

Nanoscale Science and Engineering Activities at the National Science Foundation

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ABSTRACT

Since 1998 the National Science Foundation (NSF) has provided focused funding for nanoscale research and education. Since that time federal funding for nanotechnology research has increased by an order of magnitude, to about \$1 billion in FY05. Private industry in the US commits about \$1 billion to R&D; Japan and the EU also provide government funding at the billion-dollar level. At NSF support has been allocated for a wide spectrum of research ranging from highly exploratory projects to the methodology for implementing novel manufacturing methods. Modes of support have been established for individual investigators, small businesses, small groups, and centers that have interactions with industrial organizations, government laboratories, and overseas groups. Common facilities for performing work at the nanoscale, open to all investigators, are being established through the National Nanotechnology Infrastructure Network (NNIN), an integrated network of 13 university user facilities. From the fundamental work, numerous applications are beginning to emerge in areas such as catalysis, digital camera displays, and computer disks. Medical advances are expected, especially in the prevention, diagnosis, and treatment of cancer. For this purpose the National Cancer Institute has formed the Alliance for Nanotechnology in Cancer. Corresponding educational efforts in nanoscale science and engineering are being funded. Initially, the NSF provided support for undergraduate activities along with research projects. In FY03 a more comprehensive educational and outreach activity was funded through the Nanoscale Science and Engineering Education (NSEE) initiative, which included centers for nanoscale learning and teaching, undergraduate education, media projects, and the development of material for high school students. The unexpected risks of human interactions with nanoscale materials are being addressed through studies of both societal and environmental factors. Future work is leading to convergence of nanotechnology with biotechnology, information technology, and cognitive science.