

The Pacific Research Platform: a Science-Driven Big-Data System

Abstract: Research in data-intensive fields is increasingly multi-investigator and multi-institutional, depending on ever more rapid access to ultra-large heterogeneous and widely distributed datasets. The Pacific Research Platform (PRP) is a multi-institutional extensible deployment that establishes a science-driven high-capacity data-centric “freeway system.” The PRP spans all 10 campuses of the University of California, as well as the major California private research universities, four supercomputer centers, and several universities outside California. Fifteen multi-campus data-intensive application teams act as drivers of the PRP, providing feedback over the five years to the technical design staff. These application areas include particle physics, astronomy/astrophysics, earth sciences, biomedicine, and scalable multimedia, providing models for many other applications. The PRP partnership extends the NSF-funded campus Science DMZs to a regional model that allows high-speed data-intensive networking, facilitating researchers moving data between their labs and their collaborators’ sites, supercomputer centers or data repositories, and enabling that data to traverse multiple heterogeneous networks without performance degradation over campus, regional, national, and international distances.

Bio: Larry Smarr holds the Harry E. Gruber professorship in the Department of Computer Science and Engineering (CSE) of UC San Diego’s Jacobs School of Engineering. On moving to UC San Diego in 2000 he became the founding Director of the California Institute for Telecommunications and Information Technology (Calit2), a UC San Diego/UC Irvine partnership. For the previous 20 years, he was a professor of Physics and Astronomy at the University of Illinois, Champaign-Urbana. In 1985 he became the founding director of the National Center for Supercomputing Applications.

During his career, he has pursued basic research in a wide variety of fields, first in general relativity, then computational and observational astronomy, now in the computer science of large-scale optical networks and data science analysis of the human microbiome. Over the last 15 years Smarr has been Principal Investigator (PI) or co-PI on six NSF-funded cyberinfrastructure projects (the OptIPuter wide-area LambdaGrid, the Quartzite, Prism, and Pacific Research Platform “Big Data” campus freeways, the GreenLight energy efficient machine room, and the WIFIRE wildfire wireless sensor network system), as well as PI of the Moore Foundation-funded global CAMERA marine microbial metagenomics computational repository.

He is a member of the National Academy of Engineering, as well as a Fellow of the American Physical Society and the American Academy of Arts and Sciences. In 2006 he received the IEEE Computer Society Tsutomu Kanai Award for his lifetime achievements in distributed computing systems. In 2014 he received the Golden Goose Award recognizing how his federally funded research has had significant human and economic benefits. He is a member of the DOE ESnet Policy Board. He served on the NASA Advisory Council to 4 NASA Administrators, was chair of the NSF Advisory Committee on Cyberinfrastructure for 5 years, and for 8 years he was a member of the NIH Advisory Committee to the NIH Director, serving 3 directors. His personal interests include growing orchids, snorkeling coral reefs, and quantifying the state of his body. You can follow him on his life-streaming portal at <http://lsmarr.calit2.net> and on Twitter as @lsmarr.