



An Overview of Environmental Health and Safety Research at the Center for High-rate Nanomanufacturing

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Date: Wednesday March 30th, 2011

Time: 1:30 pm-2:30pm Location:

CUTR 102

The NSF-funded Nanoscale Science and Engineering Center for High-rate Nanomanufacturing (CHN) at Northeastern University is a collaborative center with core research partners at the University of Massachusetts Lowell and the University of New Hampshire. Research falls into three categories: 1) Large scale directed assembly & transfer, 2) Environmental health & safety, and 3) Regulatory & ethical issues. Over the past six years, CHN research undertaken in IRG 4 "Responsible Nanomanufacturing" has begun to address some of the key issue related to responsible commercialization of emerging nanoprocesses and products. The objectives of IRG 4 have direct implications for the nanomanufacturing technologies under development at CHN, and aim to guide the overall development of sustainable production systems for nanomanufactured products.

An overview of the CHN technologies under development will be presented, followed by summaries of our six IRG 4 research projects that have goals to: 1) ensure that students, faculty, and staff working in the various CHN laboratories are using best-practice industrial hygiene, especially directed towards inhalation hazards of nanomaterials, and perform fundamental research on methods to measure and control nanoparticles exposures; 2) develop innovative methods for high-rate toxicity screening of nanoparticles; 3) assess the current regulatory capacity and expected needs in the Commonwealth of Massachusetts for commercial production; 4) evaluate applications of nanotechnology on their likelihood to promote or compromise environmental values, such as ecological integrity, biodiversity, environmental justice; 5) create methodologies to determine the economic feasibility of manufacturing in light of potential environmental consequences for scale-up of technologies; and 6) explore the repercussions of emissions to the aqueous environment.

Bio:

Dr. Isaacs leads the research thrust on societal implications of nanotechnology for the Center for High-rate Nanomanufacturing (CHN), an NSF funded Nanoscale Science and Engineering Center (NSEC). This center is a collaborative effort among several university partners (Northeastern University, the University of Massachusetts, Lowell, the University of New Hampshire, and Michigan State University) and the Boston Museum of Science. The CHN was awarded one of two team Aspiration Awards at NU in 2005. These collaborations on societal implications have led to the formation of the Nanotechnology and Society Research Group (NSRG), which works to address the impact and ramifications of nanomanufacturing technology. As the NU Education Coordinator for the CHN, Dr. Isaacs oversees educational opportunities for undergraduate students (REUs), K-12 teachers (RETs), and outreach activities through the Museum of Science in Boston.

Sponsored by: Nanotechnology Research & Education Center , Host: Dr. Delcie Durham