



JULY 12-23, 2010

Venue: [Micro and Nanotechnology Laboratory \(MNTL\)](#)

University of Illinois at Urbana-Champaign
 208 N. Wright Street, Urbana, IL 61801
 Phone: 217-333-3097 and 217-244-1353

P.S. Schedule is subject to change

Monday, July 12

7:00-8:15 AM Registration and Breakfast at MNTL Atrium

Plenary Session at MNTL Seminar Room 1000

8:30 AM-12:30PM Plenary Session Chair: Jimmy Hsia, Summer Institute Chair/Prof of MechSE	
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8:30	Welcome Remarks
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Ilesanmi Adesida, Dean, College of Engineering; University of Illinois

Jimmy Hsia, University of Illinois
 Shuo Hung Chang, National Taiwan University

nano@Illinois: Center for Nanoscale Science and Technology (CNST)
 Rashid Bashir, Director, MNTL and Irfan Ahmad, Associate Director, CNST,
 University of Illinois

9:00	Short Video on Micro and Nanotechnology Laboratory
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9:10	Student Introductions
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9:30	Introduction to Cell Biology (Part I) Scott Siechen , Parkland College and University of Illinois
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10:45	Discussion
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11:00 -11:10	Coffee Break
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11:15-12:15	Fluorescence-based Biodetection and Fluorescence Amplification Brian Cunningham , Professor of Electrical and Computer Engineering, and Bioengineering, University of Illinois
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12:15-12:30	Discussion
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12:30-1:15 PM	Lunch and Micro/Nanotechnology Lab Safety Session
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1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule
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Tuesday, July 13	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Registration and Breakfast at MNTL Atrium
8:30 AM-12:30 PM	Session Chair: Michael Insana, Professor and Head Department of Bioengineering
8:30-9:20	Introduction to Cell Biology (Part II) Scott Siechen, Parkland College and University of Illinois
9:20-9:35	Discussion
9:35 -9:45	Coffee Break
9:45-10:45	Bio-integrated Electronics John Rogers , Professor of Materials Science and Engineering, University of Illinois
10:45-11:00	Discussion
11:00-12:15	Mechanical Regulation of the Cytoskeleton Daniel Fletcher , Associate Professor of Bioengineering, University of California, Berkeley
12:15-12:30	Discussion
12:30-1:15 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule

Wednesday, July 14	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Registration and Breakfast at MNTL Atrium
8:30 AM-12:30 PM	Session Chair: Su-A Myong, Assistant Professor of Bioengineering
8:30-9:30	Basics of Mechanics Jimmy Hsia, Professor of Mechanical Science and Engineering, University of Illinois
9:30 -9:40	Coffee Break
9:45-10:45	Design, Fabrication, and Applications of Polymer Micro/Nanofluidic Biochips James Lee, Professor, Ohio State University
10:45-11:00	Discussion
11:00-12:15	The Molecular Mechanisms Governing Fate Decisions in Human Embryonic Stem Cells Fei Wang, Assistant Professor of Cell and Developmental Biology, University of Illinois
12:15-12:30	Discussion
12:30-1:15 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule

Thursday, July 15	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Registration and Breakfast at MNTL Atrium
8:30 AM-12:15 PM	Session Chair: Catherine Murphy, Professor of Chemistry
8:30-9:50	Neurobiology Martha Gillette , Professor of Cell and Developmental Biology, University of Illinois
9:50 -10:00	Discussion
10:00-10:20	Group Photo and Coffee Break
10:30-11:50	Feeling the Cell Force Taher Saif , Professor of Mechanical Science and Engineering, and Director, Center for Cellular Mechanics
11:50-12:15	Discussion
12:30-1:30 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule
SPECIAL PROGRAM	
6:00-9:00PM	BBQ and Sport Activities at Crystal Lake Park Main Pavilion

Note: Friday, July 16 Session will be held in Room 1005, Beckman Institute

Friday, July 16	
Technical Session at Room 1005, Beckman Institute	
7:45-8:15 AM	Registration and Breakfast at MNTL Atrium
8:30 AM-12:30 PM	Session Chair: Brenda Wilson, Professor of Microbiology
8:30-9:30	Nanotoxicology and Nanomaterials Characterization Valerie Leppert , Professor, School of Engineering, University of California, Merced
9:30 -9:40	Coffee Break
9:45-10:45	Advances in Cytomics-cellular Measurement Technologies J. Paul Robinson , Professor of Cytomics, Purdue University
10:45-11:00	Discussion
11:00-12:15	Bacterial Light Scatter as an Opportunity for Development of a Biodefense System J. Paul Robinson , Professor of Cytomics, Purdue University
12:15-12:30	Discussion
12:30-1:30 PM	Lunch
1:30-4:00 PM	Session Chair: Shuo Hung Chang, Professor and Chair, Department of Mechanical Engineering, National Taiwan University "Speed Dating": Get to Know Your Class Members Professional Interests

NO LABS!

SPECIAL PROGRAM	
Saturday, July 17:	Sightseeing Trip to Chicago
<i>(signup at the registration desk and ask for logistical details)</i>	

Monday, July 19	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Breakfast at MNTL Atrium
8:30 AM-12:30 PM	Session Chair: Amy Wagoner-Johnson, Assistant Professor of Mechanical Science and Engineering
8:30	nanoSERS Molecular Biosensing G. Logan Liu , Assistant Professor of Electrical and Computer Engineering, and Bioengineering
9:30 -9:45 AM	Discussion and Coffee Break
9:45-10:45	Two and Three-dimensional Fabrication of Soft Bio-micro-mechanical Structures (lecture 1) Rashid Bashir , Professor of Electrical and Computer Engineering, and Bioengineering
10:45-11:00	Discussion
11:15-12:15	Micro and Nano Electrical Detection of Molecules and Cells (lecture 2) Rashid Bashir , Professor of Electrical and Computer Engineering, and Bioengineering
12:15-12:30	Discussion
12:30-1:30 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule

Tuesday, July 20	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Breakfast at MNTL Atrium
8:30 AM- 12:30 PM	Session Chair: K.C. Ting, Professor and Department Head, Agricultural and Biological Engineering
8:30-9:30 AM	Acoustic Sensing in Noisy Ambience Albert Feng, Professor of Molecular and Integrative Physiology, and Bioengineering
9:30 -9:40 AM	Discussion and Coffee Break
9:45-10:45	Biologically-inspired Hearing Aids Albert Feng, Professor of Molecular and Integrative Physiology, and Bioengineering
10:45-11:00	Discussion
11:15-12:15	Engineering Cellular Microenvironments and Microstructures Brendan Harley, Professor of Chemical and Biomolecular Engineering, University of Illinois
12:15-12:30	Discussion
12:30-1:30 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule

Wednesday, July 21	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Breakfast at MNTL Atrium
8:30 AM-12:30 PM	Session Chair: Hao-Ming Hsiao, Associate Professor, Department of Mechanical Engineering, National Taiwan University
8:30-9:30	Single molecule Analyte Detection using Stochastic Nano-sensors Michael Strano, Professor of Chemical Engineering, Massachusetts Institute of Technology
9:30 -9:45 AM	Discussion
9:45-10:45	Biomimetic Cilia Sensor Arrays using Electrochemically-Synthesized Magnetic Nanowires Bethanie Stadler, Professor of Electrical Engineering, University of Minnesota
10:45-11:00	Discussion
11:00-11:15	Coffee Break
11:15-12:15	Biologically Inspired Artificial Haircell Sensors Chang Liu, Professor of Mechanical Engineering, Northwestern University
12:15-12:30	Discussion
12:30-1:30 PM	Lunch
1:30-5:30 PM	Laboratory Module: Please consult groupwise laboratory schedule

Thursday, July 22	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Breakfast at MNTL Atrium
8:30 AM- 12:30 PM	Session Chair: Matthew Gilbert, Assistant Professor of Electrical Engineering
8:30-9:30	Three Easy Pieces of Nanobiosensing M. Ashraf Alam, Professor, Electrical and Computer Engineering
9:30 -9:45	Discussion and Coffee Break
9:45-10:45	Fluorescence Spectroscopy and Microfluorimetry: Basics and Brain Cell Membrane Diffusion Martin vandeVen, Scientist, ISS, Inc., and Guest Professor, Biomedical Research Institute, Hasselt University
10:45-11:00	Discussion
11:00-12:15	Biosensor Applications in Animal Health Tiffany Houchin, Scientist, Elanco (an Eli Lilly company)
12:15-12:30	Discussion
12:30-1:30 PM	Lunch

NO LABS

SPECIAL PROGRAM	
2:00 to 5:30 PM	Poster Session and Reception (MNTL Atrium, 2nd and 3rd Floors) Session Chair: Kimani Toussaint, Jr., Assistant Professor of Mechanical Science and Engineering <i>(signup at the registration desk by July 21, and ask for logistical details)</i>

Friday, July 23	
Technical Session at MNTL Seminar Room 1000	
7:45-8:15 AM	Breakfast at MNTL Atrium
8:30 AM-12:15 PM	Session Chair: Irfan Ahmad, Summer Institute, Co-Chair, and Center for Nanoscale Science and Technology, and Agricultural and Biological Engineering
8:30-10:30	Laboratory Tours: <ul style="list-style-type: none"> • Beckman Institute • Coordinated Science Laboratory • FS Materials Research Laboratory • NCSA Evolution Highway • UI Research Park and Enterprise Works (<i>can be arranged on request</i>)
10:45 -11:00	Coffee Break
11:00-12:15	<ul style="list-style-type: none"> • Student Groups Summer Institute Report & Presentation • Post-event Survey • Recognitions • Certificate Awards and Concluding Remarks
12:30-1:30 PM	Lunch and ADJOURN

Summer Institute Location:

Micro and Nanotechnology Laboratory

Room 1000, 208 N. Wright Street, Urbana, IL 61801

For parking directions to Micro and Nanotechnology Laboratory at the University of Illinois at Urbana-Champaign visit: www.cnst.illinois.edu

<http://bsbasi-2010.mechse.illinois.edu/>

Workshop Organizing Committee

- **Jimmy Hsia**, Professor, Mechanical Science and Engineering, and Center on Emerging Behaviors of Integrated Cellular Systems, and Center for Cellular Mechanics, COE, **Summer Institute Chair**
- **Irfan Ahmad**; Associate Director, Center for Nanoscale Science and Technology (CNST), and Agricultural and Biological Engineering, Colleges of Engineering, and Agricultural, Consumer, and Environmental Sciences (ACES), **Summer Institute Co-Chair**
- **Rashid Bashir**; Professor, Electrical and Computer Engineering, Bioengineering, and Director, Micro and Nanotechnology Laboratory (MNTL), College of Engineering (COE),
- **Taher Saif**, Professor, Mechanical Science and Engineering, and Director, Center for Cellular Mechanics
- **Atif Irfan**, Administrative Assistant, Center for Nanoscale Science and Technology, Illinois
- **Shuo Hung Chang**, Professor and Chair, Department of Mechanical Engineering, National Taiwan University
- **Hao-Ming Hsiao**, Associate Professor, Department of Mechanical Engineering, National Taiwan University

Laboratory Leads:

- John Hughes, Larry Millett, JoAnne Manaster, and Tony Grift

Workshop Sponsored by:

U.S. National Science Foundation and National Science Council of Taiwan

Co-sponsors:

- [Micro and Nanotechnology Laboratory \(MNTL\)](#)
- [Center for Nanoscale Science and Technology \(CNST\)](#)
- [Center for Cellular Mechanics \(CCM\)](#)
- [Mechanical Science and Engineering \(MechSE\)](#)
- [Bioengineering \(BioE\)](#)
- [NCI Siteman Center for Cancer Nanotechnology Excellence \(SCCNE\)](#) at Washington University in Saint Louis, and University of Illinois at Urbana-Champaign
- [NSF Center on Emergent Behaviors of Integrated Cellular Systems \(EBICS\)](#) , at University of Illinois at Urbana-Champaign, Massachusetts Institute of Technology (MIT), and Georgia Institute of Technology
- NSF Integrative Graduate Education Research and Training (IGERT)- Center on Cellular and Molecular Mechanics and BioNanotechnology (CMMB)
- [Center for Agricultural and Pharmaceutical Nanotechnology \(CAPN\)](#), an NSF Industry/University Cooperative Research Center, *planning phase*