



NANO 2: Charting a New Decade for Discovery and Innovation

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NANO 1: "Nanotechnology Research Directions: Vision for the Next Decade", 1999

NANO 2: "Nanotechnology Research Directions for Societal Needs in 2020", 2010



An Exceptional Idea

The U.S. National Nanotechnology Initiative has become:

- Rich source of S&E breakthroughs and technology innovations
- Integrative, across government, industry, and academe, including across NSF directorates
- The largest cumulative R&D civilian program after space (\$12B in 2001-2010)
- A model for nano investment by other nations



NSF Contributions

In 1999, NSF prepared the long-term vision of nanotechnology development (NANO 1 Report). NNI investment has:

- Changed research & education by
 - Connecting more deeply to fundamentals
 - Connecting more broadly scientific disciplines
 - Using more transformative methods
- Contributed significantly to nano-EHS
- Increased focus on nanomanufacturing



2010 Transition

We now face momentous transitions:

- from nanocomponents to nanosystems
- from discovery to user-driven innovation
- from passive to active nanosystems
- from improvement of existing products and services to completely new products and industries



Towards Innovation

Nanotechnology R&D is essential for strengthening the innovation ecosystem, via:

- NNI Signature Initiatives: Solar Energy, Nanoelectronics for 2020 and Beyond, Sustainable Nanomanufacturing
- Partnerships between government, industry, and universities
 - Existing NSF programs such as GOALI and I/UCRC
 - Supporting innovation ecosystem, including new programs such as industry inspired Fundamental Research and Accelerating Innovation Research