



# **Nanoscale Science and Engineering at NSF**

**DOE workshop**

**“Enabling the Nanoscale Revolution”**

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**<http://www.nsf.gov/mps/dmr>**



# NSF's Role in NNI

- **Long-term, fundamental research**
- **NNI Grand Challenges**
- **Interdisciplinary centers and networks**
- **Shared user facilities**
- **Building research infrastructure**
- **Research and educational activities on the societal implications of nano**



## Nanoscale Science and Engineering Funding (Dollars in Millions)

	<b>FY 2002</b>	<b>FY 2003</b>	<b>FY 2004</b>	
	<b>Actual</b>	<b>Request</b>	<b>Request</b>	<b>Change</b>
<b>Biological Sciences</b>	<b>2.50</b>	<b>2.98</b>	<b>4.98</b>	<b>2.00</b>
<b>Computer and Information Science and Engineering</b>	<b>10.20</b>	<b>11.14</b>	<b>15.14</b>	<b>4.00</b>
<b>Engineering</b>	<b>86.30</b>	<b>94.35</b>	<b>106.85</b>	<b>12.5</b>
<b>Geosciences</b>	<b>6.30</b>	<b>7.53</b>	<b>7.88</b>	<b>0.35</b>
<b>Mathematical and Physical Science</b>	<b>98.68</b>	<b>103.93</b>	<b>110.42</b>	<b>6.50</b>
<b>Social, Behavioral and Economic Sciences</b>	<b>0.00</b>	<b>1.11</b>	<b>1.50</b>	<b>0.39</b>
<b>Subtotal, Research and Related Activities</b>	<b>204.48</b>	<b>221.03</b>	<b>246.77</b>	<b>25.74</b>
<b>Education and Human Resources</b>	<b>0.00</b>	<b>0.22</b>	<b>2.22</b>	<b>2.00</b>
<b>Total, Nanoscale Science and Engineering</b>	<b>204.48</b>	<b>221.25</b>	<b>248.99</b>	<b>27.74</b>



# **FY 2004 Areas of Emphasis**

- **Fundamental Research and Education**
- **Grand Challenges**
- **Centers and Networks of Excellence**
- **Research Infrastructure**
- **Societal and Educational Implications of Science and Technology Advances**



# **Fundamental Research and Education (\$152M)**

- **Biosystems at the Nanoscale (\$21M)**
- **Nanoscale Structures, Novel Phenomena and Quantum Control (\$57M)**
- **Device and System Architecture (\$28M)**
- **Nanoscale Processes in the Environment (\$10M)**
- **Multi-scale, Multi-phenomena Theory, Modeling and Simulation at the Nanoscale (\$22M)**
- **Manufacturing processes at the nanoscale (\$11M)**
- **Converging technologies from the nanoscale (\$3M)**



# Grand Challenges (\$10M)

- **Nanostructured materials ‘by design’**
- **Nanoscale electronics, optoelectronics and magnetics**
- **Nanoscale-based manufacturing**
- **Catalysts, chemical manufacturing**
- **Biological-chemical detection and protection**
- **Environment**
- **Healthcare**



# **Centers and Networks of Excellence (\$46M)**

- **Four research and education centers initiated in FY 2002**
- **Multidisciplinary, multi-sectoral network for modeling and simulation at the nanoscale**



# Research Infrastructure (\$28M)

- **Instrumentation and facilities for improved measurements**
- **Processing and manipulation at nanoscale**
- **Equipment and software for modeling and simulation**
- **National Nanofabrication Infrastructure Network (NNIN)**



# **Societal and Educational Implications of Science and Technology Advances (\$13M)**

- **Student assistantships, fellowships and traineeships**
- **Curriculum development**
- **Social, behavioral, legal, ethical, and economic perspective**