# Why this workshop; Why Nanotechnology at EPA

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Office of Research and Development
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Nanotechnology for Site Remediation
Washington, DC

# Organizers

- EPA: Marti Otto, Mike Gill, Barbara Karn, Jon Josephs, Terry Burton, Madaleine Nawar, Nora Savage
- NCSE: David Blockstein
- NASA: Jackie Quinn
- NSF: Pat Brezonik, Cindy Ekstein
- Air Force: David Carrilllo
- Dept. of Commerce: John Sargent
- Navy: Nancy Ruiz, Rebecca Biggers, Richard Mach
- SERDP: Scott Dockum
- DOE: Todd Anderson

# EPA's Mission:

To protect the environment and human health

# 6 Thrusts for EPA Nano research program

- Build and sustain a community of researchers in nanotech and the environment-both applications and implications.

- Institutionalize nanotechnology within EPA's mission.

- Assure consideration of the environment and human health in government research programs related to nanotechnology

- Work with industry to assure environmentally responsible development of nanotechnology and products containing nanomaterials.

- Provide leadership in international activities involving environment and human health and nanotech.

Provide education and outreach to the public to promote understanding of nanotechnology with respect to environment and human health.

# A Research Framework for Nano and the Environment

- **Applications** address existing environmental problems or prevent future problems

| Green Energy | Treatment | Remediation | Sensors | Green Manufacturing |
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- **Implications** address the interactions of nanomaterials with the environment and any possible risks that may be posed by nanotechnology

Toxicology

Natural Nano Processes

Life Cycle Aspects

Fate/Transport & Transformation

Exposure/Bioavailability & Bioaccumulation

# EPA Nanotechnology STAR Grants

2001 Environmental Applications of Nanotechnology
- 16 awards, $5.6 million (sensors, catalysis, remediation)

2002 Environmental Applications/Implications of nanotechnology
- 16 awards, $5 million (sensors, catalysis, remediation and industrial ecology)

2003 Health and Environmental Effects of Manufactured Nanoparticles
- Toxicity – 6 awards, $2 million
- Fate, transport and transformation – 5 awards, $1.7 million
- Exposure and Bioaccumulation – 1 award $.35 million

2004 Environmental applications of nanotechnology, $2 million (P2 – 1; sensors – 2; Remediation/treatment – 3)

2005 Joint solicitation with NIOSH and NSF on health and environmental effects of nanoparticles, $6.6 million (19 awards pending)

2005 Joint solicitation with NIOSH,NSF & NIEHS on health and environmental effects of nanoparticles, $8 million

# EPA (NCER) Nanotechnology Activities

NNI, NSET
NEHI, CBAN

Dec. 2003 Societal Implications II

Environmental Applications

EPA NanoMeeters

Wilson Center Meetings

SPC White Paper

Implications

2004, 2005 GRO

## 2001/2002 RFAs

- Environmentally Benign Manufacturing and Processing;
- Remediation/Treatment;
- Sensors;
- Environmental Implications of Nanotechnology (LCA)

## 2003 RFA-EPA

2004 RFA- EPA, NSF, NIOSH
2005 RFA-EPA, NSF, NIOSH, NIEHS
Environmental & Health effects of manufactured nanomaterials

## SBIR

Nanomaterials and Clean Technologies

Applications and Implications

Grantees' workshops
2002, 2004, 2005

- ACS Symposia-2003,04,05
- Gordon Conference- 2006?
- Grand Challenges Workshop
- Interagency Environmental Conference
- Edited journals
- NanoRemediation workshop

Building a Green Nanotech Community

# Call for Papers: Due Nov. 28

## Nanotechnology and the Environment

## A symposium sponsored by the Division of Industrial and Engineering Chemistry

## At the 231st American Chemical Society National Meeting

Atlanta, Georgia

**March 26-30, 2006**

- Overview of nanotechnology programs and issues
- Bio-inspired nanotechnology
- Nanocatalysts for more environmentally friendly processes
- Elements of risk assessment involving nanomaterials and nanoproducts
- Nanomaterials for use in energy applications
- Environmentally benign synthesis of nanomaterials
- Use of nanotechnology leading to cleaner production
- Industrial Ecology/LCA applied to nanotechnology
- Nanotechnology related to the hydrogen economy

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**October 26 – 28, 2005**
**Nanotechnology and the Environment: Applications and Implications Progress Review Workshop III**

**The EPA Workshop, "Nanotechnology and the Environment: Applications and Implications Progress Review Workshop III," features presentations by EPA STAR grant researchers in nanotechnology and the environment. This year we welcome our Canadian colleagues working in nano and the environment.**

Materials Research Society Boston MA, Nov. 28-Dec. 2, 2005

**The goal of the conference is to develop a community of scientists and engineers who maintain an understanding and appreciation for potential environmental implications and applications while doing their research in nanotechnology. The conference will serve as a stimulus for increased collaborations among the various researchers resulting in improved knowledge of the environmental aspects of nanotechnology. The conference is open to members of the academic, government, and industrial communities as well as the general public.**

**http://www.scgcorp.com/2005nano/index.asp**