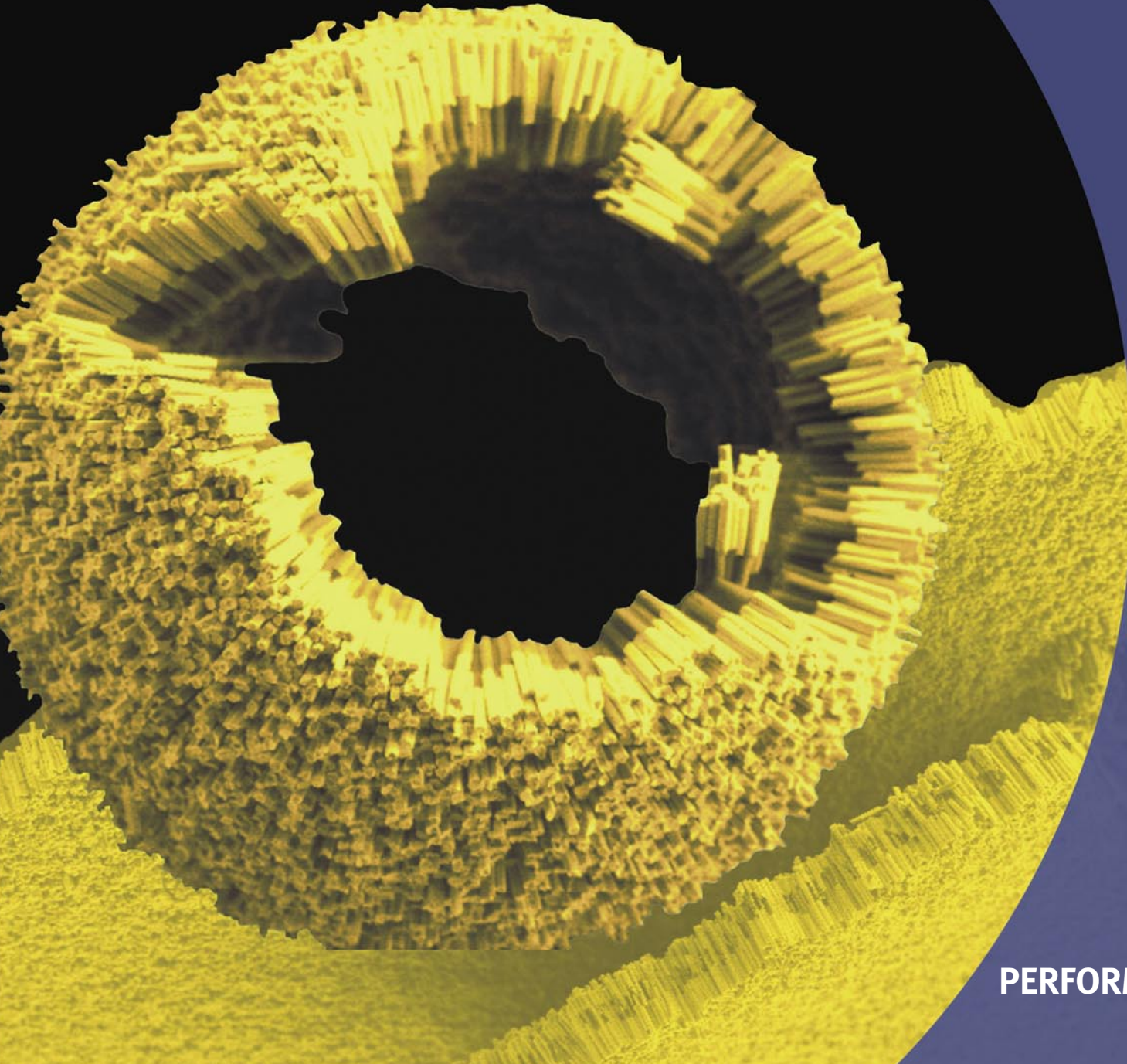
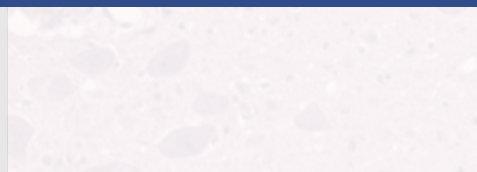
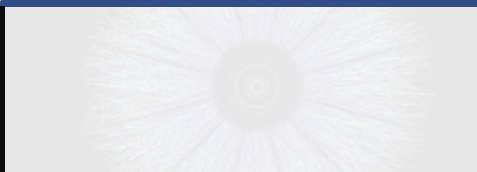


United States
National Science Foundation



FY 2004
PERFORMANCE HIGHLIGHTS



Gravitational Field from In-spiralling Black Holes

This simulation of orbiting black holes was created on the Itanium Linux Cluster supercomputer at the National Center for Supercomputing Applications (NCSA) at the University of Illinois, Champaign–Urbana. The ripples shown are known as gravitational waves, which result from the merging of two black holes. NCSA, which receives major support from the National Science Foundation, has an international reputation for high-performance computing, networking, storage, and data mining. It is the recognized leader in developing innovative systems and software for science and engineering.

Credit: Edward Seidel, Albert Einstein Institute (AEI); Max Planck Institute for Gravitational Physics; Visualization: Werner Bengert, Zse Institute Berlin and AEI

On the Cover: This image depicts the self-assembly of gold-polymer nanorods into a curved structure. National Science Foundation (NSF)-supported research by Chad Mirkin at Northwestern University has generated nanostructures with the ability to curve. These are the first nanostructures to exhibit this ability—a critical requirement for the utility of nanomaterials in further applications including drug-delivery systems, nanoscale electronics, catalysts, and light-harvesting materials. NSF is the lead agency for the National Nanotechnology Initiative, a multi-agency network working to bolster nanotechnology and ensure U.S. dominance in this emerging field. Strong research efforts are critical to capitalize on nanotechnology's potential to revolutionize science and engineering and to harness all that it offers.

Credit: Chad Mirkin, Northwestern University

Statutory Mission


To promote the progress of science; to advance the national health, prosperity, and welfare; and to secure the national defense.

Vision

Enabling the nation's future through discovery, learning, and innovation. NSF investments—in people, in their ideas, and in the tools they use—will catalyze the strong progress in science and engineering needed to establish world leadership and secure the nation's security, prosperity, and well-being.

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 NSF URLs included in this report reference the new NSF website which is scheduled to go online by the end of January 2005.

**Gold-ion Burst**

This image shows a shower of particles from a gold-ion collision in the STAR (Solenoidal Tracker) at RHIC detector at the U.S. Department of Energy's (DOE's) Brookhaven National Laboratory. Scientists there have begun detecting head-on collisions between gold nuclei in the Relativistic Heavy Ion Collider (RHIC), the world's newest and biggest particle accelerator for studying in nuclear physics. The collider aims to re-create the conditions of the early universe to gain insights into the fundamental nature of matter and extend the boundaries of scientific understanding. STAR specializes in tracking the thousands of particles produced by each ion collision at RHIC. Scientists funded by the National Science Foundation and DOE will use data collected during the collisions to explore the particles known as quarks and gluons, which make up protons and neutrons. The high temperatures and densities achieved in the collisions should, for a fleeting moment, allow the quarks and gluons to exist "freely" in a soup-like plasma, a state of matter that is believed to have last existed millionths of a second after the Big Bang, when the universe first formed.

Credit: Brookhaven National Laboratory/RHIC-STAR



FROM THE DIRECTOR

I am pleased to have this opportunity to present the National Science Foundation's (NSF's) *Performance Highlights* for fiscal year (FY) 2004. My first 10 months here at the Foundation have confirmed my prior impressions and what I think you, too, will conclude from reading this report: NSF is a well-managed and effective organization with an outstanding staff dedicated to ensuring that America's future is secure and prosperous.

NSF's "business" is fundamental research and education. By their very nature, these are long-term investments. The pay-offs from these investments do not become apparent for years and often decades. Yet we are certain of their outcome. Advances in science and engineering—such as development of the next generation of medical devices that incorporate nanoscale engineering and technology, the development of new sensors and filters that will protect buildings against chemical attack, supercomputing systems with the capability to process trillions of calculations per second—are critical for securing the homeland, sustaining economic prosperity, and advancing the quality of life for society as a whole.

FY 2004 was a busy and productive year for the agency. A record 43,817 proposals were received, and nearly 10,400 awards were made. The agency successfully achieved 27 of 30 performance goals, again exceeding its principal customer service goal of informing at least 70 percent of applicants about funding decisions within 6 months. Underlying the Foundation's programmatic achievements is NSF's commitment to organizational excellence and sound financial management. For the seventh consecutive year, NSF has received an unqualified audit opinion on its financial statements.

NSF's ongoing achievements were underscored by a number of noteworthy commendations, including the President's Quality Award for Management Excellence for exemplary performance in implementing the President's Management Agenda initiative to expand electronic government. Perhaps the most notable recognition was NSF's receiving the second highest ranking among all federal agencies on the list of "Best Place to Work" in the government. This was based on the first-ever government-wide survey of federal employees by the Office of Personnel Management—and it clearly reflects the commitment and innovation that define both the staff and the management at NSF.

Thank you for your interest in the Foundation. I invite you to visit our website (www.nsf.gov) to learn about the latest discoveries in fundamental science and engineering.


Arden L. Bement, Jr.
December 2004



"The fundamental building blocks produced by federally funded scientists, engineers, mathematicians, and technology gurus improve lives and address national challenges. They contribute to economic growth, measures to fight terrorism, energy-efficient manufacturing, environmental strategies, and medical therapies."

Arden L. Bement, Jr.
Director

For more information:

 *NSF Director:* http://www.nsf.gov/news/news_summ.jsp?cntn_id=100560&org=NSF&from=news