

NSF Sponsored ¹

USACM Workshop on Computational Nanomechanics of Materials

(Monitored by Dr Ken P. Chong)

- Dates:** April 26 and 27, 2004 **Venue:** Double Tree Hotel, Chicago
- Chairs:** K. J. Cho (Stanford), Jacob Fish (Rensselaer), Wing Kam Liu (Northwestern), and Hanchen Huang (Rensselaer)
- Invited Speakers:** Sidney Yip of MIT; Dieter Wolf of ANL; Donald Brenner of NCSU; Max Lagally of Wisconsin; Wing Kam Liu of Northwestern; and Jacob Fish of Rensselaer.
- Invited Panelists:** Bruce LaMattina of ARO; Tomas Diaz de la Rubia of LLNL; Steve Zinkle of ORNL; George Dvorak of Rensselaer; Zdenek Bazant of Northwestern; Ted Belytschko of Northwestern.

Workshop Description:

This workshop provides a short tutorial of computational nanomechanics to junior scientists, facilitates exchange of research ideas between scientists themselves and between scientists and leading experts of governmental agencies. Complementing the NSF Summer Institute on Nano Mechanics and Materials (<http://tam.northwestern.edu/summerinstitute/Home.htm>), this workshop focuses more on reviewing new discoveries and identifying challenges in the scientific principles rather than methodologies. Because of the interdisciplinary nature, the workshop bears some resemblance to a summer school, and consists of three elements: (1) Lectures covering the historical development of continuum mechanics, nanoscale mechanics of single crystals, mechanics of nanograins, mechanics of nanotubes, multiscale mechanics, and application of nanomechanics; (2) Panel discussions chaired by leading experts from governmental agencies and pioneers of mechanics research, identifying advancements of mechanics principles from past - and pressing issues in the future - nanomechanics researches; and (3) Poster presentations. Attendees are strongly encouraged to present posters.

Registration and financial support:

To attend the workshop and apply for financial support, please complete the [application form](#) (pdf) to hanchen@rpi.edu before Feb 15, 2004. Awards will be granted based on a combination of the following criteria: (1) membership of USACM, (2) educational benefit from the workshop, and (3) potential contribution to the workshop. Each fellowship may carry up to \$500 to cover hotel room and travel. Women and underrepresented minorities are particularly encouraged to apply for the support and to attend the workshop.

Logistics:

- Updated Information available at: <http://www.rpi.edu/~huangh/workshop.html> .
- Contact Person: Hanchen Huang; E-mail: hanchen@rpi.edu; Phone: 518-276-2020.

Tentative program is detailed in the following page.

¹ Co-sponsored by USACM (<http://www.usacm.org>) and ORNL Fusion Materials Program (<http://www.ms.ornl.gov/programs/fusionmatls/fusionmatl.htm>)

Tentative Program:April 26, 2004 (Lectures)

7:30 – 8:30 Continental Breakfast

8:30 – 9:00 Opening remarks (Ken Chong and Hanchen Huang)

9:00 – 10:00 Historical Development: From Continuum to Nano Mechanics (Jacob Fish)

10:00 – 11:00 Nanoscale Mechanics of Single Crystals (Sidney Yip)

11:00 – 11:30 Coffee Break

11:30 – 12:30 Mechanics of Nanotubes (Donald Brenner)

12:30 – 14:00 Lunch

14:00 – 15:00 Mechanics of Nanograins (Dieter Wolf)

15:00 – 16:00 Bridging Scales – Multiscale Modeling (Wing Kam Liu)

16:00 – 16:30 Coffee Break

16:30 – 17:30 Nanomechanics in Technology (Max Lagally)

18:00 – 19:00 Cash Bar and Poster Viewing

19:00 – 20:30 Banquet

April 27, 2004 (Panel Discussions)

7:30 – 8:30 Continental Breakfast

8:30 - 10:15 Panel Discussion I: Fitting Nanomechanics into the Mechanics Framework -
Chaired by George Dvorak, Zdenek Bazant, and Ted Belytschko

- How nanomechanics researches have impacted advancement of mechanics research
- What are the pressing issues in nanomechanics to further advance mechanics research
- What are the optimal approaches in tackling these issues

10:15 – 10:45 Coffee Break

10:45 - 12:30 Panel Discussion II: National Needs in Nanomechanics - Chaired by Tomas Diaz
de la Rubia, Bruce LaMattina, and Steve Zinkle

- What are the needs in nanoscale science and engineering
- What are the needs in energy and environmental research
- What are the needs in development for national security and defense

12:30 – 14:00 Working Group Lunch (providing feedbacks to the organizers)

12:00 – 13:00 Workshop Summary (Organizers)

Application form attached in the following page

Application Form for Registration & Fellowship

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Instruction: Send the completed form and a two-page NSF standard vitae to Hanchen Huang (hanchen@rpi.edu)

Name:

Position:

Institution:

US Citizen: Yes / No

Visa Status (if no US citizen):

Member of USACM: Yes / No

(to become a member, please visit http://www.usacm.org/org_member.htm)

Will you still attend the workshop without a fellowship: Yes / No

Contact Information (preferably with an email address):

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