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Informing Anticipatory Governance of New and Emerging Technologies through Nanotechnology in Society Research

The Center for
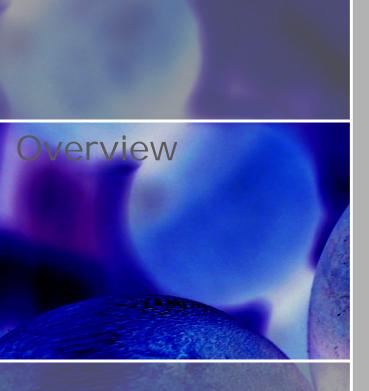Nanotechnology in Society

ARIZONA STATE UNIVERSITY

Clark A. Miller
Co-PI, Associate Professor

Overview

Anticipatory Governance,
Research on
Nanotechnology in
Society, and Science
Education

- Anticipatory Governance
  - What?
  - Why?

- Nanotechnology in Society Research
  - Key Themes
    - Environment, Health, & Risk
    - Privacy & Surveillance
    - Human Enhancement & Identity
    - Regulation, Policy, and Ethics
    - Public Dialogue & Engagement
  - Key Sites
    - NSEC Centers: ASU, UC Santa Barbara
    - NNI SEI Project: Cornell et al.
    - NIRT Projects: UCLA/Harvard, Northeastern, Minnesota, Michigan State, South Carolina
    - Others: IIT, Wisconsin, Virginia

- Integrating Research and Education

Anticipatory Governance

What?
Why?

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➢ We will construct new worlds via nanotechnology.

  ➢ What kinds of worlds will we choose to build?

  ➢ How will we decide which worlds to build?

  ➢ Who will decide which worlds to build?

Anticipatory Governance

What?
Why?

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  - What kinds of worlds will we choose to build?
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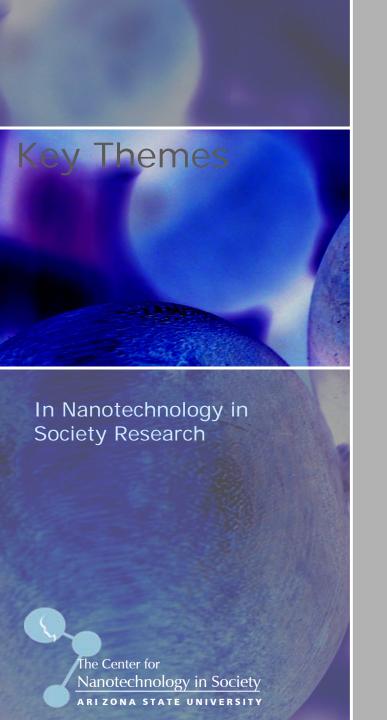 - Who will decide which worlds to build?

- What is needed?
  - Citizens who have the capacity to anticipate and reflect critically on the kinds of nanoworlds they are choosing to build
  - Scientists who will work with them to make choices about the shape of nanoworlds
  - Institutions that facilitate deliberation, decisionmaking, and implementation regarding worldbuilding goals and means
  - Knowledges of many kinds to inform citizens, scientists, and institutions

Anticipatory Governance

What?
Why?

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- What is anticipatory governance?
  - Building capacity to reflect critically on nanotechnology in society
  - Anticipating (although not necessarily predicting) risks, benefits, and social changes
  - Directing innovation toward social objectives
  - Facilitating open dialogue and deliberation about societies' nanotechnological futures
  - Acknowledging and seeking to manage the full range of uncertainties and complexities in nanotechnological societies
  - Taking into account disparities of power in the design of technological systems
  - Democratizing innovation, which is perhaps the only remaining legitimate form of radical social transformation

Key Themes

In Nanotechnology in Society Research

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- Innovation and Economic Growth
  - Countries, regions, states, and cities are staking their economic future on nanotechnology
  - What makes for a thriving innovation economy?
- Regulation, Policy, and Ethics
  - Difficult and complex questions exist about both the processes and values that should drive lawmaking
  - Lawmakers, courts, and regulatory agencies are struggling to grasp nano's implications and develop meaningful policies and processes
- Public Dialogue & Engagement
  - Equally difficult and complex questions exist about how the public should be involved in governing emerging technologies
  - Some countries are experimenting with ambitious public engagement and deliberation exercises

Key Themes

In Nanotechnology in Society Research

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- Environment, Health, & Risk
  - Nanomaterials are, essentially, new chemicals
  - Nanomaterials are exciting because they have new physical, chemical, and biological properties
  - We have an opportunity to "get nano right"
- Privacy & Surveillance
  - Nanosensors represent 1/3 of NNI budget
  - Ubiquitous sensing raises real concerns about surveillance (state, corporate, and social) and its consequences for social relationships
- Human Enhancement & Identity
  - Some of the most exciting prospects for nano involve biological applications
  - At the level of scientific and technological practice, there is no meaningful distinction between therapy and enhancement
- Military Competition
  - Will the rapid escalation of competition in nanotechnology research spill over into military competition?

Key Sites

In Nanotechnology in Society Research

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- Centers for Nanotechnology in Society
  - ASU and UCSB
  - Funded through the Nanoscale Science and Engineering Research program
  - Congressional mandate to prepare society for a nanotechnological world
- NIRTs
  - Smaller but still major investments in social science research
    - MSU (food), UCLA/HU (innovation), NEU (regulatory capacity), UMn (risk), South Carolina (visualization)
- NNI - Social and Ethical Implications
  - Cornell lead institution (clearinghouse)
- Others
  - Wisconsin NSEC/MRSEC/CNS
  - Chemical Heritage Foundation Center for History and Policy
  - University of Virginia
  - IIT
  - International Nano and Society Network

Useful Websites

In the US
(There are others in Europe)

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- CNS-ASU
  - http://cns.asu.edu/
- CNS-UCSB
  - http://www.cns.ucsb.edu/
- NNIN SEI project (Cornell)
  - http://www.sei.nnin.org/
- International Nano and Society Network
  - http://www.nanoandsociety.org/
- NIRTs
  - http://nsrg.neu.edu/
  - http://lifesci.consortium.umn.edu/nirt/
  - http://www.ifas.msu.edu/keyprojects.htm
  - http://nsts.nano.sc.edu/

Education: A Major Objective

Integration of Research and Education

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- Incorporating Nano and Society Themes in Science Education
  - Formal
    - CRESMET - K-12 Science Ed
    - Learning Community
  - Informal
    - Science Cafes
      - Tempe Community Locations
      - AZ Science Center
    - National Citizens Technology Forum
  - NISE Collaborations
    - Expert Panelist at Minnesota Science Museum Public Forum
    - Consulting on NISE website
    - Contributions to other projects
    - We are open, and all of the other research groups are open to future collaborations