

A Report from the U.S. National Science Foundation Blue Ribbon Panel on Cyberinfrastructure

Daniel E. Atkins
*Professor, EECS and Information
The University of Michigan
Ann Arbor, Michigan, USA*

*Chair, NSF Panel on Cyberinfrastructure
Email: atkins@umich.edu*

This talk will review the mission, activities, and recommendations of the “Blue Ribbon Panel on Cyberinfrastructure” recently appointed by the leadership on the U.S. National Science Foundation (NSF). The NSF invests in “people, ideas, and tools” and in particular is a major investor in basic research to produce communication and information technology (ICT) as well as its use in supporting basic research and education in most all areas of science and engineering. The NSF through its Directorate for Computer and Information Science and Engineering (CISE) has provided substantial funding for high-end computing resources, initially by awards to five supercomputer centers and later through \$70 M per year investments in two partnership alliances for advanced computation infrastructures centered at the University of Illinois and the University of California, San Diego. It has also invested in an array of complementary R&D initiatives in networking, middleware, digital libraries, collaboratories, computational and visualization science, and distributed terascale grid environments.

Recently, a ground swell of ambitious strategic research projects has emerged across many science and engineering communities of the NSF that demand and presuppose a much more advanced and comprehensive ICT infrastructure to link people, information, instruments, and services on a global scale. Such environments are not intended merely to make more productive what is currently happening, but rather to empower research communities to tackle bold new realms of inquiry requiring intelligent instruments; massive data acquisition, federation and curation; advanced simulation and visualization; and effective collaboration across organizationally and geographically distributed, multidisciplinary teams. The increasing demands for research infrastructure based heavily on ICT presents special challenges and opportunities. It obsoletes, for example, funding models based on the long depreciation curves of telescopes and ships. On the other hand, it offers new opportunities for sharing, leveraging, collaboration, and broadened participation. The term, “cyberinfrastructure,” was coined to denote this special type of infrastructure and to distinguish it from traditional models of infrastructure based on big-iron, bricks, and mortar.

In response to this growing grass roots demand, the NSF leadership in May 2001 established an advisory panel with a three-part charge: (1) to review and comment on the effectiveness and continuation of the current major investments in cyberinfrastructure, especially the Partnership for Advanced Computational Infrastructure (PACI) Projects;

(2) to define a vision of needs, opportunities, and initiatives for cyber infrastructure for the science research community (including international collaboration); and (3) to recommend the role for NSF and related implementation plans to create and provide such an environment. The text of the full charge may be found at the following URL: www.cise.nsf.gov/b_ribbon/index.html.

The Panel has gathered extensive testimony from a broad sample of the NSF research communities and, at the time of the writing this abstract, is working intensely to respond to its charge and issue a report well before the CCGrid 2002 meeting. We are anxious to share the findings of this panel with an international audience and especially to solicit ideas on how the proposed initiatives could be better linked and leveraged with Grid and e-science initiatives outside the U.S.