



LEADING THE WAY TO TOMORROW'S INTERNET


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CENIC 2000 Leading the Way to Tomorrow's Internet

Serious planning is underway for a superb program at CENIC's annual conference, CENIC 2000 Leading the Way to Tomorrow's Internet. This year's event will be held in beautiful San Diego, California on May 18 and 19 at the Paradise Point Resort. Three tracks are being planned to meet the needs of the attendees. The technology track includes topics such as dark fiber to the campus, Quality of Service (QoS) and middleware. The local track focuses on campus issues such as local networks, roaming using wired and wireless lines, and charging. The final track will provide an introduction to CENIC, a view of the exciting science and research that is being conducted over CENIC's CalREN-2 network, and a glimpse of the future of CENIC and high performance networking.

Jay Kohn, CENIC 2000 conference chair, expects a great turnout. "The conference committee is excited about the caliber of speakers and the topics," she said. "This should be the best CENIC conference yet."

In addition to a great program, fun events are being planned to take advantage of the bayside location of the hotel. Registration information will be available in February at <http://www.cenic.org>.

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Find it Fast in the HPC Applications Database

Whose doing what to whom in the high performance connections world, you ask? You can now preview the High Performance Connections Applications Database courtesy of the NLANR Distributed User/Applications Support Team.

Initially, the HPC Applications Database includes basic information about the NSF HPC awards: meritorious applications (projects), participants, institutions, discipline areas, and specific applications. Later, the database will grow to include more detailed information about technical requirements of the applications and results of application research.

In addition to looking up basic information, the NLANR staff wants you to review project, application, and resource information and then send corrections or updated information. Also, if projects being developed/developed at your institution are not listed, they are looking for new submissions via their web data submission form.

Please check the data using the query page at: <http://dast.nlanr.net/Clearinghouse/Query.htm>.

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R&D as a Percentage of GDP Continues Upward Climb

(Excerpted from NSF 99-357) By current projections, total annual research and development (R&D) expenditures in the United States will be \$247.0 billion in 1999 - an 8.8 percent increase over the \$227.0

billion estimated for 1998. In turn, the 1998 estimate represents a 7.3 percent increase over 1997, and the 1997 level a 7.7 percent increase over 1996. In inflation-adjusted terms, R&D annual increases are 7.2 percent for 1999, 6.2 percent for 1998, and 5.7 percent for 1997.

Since 1980, industry has provided the largest share of financial support for R&D, projected to reach \$169.3 billion in 1999, or 68.5 percent of the total. This funding represents a 10.3-percent increase in real terms over the preliminary 1998 level. Of these funds, nearly all (\$166.0 billion) will be devoted to R&D performed by industry itself, with the remainder directed toward academic R&D (\$2.2 billion) and R&D performed by other nonprofit organizations (\$1.2 billion).

Federal R&D support in 1999 is expected to be \$65.9 billion, virtually unchanged in real terms from 1998. The Federal share of support for the Nation's R&D first fell below 50 percent in 1979, and it remained between 45 and 50 percent until 1988. It then fell steadily, dropping from 44.9 percent in 1988 to 26.7 percent projected for 1999 (the lowest it has ever been since the start of the time series in 1953). Other R&D funds will be provided by universities and colleges, state and local governments, and other nonprofit institutions. These funds, in combination, are expected to reach \$11.8 billion in 1999, reflecting a 5.7 percent real increase over their 1998 level.

For the full text of the article, visit <http://www.nsf.gov/sbe/srs/databrf/sdb99357.htm>.

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Interplanetary Internet Special Interest Group

The Interplanetary Internet Special Interest Group [IPNSIG] exists to allow public participation in the evolution of the Interplanetary Internet. The technical research into how the Earth's internet may be extended into interplanetary space has been underway for several years as part of an international communications standardization body known as the Consultative Committee on Space Data Systems.

The CCSDS organization is primarily concerned with communications standardization for scientific satellites, with a primary focus on the needs of near-term missions. In order to extend this horizon out several decades, and to begin to involve the terrestrial internet research and engineering communities, a special Interplanetary Internet Study was proposed and subsequently funded in the United States.

The Interplanetary Internet Study is funded by DARPA's Next Generation Internet Initiative, and presently consists of a core team of researchers from the NASA Jet Propulsion Laboratory, MITRE Corporation, SPARTA, Global Science & Technology and consulting researchers from USC/ISI, UCLA and CalTech. The primary goal of the study is to investigate how terrestrial internet protocols and techniques may be extended and/or used as-is in the exploration of deep space. The study team has also founded the IPNSIG and has formed the core of an IPNRG under the sponsorship of the Internet Research Task Force.

For more information, visit <http://ipn.jpl.nasa.gov/>.

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President's Report

In the October issue of CENIC Today, I posted the CENIC Plan for FY 99/00 at <http://www.cenic.org>. One of its 11 goals -- the development of CalREN-2 -- has been our primary focus. Over the past three months, there has been considerable progress towards this goal including:

- **Abilene Connections to Internet2** -- We have implemented two temporary Abilene connections at UC Berkeley and One Wilshire in LA. In the next few months, we will permanently relocate the Berkeley connection to Sunnyvale and the LA connection to Anaheim. We discontinued the direct vBNS connection this month.
- **ISP Services** -- We implemented Cable and Wireless connections on both the north and south rings. An additional Qwest link at Sunnyvale will be implemented within the month.
- **Linking CUDI** -- The Mexican consortia has had plans to connect their network to CalREN-2 in San Diego. Coordination is underway to set a date and work out the technical details of the connections.
- **Link Nevada Net** -- Implementation planning for connections in both Sacramento and Anaheim is well underway. The target date is May 2000.
- **North South Link** -- UC has received State funding to enable CENIC to link the north and south SONENT rings through the Central Valley. Initially, UC campuses will be the sole users of this connection. An RFP will be issued soon with implementation scheduled this spring.
- **Los Nettos** -- Los Nettos is investigating utilizing CalREN-2 to augment some of its infrastructure.

An equally important goal in the plan is to promote the scientific and research prominence of CENIC institutions within the broader Internet2 domain of academic applications. This spring, I will visit each CENIC campus to meet researchers and educators. Using the NLANR database framework (see the [Find it Fast in the HPC Applications Database](#) article), one major focus of these visits will be to gather additional

information to augment the current HPC applications database. Another focus will be to identify and stimulate the development of inter-institutional groups that could collaborate to develop applications. Last fall, we formed the Bio-Medical Advisory Group.

Researchers at CENIC institutions are integrally involved in a number of nationally recognized advanced applications and middleware projects. These include:

- Globus Project Carl Kesselman, USC/ISI
- Digital Sky Lab Tom Prince, Caltech/JPL
- National Virtual Observatory Tom Prince, Caltech/JPL
- Urban Planning Modeling Bill Jepson, UCLA

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CENIC Associates Program

California companies and universities are encouraged to investigate their qualifications for joining CENIC Associates program. Current Charter Associates include California Institute of Technology, the California State University with its 22 campuses, Stanford University, the University of California with its 9 campuses, and the University of Southern California. Current Partner Associates include Cisco Systems, IBM, Pacific Bell, and Sun Microsystems.

For more information, click on the Associates button at the CENIC web site (<http://www.cenic.org>) or contact Tom West at twest@cenic.org or 562-985-9656.

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About CENIC

CENIC is a not-for-profit corporation formed by the California Institute of Technology, the California State University, Stanford University, the University of California, and the University of Southern California to advance the use of communications technology in teaching, learning, and research at California's institutions of higher education. For more information about CENIC, visit <http://www.cenic.org>.

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Website questions: webmaster@cenic.org
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