

**U.S. EPA 2004 Nanotechnology Science To Achieve Results (STAR)  
Progress Review Workshop — Nanotechnology and the Environment II**

**Loews Philadelphia Hotel  
1200 Market Street  
Philadelphia, PA 19107**

**August 18 – 20, 2004**

**Draft Agenda**

**Wednesday, August 18, 2004**

- 9:30 – 10:00 a.m.**      **Registration**
- Overview**
- 10:00 – 10:15 a.m.**      **Welcome – Region 3**
- 10:15 – 10:40 a.m.**      **Overview of Nanotechnology—Responsible Research and Development of Nanotechnology**  
Mihail Roco
- 10:40 – 11:05 a.m.**      **EPA’s Nanotechnology Program—Vision of How Nanotechnology Can Be Used To Protect, Inform, Manage, and Improve the Environment and How Harm From Nanotechnology Can Be Studied and Prevented**  
Barbara Karn
- Plenary Talks**
- 11:05 – 11:35 a.m.**      *Nanotechnology Applications for Environmental Sensors: Rapid and Precise Monitoring; Lab-on-a-Chip Devices; Real-Time Analyses; Remote, In Situ, and Continuous Devices*  
Nongjian Tao
- 11:35 a.m. – 12:05 p.m.**      *Nanotechnology Applications for Treatment: Cost-Effective and Rapid Technologies; Smart Materials or Active Surface Coatings*  
Wilfred Chen
- 12:05 – 12:35 p.m.**      *Nanotechnology Applications for Remediation: Cost-Effective and Rapid Technologies; Removal of Contaminants From Soil, Ground Water, and Aqueous Environments*  
Gregory Wilson
- 12:35 – 1:35 p.m.**      **Lunch**
- 1:35 – 2:05 p.m.**      *Nanotechnology Applications for Green Manufacturing: Minimize Harmful Emissions and Generated Wastes; Reuse; Recycle; Benign Chemical Processes; Self-Assembly*  
Lawrence T. Drzal

**2:05 – 2:35 p.m.**      *Nanotechnology Implications in the Environment and Human Health: Life Cycle Assessment, Ecosystem Health, Persistence, Toxicity, Fate and Transport, Bioavailability, Bioaccumulation/Biotransformation*  
Nora Savage

**Green Manufacturing**  
Maria Rodriguez, Chair

**2:35 – 2:55 p.m.**      *Green Engineering of Dispersed Nanoparticles: Measuring and Modeling Nanoparticle Forces*  
Darrell Velegol

**2:55 – 3:15 p.m.**      *Sustainable Biodegradable Green Nanocomposites From Bacterial Bioplastic for Automotive Applications*  
Lawrence T. Drzal

**3:15 – 3:35 p.m.**      *Development of Nanocrystalline Zeolite Materials as Environmental Catalysts: From Environmentally Benign Synthesis to Emission Abatement*  
Sarah C. Larsen

**3:35 – 4:00 p.m.**      **Break**

**4:00 – 4:20 p.m.**      *Plasmon-Sensitized TiO<sub>2</sub> Nanoparticles as a Novel Photocatalyst for Solar Applications*  
George Chumanov

**4:20 – 4:40 p.m.**      *Graft Polymerization as a Route To Control Nanofiltration Membrane Surface Properties To Manage Risk of EPA Candidate Contaminants and Reduce NOM Fouling*  
George Belfort

**4:40 – 5:00 p.m.**      *Ecocomposites Reinforced With Cellulose Nanoparticles: An Alternative To Existing Petroleum-Based Polymer Composites*  
William T. Winter

**5:00 – 5:20 p.m.**      **TBD**

**Aerosols**  
Maria Rodriguez, Chair

**5:20 – 5:40 p.m.**      *Elemental Composition of Freshly Nucleated Particles*  
Murray V. Johnston

**5:40 – 6:00 p.m.**      *Ion-Induced Nucleation of Atmospheric Aerosols*  
Peter H. McMurry

**6:00 p.m.**      **Adjourn**

**7:00 p.m.**      **Dinner – Zanzibar Blue**  
\$50/person, 200 S. Broad Street. Please contact Barbara Karn or Nora Savage for reservations.

Web Site: [zanzibarblue.com/pa/](http://zanzibarblue.com/pa/)

**Thursday, August 19, 2004**

- 8:40 a.m. – 1:50 p.m. Sensors**  
Marti Otto, Chair
- 8:40 – 9:00 a.m.** *Nanostructured Porous Silicon and Luminescent Polysiloles as Chemical Sensors for Carcinogenic Chromium (VI) and Arsenic (V)*  
William C. Trogler
- 9:00 – 9:20 a.m.** *Nanosensors for Detection of Aquatic Toxins*  
Robert E. Gawley
- 9:20 – 9:40 a.m.** *Micro-Integrated Sensing System ( $\mu$ -ISS) by Controlled Assembly of Carbon Nanotubes on MEMS Structures*  
Somenath Mitra
- 9:40 – 10:00 a.m.** *Advanced Nanosensors for Continuous Monitoring of Heavy Metals*  
Omowunmi Sadik
- 10:00 – 10:20 a.m.** *Metal Biosensors: Development and Environmental Testing*  
Anne J. Anderson
- 10:20 – 10:40 a.m. Break**
- 10:40 – 11:00 a.m.** *Compound-Specific Imprinted Nanospheres for Optical Sensing*  
Barry K. Lavine
- 11:00 – 11:20 a.m.** *Ultrasensitive Pathogen Quantification in Drinking Water Using Highly Piezoelectric PMN-PT Microcantilevers*  
Wan Y. Shih
- 11:20 – 11:40 a.m.** *Nanomaterial-Based Microchip Assays for Continuous Environmental Monitoring*  
Joseph Wang
- 11:40 – 12:00 noon** *Low-Cost Organic Gas Sensors on Plastic for Distributed Environmental Monitoring*  
Vivek Subramanian
- 12:00 noon – 12:20 p.m.** *The Silicon Olfactory Bulb: A Neuromorphic Approach to Molecular Sensing With Chemoreceptive Neuron MOS Transistors (CvMOS)*  
Edwin C. Kan
- 12:20 – 1:30 p.m. Lunch**
- 1:30 – 1:50 p.m.** *A Nanocontact Sensor for Heavy Metal Ion Detection*  
Nongjian Tao
- Remediation**  
Phil Sayre, Chair
- 1:50 – 2:10 p.m.** *Membrane-Based Nanostructured Metals for Reductive Degradation of Hazardous Organics at Room Temperature*  
Dibakar Bhattacharyya

<b>2:10 – 2:30 p.m.</b>	<b><i>Dendritic Nanoscale Chelating Agents: Synthesis, Characterization, Molecular Modeling, and Environmental Applications</i></b> Mamadou S. Diallo
<b>2:30 – 2:50 p.m.</b>	<b><i>Synthesis, Characterization and Manipulation of (FeS-PAMAM) Dendrimer Nanocomposites</i></b> Lajos Balogh
<b>2:50 – 3:10 p.m.</b>	<b><i>Nanoscale Bimetallic Particles for In Situ Remediation</i></b> Wei-Xian Zhang
<b>3:10 – 3:30 p.m.</b>	<b>Break</b>
<b>3:30 – 3:50 p.m.</b>	<b><i>Developing Functional Fe(0)-Based Nanoparticles for In Situ Degradation of DNAPL Chlorinated Organic Solvents</i></b> Gregory V. Lowry
<b>3:50 – 4:10 p.m.</b>	<b><i>A Bioengineering Approach to Nanoparticle-Based Environmental Remediation</i></b> Daniel R. Strongin
	<b>Implications</b> Phil Sayre, Chair
<b>4:10 – 4:30 p.m.</b>	<b><i>A Life Cycle Analysis Approach for Evaluating Future Nanotechnology Applications</i></b> Shannon Lloyd
<b>4:30 – 4:50 p.m.</b>	<b><i>Implications of Nanomaterials Manufacture and Use: Development of a Methodology for Screening Sustainability</i></b> Earl R. Beaver
<b>4:50 p.m.</b>	<b>Adjourn</b>

**Friday, August 20, 2004**

**Treatment**

Anita Street, Chair

**8:40 – 9:00 a.m.**      *Synthesis, Characterization, and Catalytic Studies of Transition Metal Carbide Nanoparticles as Environmental Nanocatalysts*  
S. Ismat Shah

**9:00 – 9:20 a.m.**      *Simultaneous Environmental Monitoring and Purification Through Smart Particles*  
Wolfgang M. Sigmund

**9:20 – 9:40 a.m.**      *Nanoscale Biopolymers With Tunable Properties for Improved Decontamination and Recycling of Heavy Metals*  
Wilfred Chen

**9:40 – 10:00 a.m.**      *Use of Coronation in Combination With Nanocrystalline Ceramic Membranes for Controlling Disinfection By-Products*  
Simon Davies

**10:00 – 10:30 a.m.**      **Break**

**Health and Environmental Effects**

Kevin Dreher, Chair

**10:30 – 10:40 a.m.**      *Absorption and Release of Contaminants Onto Engineered Nanoparticles*  
Mason Tomson

**10:40 – 10:50 a.m.**      *A Focus on Nanoparticulate Aerosol and Atmospherically Processed Nanoparticulate Aerosol*  
Vicki Grassian

**10:50 – 11:00 a.m.**      *Chemical and Biological Behavior of Carbon Nanotubes in Estuarine Sedimentary Systems*  
Lee Ferguson

**11:00 – 11:10 a.m.**      Chin-Pao Huang

**11:10 – 11:20 a.m.**      Patricia Holden

**11:20 – 11:30 a.m.**      Ron Turco

**11:30 – 11:40 a.m.**      N7

**11:40 – 11:50 a.m.**      N8

**11:50 a.m. – 12:00 noon**      N9

**12:00 noon – 12:10 p.m.**      N10

**12:10 – 12:20 p.m.**      N11

**12:20 – 12:30 p.m.**      N12

**12:30 p.m.**      **Adjourn**