



American Institute of Chemical Engineers

3rd Quarter 2006

Nanotech News

- The Office of Science and Technology Policy released the annual report on the US National Nanotechnology Initiative (NNI) as a Supplement to the President's Budget for Fiscal Year 2007.
http://www.nano.gov/NNI_07Budget.pdf
- The American Bar Association Section of Environment, Energy and Resources (ABA SEER) recently completed a comprehensive review of the core federal environmental statutes to assess the applicability of each statute and regulatory program to human health and environmental issues arising from nanotechnology. <http://www.abanet.org/environ/nanotech/>
- Nano-sized gold particles supported on titanium or iron oxide have been found to catalyze the hydrogenation of nitro-containing compounds with extremely high selectivity, possibly leading to greener industrial chemical processes in the future.
<http://www.sciencemag.org/cgi/content/abstract/313/5785/332>
- Chemical engineers at Johns Hopkins University have developed a technique to prepare micron-sized containers that self-assemble from photolithographically-derived 2-D shapes.
http://pubs3.acs.org/acs/journals/doilookup?in_doi=10.1021/ja063100z
- A collection of nanotechnology-related links are available from the Nano Science and Technology Institute.
<http://www.nsti.org/news/>

Society News

The NSEF awards have been announced for 2006!

Prof. Ronald P. Andres (Purdue University) is being recognized with the Forum Award for his leadership and pioneering innovation in the production, utilization, and fundamental understanding of the mechanical, electronic, and magnetic properties of nanoparticles and nanoparticle arrays. This Award recognizes outstanding contributions in the advancement of nanoscale science and engineering in the field of chemical engineering through scholarship, education or service.

Prof. Michael S. Wong (Rice University) is being recognized with the Young Investigator Award for advances made in the development of superior nanoparticle catalysts for groundwater purification and in the assembly chemistry and scalable production of nanoparticles. This Award recognizes outstanding interdisciplinary research in nanoscale science and engineering by an engineer or scientist who has not yet reached the age of 35.

Both will receive their Awards at the Annual Meeting and give their Award Lectures on Wed. November 15 (see below).

Nominations requested for NSEF Executive Committee positions

The positions are Second Vice-Chair, the Secretary-Treasurer, and two Liaison Directors (2-year terms). More information about the specific duties can be found in the NSEF by-laws (<http://www.aiche.org/uploadedFiles/Nano/Bylaws.pdf>). Please send your nominations (self-nominations are welcome!) to NSEF Chair, Dr. Dan Coy (dcoy@wideopenwest.com) by September 24 (deadline for submitting names). Elections will be held electronically by October 1.

Interested NSEF members to participate in education and policy development efforts through the American Bar Association SEER's Nanotech Project?

Mary Ellen Ternes, Ad Hoc NSEF Board Member, former chemical engineer turned environmental lawyer and ABA SEER council member, authored the Clean Air Act analysis for the ABA SEER Nanotech Project (<http://www.abanet.org/environ/nanotech/>). If you are interested in assisting in the development of appropriate environmental policy to address the scaling up of nanotech applications from research to manufacturing, please send her an e-mail at maryellen.ternes@mcafeetaft.com.

Interested in developing joint ACS-AICHE nano programming in Spring 2008?

In Spring 2008, ACS and AICHE will hold their respective meetings concurrently in New Orleans. Please contact to NSEF Chair, Dr. Dan Coy (dcoy@wideopenwest.com) for more information.

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.

AICHE Meeting Events

Be sure to register for the upcoming **2006 AIChE Annual Meeting** 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. (<http://www.aiche.org/Conferences/AnnualMeeting/index.aspx>)

NSEF Executive Committee Meeting.

Scheduled for 5:30pm on Sunday, November 12. Room TBA.

AIChE NSEF Plenary Lectures on Bionanotechnology

Date/Time: Monday, November 13, 8:30am-11:00am

This plenary session features presentations from three leading researchers who will discuss nanotechnology in cancer therapeutics and diagnostics (Professor Jennifer West), molecular evolution of new viruses for gene delivery (Professor David Schaffer) and the isolation and concentration of biomarkers using self-assembled nanomaterials (Professor James Schneider).

AIChE NSEF Plenary Lectures on Chemical Engineering Principles for Nanotechnology

Date/Time: Wednesday, November 15, 8:30am-11:00am

This plenary session addresses chemical engineering contributions to nanotechnology. Four distinguished researchers in the field of nanotechnology will present broad perspectives on the role of theory and simulation in the development of nanotechnology (Professor Juan de Pablo), recent advances in nanoporous thin film technology (Professor Michael Tsapatsis), the realization of nanostructured materials for solar-to-electric conversion (Professor Eray Aydil) and the chemistry of single walled carbon nanotubes (Professor Michael Strano). These presentations are suitable for industrial scientists entering nanotechnology or university researchers wishing to learn about new research areas.

AIChE NSEF Award Lectures

Date/Time: Wednesday, November 15, 12:30pm-3:00pm

This session involves presentations by the recipients of the two 2006 NSEF awards: NSEF Forum Award – Professor Ron Andres. NSEF Young Investigator Award – Professor Michael Wong.

AIChE NSEF Poster Session

Date/Time: Wednesday, November 15, 3:15pm-5:45pm.

Poster awards will be announced at the NSEF reception that begins at 6:00pm on Wednesday, November 15 (just after the poster session ends).

AIChE NSEF Planning Meeting and Reception

Date/Time: Wednesday, November 16, 6:00pm-8:00pm.

This planning meeting and reception provides a venue for the NSEF executive committee to report to the members of NSEF on recent activities. Members of NSEF are encouraged to attend this meeting and provide input into plans for future programming and other NSEF-sponsored initiatives. Recipients of the NSEF poster awards will be announced at this reception. Nibbles and drinks.

Visit this web page for up-to-date information on session locations and times

(<http://aiche.confex.com/aiche/2006/techprogram/D1132.HTM>).

Other Events

Nano TX '06 will be held on September 27-28, 2006 in Dallas, TX. The conference-exposition will feature leaders from government, business, and science, and six Nobel Prize winners discussing various aspects of nanotechnology.

<http://www.nanotx.biz/>

Comments and Feedback

Please let us know what you think of NSEF, its newsletter, or provide us with your suggestions by emailing:

nano@aiche.org. Visit our website: <http://www.aiche.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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