



# Seventh PCAST Quadrennial Review of the NNI

July 27, 2023

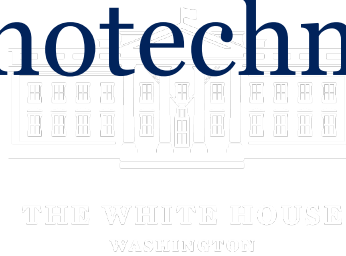
**DRAFT/PRE-DECISIONAL**

# PCAST Reports

- Established by Executive Order, PCAST is an independent Federal Advisory Committee comprised of individuals from industry, academia, and non-profit sectors
- A PCAST Working Group studies the topic, solicits information from diverse stakeholders, and drafts a report
- To release a report, full Council must make the decision in public, which includes discussion and voting
- Recommendations must reflect the Council's independent judgment, and thus *PCAST reports are not subject to any interagency review or approval process*
- Reports are public, except if classified



# Working Group Reviewing the National Nanotechnology Initiative



## Co-Leads:

**Bill Dally (NVIDIA)**

**Lisa Su (Advanced Micro Devices [AMD])**

## Members:

**Paula Hammond (MIT)**

**John Banovetz (3M)**



# Organizations and Experts Consulted

- Centers for Disease Control and Prevention

- Cerion Nanomaterials

- Consumer Product Safety Commission

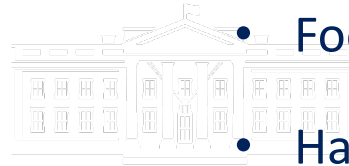
- Department of Energy

- Department of Homeland Security

- Department of Labor, Occupational Safety and Health Administration

- Department of Justice

- Environmental Protection Agency



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- Food and Drug Administration

- Harvard University

- Massachusetts Institute of Technology

- National Aeronautics and Space Administration

- National Institutes of Health

- Nuclear Regulatory Commission

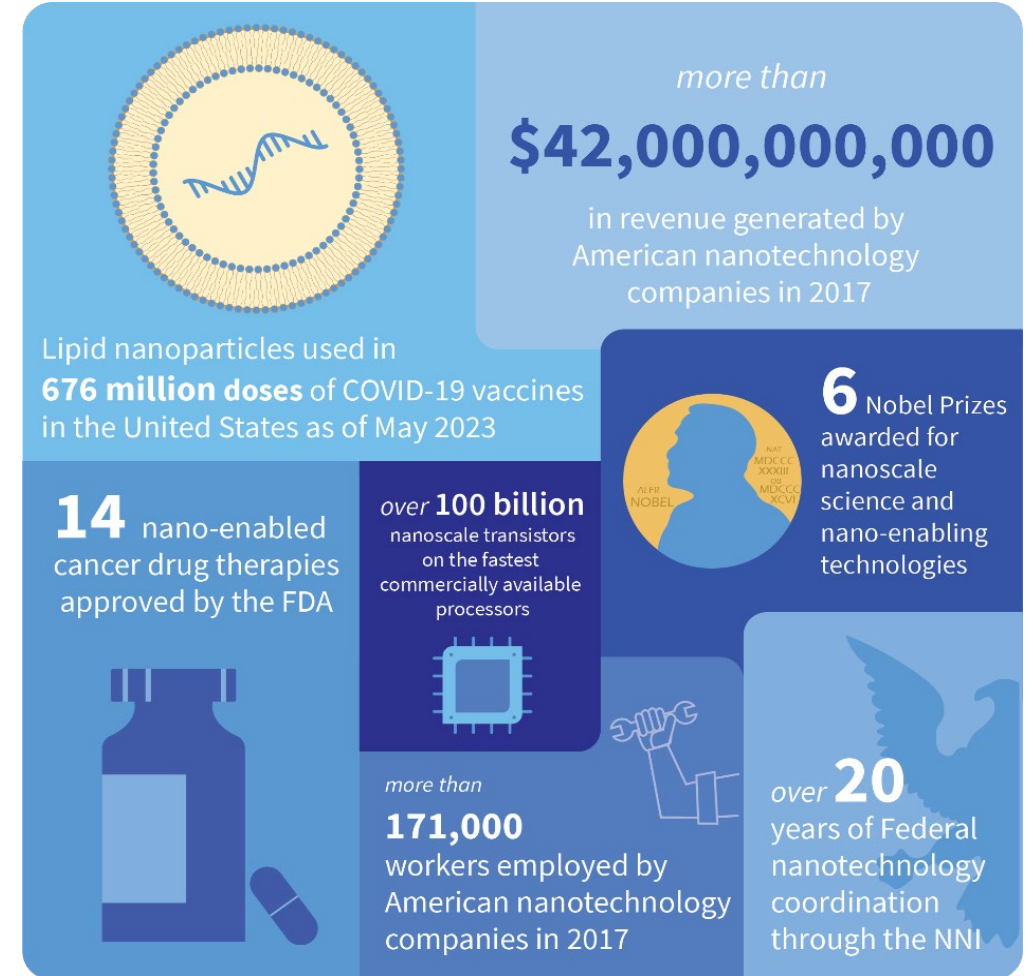
- University of California, Los Angeles

- U.S. Department of Agriculture



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- Nanotechnology research is critical to U.S. innovation and needs to continue
- Nanotech has proven value: microelectronics, mRNA vaccines, next gen energy tech, myriad other materials
- 3,700 companies that identify as nanotech enterprises generated \$42B in revenue and employed 171,000 workers in 2017
- Many more companies employ nanotech as part of their broader business portfolio, making total value to the US economy substantial



Selected examples of Nanotechnology Achievements

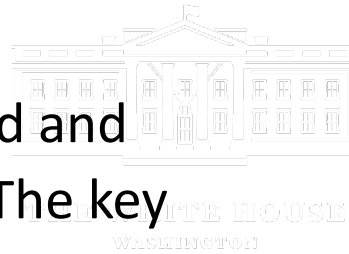


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- In the late 1990s, federal leaders and scientific visionaries recognized that nanotechnology would be essential to grow our economy and strengthen our global competitiveness
- Congress authorized the NNI through the 21st Century Nanotechnology Research and Development Act of 2003 and directed the executive branch to create a governance infrastructure that would coordinate activities that support nanotechnology research and funding
- Through the NNI, the United States established itself as a global leader in nanotechnology
- National Science and Technology Council's (NSTC) Nanoscale Science, Engineering, and Technology (NSET) Subcommittee and facilitated by the National Nanotechnology Coordination Office (NNCO) have been crucial to this process



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- Nanotechnology has significantly evolved and matured since NNI began 20 years ago. The key concerns are no longer gaps in basic research
- Nanotechnology efforts are now more focused on development and applications across materials
- PCAST considered **how** Federal coordination of nanotechnology research should be continued; **what best serves the science and the American people**

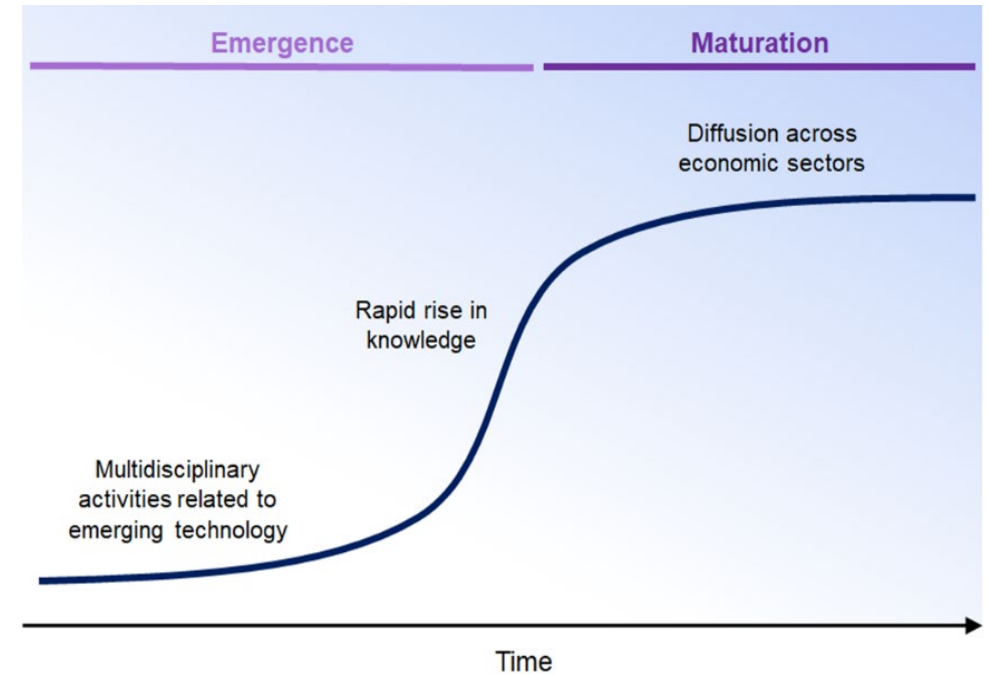


Figure 1. Generalized Emerging Technology Timeline



# Recommendations

**Recommendation 1**: PCAST recommends the President work with Congress to sunset or substantially revise the 21<sup>st</sup> Century Nanotechnology R&D Act.





# Recommendations

**Recommendation 2:** PCAST recommends the Director of the Office of Science and Technology Policy (OSTP) work with the Executive Director of the National Science and technology Council (NSTC) to direct the NSET Subcommittee to continue leadership for Federal coordination of nanotechnology strategic planning, implementation, and outreach.



# Recommendations



## **Recommendation 3:** PCAST recommends the NSET

Subcommittee enhance experiential learning programs for nanotechnology students and scientists to become the collaborative, multi-disciplinary workforce needed for nanotechnology and other advanced technologies.

