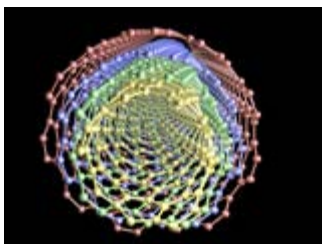




### The NNN Newsletter

#### **NENS 2010: Nanomanufacturing Stakeholders Provide Insights into Challenges, Benefits, and Societal Impact**



The New England Nanomanufacturing Summit 2010 (NENS 2010) held June 22-24 in Lowell, MA included technical discussions by scientists, experts, and industries in the field of nanomanufacturing by stakeholders from

academic institutions, government, and industries in the Northeast, along with national and international participants. The event, sponsored by the National Nanomanufacturing Network and organized by the NSF Center for High-rate Nanomanufacturing (CHN) at Northeastern University, with partners University of Massachusetts Lowell and University of New Hampshire, along with the NSF Center for Hierarchical Manufacturing at the University of Massachusetts Amherst, provided topical presentations on emerging technologies, applications, and high impact, fundamental research.

The first day of the event focused on Nano Environmental Health and Safety (NanoEHS) topics including regulations of nanomaterials and consumer/worker protection challenges presented by the EPA and CDC/NIOSH respectively. The last 2 days focused on advanced process development, scaled production of nanomaterials, and applications such as energy and power, nanoelectronics, protective coatings, multiscale and ultra-high density nanopatterning, biosensors, and data storage.

The event provided key insights into challenges and potential benefits of nanotechnology and nanomanufacturing, and further engaged stakeholders and attendees in networking discussions and opportunities. Fostering such interactions enables broader understanding by all stakeholders and participants on the challenges associated with transitioning nanoscience research to commercially viable consumer products.

[More...](#)

Regards,  
Jeff Morse, Managing Director,  
National Nanomanufacturing Network

### Upcoming Events

July 1 - 2, 2010

[Nanomedicine 2010](#)

July 4 - 8, 2010

[1st International Conference on  
Materials for Energy](#)

July 11 - 16, 2010

[Advances in Nonvolatile Memory  
Materials and Devices](#)

July 13 - 15, 2010

[SEMICON West 2010](#)

July 18 - 23, 2010

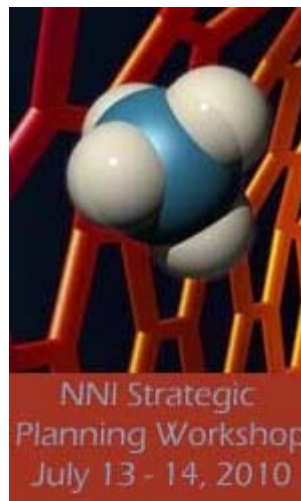
[Gordon Research Conference:  
Nanostructure Fabrication](#)

July 21 - 23, 2010

[Nanomaterials and Worker  
Health: Medical Surveillance,  
Exposure Registries, and  
Epidemiologic Research](#)

[View Full Calendar](#)

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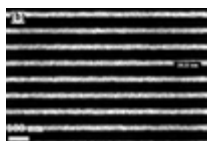
### Upcoming Calls

Through July 6, 2010

Learn More about the



## When Top-Down Meets Bottom-Up: EUV and X-ray Interference Lithography for Sub-20-nm Features



After achieving the 45-nm process [1], today's semiconductor industry is nearing the 20-nm process and looking for techniques that would enable sub-22-nm-half-pitch line patterns [2]. Following the continuous increase in exposure tool numerical aperture (NA), researchers are pursuing reductions in exposure wavelengths. This effort had them look at extreme ultraviolet (EUV: 13.4 nm in wavelength) as an exposure light source. Unlike the numerical aperture engineering, change of a light source to EUV demands development of its related components, such as photoresist and optics. Until a reliable solution for EUV lithography is developed, EUV interference lithography (EUVIL) would not solely advance the lithographic technology but would also help to optimize photoresist materials for EUV. EUVIL is capable of patterning sub-20-nm features at large scales and, unlike hexagonal sub-20-nm features demonstrated by block copolymer lithography, can create diverse geometries from line/space to hexagonal to rectangular array of dots. EUVIL and XIL are noted as some of the next generation lithography techniques that are under active development. Demonstrated applications of these techniques encompass production of catalyst arrays, nanophotonic devices, nanoimprint stamps, holographic fabrication of Fresnel zone plates, guided self-assembly of block copolymers and colloidal particles, nanoparticle arrays, chemical patterning of self-assembled monolayers and radiation grafting of polymer nanostructures. [More....](#)

## NNI Strategic Planning Stakeholder Workshop To Take Place July 13 - 14, 2010



The National Nanotechnology Initiative will hold a Strategic Planning Stakeholder Workshop on July 13 - 14, 2010, in Arlington, VA. This event is free, open to the public, and will be webcast for the benefit of those who are unable to attend. Complete Agenda and Confirmed Participants are available on the Workshop Web site. [More....](#)

[APCOT 2010](#) Postdeadline submissions for papers

July 30, 2010

[3rd Annual Nanotechnology Symposium](#)

Deadline for abstracts

July 30, 2010

[Nanosafe 2010](#)

Deadline for paper and poster abstracts

August 30, 2010

[BIT's 1st Annual World Congress of Nanomedicine](#)

Deadline for poster abstracts

## Recently Published

### From Our Affiliates

Toxicity of Carbon Nanotubes to the Activated Sludge Process  
[Journal of Hazardous Materials](#)  
[178\(1-3\):356-362](#)

Photooxidation of Nanopatterned Poly(chloromethylstyrene): Direct Formation of Cross linked Aldehyde-Functionalized Films for Chemical Functionalization and Bioconjugation  
[Macromolecular Rapid Communications](#) [31\(9\):910-914](#)

Gating of Single-Layer Graphene with Single-Stranded Deoxyribonucleic Acids  
[Small](#) [6\(10\):1150-1155](#)

Water Transport through Ultrathin Graphene  
[Journal of Physical Chemistry Letters](#) [1\(10\):1590-1594](#)

Catalytic and Molecular Beacons for Amplified Detection of Metal Ions and Organic Molecules with High Sensitivity  
[Analytical Chemistry](#)  
[82\(12\):5005-5011](#)

## Affiliated Centers

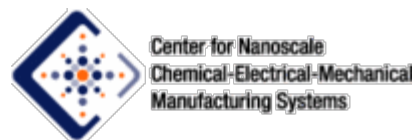
## New England Nano Event Addresses Environmental Health and Safety Topics



The first day of NENS 2010 focused on Environmental Health and Safety issues associated with nanotechnology, providing presentations by leaders in the field from government, academic centers, industry consortia, and nonprofit organizations. Speakers included Kristan Markey from the Environmental Protection Agency (EPA), who discussed the challenges of risk assessment and regulation of nanomaterials, and further described the EPA's approach to interacting with industry regarding emerging nanomaterials which includes a pre-manufacture notice where companies voluntarily supply the EPA with information on properties of their specific under the Toxic Substance Control Act (TSCA). Hilary Godwin from the University of California Center for Environmental Implications of Nanotechnology (UC CEIN) at UCLA discussed prevention-based approaches to managing the risks of nanomaterials. Paul Schulte of the Center for Disease Control/National Institute for Occupational Safety and Health presented a progress report on protecting the health and safety of nanomaterial workers.

[More....](#)

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