

NSF Announces Six New Centers for Nanoscale Research

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The National Science Foundation (NSF) today announced **awards of \$69 million over five years to fund six major centers in nanoscale science and engineering**. These awards complement eight existing centers established since 2001. The awards are part of a series of NSF grants totaling \$250 million for nanoscale research in multiple disciplines in fiscal year 2004.

The new centers will be located at the University of California-Berkeley, Stanford University in California, the University of Wisconsin, Ohio State University, the University of Pennsylvania, and Northeastern University in Massachusetts.

"The nanoscale science and engineering initiative at the National Science Foundation supports high-risk/high-reward priority research themes aligned with societal needs," said Mihail Roco, head of the NSF initiative and chair of the National Science and Technology Council's subcommittee on Nanoscale Science, Engineering and Technology.

"Each new center has a bold vision for research and education at the frontiers of science and technology, and with the existing centers, provide a coherent approach to U.S. nanotechnology research and education. Recent breakthroughs supported by NSF in exploratory research in nanomachines, nanobiosystems, medical devices, high-rate manufacturing, nanopores, and self-assembly are now moving to the next level."

Nanoscale Science and Engineering Centers (NSEC) bring together

researchers with diverse expertise -- in partnership with industry, government laboratories, or partners from other sectors -- to address complex, interdisciplinary challenges in nanoscale science and engineering. The new centers will impact a wide range of technologies, including nanomanufacturing, nanobiotechnology, electronics and medicine.

In addition, Roco said, the centers' education programs are designed to develop an innovative work force, advance pre-college training, address societal implications related to the research topic of each center, and to advance the public understanding of science and engineering.

NSF Awards in 2004 for Nanoscale Science and Engineering Centers

Center of Integrated Nanomechanical Systems (\$11.9 million)

University of California - Berkeley

Director: Alex Zettl

The center is a partnership between UC Berkeley, Caltech, Stanford and UC-Merced with collaborators in industry and the national laboratories. Research is focused on the science and engineering of nano-mechanical systems that are likely to have applications in chemical and biological sensing, and high-density, low-power, low-cost computation. The center's education program involves the general public, high school and college students to attract them to diverse educational paths and career opportunities.

Center for High Rate Nanomanufacturing (\$12.4 million)

Northeastern University

Director: Ahmed Busnaina

Northeastern University will partner with the University of Massachusetts, Lowell, the University of New Hampshire, and Michigan

State University to develop novel high-rate/high-volume, precise nanomanufacturing techniques that are expected to impact the electronic, medical and automotive industries. Partnerships among industry, universities and K-12 teachers and students will be utilized to educate the current and emerging nanotechnology workforce. The center will assess the environmental impact of nanomanufacturing during process development. In addition, the center will evaluate economic viability in light of environmental and public health findings, and regulatory policy issues related to developmental technology.

Center for Affordable Nanoengineering of Polymer Biomedical Devices (\$12.9 million)

Ohio State University

Director: L. James Lee

The center seeks to develop polymer-based, low-cost nanoengineering technology that can be used to produce nanodevices and structures for next-generation medical diagnostic and therapeutic applications. The education and outreach vision of the center is to impart multidisciplinary skills and global awareness to both graduate and undergraduate students, and create web-based science modules for K-12 students nationwide.

Center on Molecular Function at the Nano/Bio Interface (\$11.4 million)

University of Pennsylvania

Director: Dawn Bonnell

The center's research is aimed at the interface of nanotechnology and biology at the molecular level. Potential practical outcomes are in the areas of nanoscale device manufacturing, drug delivery and integrated chemical sensors as well as understanding basic complex biological and physiological processes. The center will impact public education, social discourse, workforce development and diversity, both locally and nationally, and will examine ethical issues in nanoscience and technology.

Center for Probing the Nanoscale (\$7.5 million)

Stanford University

Director: Kathryn Moler

This partnership between Stanford University, IBM, and other researchers in industry addresses the development of novel nanoprobe and application of these probes to answer fundamental questions in science and technology. The center expects to enhance the capabilities of the nanotechnology community to measure, image and control nanoscale phenomena. Specific connections to users and manufacturers of nanoprobe instrumentation will be utilized to rapidly transfer technological advances. The center is committed to educating the next generation of scientists and engineers regarding the theory, practice, and implications of novel nanoprobe.

Center for Templated Synthesis and Assembly at the Nanoscale (\$13.4 million)

University of Wisconsin - Madison

Director: Paul Nealey

The center addresses the self-assembly of complex materials and building blocks, including biological materials, at the nanoscale. Potential applications are in the areas of gene mapping, nanophotonics and nanosensors. The center also develops an integrated, multidisciplinary understanding of nanoscale science and engineering as it moves out of the laboratory and into society and will build a public dialog about its societal, ethical, legal, and policy implications. The shared experimental facilities leverage existing state-of-the-art instrumentation and infrastructure at the NSF sponsored Synchrotron Radiation Center and other centers on campus.

The National Science Foundation (NSF) is an independent federal agency that supports fundamental research and education across all fields of science and engineering, with an annual budget of nearly \$5.58 billion. NSF funds reach all 50 states through grants to nearly 2,000

universities and institutions. Each year, NSF receives about 40,000 competitive requests for funding, and makes about 11,000 new funding awards. The NSF also awards over \$200 million in professional and service contracts yearly.

Source: NSF

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