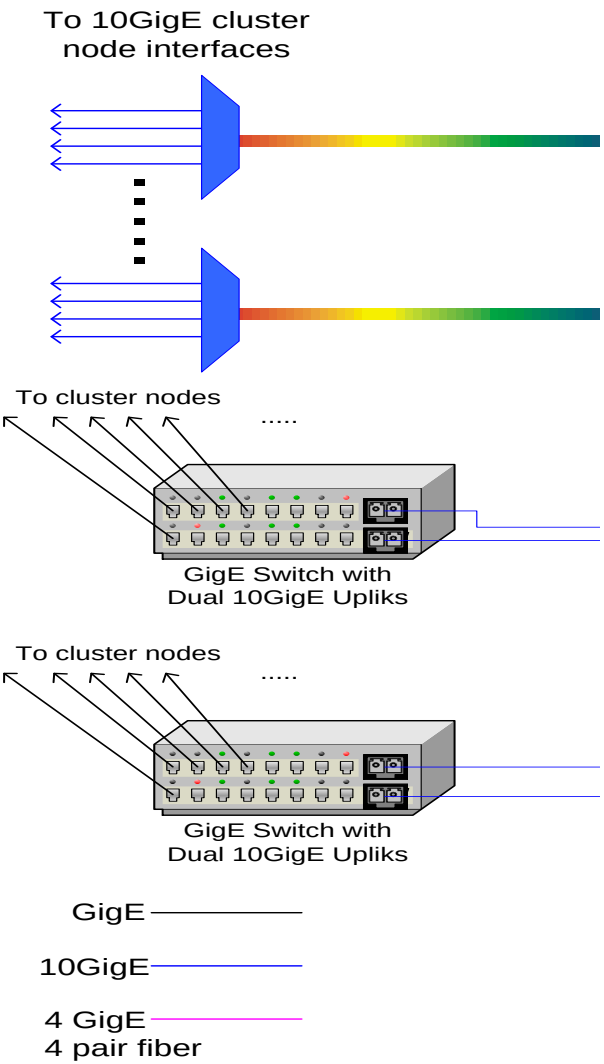
Volume 25, Issue 2, February 2009

Campus Preparations Needed to Accept CENIC CalREN Handoff to Campus



Source: Jim Dolgonas, CENIC

Current UCSD Prototype Optical Core: Bridging End-Users to CENIC L1, L2, L3 Services



Enpoints:

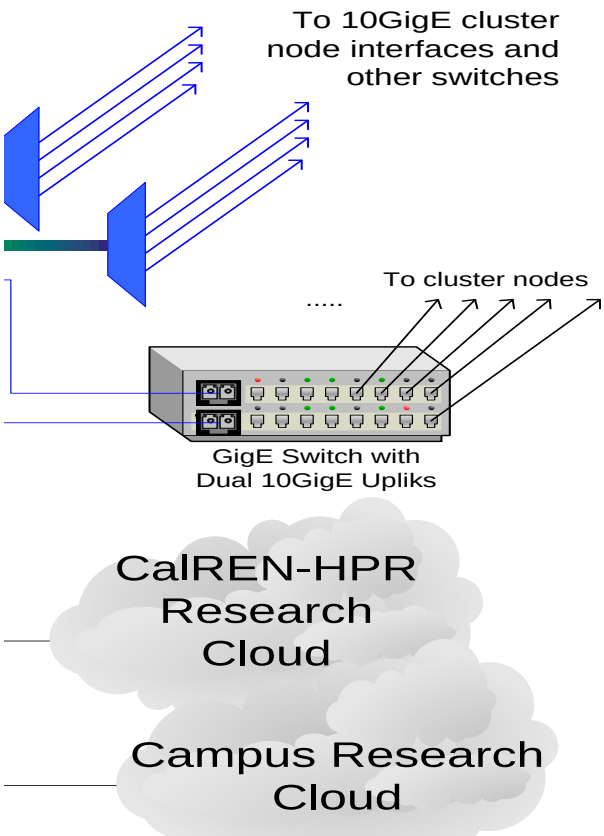
>= 60 endpoints at 10 GigE

>= 32 Packet switched

>= 32 Switched wavelengths

>= 300 Connected endpoints

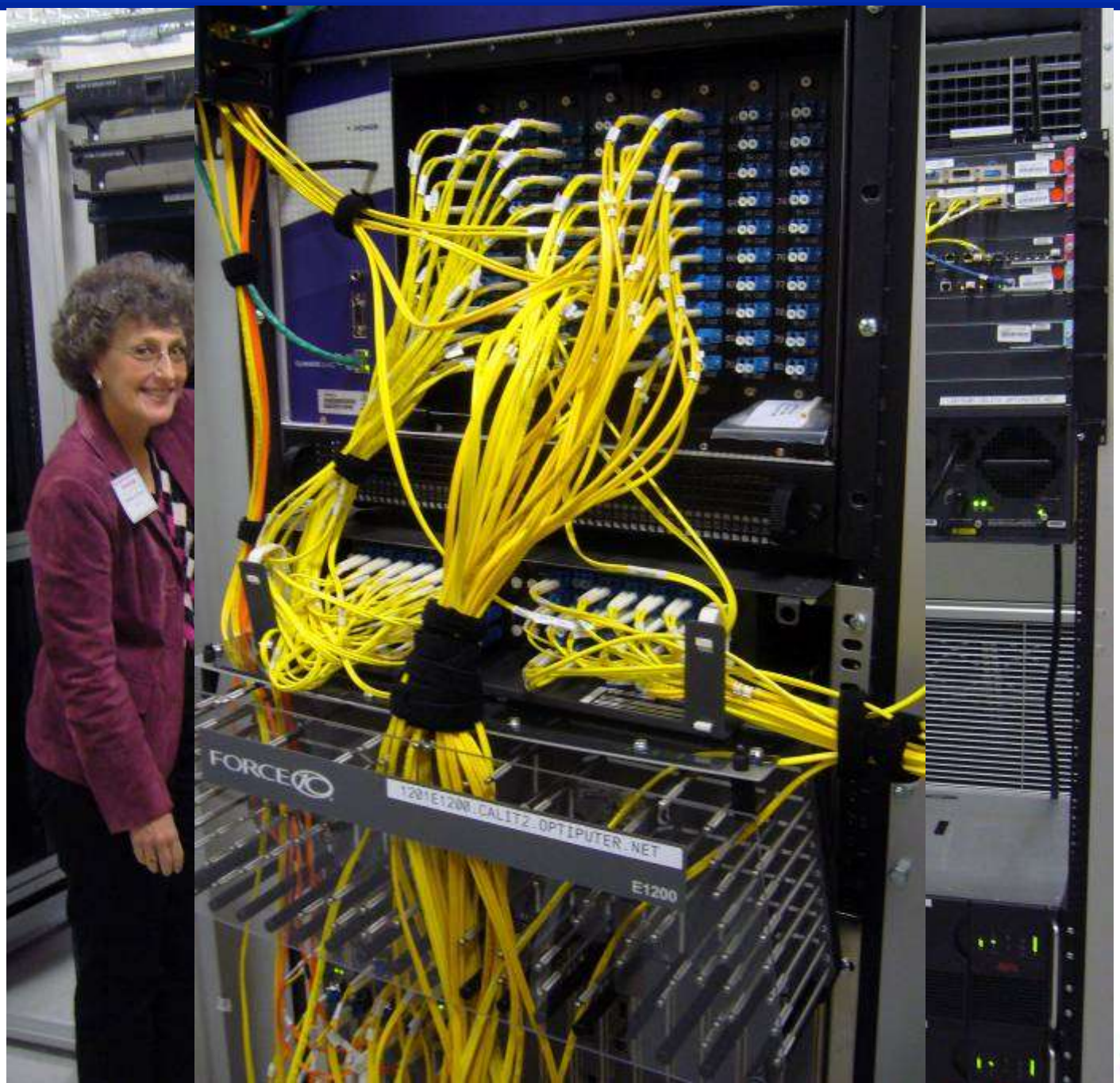
Approximately 0.5 TBit/s Arrive at the "Optical" Center of Campus. Switching is a Hybrid of: Packet, Lambda, Circuit -- OOO and Packet Switches



Source: Phil Papadopoulos, SDSC/Calit2 (Quartzite PI, OptIPuter co-PI)

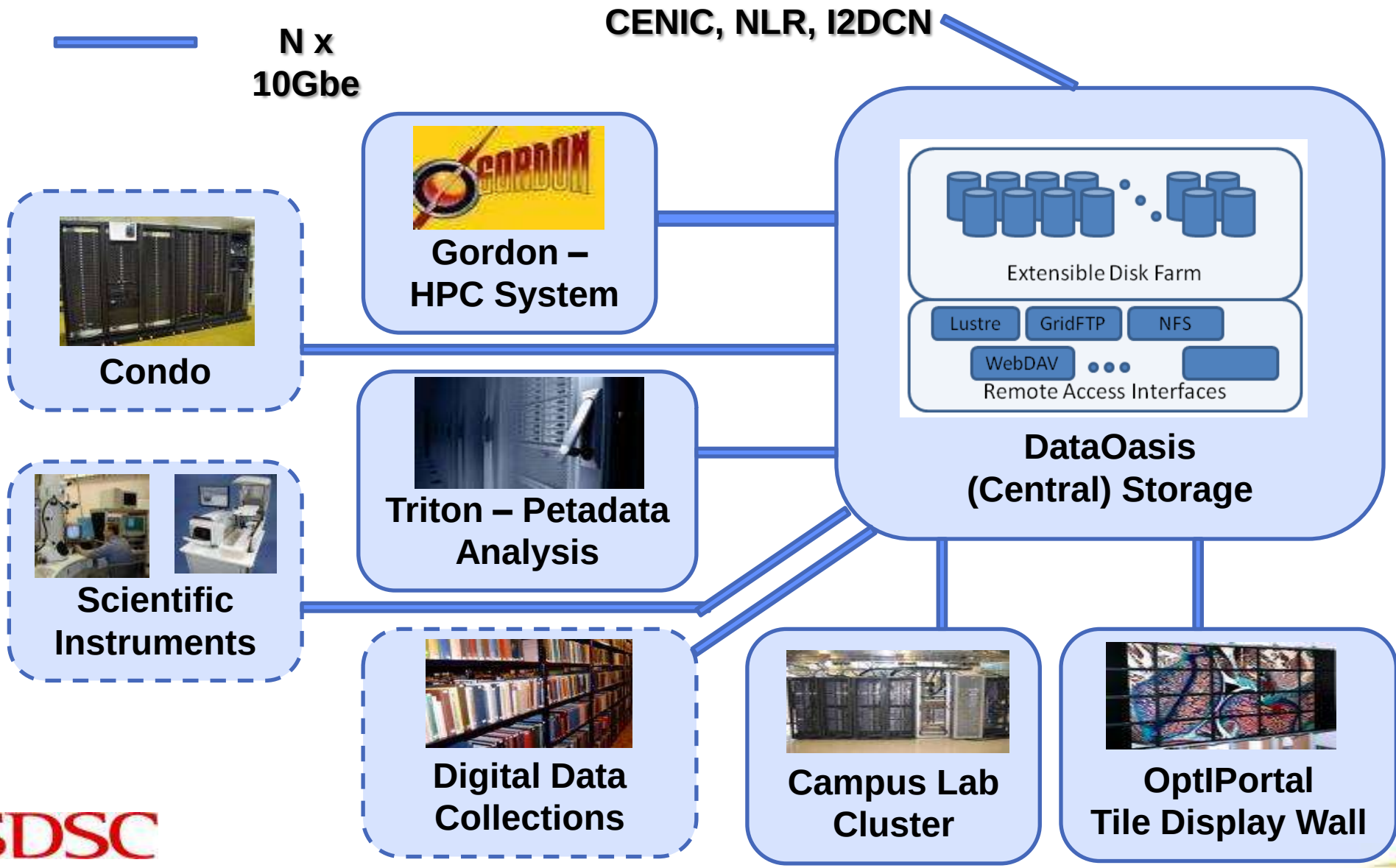
Quartzite Network MRI #CNS-0421555; OptIPuter #ANI-0225642

Calit2 Sunlight Optical Exchange Contains Quartzite



Maxine Brown, EVL, UIC OptIPuter Project Manager

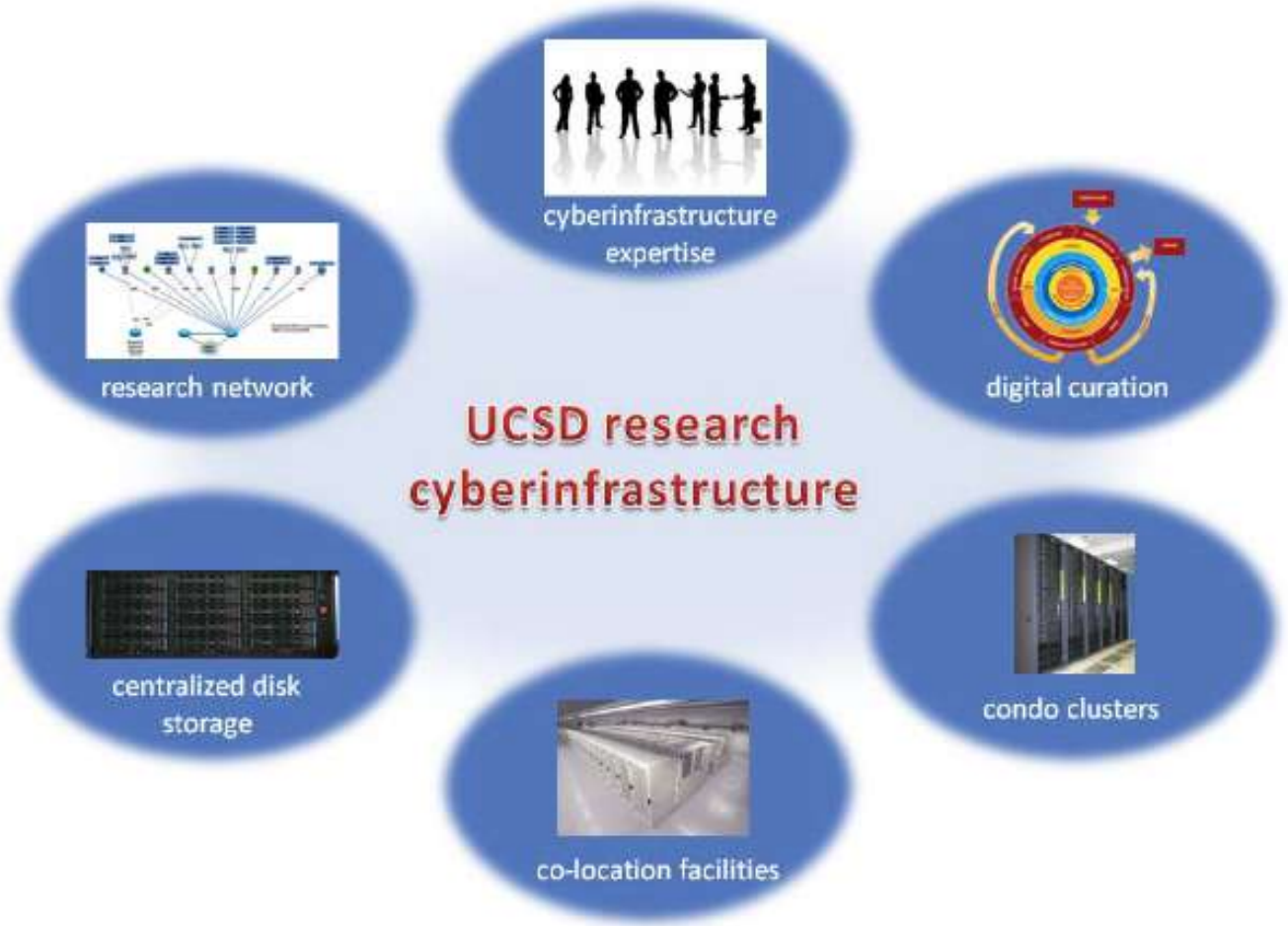
UCSD Campus Investment in Fiber Enables Consolidation of Energy Efficient Computing & Storage



Source: Philip Papadopoulos, SDSC, UCSD

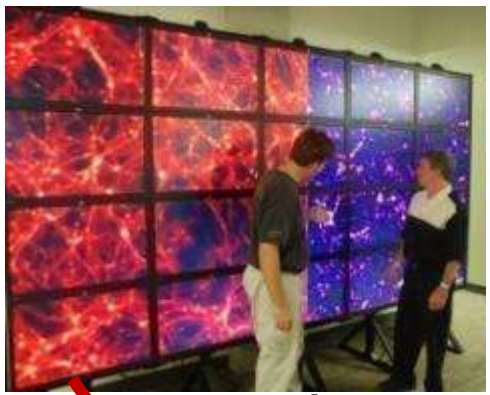
"Blueprint for the Digital University"--Report of the UCSD Research Cyberinfrastructure Design Team

- **Focus on data *storage* and data *curation***
  - **These Become the Centralized Components**
  - **Other Common Elements "Plug In"**



research.ucsd.edu/documents/rcidt/RCIDTReportFinal2009.pdf

Academic Research "OptIPlatform" Cyberinfrastructure: A 10Gbps "End-to-End" Lightpath Cloud



End User OptIPortal



Instruments



HD/4k Telepresence



HD/4k Video Cams

HPC



10G Lightpaths

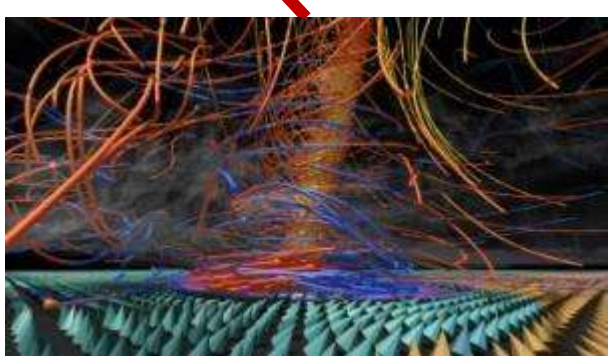


TeraGrid

Campus Optical Switch



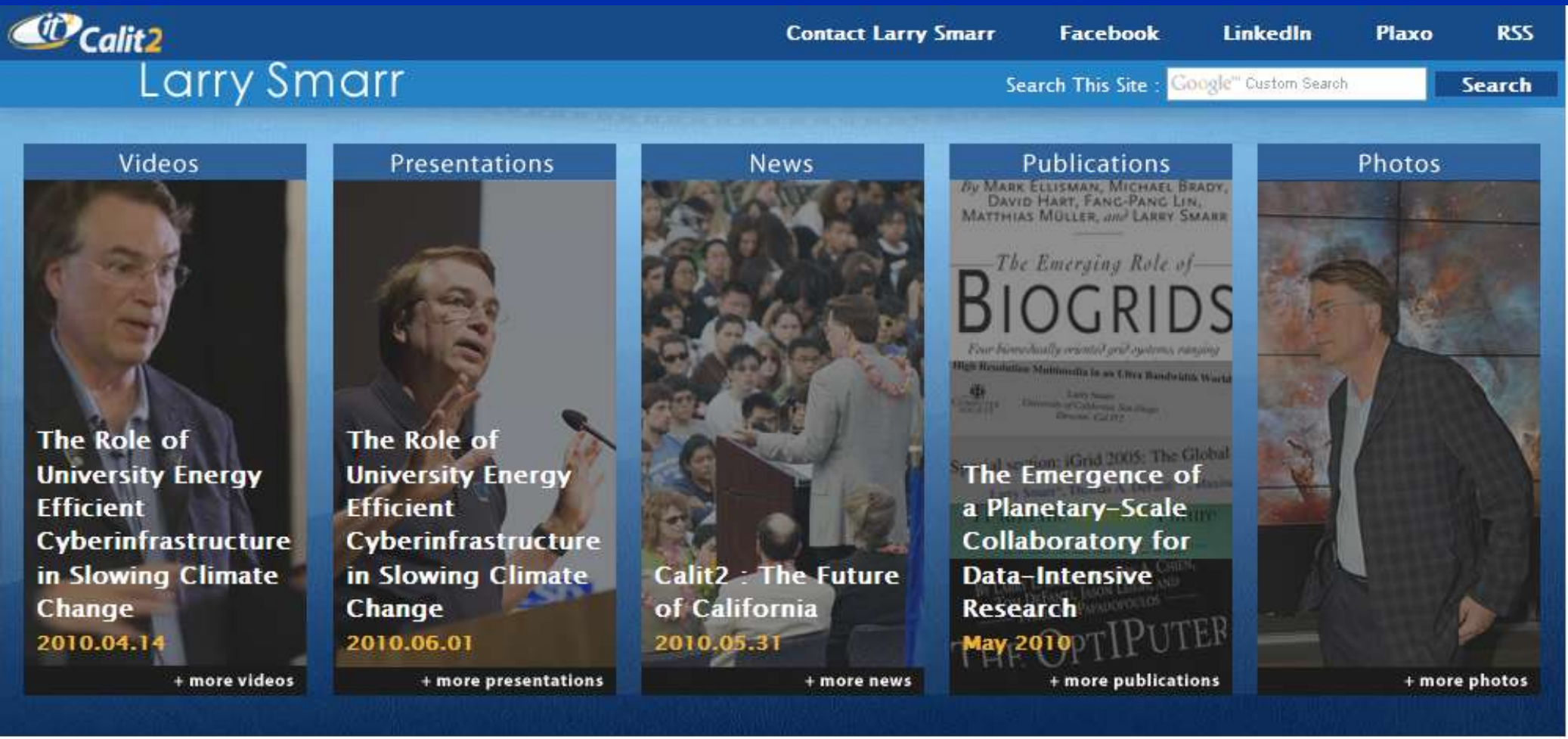
Data Repositories & Clusters



HD/4k Video Images

OptIPuter

Follow My Talks and Tweets at lsmarr.calit2.net



ABOUT LARRY SMARR

Larry Smarr is the founding Director of the California Institute for Telecommunications and Information Technology (Calit2), a UC San Diego/UC Irvine partnership, and holds the Harry E. Gruber professorship in Computer Science and Engineering (CSE) at UCSD's Jacobs School. At Calit2, Smarr has

WHAT I'M READING

Complete List of Larry's Recommendations

Homo Britannicus: The Incredible Story of Human Life in Britain (2006)

American College and University

RECENT TWITTER POSTS

Twitter?
Click To Follow Me

lsmarr: The MSI workshop focuses on GreenLight & OptIPortal projects- talking to NASA using OptIPortals with