

10:20 a.m.

Three-Dimensional Fountain
Pen Nanofabrication
Min-Feng Yu, Mechanical Science & Engineering

10:40 a.m.

Nanometer-Scale Manufacturing
and Metrology using Probe Tips
William King, Mechanical Science & Engineering

11:00 a.m.

Carbon Nanotube FETs for High
Frequency Electronics
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

11:50 a.m.

Tubes, Ribbons and Wires for Printed Electronics
*John Rogers, Materials Science and
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.

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,
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.*

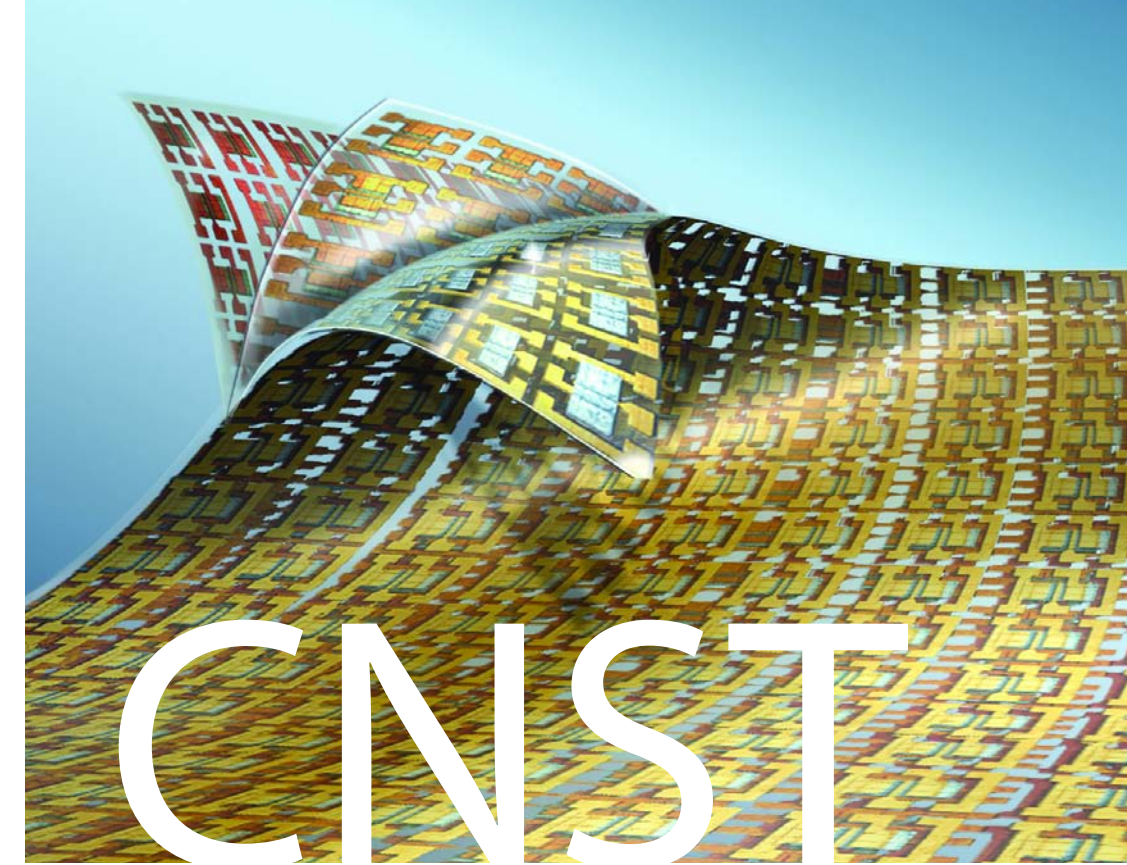
Micro and Nanotechnology Laboratory

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.*

Center for Nanoscale Science and Technology

University of Illinois at Urbana-Champaign
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Urbana, IL 61801

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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)

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

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

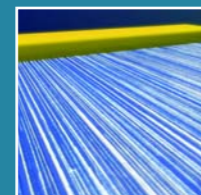
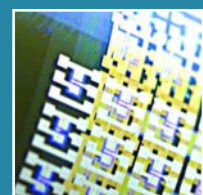
For information on registration, poster signup, hotels, and parking visit www.cnst.uiuc.edu/NanoWorkshop2007.htm. There is no registration fee, but pre-registration is required. Seating is limited.

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 for Nanomedicine

Beniamino Barbieri, ISS, Inc. (local company)

12:35 p.m.

Buffet Lunch, Poster Session, and NCSA Demos

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.

Dendritic, Single-Molecule Nanoparticle-Aptamer Bioconjugate for Targeted Breast 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; Stephen Sligar, University of Illinois; Gregory Lanza, Washington University, Saint Louis

5:15 – 6:45 p.m.

Reception, Poster Session, and NCSA Demos

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.

Ligand-Nanoparticle Conjugates for MRI of Clinically Relevant Receptor Targets

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

NANOFABRICATION/ NANOMANUFACTURING/ NANOELECTRONICS

10:20 – 11:30 a.m.

Session VI

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

Plenary and Main Session Speakers

Dr. Leonard L. Yowell

NASA Johnson Space Center



Dr. Leonard Yowell is the lead for the Applied Nanotechnology Project at NASA Johnson Space Center in Houston, Texas. He directs a multi-disciplinary research team in the field of nanotechnology, responsible for developing innovative, sustainable, and affordable technologies for the advancement of human and robotic space exploration missions.

His group conducts substantial liaison with researchers throughout the agency and maintains significant technical collaborations with nanotechnology researchers in academia, industry, and other government agencies. He holds a Ph.D. in Materials Science from Rice University, as well as M.S. and B.S. degrees in Aeronautical Engineering from Stanford University and Rensselaer Polytechnic Institute, respectively.

Dr. Wendy Sanhai

U.S. Food and Drug Administration



Dr. Wendy Sanhai is Senior Scientific Advisor for the U.S. Food and Drug Administration Office of the Commissioner. Prior to her current appointment, Dr. Sanhai was the Director of Public-Private Partnerships at the Foundation for the National Institutes of Health and was the senior Foundation officer responsible for creating, implementing, managing and

evaluating all new and existing programs in clinical research, education and training.

Dr. Sanhai's dedication to the advancement of biomedical research and public health started in academia as a clinical fellow, scientific researcher/faculty member in the Departments of Pathology and Medical and Research Technology at the University of Maryland. Dr. Sanhai moved to the NIH, Office of Technology Transfer as a Technology Licensing Specialist and Patent Advisor. In that capacity, she managed a license and intellectual property portfolio of more than 200 NIH invention families from across the 27 Institutes and Centers of the NIH. Dr. Sanhai worked extensively with the NIH, industry, academic and international organizations on behalf of the NIH and the FDA.

Dr. Sanhai has a Ph.D. in biochemistry and structural biology from the School of Medicine, State University of New York at Buffalo and a baccalaureate degree in chemistry from the University of Florida, Gainesville.