PLENARY & SESSION SPEAKERS

Sharon Smith, Lockheed Martin Corporation

Sharon Smith is a corporate executive and director for Advanced Technology, at Lockheed Martin's corporate headquarters in Bethesda, Maryland. She is responsible for research and technology initiatives, including independent research and development projects, university involvement, and various other R&D activities. She is the prior chair of the Lockheed Martin Steering Group on Microsystems/MEMS (Micro Electro Mechanical Systems) and is currently the chair of the corporation's Steering Group on Nanotechnology.

Dr. Smith has 25 years of experience in management, program management, engineering, and research and development at Eli Lilly and Company, IBM Corporation, Loral, and Lockheed Martin Corporation. She has more than 25 technical publications and has given numerous technical presentations in the United States and Europe. She obtained her PhD in Analytical Chemistry from Indiana University, MS from Purdue University, and BS from Indiana University.

Daniel Radack, DARPA

Daniel Radack joined the DARPA Microsystems Technology Office (MTO) as a program manager in 1997. He is currently managing a number of MTO research programs in high performance semiconductor technologies. His program interests are in high performance integrated electronics and nanotechnologies for defense applications. Prior to joining DARPA, he was with the Institute for Defense Analyses in Alexandria, Virginia. From 1990 to 1996, he worked on the development of advanced microelectronic technologies for future defense applications at Science Applications International Corporation (SAIC). During the 1980s, he worked for the National Bureau of Standards (now NIST) in the Semiconductor Electronics Division where he developed dynamic test circuits and test structures for VLSI processes, and later, served on the research faculty at the University of Maryland's Laboratory for Plasma Research working on gyrotons and investigating intense, relativistic electron beams. He obtained his PhD, MS, and BS in Electrical Engineering from the University of Maryland at College Park.

Daniel Gallahan, National Institutes of Health

As a molecular and cancer biologist with expertise in the fields of breast cancer, technology development, and science administration, Daniel Gallahan's primary focus is the integration of multiple approaches, tools, and data sets to the understanding of cancer. He currently serves as associate director and chief of the Structural Biology and Molecular Applications Branch within the Division of Cancer Biology. There, he oversees the division's efforts in technology and systems biology, which has recently resulted in the NCI's Integrative Cancer Biology Program (ICBP). In addition, he assists in the planning and implementation of the NCI's overall efforts in genomics, proteomics, and nanotechnology. His group also acts as liaison with other government and commercial entities in the area of technology and systems biology.

Dr. Gallahan is the NCI representative to the trans-NIH Biomedical Information Science and Technology Initiative (BISTI) committee. He serves on numerous NCI and NIH advisory panels, including three roadmap efforts. The branch plays a major role in the development and management of the NCI Innovative Molecular Analysis Technologies (IMAT) program, which has been responsible for the development of new technologies for cancer research. He was trained in Molecular Biology and Biochemistry at the University of Maryland, receiving additional post-doctoral training at the NIH and the German Cancer Research Center. His post-doctoral work included training in proteomics and bio-informatics. He had an active NCI intramural career resulting in numerous publications within the Laboratory of Tumor Immunology and Biology, as well as experience outside the government when he served as Director of Molecular Biology and Development for a small bio-tech company.

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. Currently, an $18 million expansion of the MNTL is underway, which will include bionanotechnology and additional space for researchers. The expansion is scheduled to be completed in 2006. (www.micro.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 Laboratory, 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 bionanotechnology, computational nanotechnology, nanocharacterization, nanoelectromechanical systems, nanoelectronics, nanofabrication, nanomaterials, nanomanufacturing, nanomedicine, and nanophotonics. (www.cnst.uiuc.edu).

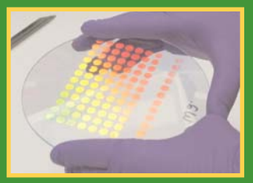
Workshop Organizing Committee

Ilesanmi Adesida, Professor, Electrical and Computer Engineering; Director CNST and MNTL (Chair)
Irfan Ahmad, Assistant Director, CNST
Kent Choquette, Professor, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory
James Coleman, Professor, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory
Brian Cunningham, Associate Professor, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory
Milton Feng, Professor, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory
Kathy Harper, Coordinator, Micro and Nanotechnology Laboratory
Chang Liu, Associate Professor, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory
John Rogers, Professor, Materials Science and Engineering; Micro and Nanotechnology Laboratory
Edmund Seebauer, Professor, Chemical and Biomolecular Engineering
Mark Shannon, Professor, Mechanical Engineering; Nano-CEMMS; and CAMPWS
Bruce Vojak; Associate Dean for External Affairs, College of Engineering

Micro and Nanotechnology Labratory
Center for Nanoscale Science and Technology
208 N. Wright St., Urbana, IL 61801
(217) 333-3097, fax (217) 244-6375
nano@cnst.uiuc.edu
www.micro.uiuc.edu
www.cnst.uiuc.edu

MNTL/CNST

Nanotechnology Workshop

May 5-6, 2005

Location
University of Illinois at Urbana-Champaign
Beckman Institute for Advanced Science and Technology
405 North Mathews Avenue, Urbana

Sponsored by
Micro and Nanotechnology Laboratory (MNTL)
Center for Nanoscale Science and Technology (CNST)
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 (CAMPWS)
College of Engineering
Institute for Genomic Biology (IGB)
Nanoscale Chemical, Electrical, Mechanical, Manufacturing Systems (Nano-CEMMS)

www.micro.uiuc.edu
www.cnst.uiuc.edu

MNTL/CNST

Nanotechnology Workshop

The broad objective of the MNTL/CNST Nanotechnology Workshop 2005 is to showcase University of Illinois' research in nanoelectronics, nanodevices, nanomaterials, and bionanotechnology applications.

The workshop brings together leading industry speakers and University of Illinois faculty engaged in cutting-edge research.

It provides a forum for industry interactions and collaborations, bringing together the campus community—faculty, graduate students, undergraduates, and administrators—with representatives of government and industry. Similar interactions during previous workshops have let to industry and cross-campus collaborations.

A workshop panel will discuss the roadmap to future direction of research and development. Together, we will explore the emerging world that nanotechnology offers.

Welcome!

Registration, Poster Signup, and Hotel Information
Pre-registration required. Seating is limited, so register early online: **www.cnst.uiuc.edu/NanoWorkshop2005.htm**

Parking
For parking directions to the Beckman Institute at the University of Illinois at Urbana-Champaign visit: www.cnst.uiuc.edu/NanoWorkshop2005.htm

For Workshop Information Contact
Kathy Harper
nano@cnst.uiuc.edu
(217) 333-3097

For Technical Collaboration Contact
Dr. Ilesanmi Adesida
iadesida@uiuc.edu
(217) 333-3097

Dr. Irfan Ahmad
isahmad@uiuc.edu
(217) 333-2015

Thursday, May 5, 2005

Beckman Auditorium/Atrium

7:30 – 8:15 a.m.
Registration and Breakfast

8:30 – 10:20 a.m.
Plenary Session
Chair – Ilesanmi Adesida, CNST/Micro and Nanotechology Laboratory

8:30 a.m.
Welcome Remarks
Richard Herman, Chancellor, University of Illinois at Urbana-Champaign

Ilesanmi Adesida, Director, Micro and Nanotechnology Laboratory, CNST; Interim-Dean Designate, College of Engineering

9:00 a.m.
Opportunities and Challenges for Nanotechnologies in Defense
Sharon Smith, Director, Advanced Technology, Lockheed Martin

9:40 a.m.
A Research Perspective on Nanoelectronics for Defense Applications
Daniel Radack, Program Manager, MTO, DARPA

10:20 a.m.
Coffee Break

NANOELECTRONICS

10:40 a.m. – 12:20 p.m.
Session I
Chair – Pierre Wiltzius, Beckman Institute for Advanced Science and Technology

10:40 a.m.
Benchmarking Nanotechnology for High-Performance and Low-Power Logic Transistor Applications
Amlan Majumdar, Intel

11:00 a.m.
Integrating Carbon Nanotubes with Semiconductor Platforms
Joseph Lyding, Peter Albrecht, and Laura Ruppalt, Electrical and Computer Engineering

11:20 a.m.
Electrochemical Gating and Molecular Adsorption on Carbon Nanotube Transistors
Moonsub Shim, Materials Science and Engineering

11:40 a.m.
Bio-assisted Development of Single Wall Carbon Nanotube Electronic Devices
Timothy Gierke, DuPont

Noon
Biomimetics using Silicon Nanotechnology
Gregory Timp, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory

12:20 p.m.
Buffet Lunch and Poster Session

NANOPHOTONICS

1:45 – 3:05 p.m.
Session II
Chair – Dale Van Harlingen, Physics

1:45 p.m.
Patterned Quantum Dot Lasers by Selective Area MOCVD
V.C. Elarde and J. J. Coleman, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory

2:05 p.m.
The Invention of Transistor Laser
Milton Feng, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory

2:25 p.m.
Tunable Photonic Crystals
Brian Cunningham, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory

2:45 p.m.
High Power III-Nitride Light Emitting Diodes
Jonathan Wierer, Lumileds Lighting

3:05-3:25 p.m.
Coffee Break

PANEL ON RESEARCH AND DEVELOPMENT IN NANOTECHNOLOGY

3:30-5:15 p.m.
Session III
Moderator – Charles Zukoski, Vice Chancellor for Research

3:30 p.m.
Panelists: Edmund Seebauer, Chemical and Biomolecular Engineering; Timothy Gierke, DuPont; Sharon Smith, Lockheed Martin; Sean Murdock, Nanobusiness Alliance; and Ray Eby, NanoInk

5:15-7:00 p.m.
Poster Session and Reception
Beckman Center Atrium

Friday, May 6, 2005

7:30 – 8:30 a.m.
Continental Breakfast – Beckman Center

NANOWIRES

8:30-9:55 a.m.
Session IV
Chair – Karl Hess, Electrical and Computer Engineering

8:30 a.m.
Heterogeneous Vapor Phase Integration and Electrical Properties of Inorganic Nanowires
Loucas Tsakalakos, General Electric

8:55 a.m.
Self-assembly of Nanowires and their Characterization
Taher Saif and Sathya Mani, Mechanical Engineering

9:15 a.m.
Molecular Templates for Superconducting Nanowires
Alexey Bezryadin, Physics

9:35 a.m.
Silicon(e) in Nanotechnology
Anne Shim, Dow Corning

9:55-10:15 a.m.
Coffee Break

BIONANOTECHNOLOGY AND NANOFABRICATION

10:15 a.m. – 12:35 p.m.
Session V
Chair – Eric Jakobsson, Molecular and Integrative Physiology

10:15 a.m.
Nanotechnology and Nanomedicine Roadmap at National Institutes of Health
Daniel Gallahan, Associate Director, Division of Cancer Biology, NCI, NIH

10:45 a.m.
Biomimetic Conductivity: Electrical Signaling through Synthetic Ion Channels
Mary Gin, Chemistry

11:05 a.m.
Electrical Response of DNA Translocation through Nanopore MOS-Capacitors
Jean-Pierre Leburton, Electrical and Computer Engineering

11:25 a.m.
Coffee Break

11:30 a.m.
Advanced Nano Lithography Tools Based on MEMS Technology
Chang Liu, Electrical and Computer Engineering; Micro and Nanotechnology Laboratory

11:50 a.m.
Nano-Gates for Mass-Limited Molecular Manipulation and Analysis
Mark Shannon, Mechanical Engineering; Water CAMPWS; Nano-CEMMS

12:10 p.m.
Multi-Pen DPN™ Methods for Nanofabrication
Ray Eby, NanoInk, Inc.

12:30 p.m.
Closing Remarks

12:35-1:30 p.m.
Box Lunch

2:00-4:00 p.m.
NIH Grant Writing Framework/ Strategies Session for CNST Faculty Affiliates
Daniel Gallahan, Associate Director, Division of Cancer Biology, NCI, NIH
Room 5602 Beckman Institute
(seating is limited – signup required; send email to nano@cnst.uiuc.edu)

Objective: This CNST-organized session is primarily intended for UIUC engineering faculty and others who have had no or little NIH grant-writing experience, and have continued interest in working with/through CNST and MNTL on Nanotechnology-based research and development.

2:00-4:00 p.m.
Micro and Nanotechnology Laboratory Tours are available on request.
(signup online at **www.cnst.uiuc.edu/NanoWorkshop2005.htm.** Tour duration: 20 minutes; tours start at 20-minute intervals beginning at 2:00 p.m.)