

# Partnership in Nanotechnology

NSF Grantees Conference

January 29-30, 2001

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*Charge to the workshop  
as part of the NNI Implementation Plan*

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Chair, NSTC's Subcommittee on Nanoscale  
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# HISTORY -

## National Nanotechnology Initiative Timeline

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- November 1996 Nanotechnology Group (bottom-up)
- September 1998 NSTC establishes IWGN
- March 1999 OSTP/CT presentation on NNI
- May-June 1999 Congress hearings
- July-Sept. 1999 Three background publications
- August 1999 First draft of the IWGN Plan
- Oct. - Nov. 1999 PCAST Nanotech Panel Review
- December 1999 PCAST Full Committee; OMB
- January 2000 OSTP and WH Approval
- February 2000 WH Release of NNI Initiative
- November 2000 Congress enacts the NNI budget

# Nanotechnology R&D Funding by Agency

## - Interagency coordination -

	FY 2000 (\$M)	FY 2001 (\$M)	% Increase
National Science Foundation	\$97M	\$150M	55%
Department of Defense	\$70M	\$110M	57%
Department of Energy	\$58M	\$93M	60%
NASA	\$5M	\$20M	300%
Department of Commerce	\$8M	\$10M	25%
<u>National Institutes of Health</u>	<u>\$32M</u>	<u>\$39M</u>	<u>22%</u>
<b>TOTAL</b>	<b>\$270M</b>	<b>\$422M</b>	<b>56%</b>

EPA, DOJ, DOT, DTreas, USDA, DOS will participate starting with FY2001

# Current Solicitations for NNI FY 2001

(see [nano.gov](http://nano.gov))

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- **NSF: Nanoscale Science and Engineering (NSE)**  
for interdisciplinary team research, centers and exploratory research  
Planned \$74M; [www.nsf.gov/nano](http://www.nsf.gov/nano); **Deadline : 11/01/00**
- **DOD: Defense University Research Initiatives on NanoTechnology (DURINT)** for research projects and equipment - planned \$23M;  
[www.onr.navy.mil/sci\\_tech/special/durint/durint01baa.htm](http://www.onr.navy.mil/sci_tech/special/durint/durint01baa.htm); **(11/00)**
- **DARPA: Simulation of Bio-Molecular Systems**  
Solicitation 01-07, **Deadline: 1/12/01**  
**Molecular Electronics**, <http://www.darpa.mil/mto/mole/index.html>
- **DOE: Nanoscale Science, Engineering, and Technology**  
for materials, chemical and engineering sciences; planned: \$18M;  
[file:///C:/getdoc.cgidbname2000\\_registerdocid00-30640-filed.htm](file:///C:/getdoc.cgidbname2000_registerdocid00-30640-filed.htm);  
**Deadline 4/14/01**
- **NASA: from NASA labs**
- **NIH, Other agencies**

# NNI Interagency Collaborative Activities

(Examples, subject of NNI plan revisions)

Agency	DOC	DOD	DOE	NASA	NIH	NSF
Fundamental research		x	x	x	x	x
Nanostructured materials	x	x	x	x	x	x
Molecular electronics		x		x		x
Spin Electronics		x		x		x
Lab-on-a-chip (nanocomponents)	x	x	x	x	x	x
Biosensors, bioinformatics (1)				x	x (1)	
Bioengineering		x	x		x	x
Quantum computing		x	x	x		x
Measurements and standards for tools	x	x	x		x	x
Nanoscale theory, modeling and simulation		x	x	x		x
Environmental monitoring			x	x		
Unmanned missions		x		x		
Nanofabrication user facilities	x		x	x		x

(1) NASA and National Cancer Institute (NCI) join effort to develop nano-explorers for the human body (MOU signed on 4/13/00)

*From IWGN Implementation Plan*

# Sampling the Programs at NSF

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## *Mainly seed funds:*

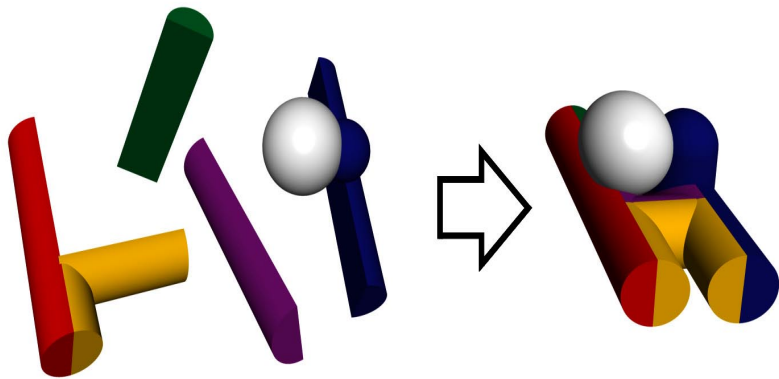
- **Synthesis and Processing of Nanoparticles (since 1991)**
- **National Nanofabrication User Network (since 1994)**
- **Nanoscale Instrumentation (1995)**

## *Larger investments:*

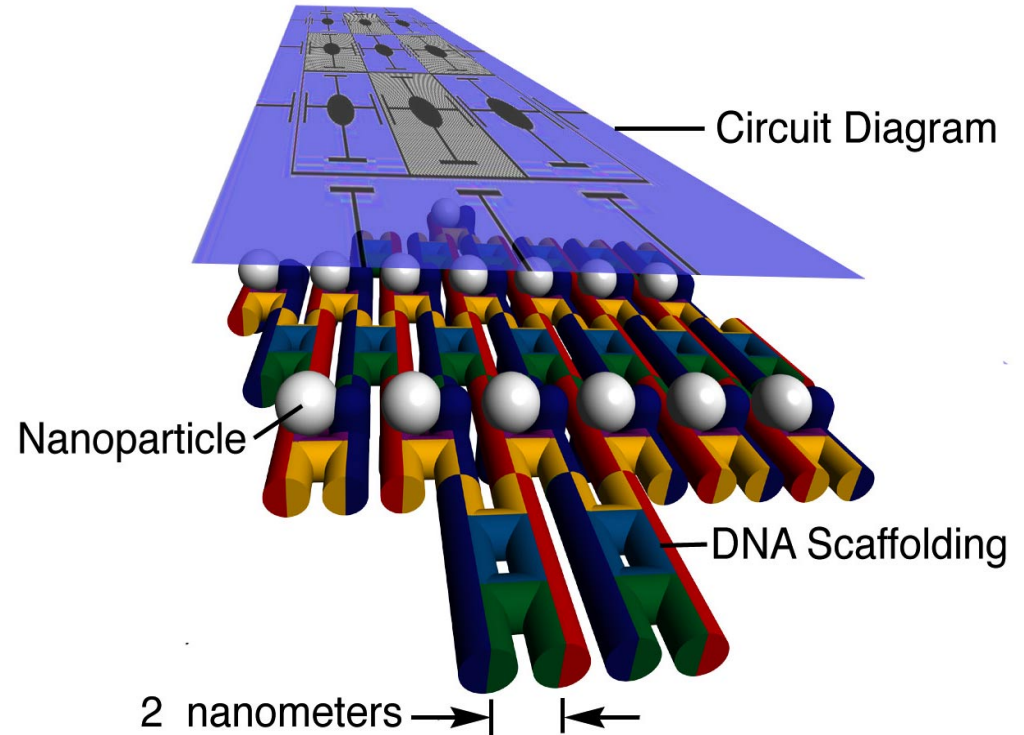
- **Functional Nanostructures (FY98)**
- **Biosystems at Nanoscale (FY99, Only exploratory)**
- **Nanoscale Modeling and Simulation (FY00)**
- **STTR& SBIR Solicitations on Nanotechnology (FY98-00)**

# Three-dimensional assembling (U. Minnesota)

- synergism Nano - BIO - IT -



Selfassembled DNA synthetic strands and nanoparticles



3D architecture  
for a nanoscale electronic circuit

# Nanoscale Science and Engineering Program (NSF, FY 2001)

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- Support research in emerging areas of nanoscale science and technology, including:
  - Biosystems at nanoscale levels
  - Nanoscale structures, novel phenomena, quantum control
  - Device and system architecture; nanosystems specific software
  - Nanoscale processes in the environment
  - Multi-scale, multi-phenomena modeling and simulation
  - Studies on societal implications of NSE, education and training
- Support collaborative research and educational activities with larger and longer grants than in exiting programs
  - Interdisciplinary Research Teams (378 proposals)
  - Nanoscale Science and Engineering Centers (69 proposals)
  - Nanoscale Exploratory Research (260 proposals)



# Expectations from the workshop

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- Timely communication of results, synergism
- Identify scientific drivers and new research directions
- Promote future interactions between grantees, the existing networks, industry, government sponsored laboratories, and various funding agencies.  
Identify international opportunities
- Disseminate innovations

# Presentations

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- Areas of research and education covered by the group
- Most significant research accomplishments and conclusions
- Promising future directions and opportunities for collaborations