



Science, Technology, and Innovation Initiatives in the Obama Administration

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**“We will restore science to its
rightful place...”**

Barack Obama, January 20, 2009



S&T is a Priority for the President

“Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before.”

National Academy of Sciences, April 27, 2009



Boise State, January 21, 2015

“Twenty-first century businesses will rely on American science and technology, research and development...I want Americans to win the race for the kinds of discoveries that unleash new jobs.”

State of the Union, January 20, 2015



The Place of S&T on the Agenda

Science and technology are central to meeting the key challenges of

- Economic development and sustainable growth
- Biomedicine and health-care delivery
- Clean, safe, reliable, and affordable energy
- Climate-change mitigation and adaptation
- Competing uses of land and water
- The health and productivity of the oceans
- National and homeland security



as well as lifting the human spirit through discovery, invention, and expanded understanding.



A Strategy for American Innovation

Strategy released in Oct '09, updated in Feb '11 and Oct '15

- Provides overview of Administration efforts to ensure America continues to lead as world's most innovative economy

Three core components focusing on:

- Importance of investing in R&D
- Strategic areas for focused effort
- Making government more innovative



A Strategy for American Innovation

Nine Areas of Strategic Opportunity

- Advanced Manufacturing
- Precision Medicine
- BRAIN Initiative
- Advanced Vehicles
- Smart Cities
- Clean Energy and Energy Efficient Technologies
- Educational Technology
- Space
- New Frontiers in Computing

Also highlights “general-purpose” technologies:

- Nanotechnology, robotics and autonomous systems, advanced materials, engineering biology



Ongoing S&T Initiatives and Investments

Strong S&T support across all agencies (NIH, NSF, DOD, DOE, NASA, USDA, NIST), and for ongoing initiatives, including:

- **Global Change Research Program (GCRP)**
 - Working to understand, assess, predict, and respond to human-induced and natural processes of global change (\$2.5 B in FY'15)
- **Networking and Information Technology Research and Development (NITRD)**
 - Funding revolutionary breakthroughs in advanced information technologies such as computing, networking, and software (\$4.0 B in FY'15)
- **National Nanotechnology Initiative (NNI)**
 - Working toward a future in which the ability to understand and control matter at the nanoscale leads to a revolution in technology and industry (\$1.5 B in FY'15)



National Nanotechnology Initiative (NNI)

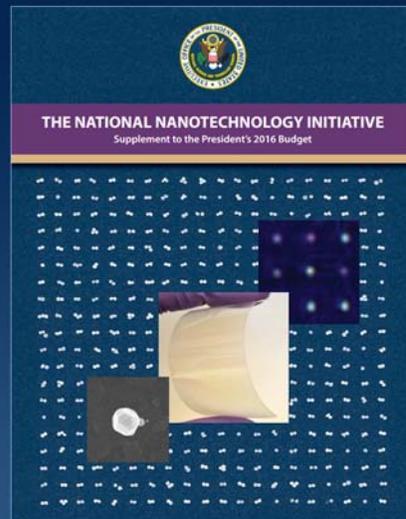
20 Federal Departments and Independent Agencies

11 with nanotech budgets

2015 budget: \$1.5 billion

\$22 billion since 2001

www.nano.gov



2016 Budget Supplement



Major New S&T Initiatives & Investments

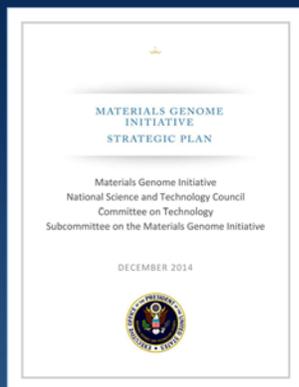
Launched a series of new initiatives, including:

- **Big Data R&D Initiative**
 - Improving our ability to extract knowledge and insights from large and complex collections of digital data
- **Materials Genome Initiative**
 - Creating a new era of policy, resources, and infrastructure that support U.S. institutions in the effort to discover, manufacture, and deploy advanced materials twice as fast, at a fraction of the cost
- **National Robotics Initiative**
 - Accelerating the development and use of robots in the U.S. that work beside or cooperatively with people
- **BRAIN Initiative**
 - **Brain Research through Advancing Innovative Neurotechnologies (BRAIN)** to revolutionize our understanding of the human brain



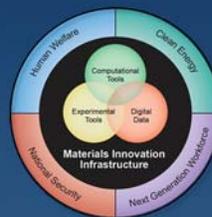
Materials Genome Initiative

Launched in 2011 to enable discovery, development, manufacturing, and deployment of advanced materials at least twice as fast, at a fraction of the cost.



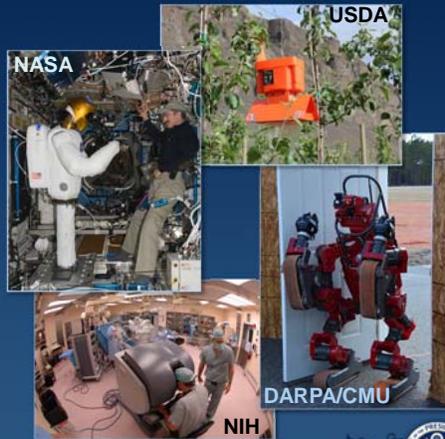
www.mgi.gov

- **Meeting Societal Needs:**
 - Create advanced materials for clean energy, human welfare, and national security, and develop the associated workforce
- **Accelerating Our Pace**
 - Reduce time and resources needed to bring new materials to market
- **Building Infrastructure for Success, including:**
 - Computational tools
 - Experimental tools
 - Collaborative networks
 - Digital data



National Robotics Initiative

The realization of co-robots acting in direct support of individuals and groups...for manufacturing, exploration, discovery, agriculture, security,



• Major Themes:

- Fundamental research
- Controls and dynamical systems
- Computational models of human cognition
- Application-inspired topics
- Micro- and nano-robotics, neuro-robotics, humanoid robotics, and networked multi-robot team
- Understanding of the long term social, behavioral and economic implications of co-robots across all areas of human activity
- Use of co-robots for STEM learning



BRAIN Initiative

Brain Research through Advancing Innovative Neurotechnologies

- Accelerate development & application of new tech to produce dynamic pictures of the brain that show how individual brain cells and complex neural circuits interact at the speed of thought
- Explore how the brain encodes, stores, and retrieves vast quantities of info, and shed light on complex links between brain function and behavior
- National effort led by NIH, DARPA, NSF, and FDA (FY16 ~\$300 M)
- Major foundations and research institutions (HHMI, Allen, Kavli, others) have committed >\$240 M



www.whitehouse.gov/BRAIN



New S&T Initiatives and Investments

- **US Ignite Initiative**
 - Promoting U.S leadership in the development and deployment of next-generation gigabit applications with the potential for significant societal impact
- **Advanced Manufacturing Initiative**
 - National Network for Manufacturing Innovation (NNMI): regional hubs to accelerate development and adoption of cutting-edge manufacturing technologies for making new, globally competitive products
- **Advanced Research Projects Agency – Energy (ARPA-E) and 5 Energy Innovation Hubs**
- **Precision Medicine Initiative**
 - To enable a new era of medicine through research, technology, and policies that empower patients, researchers, and providers to work together toward development of individualized treatments



Fostering U.S. Innovation: Key Elements of the Innovation Toolkit

Two primary goals:

1. Increase the effectiveness, efficiency, and agility of the government through improvements in its core processes
2. Promote innovation externally, accruing economic and societal benefits

Priority Areas:

- Bring innovative people and culture to the Federal government
- Embrace open government and a digital government strategy
- Be innovative in Federal procurement; pay for outcomes
- Convene partnerships
- Use evidence and evaluation to improve government performance



