CONFERENCE PROGRAM

ASME Nano Conference 2005
Integrated Nanosystems: Design, Synthesis & Applications

University of California, Berkeley * Berkeley, California
September 14 – 16, 2005

Conference Chairs
Arun Majumdar, University of California, Berkeley
Gang Chen, Massachusetts Institute of Technology

PRODUCED BY

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ASME Nano Conference 2005
Integrated Nanosystems: Design, Synthesis & Applications
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FINAL PROGRAM

WEDNESDAY, September 14, 2005

11:00am - 1:00pm  REGISTRATION (In front of Sibley Auditorium, Bechtel Engineering Ctr.)
1:00pm - 1:10pm  Welcome (Sibley Auditorium, Bechtel Engineering Ctr.)
                  Arun Majumdar & Gang Chen, Conference Chairs
1:10pm - 2:00pm  Plenary Session I (Sibley Auditorium, Bechtel Engineering Ctr.)
                  Chair: Arun Majumdar, UC Berkeley
                  P: Nanotechnology – A Washington Perspective
          Floyd Kvamme, Kleiner Perkins Caufield & Byers, Menlo Park, United States

2:00pm - 3:30pm  Session 3-1 Nanomanufacturing I (Sibley Auditorium, Bechtel Engineering Ctr.)
                  Chair: Steven Girshick, University of Minnesota
                  Keynote: NANO2005-87038 Nanocomposites
          Rodney Ruoff, Northwestern University
          NANO2005-87036: Synthesis of Nanocomposites by Ballistic Impaction of Nanoparticles
          Rajesh Mukherjee, William M. Mook, Jami Hafiz, Xiaoliang Wang, William W. Gerberich, Joachim V. R. Heberlein, Peter H. McMurry, Steven Girshick, University of Minnesota, Minneapolis, MN, United States
          NANO2005-87068: Flexible Electronic Devices from Hot Embossing Materials Transfer
          Ashante Allen, Andrew Cannon, William King, Samuel Graham, Georgia Institute of Technology, Atlanta, GA, United States
          NANO2005-87082: Partially Aligned Piezoelectric Nanofibers By Sol-Gel Electrospinning Process
          Yong Shi, Shiyou Xu, Stevens Institute of Technology, Hoboken, NJ, United States, Sang-Gook Kim, Massachusetts Institute of Technology, Cambridge, MA, United States

3:30pm - 4:00pm  BREAK – Sponsored by Fulwider Patton Lee & Utecht, LLP (Rm. 120ABC, Bechtel Ctr.)

4:00pm - 5:30pm  Session 3-2 Nanomanufacturing II (Sibley Auditorium, Bechtel Engineering Ctr.)
                  Chair: Sang-Gook Kim, Massachusetts Institute of Technology
          Ray H. Baughman, University of Texas at Dallas, Richardson, TX, United States, M. Zhang, S. Fang, A. A. Zakhidov, M. Kozlov, S. B. Lee, A. E. Aliev, C. D. Williams, University of Texas at Dallas Nanotech Institute, Richardson, TX, United States, K. R. Atkinson, CSIRO Textile & Fibre Technology, Belmont, Victoria, Australia
          NANO2005-87033: Controlled Manipulation of Carbon Nanotubes For Nanodevices, Arrays, And Films.
          Xue Ming Henry Huang, Robert Caldwell, Bhupesh Chandra, Columbia University, New York, NY, United States, Seong Chan Jun, Columbia University, New York, NY, United States, Mingyuan Huang, James Hone, Columbia University, New York, NY, United States
          NANO2005-87058: Surface Plasmons-Assisted Nanoscale Photolithography
          Dongbing Shao, same, Austin, TX, United States, Shaochen Chen, The University of Texas at Austin, Austin, TX, United States
**NANO2005-87067: High-Yield Plasma Synthesis of Luminescent Silicon Quantum Dots**  
Lorenzo Mangolini, Elijah Thimsen, Uwe Kortshagen, University of Minnesota, Minneapolis, MN, United States

5:30pm - 7:00pm  
Session 2-1 Nanoscale Phenomena I *(Sibley Auditorium, Bechtel Engineering Ctr.)*  
Chair: Kenny Breuer, Brown University

**Keynote: NANO2005-87045: Nanomaterials and Physics**  
Zhifeng Ren, Boston College, Chestnut Hill, MA, United States

Xiaolan Song, Qingfeng Ge, S. C. Yen, Southern Illinois University, Carbondale, IL, United States

**NANO2005-87055: Field-dependent Electrical and Thermal Characterization of Cu/CoFe Multilayer for Giant Magnetoresistive (GMR) Head Applications**  
Yizhang Yang, Jian-Gang Zhu, Carnegie Mellon University, Pittsburgh, PA, United States, Robert White, Carnegie Mellon University, Pittsburgh, PA, United States, Mehdi Asheghi

**NANO2005-87046: Understanding Surface Instability Patterns in Nanoscale Thin Films**  
Rui Huang, Se Hyuk Im, Yaoyu Pang, University of Texas at Austin, Austin, TX, United States

7:00pm - 8:00pm  
**RECEPTION** *(Lobby, Hearst Mining Building)*

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**THURSDAY, September 15, 2005 - Nanotechnology Commercialization Showcase**

7:00am - 9:00am  
**REGISTRATION** *(In front of Sibley Auditorium, Bechtel Engineering Ctr.)*

9:00am - 9:30am  
**Plenary Session II: Nano Commercial Showcase** *(Sibley Auditorium, Bechtel Engineering Ctr.)*  
Chair: Anthony Waitz, Quantum Insight

**Plenary II: Nanotechnology Applications in Mature Industries**  
David Soane, Soane Labs, LLC

9:30am - 10:00am  
**Keynote Session** *(Sibley Auditorium, Bechtel Engineering Ctr.)*  
Chairs: Anthony Waitz, Quantum Insight  
Kitu Bindra, Buchanan Ingersoll PC  
Terry Fuqua, PricewaterhouseCoopers

**Keynote: Development and Commercialization of Nanotechnology Based Products**  
Mohan Misra, President & CEO, ITN Energy Systems, Inc.

10:00am - 10:30am  
**Keynote: VC Investments in Nano/Micro Technology - PwC MoneyTree Survey Results**  
Steve Bengston, Money Tree

10:30am - 10:45am  
**BREAK** *(Rm. 120ABC, Bechtel Engineering Ctr.)*

10:45am - 11:45pm  
**Panel: Obtaining Venture Capital**  
Presenter and Moderator: Steve Bengston, PricewaterhouseCoopers

**VCs on the Panel:**  
David Aslin, 3i  
Tom Baruch, CMEA Ventures  
Michael Dierks, Intel Capital  
Erik Straser, Mohr Davidow Ventures

**Company on the Panel:**  
Nobi Kambe, Nanogram Corporation

11:45pm - 1:10pm  
**LUNCH**

1:10pm - 2:00pm  
**Plenary Session III** *(Sibley Auditorium, Bechtel Engineering Ctr.)*  
Chair: Gang Chen, Massachusetts Institute of Technology

**Plenary III: Colloidal Nanocrystals: From Fundamental Properties to Applications in Renewable Energy**  
Paul Alivisatos, UC Berkeley

nano.asme.org 3
2:00pm - 4:00pm  
**Nanolgnite Company Presentations** *(Sibley Auditorium, Bechtel Engineering Ctr.)*  
Chair: Kitu Bindra, Buchanan Ingersoll PC.

*Come listen to the presentations of 8 exciting nanotechnology related startups:*

1. **Transfer Devices Inc.**, a nanolithography company  
2. **Wostec, Inc.**, using nanowires for displays, membranes and semiconductors.  
3. **Gemio Technologies**, accelerating the development of nanobio products  
4. **Lithium Electrochromic Systems**, a revolutionary energy efficiency company.  
5. **CoTherm**, an alternative energy company  
6. **Nanopoint, Inc.**, a nanobio tools and solutions company  
7. **Crystal Clear Technologies**, a nanotechnology based water purification company  
8. **Nanovative Technologies Inc.**, start-up company in virtual simulation tools for nanotechnology

**Judges:**  
Eric Straser, General Partner, Mohr Davidow Ventures  
Tom Baruch, Managing General Partner, CMEA Ventures  
Himanshu Choksi, Managing Director, Pacifica Fund  
Mohanjit Jolly, Managing Director, Garage Technology Ventures  
Wasiq Bokhari, Managing Partner, Quantum Insight

4:00pm - 4:30pm  
**BREAK** *(Rm. 120ABC, Bechtel Engineering Ctr.)*

4:30pm - 5:30pm  
**Poster Introduction** *(Sibley Auditorium, Bechtel Engineering Ctr.)*

5:30pm - 8:30pm  
**Poster Session/Exhibit/Reception** *(Lobby, Hearst Mining Building)*  
Chairs:  
Mehdi Asheghi, Carnegie Mellon University,  
Sang-Gook Kim, Massachusetts Institute of Technology  
Gang Chen, Massachusetts Institute of Technology

**NANO2005-87012: Shear-Driven Transport and Binding Reactions of Macromolecules in Nano-Channels: Mechanical and Tribological Investigations**  
Tony Tuzolana Mbumba, University of Ghent, Ghent, Belgium

**NANO2005-87024: Nano Sensors**  
Samson Isaac, R.M.K. Engineering College, Chennai, Tamil Nadu, India, Sutharson B, Vellammal Engg College, Chennai, Tamil Nadu, India, Saral Sutharson, Velammal Engineering College, Chennai, Tamil Nadu, India

Maksim Kireitseu, Damping tech Inc., Minsk, Russia, Natalie Kamanina, Vavilov State Optical Institute, St. Petersburg, Russia

**NANO2005-87049: Microelectrode Design in Mems-Based Dep Cell Filtration Devices**  
Mohammed Jalal Ahamed, Mohammad Rahman, University of Toronto, Toronto, ON, Canada

**NANO2005-87059: Photo-deformable Micro-shells of Nanometer Thick**  
Li-Hsin Han, The University of Texas at Austin, Tingji Tang, The University of Texas at Austin, Shaochen Chen, The University of Texas at Austin

**NANO2005-87060: Lower Limits of Detection for Single Biological Particles using Impedance Spectroscopy**  
Pahnit Seriburi, Ashutosh Shastry, Angelique Van’t Wout, John Mittler, Shih-Hui Chao, John Koschwanez, Deirdre Meldrum, University of Washington, Seattle, WA, United States

**NANO2005-87062: The Patterned Optical Phase Change Recording Media**  
Evan Small, Carnegie Mellon University, Pittsburgh, PA, United States, Sadegh M. Sadeghipour, Carnegie Mellon University, Pittsburgh, PA, United States, Mehdi Asheghi

**NANO2005-87070: Single Crystal Silicon Nanoparticle-Based Transistor**  
Yongping Ding, Ying Dong, Ameya Bapat, Christopher Perrey, C. Barry Carter, Stephen A. Campbell, Uwe Kortshagen, University of Minnesota, Minneapolis, MN, United States
Mohammad H. Saghafi, Sharif University of Technology, Tehran, Tehran, Iran, Mohammad T. Ahmadian, Sharif Uni. of Tech., Tehran, Iran, Hadi Salehi, Sharif University of Technology, Tehran, Iran, Reza Monazami, Sharif Uni. of Tech., Tehran, Iran, Azad Qazi Zade, Sharif University of Technology, Tehran, Iran

NANO2005-87074: Compressive Properties of Dense Vertically Aligned Multi-Walled Carbon Nanotube Arrays

NANO2005-87083: Photoswitchable Synaptic Receptors

NANO2005-87086: Fabrication of First-level Carbon Nanotube Interconnect Via Structures by Thermal Chemical Vapor Deposition
Yunyu Wang, Paul S. Ho, Zhen Yao, Li Shi, The University of Texas at Austin, Austin, TX, United States

NANO2005-87061: A Novel Structure and Experimental Procedure for Nanocalorimetry
Yizhang Yang, Shu Zhang, Carnegie Mellon University, Pittsburgh, PA, United States, Mehdi Asheghi

NANO2005-87018: Effective Thermal Conductivity and Viscosity of Nanofluids
S. M. S. Murshed, Nanyang Technological University, Singapore, Singapore, Singapore, Kai Choong Leong, Charles Yang, Nanyang Technological University, Singapore, Singapore, Singapore

NANO2005-87030: Elastic Fields of Surface Quantum Dots
Fjola Jonsdottir, Dadi Halldorsson, University of Iceland, Reykjavik, Iceland, Glenn Beltz, University of California, Santa Barbara, CA, United States, Alexei Romanov, A. F. Ioffe Physico-Technical Institute, St. Petersburg, Russia

Ashutosh Jain, Shri Shankaracharyya College of Engineering and Technology, Bhilai, India

NANO2005-87067: Thermal Characterization of Silicon Nanowires
Wenjun Liu, Yizhang Yang, Carnegie Mellon University, Pittsburgh, PA, United States, Mehdi Asheghi

NANO2005-87064: Pump-Probe Experimental Study of Phonon Reflectivity at an Interface and Phonon Relaxation Time
Ronggui Yang, Xiaoyuan Chen, Aaron Schmidt, Gang Chen, MIT, Cambridge, MA, United States

NANO2005-87066: Thermal Radiative Heat Transfer between Closely Spaced Nanostructures
Lu Hu, Massachusetts Institute of Technology, Cambridge, MA, United States, Gang Chen, MIT, Cambridge, MA, United States

NANO2005-87072: Nonlocal Formulation of Rarefied Poiseuille Flow
Ronggui Yang, Gang Chen, MIT, Cambridge, MA, United States

NANO2005-87080: Tuning Thermal Transport in a Crystalline Solid Using Epitaxially Embedded Nanoparticles
Woohul Kim, University of California, Berkeley, Suzanne Singer, University of California, Berkeley, Arun Majumdar, University of California, Berkeley

NANO2005-87087: Thermal Transport in Silicon Nanowires
Marc Llaguno, University of California Berkeley, Berkeley, CA, United States, Renkun Chen, Dept. of Mechanical Engineering, University of California, Berkeley, CA, United States, Allon Hochbaum, Peidong Yang, Dept. of Chemistry, University of California, Berkeley, CA, United States, Arun Majumdar
NANO2005-87015: Modelling And Fem Simulation Of Vibration Damping Properties Of Nanoscale-Reinforced Composite Materials In Aerospace Applications
Maksim Kireitseu, Rolls-Royce UTC, Univ. of Sheffield and NAS of Belarus, Minsk, Belarus

NANO2005-87022: Bending Stiffness of a Double-Layered Graphene Sheet Using a Geometrically-Based Analytical Approach
Kambiz Behfar, Reza Naghdabadi, Sharif University of Technology, Tehran, GA, Iran

Inderpreet Singh, Punjab Engineering College, Chandigarh, India, Anindo Bandypadhyay, NIT,Suratkal, Karnataka, India

NANO2005-87025: Activities In Iran For Standardization Of Nanotechnology
Ayat Rezaeifar, BTF Foundation, Tehran, Tehran, Iran, Bahar Mehmani, Workgroup of nanotechnology, Ministry of Industries and Mines, Tehran, Tehran, Iran, Mojtaba Mesgari Mashhadi, BTF Foundation, Tehran, Tehran, Iran

NANO2005-87027: The Local Instability of Nanostructures
Liang Zhang, University of Iowa, Jia Lu, University of Iowa

NANO2005-87028: Computational Modelling of Vibration Damping Effects In Nanoscale-Reinforced Materials
Liya Bochkareva, NAS of Belarus, Minsk, Belarus, Maksim Kireitseu, Damping tech Inc., Minsk, Russia

NANO2005-87031: The Invention Using a Liposome of a Bio-Micromachine
Matsunori Nara, Tokyo University of Science, Suwa, Chino Nagano, Japan

NANO2005-87039: Molecular Dynamics Simulations of Fluid Flow in a Rotating Channel
Zhaohui Qin, Iowa State University, Ames, IA, United States

Tina Arora, Tilak Dias, Manuchehr Soleimani, The University of Manchester, Manchester, United Kingdom

NANO2005-87081: Detecting Phase Transitions During Melting using Microcantilevers
Sibani Lisa Biswal, UC Berkeley, Digvijay Raorane, UC Berkeley, Alison Chaiken, HP Labs, Arun Majumdar, UC Berkeley

Anant Trivedi, New Mexico State University, J. Cecil, New Mexico State University

FRIDAY, September 16, 2005

8:00am - 9:00am  REGISTRATION (In front of Sibley Auditorium, Bechtel Engineering Ctr.)

9:00am - 10:30am  Session 2-2 Nanoscale Phenomena II (Sibley Auditorium, Bechtel Engineering Ctr.)
Chair: Mehdi Asheghi, Carnegie Mellon University

Keynote: NANO2005-87090: Direct Measurement of Slip Velocities Using Three Dimensional Total Internal Reflection Velocimetry
Peter Huang, Jeffrey Guasto, Kenny Breuer, Brown University, Providence, RI, United States

NANO2005-87079: Measurement of Liquid Slip on NanoTurf Surfaces
Chang-Hwan Choi, UCLA (University of California, Los Angeles), Los Angeles, CA, United States, CJ Kim, UCLA, Los Angeles, CA, United States

NANO2005-87075: Nanofluidic Transistors for Control and Sensing of Ions and Biomolecules
Rohit Karnik, University of California at Berkeley, Kenneth Castelino, University of California at Berkeley, Chuanhua Duan, University of California at Berkeley, Rong Fan, University of California at Berkeley, Peidong Yang, University of California at Berkeley, Arun Majumdar
NANO2005-87056: Molecular Scale Imaging with a Multilayer Superlens
Pratik Chaturvedi, UIUC, MIE Dept, Urbana, IL, United States, Nicholas Fang, University of Illinois at Urbana-Champaign, Urbana, IL, United States

10:30am - 11:00am  
**BREAK (Rm. 120ABC, Bechtel Engineering Ctr.)**

11:00am - 12:30pm  
**Session 1-1 Devices & Systems I (Sibley Auditorium, Bechtel Engineering Ctr.)**  
Chair: C.J. Kim, University of California at Los Angeles

**Keynote: NANO2005-87089: Information Storage and Retrieval using Macromolecules as Storage Media**  
Masud Mansuripur, The University of Arizona, Tucson, AZ, United States

**NANO2005-87052: Development of Ultra-sensitive Capacitive Readout for Magnetic Resonance Force Microscopy**  
Harish Bhaskaran, University of Maryland, College Park, MD, United States, Denis Pelekhov, P Chris Hammel, Department of Physics, The Ohio State University, Columbus, OH, United States, Keith Schwab, Laboratory for Physical Sciences, College Park, MD, United States

**NANO2005-87077: Novel Piston Motion Opto-Mechanical Sensor for Nanoscale Motion Detection**  
Si-Hyung “Shawn” Lim, UC, Berkeley, Albany, CA, United States, Roberto Horowitz, UC, Berkeley, Berkeley, CA, United States, Arun Majumdar

**NANO2005-87069: Nano-Imprint Fabrication of Injectable, Stimuli-Responsive Drug Delivery Vehicles**  
Luz Cristal Glangchai, University of Texas at Austin, Austin, TX, United States, Li Shi, The University of Texas at Austin, Austin, TX, United States, Krishnendu Roy, University of Texas at Austin, Austin, TX, United States

12:30pm - 1:30pm  
**LUNCH (Rm. 120ABC, Bechtel Engineering Ctr.)**

1:30pm - 3:00pm  
**Session 1-2 Devices & Systems II (Sibley Auditorium, Bechtel Engineering Ctr.)**  
Chair: Mark Shannon, University of Illinois at Urbana Champaign

**Keynote: NANO2005-87084: Programmable Self-Assembly Across the Micro and Nano Scales**  
Karl Bohringer, University of Washington, Seattle, WA, United States

**NANO2005-87026: Nanoporous Energy Absorption Systems**  
Yu Qiao, Univ of Akron, Akron, OH, United States, Xinguo Kong, Falgun B. Surani, University of Akron, Akron, OH, United States

**NANO2005-87057: Electromagnetic Nanoactuators Based On Nanocoils**  
D.J. Bell, L.X. Dong, B.J. Nelson, ETH Zurich, Zurich, Switzerland, Y. Sun, University of Toronto, Toronto, ON, Canada, L. Zhang, D.A. Gruetzmacher, Paul Scherrer Institute, Villingen, Switzerland

Zayd C. Leseman, Zuhaib Sheikh, Thomas J. Mackin, University of Illinois Urbana-Champaign, Urbana, IL, United States, Matthew R. Begley, University of Virginia, Charlottesville, VA, United States

3:00pm  
**CONFERENCE ADJOURN**
The Future of Water: A New ASME Initiative @ ASME’s Annual Congress
Orlando, Florida * November 2, 2005, 11:15 am - 1:00 pm
www.asme.org/congress

1st European Fuel Cell Technology & Applications Conference
Rome, Italy * December 14-16, 2005
www.asmeconferences.org/efc05

Nanomechanics: Sensors & Actuators Impact Forum
May 2006

Frontiers in Biomedicine
Irvine, California * May 11-12, 2006

4th International Conference on Fuel Cell Science, Engineering and Technology
Irvine, California * June 19-21, 2006
www.asmeconferences.org/fuelcell06

4th International Conference on Nanochannels, Microchannels and Minichannels
Limerick, Ireland * June 19-21, 2006
www.asmeconferences.org/icnmm06

5th Nano Training Bootcamp
July 2006

CANEUS 2006 Conference on Micro-Nano-Technologies for Aerospace Applications – From Concepts to Systems
Toulouse, France * August 27 – September 1, 2006
www.caneus.org/caneus06