

NANOFABRICATION/ NANOMANUFACTURING/ NANO ELECTRONICS

10:20 – 11:30 a.m.

Session VI

Chair: Kent Choquette, Micro and Nanotechnology Lab/Electrical & Computer Engineering

10:20 a.m.

Three-Dimensional Fountain Pen Nanofabrication

Min-Feng Yu, Mechanical Science & Engineering

10:40 a.m.

Solid-State Superionic Stamping: A Direct Approach to Nanopatterning of Metallic Structures

Placid Ferreira, Nano-CEMMS/Mechanical Science & Engineering

11:00 a.m.

Carbon Nanotube FETs for High Frequency Electronics

John Przybysz and Hong Zhang, Northrop Grumman

11:20 a.m.

Electro-Thermal Interaction in Nanoscale Devices: Carbon Nanotubes and Phase-Change Memory

Eric Pop, Electrical & Computer Engineering

11:40 a.m.

Coffee Break

NANOMATERIALS

11:50 – 12:30 p.m.

Session VII

Chair: Nancy Sottos, Materials Science and Engineering

Workshop Organizing Committee

James Coleman, Professor, ECE/MNTL/CNST– Chair

Irfan Ahmad, Associate Director CNST– co-Chair

Narayana Aluru, Associate Professor, MechSE

Brian Cunningham, Associate Professor, ECE/MNTL/CNST

Nicholas Fang, Assistant Professor, MechSE/Nano-CEMMS

Edwin Hahn, Professor and Associate Dean (Research), VetMed

Michael Insana, Professor, BioE

Munir Nayfeh, Professor, Physics

Graciela Padua, Associate Professor, FSHN/ACES

John Rogers, Professor, MatSE/FSMRL/Nano-CEMMS

Taher Saif, Professor, MechSE/CCM

Nahil Sobh, Senior Research Scientist, NCSA

Nancy Sottos, Professor, MatSE

Kenneth Watkin, Professor, AHS/Beckman/CNST

11:50 a.m.

'Wavy' Semiconductor Nanomaterials for Stretchable Electronics

John Rogers, Materials Science & Engineering/Nano-CEMMS

12:10 p.m.

Research in Beyond CMOS Materials, Devices, and Architectures

George Bourianoff, Intel

12:30 p.m.

Mechanical Behavior of Polymeric Nanofibers Subject to Cold Drawing

Ioannis Chasiotis, Aerospace Engineering

12:50 p.m.

Novel Techniques in Fine-Particle Manufacturing for Liquid Crystal Displays and Inkjet Printing

Anne Shim, Cabot Corporation

1:10 p.m.

CNST Poster Awards and Concluding Remarks

1:20 p.m.

Box Lunch

2:00 – 3:30 p.m.

Micro and Nanotechnology Lab and Institute for Genomic Biology Tours

Tours are available on request, [signup online](http://signup.online),

www.cnst.uiuc.edu. Tour duration: 20mins;

tours start at 20 minute intervals from 2:00

p.m. (Explore MNTL at: www.micro.uiuc.edu

and IGB at: www.igb.uiuc.edu)

Center for Nanoscale Science and Technology

The University of Illinois Center for Nanoscale Science and Technology (CNST) is the premier center for nanotechnology research, education, and outreach activities. CNST draws its strength from working as a collaboratory involving the Beckman Institute for Advanced Science and Technology, Biotechnology Center, Coordinated Science Laboratory, Frederick Seitz Materials Research Laboratory, Institute for Genomic Biology, Micro and Nanotechnology Laboratory, Center for Nanoscale Chemical, Electrical, Mechanical, Manufacturing Systems, National Center for Supercomputing Applications, and the School of Chemical Sciences. The Center is working towards seamless integration of interdisciplinary research from atoms and materials to devices and systems. CNST is uniquely located to harness the entrepreneurial and technical spirit in the Midwest, with ongoing industrial linkages as it prepares tomorrow's workforce. The CNST thrives on its cutting-edge research in bionano-technology, computational nanotechnology, nanocharacterization, nanoelectromechanical systems, nanoelectronics, nanofabrication, nanomaterials, nanomanufacturing, nanomedicine, and nanophotonics. [For more information visit: www.cnst.uiuc.edu](http://www.cnst.uiuc.edu).

Micro and Nanotechnology Laboratory

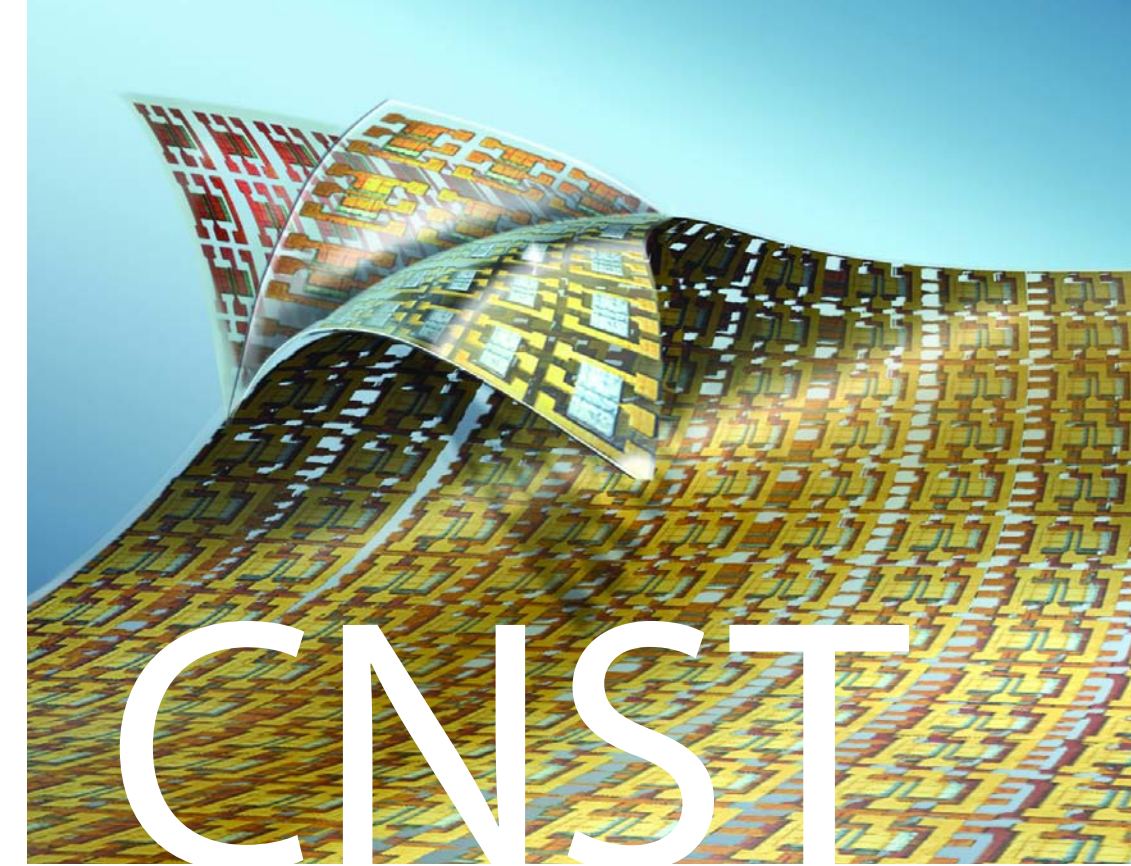
The Micro and Nanotechnology Laboratory (MNTL) at the College of Engineering, University of Illinois at Urbana-Champaign is one of the nation's largest and most sophisticated university-based facilities for semiconductor, nanotechnology, and biotechnology research. The laboratory is a user facility that is available for use by university and industry from across the nation. It contains over 8,000 square feet of class 100 and class 1000 clean room laboratory and state-of-the-art ultra-high-speed optical and electrical device and circuit measurements. The bionanosystems area focuses on utilizing the various technologies developed in materials, nanofabrication, devices, MEMS and NEMS to study and solve biological issues. Biomolecular flow patterns in nanoscale channels, integration of lasers onto biochips for real-time fluorescence study of bioreactions, and implantation of active devices in cells to study cellular biochemistry are examples of research activities being carried out. Recently, an \$18 million expansion of the MNTL was completed, which included construction of bionanotechnology labs., and additional space for researchers. [For more information visit: www.micro.uiuc.edu](http://www.micro.uiuc.edu).

Center for Nanoscale Science and Technology

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Rev. 5/2/07



Nanotechnology Workshop

May 3-4, 2007

National Center for Supercomputing Applications
University of Illinois at Urbana-Champaign

Sponsored by

The Center for Nanoscale Science and Technology at the
University of Illinois at Urbana-Champaign

Co-sponsors

Beckman Institute for Advanced Science and Technology, Center of Advanced Materials for Purification of Water with Systems (Water CAMPWS), Micro and Nanotechnology Laboratory (MNTL), Nanoscale Chemical, Electrical, Mechanical, Manufacturing Systems (Nano-CEMMS), National Center for Supercomputing Applications (NCSA), Siteman Center for Cancer Nanotechnology Excellence at Washington University in Saint Louis, and University of Illinois at Urbana-Champaign (SCCNE)

www.cnst.uiuc.edu





Workshop Premise

The broad objective of the workshop is to showcase University of Illinois research in nanomedicine, nanoelectronics/nanophotonics, and nanomaterials/nanomanufacturing.

The general framework of the nanotechnology workshop will be similar to those held on campus in May 2003-06; which were well attended by industry and academia. Some of those interactions have since then led to industry and cross-campus collaborations.

The workshop will provide a forum for industry interactions and collaborations. The workshop will bring together campus community (faculty, graduate and undergraduates, administration) from UIUC and other campuses, and industry engaged in cutting-edge research. A workshop panel will discuss the roadmap to future direction of research and development and commercialization in nanomedicine, and nanoscale energy.

Workshop Information & Registration

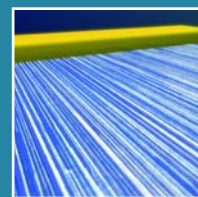
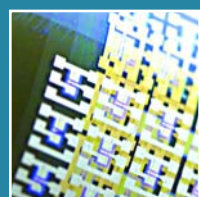
For information on registration, poster signup, hotels, and parking visit www.cnst.uiuc.edu/NanoWorkshop2007.htm. There is no registration fee, but pre-registration is required. Seating is limited.

Workshop Location

National Center for Supercomputing Applications (NCSA)
1205 W. Clark Street, Urbana, IL 61820
<http://webtools.uiuc.edu/ricker/CampusMap>

For More Information

Contact the Center for Nanoscale Science and Technology
University of Illinois at Urbana-Champaign, (217) 333-3097
nano@uiuc.edu, www.cnst.uiuc.edu.



AGENDA

Thursday, May 3, 2007

7:30 – 8:15 a.m.

Registration and Breakfast
NCSA Atrium

8:30 – 9:35 a.m.

Plenary Session
Chair: James Coleman, Micro & Nanotechnology Lab/Electrical & Computer Engineering

8:30 a.m.

Introductory Remarks
Irfan Ahmad, Associate Director, Center for Nanoscale Science and Technology

Welcome Remarks

Ilesanmi Adesida, Dean, College of Engineering/
Director, Center for Nanoscale Science and Technology

Bradford Schwartz, Regional Dean, College of Medicine

Robert Pennington, Deputy Director, National Center for Supercomputing Applications

9:00 a.m.

Applied Nanotechnology for Human Space Exploration
Leonard Yowell, Applied Nanotechnology Project Lead, National Aeronautics and Space Administration

9:35 a.m.

Coffee Break

NANOSCALE ENERGY

9:50 – 11:00 a.m.

Session I
Chair: Mark Shannon, WATER CAMPWS/
Mechanical Science & Engineering

9:50 a.m.

Down-sizing Matter: The Impact on Ion Conductivity and Mass Storage
Joachim Maier, Solid State Chemistry,
Max-Planck Institute for Solid State Research

10:10 a.m.

Characterization of Adsorption Properties of Single-Walled Carbon Nanotubes for Gas Storage and Purification
Massoud Rostam-Abadi, Energy and Environment Engineering, Illinois State Geological Survey

10:30 a.m.

Nanoparticle Coating in Low-pressure Plasma Reactor for Energy-related Applications
Farzad Mashayek, Mechanical & Industrial Engineering, University of Illinois at Chicago

BIONANOTECHNOLOGY/ BIOINFORMATICS

10:55 – 12:35 p.m.

Session II
Chair: Michael Insana, Bioengineering

10:55 a.m.

Integration of Biology and Silicon Devices; Opportunities and Prospects
Rashid Bashir, Birck Nanotechnology Center, Purdue University

11:15 a.m.

Materials for the 21st Century: Biological Inspiration for Complex Synthetic Nanoscale Materials Systems
Michael Simpson, Oak Ridge National Laboratory

11:35 a.m.

Identification of Transcription Networks in Embryonic Stem Cells
Sheng Zhong, Bioengineering

11:55 a.m.

Informatics Resource for Nanotechnology Research in Cancer Diagnostics and Therapeutics
David Sept, Biomedical Engineering/SCCNE, Washington University in Saint Louis

12:15 p.m.

Fluorescence Lifetime Imaging of Microarrays
Ewald Terpetschnig and Beniamino Barbieri, ISS, Inc. (local company)

12:35 p.m.

Buffet Lunch, Poster Session, and NCSA Demos: Evolutionary Highway
1:00 – 2:00 p.m. Poster Judging
NCSA Atrium

NANOMEDICINE I

2:00 – 3:35

Session III
Chair: Taher Saif, Center for Cellular Mechanics/
Mechanical Science & Engineering

2:00 p.m.

Nanotechnology: Innovation through Collaboration with FDA
Wendy Sanhai, Senior Scientific Advisor, Office of the Commissioner, U.S. Food and Drug Administration

2:35 p.m.

Nanoparticles with Predefined Drug Loading and Controlled Drug Release for Cancer Therapy
Jianjun Cheng, Materials Science & Engineering

2:55 p.m.

Improving Host Immune Response to Cancer using Targeted Anti-Angiogenic Nanoparticles
Gregory Lanza, Division of Cardiovascular Diseases/SCCNE, Washington University in Saint Louis

3:15 p.m.

Magnetomotive Nanoparticle Contrast for Optical Coherence Tomography and Multi-Modality Imaging
Amy Oldenburg, Bioengineering

3:35 p.m.

Coffee Break

PANEL ON RESEARCH, DEVELOPMENT, AND COMMERCIALIZATION IN NANOMEDICINE AND NANOSCALE ENERGY

3:45 – 5:15 p.m.

Session IV
Moderator: Irfan Ahmad, Center for Nanoscale Science and Technology

3:45 p.m.

Panelists: Wendy Sanhai, Food and Drug Administration; Joachim Maier, Max-Planck; Sean Murdock, Nanobusiness Alliance; Larry Nagahara, National Cancer Institute; Gary Eden, University of Illinois; Gregory Lanza, Washington University, Saint Louis

5:15 – 6:45 p.m.

Reception, Poster Session, and NCSA Demos: Evolutionary Highway
NCSA Atrium

Friday, May 4, 2007

7:30 – 8:30 a.m.

Continental Breakfast
NCSA Atrium

NANOMEDICINE II/ SOCIETAL IMPLICATIONS OF NANOTECHNOLOGY

8:30 – 10:10 a.m.

Session V
Chair: Stephen Boppart, Director, Mills Breast Cancer Institute, Carle/Electrical & Computer Engineering

8:30 a.m.

Advancing Cancer Research through Nanotechnology
Larry Nagahara, Nanotechnology Projects Manager, National Cancer Institute

8:50 a.m.

Hybrid Viral/Synthetic Gene Delivery Nanovectors: Toward an "Artificial Virus"
Daniel W. Pack, Department of Chemical & Biomolecular Engineering

9:10 a.m.

Novel Techniques for Fabricating Uniform Micro and Nanospheres, Thin Films, Nanofibers, and Nanowires and Their Applications
Kevin Kim, Electrical and Computer Engineering

9:30 a.m.

Fibrous Scaffolds for Cartilage Engineering
Dominique Griffon, Large Animal Clinic, Veterinary Medicine

9:50 a.m.

Public Perceptions and Understanding of Nanotechnology
Dietram Scheufele, Journalism & Mass Communications, University of Wisconsin

10:10 a.m.

Coffee Break

Continued