

CalREN-XD at UC San Diego/ UC Irvine/ USC ISI: A SoCal XD Anchor for Networking Research

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The OptiPuter Project –

A Model of Cyberinfrastructure Partnerships

NSF Large Information Technology Research Proposal

- Calit2 (UCSD, UCI) and UIC Lead Campuses—Larry Smarr PI
- Partnering Campuses: USC, SDSU, NW, TA&M, UvA, SARA, NASA

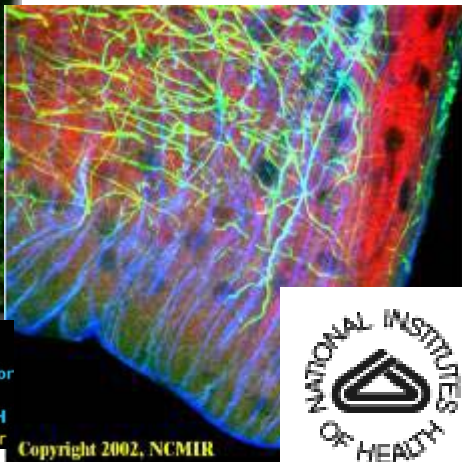
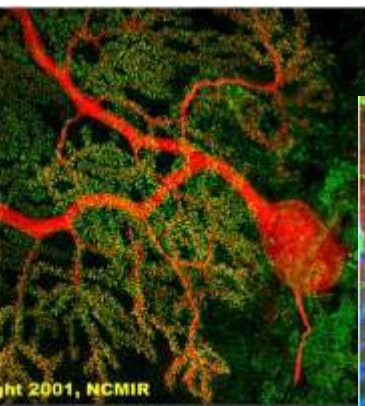
Industrial Partners

- IBM, Sun, Telcordia, Chiaro, Calient, Glimmerglass, Lucent

\$13.5 Million Over Five Years

Driven by Global Scale Science Projects

NSF Biomedical Informatics Research Network

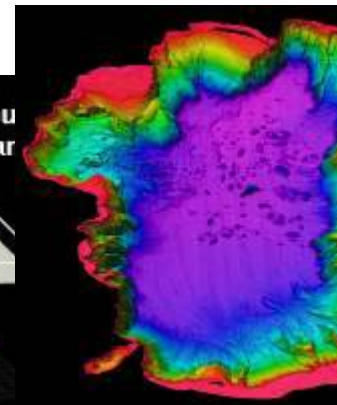
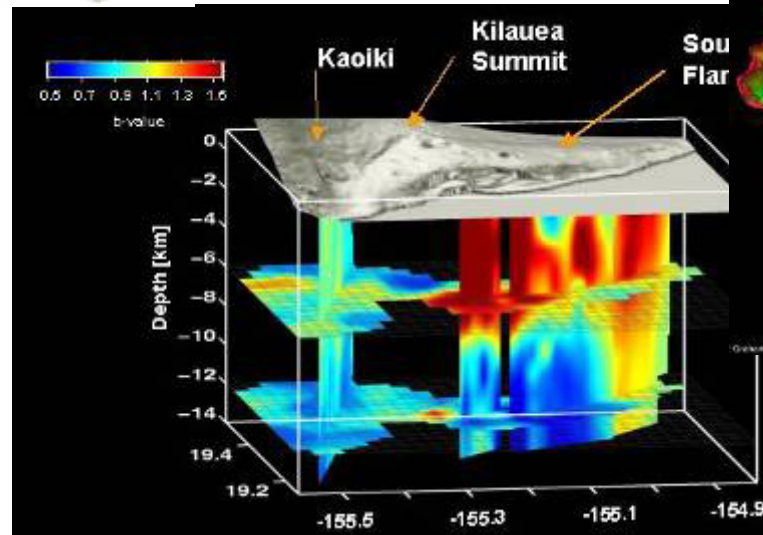


Copyright 2002, NCMIR

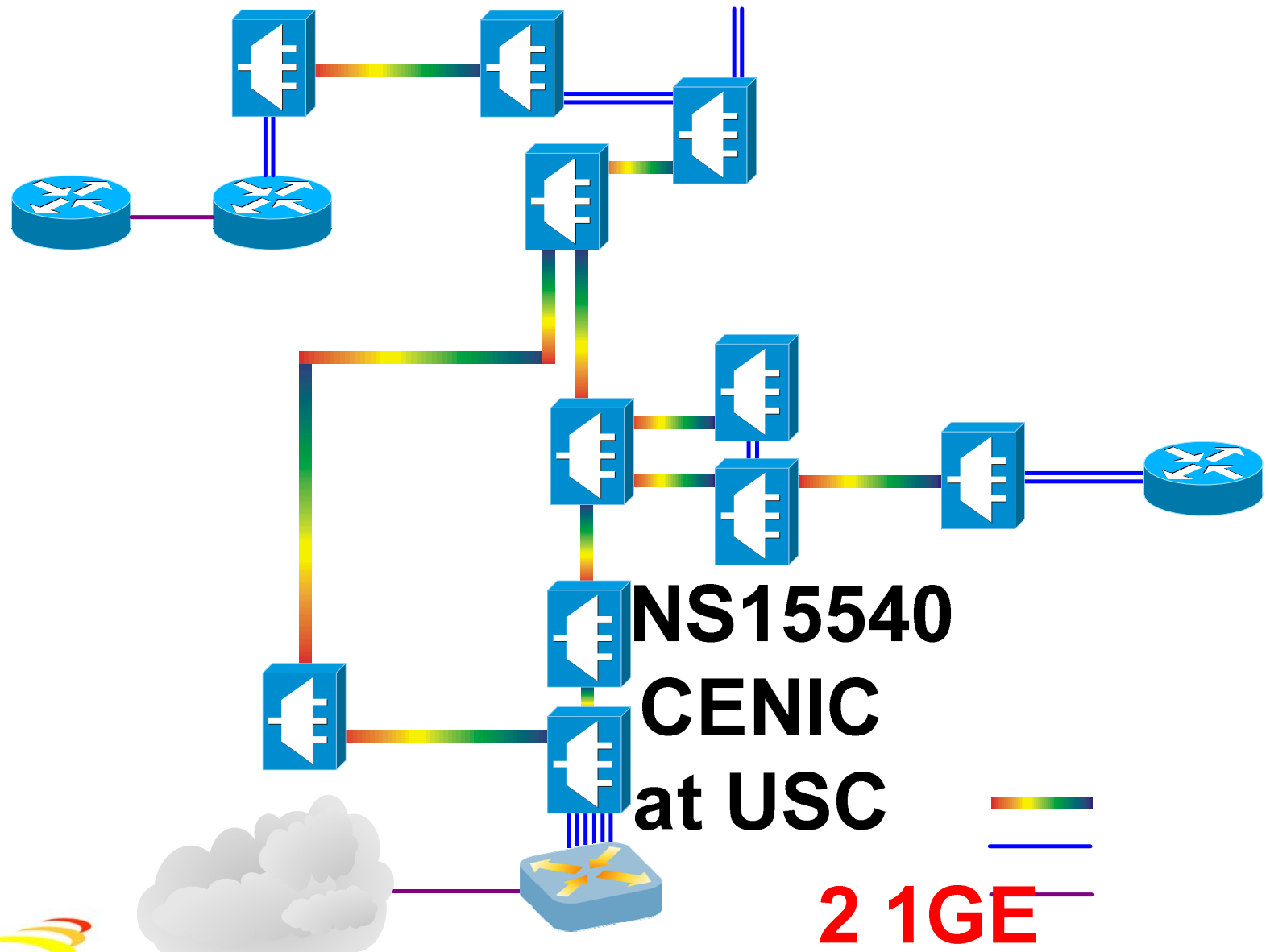
<http://ncmir.ucsd.edu/gallery.html>



NSF EarthScope and ORION



Southern California CalREN-XD Build Out



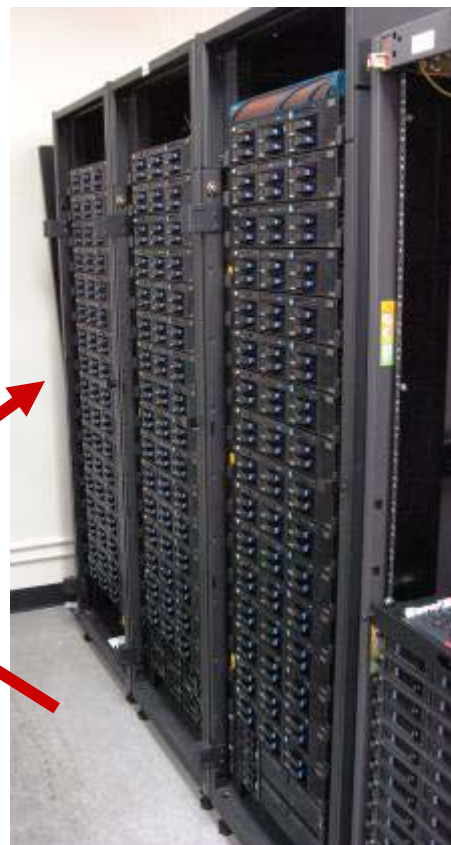
UCSD Campus LambdaStore Architecture

Dedicated Lambdas to Labs Creates Campus LambdaGrid

SIO Ocean Supercomputer



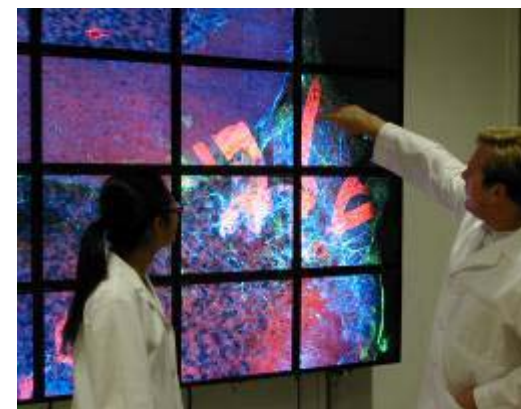
IBM Storage Cluster



Streaming Microscope

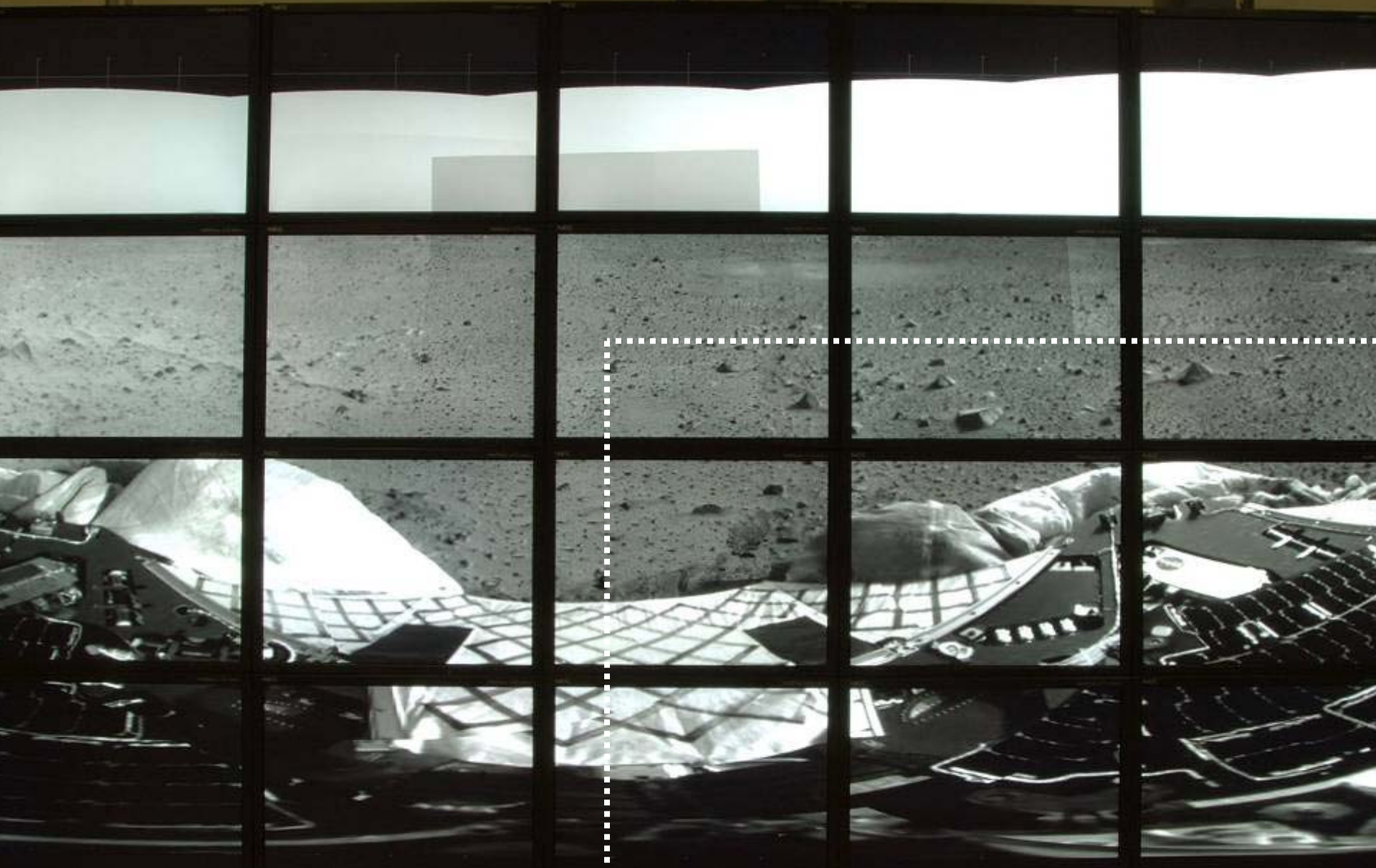


Extreme Switch with 2 Ten Gbps Uplinks



High Resolution Displays Allow for Both Global Context and High Levels of Detail— 50 MPixel Rover Image on 40 MPixel OptIPuter Visualization Node Display

"Source: Data from JPL/Mica; Display UCSD NCMIR, David Lee"



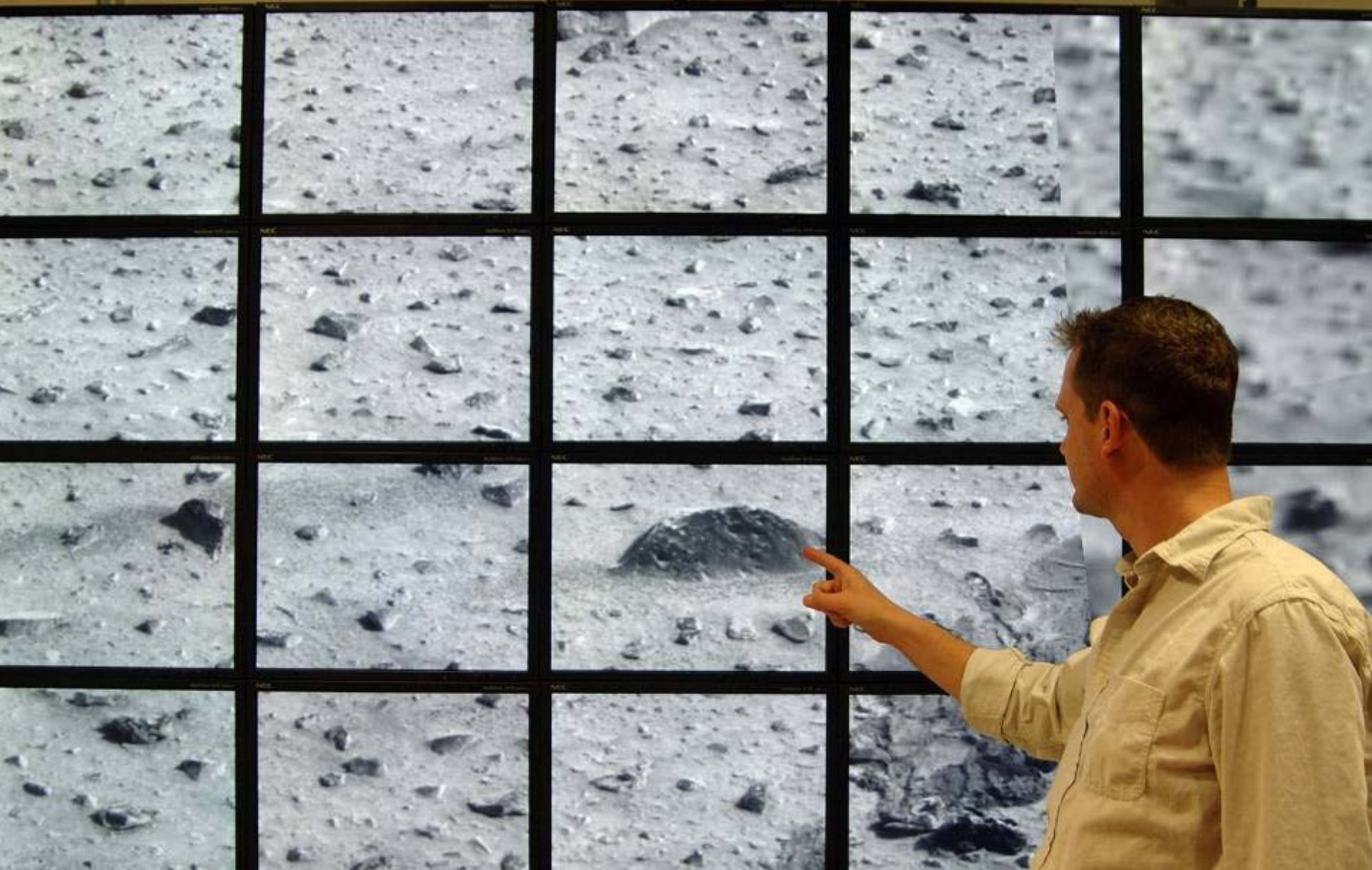
Interactively Zooming In Using EVL's Juxtaposition on NCMIR's Sun Microsystems Visualization Node

"Source: Data from JPL/Mica; Display UCSD NCMIR, David Lee"



Highest Resolution Zoom on NCMIR 40 MPixel OptIPuter Display Node

"Source: Data from JPL/Mica; Display UCSD NCMIR, David Lee"



GeoWallz: OptIPuter Juxtaview Software for Viewing High Resolution Images on Tiled Displays

This 150 Mpixel Rat Cerebellum Image is a Montage of 43,200 Smaller Images

Green: The Purkinje Cells

Red: GFAP in the Glial Cells

Blue: DNA in Cell Nuclei

Source: Mark Ellisman,
Jason Leigh -
OptIPuter co-PIs



Source: Falko Kuester, UIC

to Similar Walls at UCSD and UIC

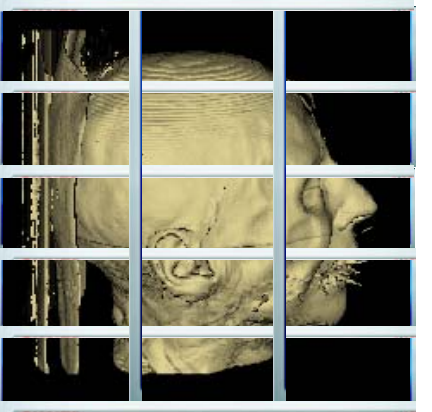
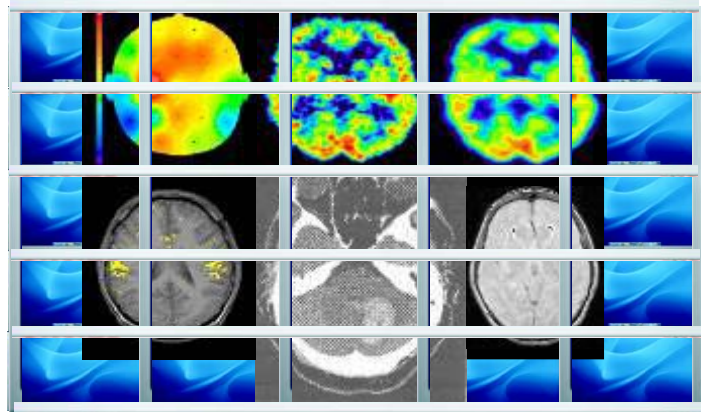
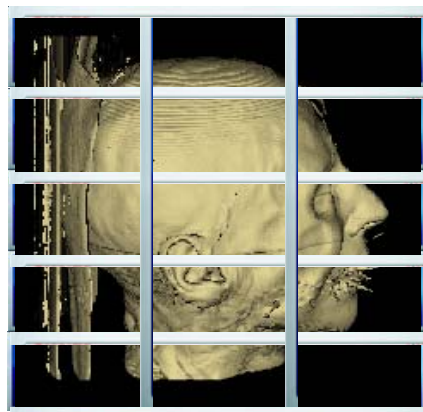
0 Mpixels



Source: Falko Kuester, UIC



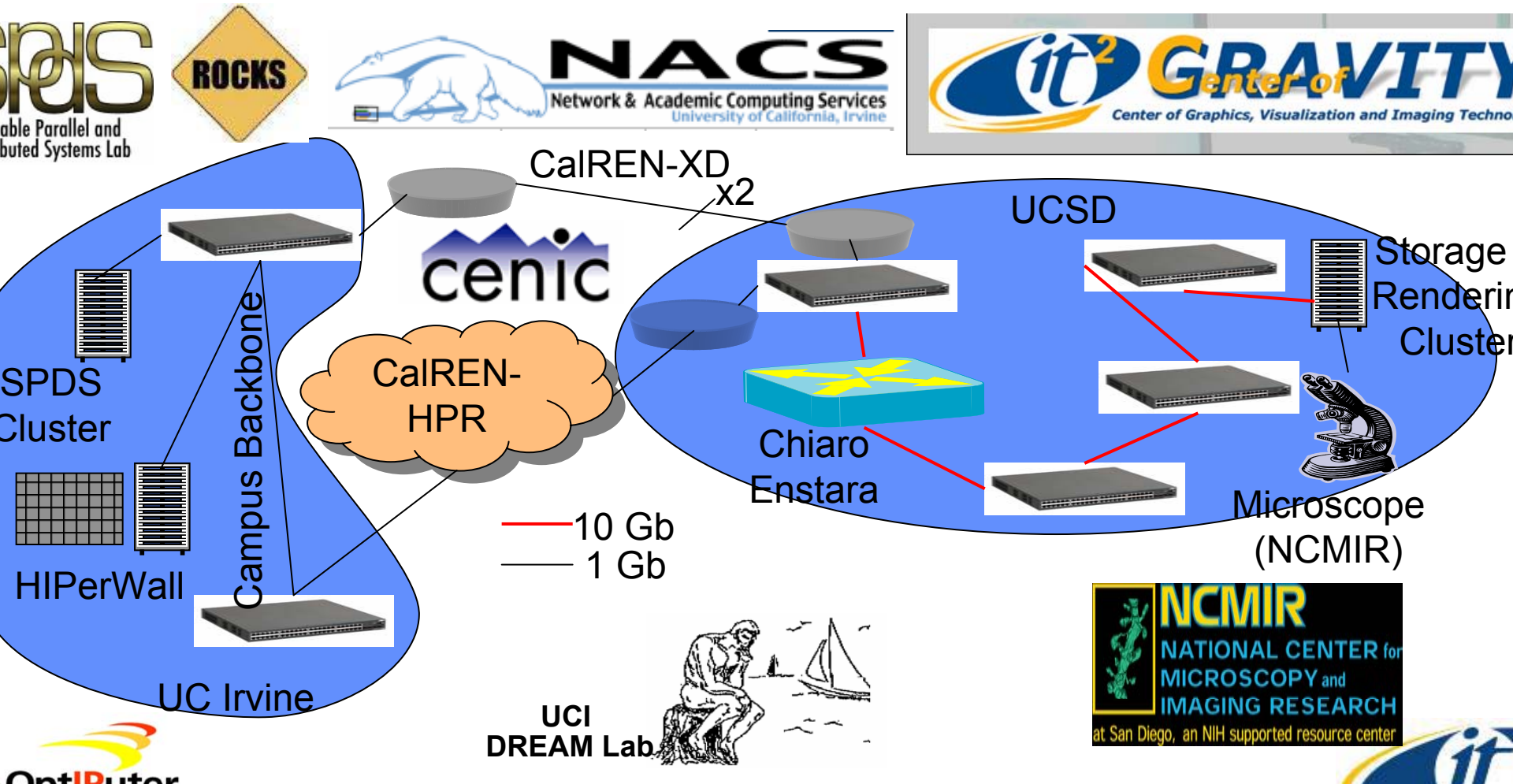
Funded by NSF MRI



UCI is Adding Real Time Control to the Calit2 OptIPuter Testbed

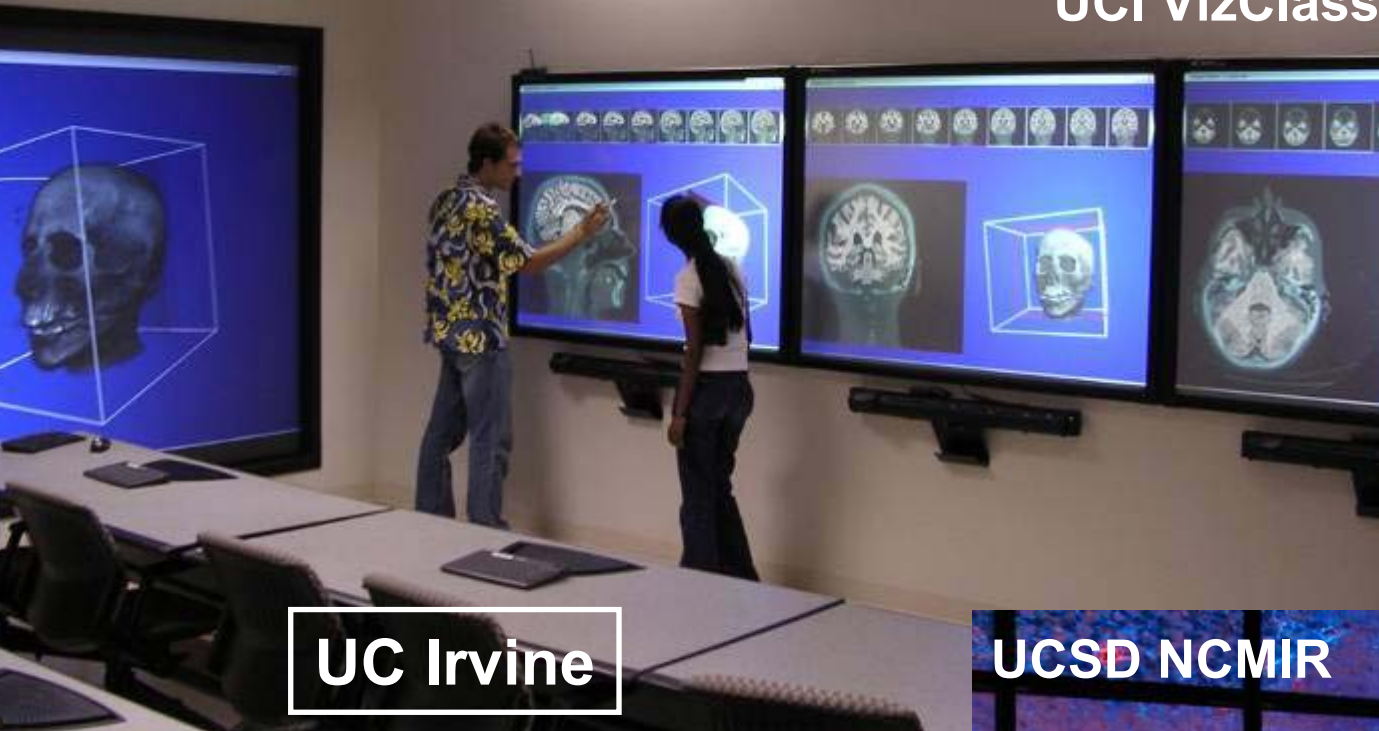
Application Development Experiments Requires Institutional Collaboration

- An Experiment for Remote Access and Control within the UCI Campus
- A Step Toward Preparation of an Experiment for Remote Access and Control of Electron Microscopes at UCSD-NCMIR



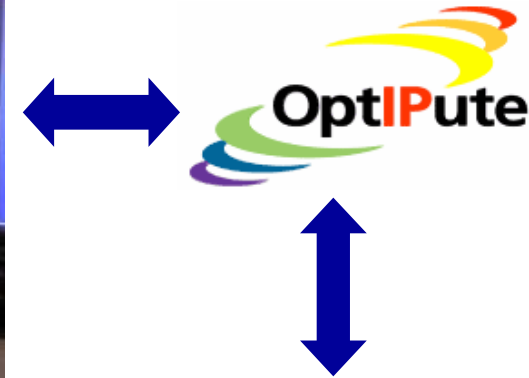
Calit2 Collaboration Rooms Tested UCI to UCSD

UCI VizClass



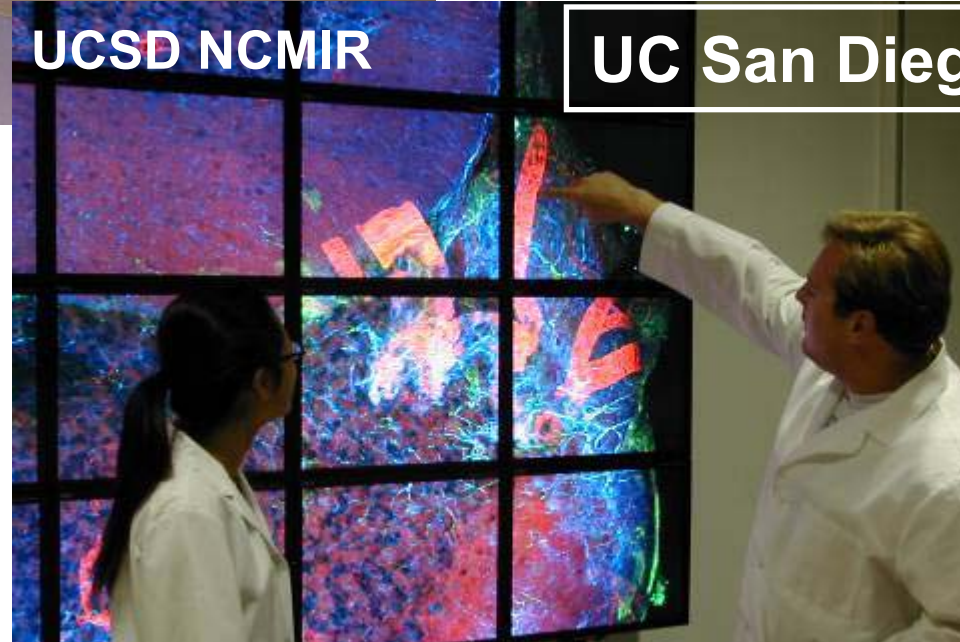
UC Irvine

Source: Falko Kuester, UCI
& Mark Ellisman, UCSD



UCSD NCMIR

UC San Diego



**In 2005 Calit2 will
Link Its Two Buildings
a CENIC-XD Dedicated Fiber over
75 Miles Using OptIPuter
Architecture to Create a
Distributed Collaboration
Laboratory**



Applying OptIPuter Technologies to Support Global Change Research

UCI Earth System Science Modeling Facility (ESMF)

- NSF's CISE Science and Engineering Informatics Program Funded ESMF and Calit2 to Improve Distributed Data Reduction & Analysis
 - Calit2 and UCI is Adding ESMF to the OptIPuter Testbed
 - Link to Calit2@UCI HiPerWall
 - Funding UCSD OptIPuter co-PI Phil Papadopoulos' Team



ESMF Challenge:

- Extend the NCO netCDF Operators Over Calit2 OptIPuter Testbed
 - Exploit MPI-Grid and OPeNDAP
- Test DDRA on TBs of Data Stored Across the OptIPuter (at UCI and UCSD) and the Earth System Grid (LBNL, NCAR, and ORNL)

The Resulting Scientific Data Operator LambdaGrid Toolkit will Support the Next Intergovernmental Panel on Climate Change (IPCC) Assessment Report

Variations of the Earth Surface Temperature Over One Thousand Years

