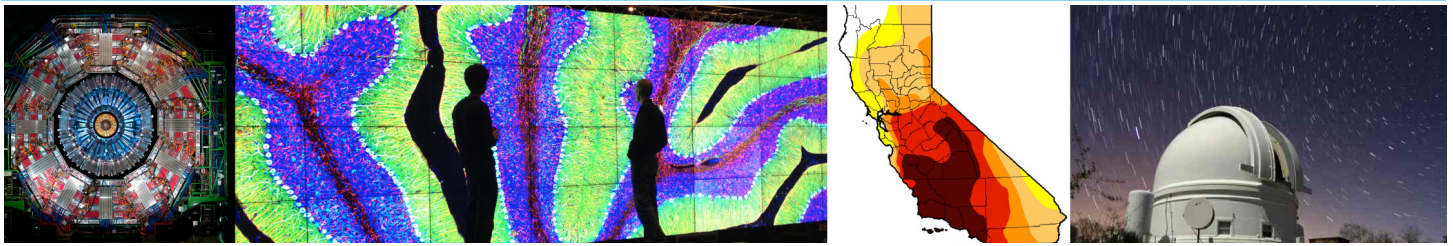




Pacific Research Platform: The Future of Big Data Collaboration

From biomedical sciences to particle physics, today nearly all research and data analysis involves remote collaboration. In order to work effectively and efficiently on multi-institutional projects, researchers depend heavily on high-speed access to large datasets and computing resources.

To meet the needs of researchers in California and beyond, the National Science Foundation (NSF) has awarded a five-year, \$5 million grant to fund the Pacific Research Platform (PRP). The PRP integrates Science DMZs, an architecture developed by the U.S. Department of Energy's Energy Sciences Network (ESnet), into a high-capacity regional "freeway system." This system makes it possible for large amounts of scientific data to be moved between scientists' labs and their collaborators' sites, supercomputer centers or data repositories, without performance degradation.



A Regional Model for Multi-Discipline Data-Intensive Networking

The PRP, led by researchers at UC San Diego and UC Berkeley, will enable fast and secure data transfers between researchers in over 20 universities. The PRP builds on the optical backbone of Pacific Wave, a joint project of CENIC and the Pacific Northwest GigaPOP (PNWGP) to create one large, seamless research platform that will encourage statewide, regional—even worldwide—collaboration.

The PRP will support a broad range of data-intensive research projects that will have wide-reaching impacts on science and technology worldwide. Cancer genomics, galaxy evolution research, climate modeling, and the creation of virtual reality gaming systems are just a few of the projects that will benefit from the PRP.

Principal Investigator

Larry Smarr

UC San Diego (UCSD), California Institute for Telecommunications and Information Technology (Calit2)

Co-Principal Investigators

Camille Crittenden

UC Berkeley, Center for Information Technology Research in the Interest of Society (CITRIS) and the Banatao Institute

Tom DeFanti

UCSD, Calit2/Qualcomm Institute

Philip Papadopoulos

UCSD, San Diego Supercomputer Center

Frank Wuerthwein

Physics Dept. and UCSD, San Diego Supercomputer Center

During a demonstration of its capabilities at the 2015 CENIC Conference, researchers showed that the PRP moved data up to 500 times faster than speeds currently available.

Pacific Research Platform: Cyberinfrastructure for Big Data

The PRP's data-sharing architecture, with disk-to-disk 10-100Gbps connections, enables region-wide virtual co-location of data with computing resources. Today, dozens of top universities and research centers are doing work across ten major application areas, positioning the PRP to be a regional-scale model for a future national-scale Big Data cyberinfrastructure.

Pacific Wave 100Gbps Research DMZ Backbone with PNWGP DMZ & CENIC's 100Gbps Network



West Coast Participants:

Caltech
CENIC
ESnet
LBNL/NERSC
NASA Ames/NREN
Naval Post Graduate School
NCAR/UCAR
San Diego State Univ.
Stanford
UC Berkeley
UC Davis
UC Irvine
UC Merced
UC Riverside
UC San Diego/SDSC
UC San Francisco
UC Santa Barbara
UC Santa Cruz
UCLA
USC
Univ. Washington/PNWGP

Biomedical Data Analysis

Cancer Genomics:
UCSC, UCSD/SDSC; UChicago
Microbiome and Integrative 'Omics:
UCSD, Caltech, UCD, UCSF
Integrative Structural Biology:
UCSF, UCSD/SDSC, LBNL/NERSC
Microscopy Data Wormhole:
UCSD, UCR, NSCC

Earth Sciences Data Analysis

Data Analysis and Simulation for Earthquakes and Natural Disasters:
Pacific Earthquake Engineering Research Center (PEER)
[UCB, UCSD, UCSC, UCD, UCLA, UCI, USC, Stanford, OSU, & UW]
Climate Modeling:
NCAR/UCAR
California/Nevada Regional Climate Data Analysis:
NCAR/UCAR, UCSD/SIO
CO₂ Subsurface Modeling:
SDSU, UCSD/SDSC
Drones & 3D Terrestrial Modeling:
UCSD, UCM
Wildfire Simulations & Situational Awareness
UCSD, NCAR/UCAR

Particle Physics Data Analysis

UCSD/SDSC, UCI, UCR, UCSB, UCSC, UCD, Caltech, OSG

Astronomy and Astrophysics Data Analysis

Telescope Surveys: LBNL/NERSC, LLNL, UCB, UCI, UCSC, Caltech/IPAC/JPL, Stanford/SLAC, UW
Galaxy Evolution: UCI, UCSD, UCLA, UCSB, UCR, UCSC, LBNL/NERSC, NASA Ames, UW
Gravitational Wave Astronomy: Caltech, LIGO Laboratory; UCSD, OSG

Scalable Visualization, Virtual Reality, and Ultra-Resolution Video

UCSD, UCI, UCLA, UCSC, UCB, UCD, UCM, USC, UIC, UHM, Jackson State U, UvA

High Performance Wireless R&E Network

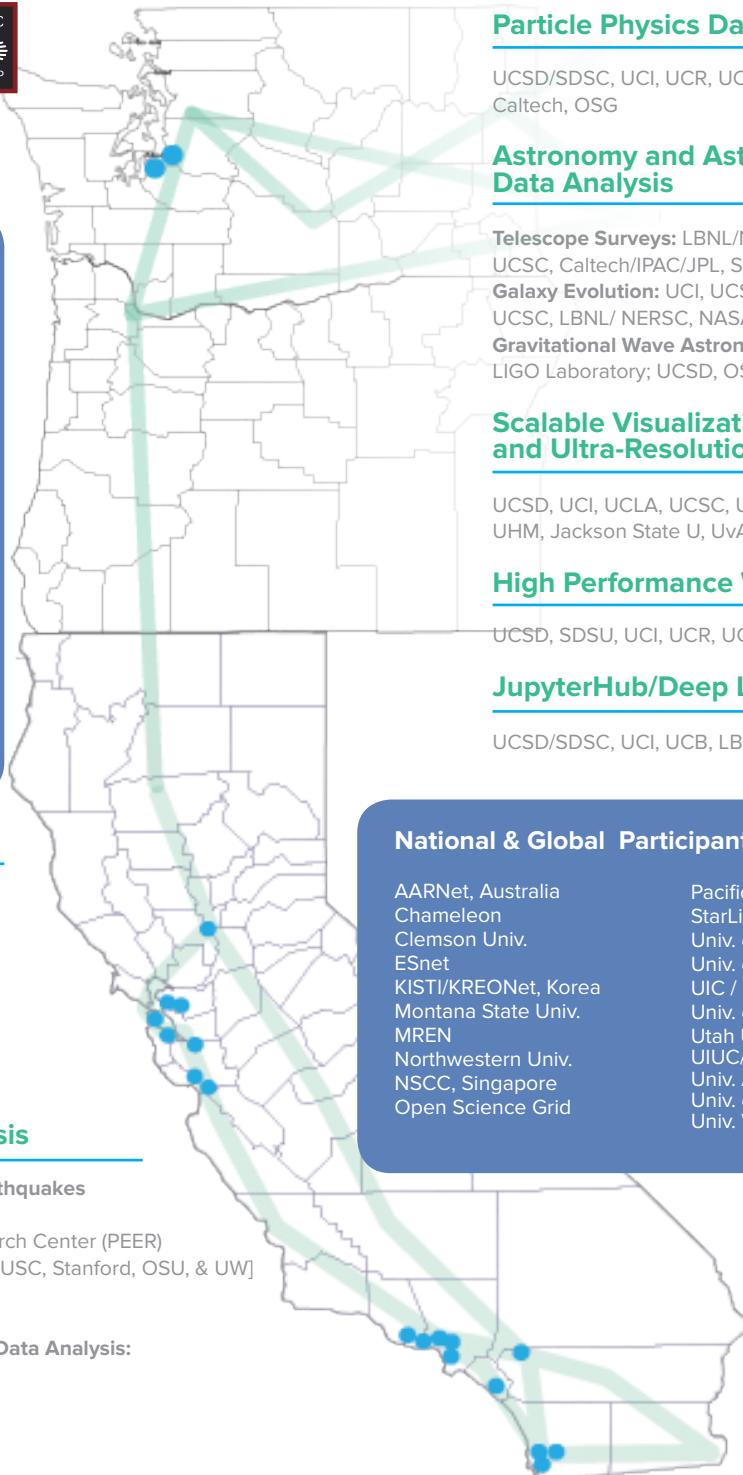
UCSD, SDSU, UCI, UCR, UCSC, UCM

JupyterHub/Deep Learning

UCSD/SDSC, UCI, UCB, LBNL, LLNL, UIC

National & Global Participants:

AARNet, Australia	Pacific Wave (CENIC + PNWGP)
Chameleon	StarLight
Clemson Univ.	Univ. of Chicago
ESnet	Univ. of Hawaii System
KISTI/KREONet, Korea	UIC / EVL
Montana State Univ.	Univ. of Tokyo, Japan
MREN	Utah University
Northwestern Univ.	UIUC/NCSA
NSCC, Singapore	Univ. Amsterdam, Netherlands
Open Science Grid	Univ. of Utah
	Univ. Washington/PNWGP



With support from the National Science Foundation
For more information visit: <http://pacificresearchplatform.org>