



American Institute of Chemical Engineers

2nd Quarter 2006

Nanotech News

- Researchers create the first reliable method for making nanogaps.
<http://www.upenn.edu/researchatpenn/article.php?1027&tch>
- Gold nanorods may enhance the safety of targeted cancer treatment.
<http://www.gatech.edu/news-room/release.php?id=889>
- Rice University researchers create 'nanorice'.
<http://www.media.rice.edu/media/NewsBot.asp?MODE=VIEW&ID=8323&SnID=1505472306>
- Team of scientists discover nanotube self assembly process.
<http://www.lbl.gov/Science-Articles/Archive/MSD-nanonetwork.html>
- Nanoparticles create biocompatible capsules.
<http://www.news.uiuc.edu/news/06/0306lipids.html>
- UCR researchers grow bone cells on carbon nanotubes.
<http://www.newsroom.ucr.edu/cgi-bin/display.cgi?id=1273>
- Protein nanocages target melanoma cells.
http://nano.cancer.gov/news_center/nanotech_news_2006-03-06d.asp
- [The Nanotechnology Consumer Products Inventory](#) was launched in March 2006 by the Project on Emerging Nanotechnologies at the Woodrow Wilson International Center for Scholars. This database lists the 200+ nanotechnology-based consumer products currently on the market.

Society News

Do your colleagues elevate your level of thinking? Here is a great opportunity to recognize them. NSEF offers the [Forum Award](#) and the Young Investigator Award. The Forum Award recognizes outstanding contributions in the advancement of nanoscale science and engineering in the field of chemical engineering through scholarship, education or service. Dr. Mihail Roco received the award last year for his contribution as a key player in the National Nanotechnology Initiative. The [Young Investigator Award](#) recognizes outstanding interdisciplinary research in nanoscale science and engineering by an engineer or scientist who has not yet reached the age of 35. Dr. Michael Strano received the honor for his pioneering work in carbon nanotube chemistry.

To submit a nomination for either the NSEF's Forum Award or the Young Investigator Award, you may use the General Nomination form (found in the 2005 AICHE Awards Brochure and on the [AICHE website](#)). **The deadline is June 30th, 2006.** The original and 8 copies are required. You may send PDF files to: nano@aiiche.org. Hard copies can be mailed to: Ms. June C. Wispelwey, AICHE, 3 Park Ave, New York, NY 10016.

The 2006 AICHE Annual Meeting is fast approaching and so is the deadline for the call for papers! To be held in San Francisco from November 12-17, 2006 at the San Francisco Hilton, the meeting will feature 62 nano-related sessions that NSEF is sponsoring or cosponsoring. Just as a reminder the deadline for abstract submission is May 15, 2006. To find out more, go to <http://www.aiiche.org/annual>.

Chemical engineering faculty and professionals — encourage any students who join AICHE to also join NSEF. The membership fees are only \$1 instead of the normal \$10.

Events

Last chance to submit an abstract for the 2nd International Conference on Bioengineering and Nanotechnology. This conference brings together leading nanotechnologists and biological engineers on September 5-7, 2006, in beautiful Santa Barbara, California. Topics include:

- Drug delivery systems and devices
- Protein and gene delivery systems
- Nano imaging tags (quantum dots, magnetic nanoparticles)
- Cell and tissue engineering
- Bio-MEMS and microreactors
- Biomimetic and self-assembled materials
- Medical devices and microtools

- Nanoparticles, nanocomposites
- Biological and biomedical imaging
- Biomarkers, biosensors and molecular diagnostics
- Nanoporous materials for bio-applications.

The deadline for submitting a paper is rapidly approaching – May 15th. You can submit the abstract as a word document to icbn@aiiche.org.

New on the Environmental Front (by Mary Ellen Ternes)

The Environmental Protection Agency has begun taking a thorough look at regulation of nanotechnology manufacturing and potential risks associated with the industry. On December 2, 2005, EPA's Science Policy Council informally released an external review draft of a document entitled "Nanotechnology White Paper." The white paper summarizes the state and breadth of the industry, knowledge of potential risks and touches on potential regulation of the industry pursuant to existing statutes and regulatory programs pursuant to these statutes, namely the Toxic Substances Control Act, Federal Insecticide, Fungicide and Rodenticide Act, Clean Air Act, Pollution Prevention Act, Clean Water Act, the Safe Drinking Water Act, the Comprehensive Environmental Response Compensation and Liability Act (or Superfund), the Resource Conservation and Recovery Act, and the Emergency Planning and Community Right to Know Act. EPA did not attempt to provide guidance regarding exactly how these statutes could be utilized in their current form to regulate materials that would not effectively be regulated through prohibitions of releases which are currently based upon mass limitations, or how the current policies could be implemented without reliable toxicological data, or without even reliable data regarding the fate of these materials in the environment. Nor did EPA identify a path forward in developing tools necessary to identify and monitor releases of such materials, where current tools are designed to identify and quantify chemical substances, rather than chemical structures.

On February 8, 2006, the American Bar Association Section of Environment Energy and Resources offered to assist EPA with a legal review of the current statutes and regulatory programs and offer analysis regarding whether the current law can be used to manage risks posed by the nanotech industry, and if not, what changes may be needed. EPA has accepted this offer, and the section has created committees for each statute that are currently drafting briefing papers for EPA's review. These briefing papers will follow up on discussions hosted by the Environmental Law Institute in May, 2005, and hopefully move the current state of thought forward in this area.

Mary Ellen Ternes, a senior member of AICHE, former hazardous waste combustion specialist with both EPA and industry, and now an environmental lawyer with McAfee & Taft in Oklahoma City, is currently serving a three year term as Council member for the ABA environmental section. As a past chair of the section's Air Quality Committee, and with her many years experience implementing air pollution control technology and regulation, Mary Ellen agreed to chair the Clean Air Act committee responsible for that portion of the EPA briefing paper. Mary Ellen has asked to be active in the Nanoscale Science and Engineering Forum 2006 so that we can inform her and others work in evaluating potential regulatory processes. We recently voted her onto our Forum as an "ad hoc" member for that purpose. Mary Ellen will continue to keep us informed of developments. We encourage you to contact her if you'd like to discuss regulatory issues at: maryellen.ternes@mcafeetaft.com.

Comments and Feedback

Please let us know what you think of NSEF, its newsletter, or provide us with your suggestions by emailing: nano@aiiche.org. Visit our website: <http://www.aiiche.org/DivisionsForums/ViewAll/NSEF.aspx>

Gold Level Sponsors

Hielscher USA, Inc.: Ultrasonic Dispersing, Deagglomeration and Milling Equipment Nanomaterials are currently on the way from lab to production. Very small powders and particles are available for materials, such as metal oxides, nanotubes or nanoclays. Often these materials need to be mixed into liquid formulations. This is where agglomeration and aggregation blocks surface area from contact with other matter. In particular very fine powders and carbon nanotubes are very cohesive and hard to disperse. As surface activity is a key aspect of nanomaterials, only well dispersed or single-dispersed particles allow utilization of the full potential of the nanomaterials. In result good dispersing reduces the quantity of nanomaterials needed to achieve the same effects. Conventional processing devices, e.g. high-shear or rotor-stator mixers, high-pressure homogenizers or colloid and disk mills fall short in separating the nanoparticles into discrete particles.

Ultrasonic cavitation is very effective in breaking agglomerates, aggregates and even primaries. When ultrasound is being used for the milling of high concentration batches, the liquid jets streams resulting from ultrasonic cavitation make the particles collide with each other at velocities of up to 1000km/h. This breaks van der Waals forces in agglomerates and even primary particles (milling).

Hielscher manufactures ultrasonic devices for the efficient dispersing, deagglomeration and milling of nanomaterials in lab, bench-top and production level. With devices from 50 to 16,000 watts you can select the appropriate device for quantities from 1mL to several tons/hour. There is more information available at: <http://hielscher.com/ultrasonics/nano.htm>



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