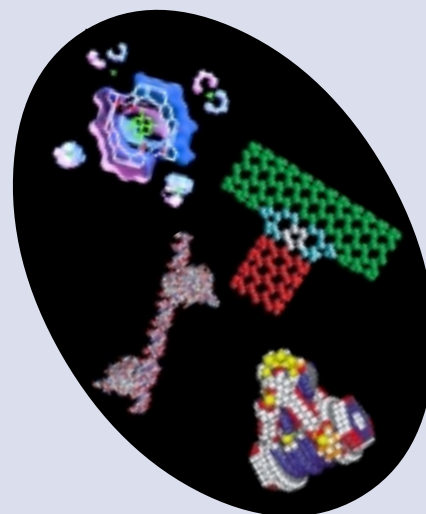


8th FORESIGHT INSTITUTE Conference on
**Molecular
Nanotechnology**

November 3-5, 2000

November 2 Tutorial

Bethesda, Maryland (Washington, DC)



Keynote Speaker

Raymond Kurzweil

1999 National Medal of Technology Award

A leader in artificial intelligence systems, Kurzweil's work includes successful commercialization as well as state-of-the-art technical advances in pattern recognition. His first book, *The Age of Intelligent Machines*, received the award for the Most Outstanding Computer Science Book of 1990 by the Association of American Publishers. Come hear this practical visionary as he turns his attention to nanotechnology.

Invited Speakers

Scanning Probes

Charles Lieber, Harvard University

Phillip E. Russell, North Carolina State University

Richard Superfine, University of North Carolina

Paul Weiss, Penn. State University

Biological Machines and Materials

Julio Fernandez, Mayo Clinic

Peter G. Gillespie, Oregon Health Sciences University

Nadrian C. Seeman, New York University

Nano/Materials and Mechanics & Manipulation

Robert J. Celotta, NIST

Mostafa A. El-Sayed, Georgia Institute of Technology

James Heath, UCLA

Jacqueline Krim, North Carolina State University

Molecular Electronics/Self-Assembly

Mark Ratner, Northwestern University

James Tour, Rice University

Theory/Modeling and Computations

Ralph C. Merkle, Zyvex, LLC

Klaus Schulten, University of Illinois

Susan B. Sinnott, University of Kentucky

Abstracts due
June 16, 2000

Special Session

National Initiatives in Nanotechnology

Dr. Cheryl Shavers, Under Secretary of Commerce for Technology, will speak followed by a panel discussion with representatives from federal agencies.

Introductory Tutorial Foundations of Nanotechnology

Nano/Materials and Mechanics & Manipulation

James Heath, UCLA

Biological Machines and Materials

Peter G. Gillespie, Oregon Health Sciences University

Scanned-Probe Microscopy

Phillip E. Russell, North Carolina State University

Theory/Modeling and Computations

Susan B. Sinnott, University of Kentucky



Feynman Prize Awards Banquet
**Annual Feynman Prizes in
Nanotechnology**

Nominations or Submissions
due July 31, 2000

Conference Co-chairs:

Jan H. Hoh, Johns Hopkins University

Donald W. Brenner, North Carolina State University

www.foresight.org/conference

8th Foresight Conference on Molecular Nanotechnology

Over the next few decades, manufacturing is expected to undergo profound changes. Advances in miniaturization will reach the level of individual atoms and products will be designed and built to atomically-precise specifications.

This conference is a meeting of scientists and technologists working in fields leading toward molecular nanotechnology: through three-dimensional structural control of materials and devices at the molecular level. The conference will cover topics relevant to the pursuit of molecular control, drawing from fields such as:

- molecular electronics
- biochemical molecular engineering
- scanning probe microscopy
- supramolecular chemistry and self-assembly
- theory/modeling and computations
- computer science
- natural and artificial molecular machines
- nanomaterials/mechanosynthesis
- mechanical engineering and robotics
- applications of nanotechnology

Abstracts

There will be oral presentations and a poster session during the conference. The poster session will be held on Friday afternoon. On Saturday there will be additional time for viewing and discussion of the posters. For those who wish to submit papers, abstracts are due **June 16, 2000**. The abstracts should be no longer than 500 words including references and footnotes. Each submitted abstract may include only **one** graphic in jpg or gif format. The size should be no larger than 250 x 250 pixels (will be displayed at 72 dpi). Abstracts not in the appropriate format will be returned without being considered.

Submission information is available on the web at www.foresight.org/conference. If you do not have web access, email to inform@foresight.org or fax to Foresight at +1 (650) 917-1123. If you have additional questions, contact the conference co-chairs: Jan Hoh, jhoh@jhmi.edu or Don Brenner, brenner@eos.ncsu.edu

Foresight Institute and Institute for Molecular Manufacturing are non-profit organizations focused on nanotechnology education and research and are funded primarily through Senior Associate donations. Senior Associates receive discounts for all Foresight and IMM sponsored events. For more information about the Senior Associate Program including our annual Gatherings see www.foresight.org/SrAssoc

This conference is sponsored by:



Annual Feynman Prizes

The Annual Feynman Prizes will be awarded to the person or group whose recent research (experiment or theory) has made the most significant contribution to the advancement of nanotechnology. An award of \$5,000 will be given in each category to the top submission by an individual or team, as selected by the Feynman Prize Committee.

Nominations or submissions consisting of a cover letter with a description of the candidate and his/her/their contributions together with supporting materials (papers, theses, etc) must be received at Foresight Institute by July 31, 2000. Details are available at www.foresight.org/FI/2000Feynman.html

The Annual Feynman Prizes are distinct from the \$250,000 Feynman Grand Prize. Details on the Grand Prize are available at www.foresight.org/GrandPrize.1.html

Program Committee

Donald W. Brenner, North Carolina State University

M. Reza Ghadiri, Scripps Research Institute
1998 Feynman Prize Winner — Experimental

James K. Gimzewski, IBM Zurich Research Laboratory
1997 Feynman Prize Winner — Experimental

William A. Goddard III, Caltech
1999 Feynman Prize Winner — Theoretical

Jan H. Hoh, Johns Hopkins University

Ralph C. Merkle, Zyvex, LLC
1998 Feynman Prize Winner — Theoretical

Nadrian C. Seeman, New York University
1995 Feynman Prize Winner

Susan B. Sinnott, University of Kentucky

Richard E. Smalley, Rice University
1996 Nobel Prize in Chemistry

Deepak Srivastava, NASA Ames, MRJ
1997 Feynman Prize Winner — Theoretical

Journal Special Issue

A special conference issue of *the journal Nanotechnology* will be published. Submissions are optional, but strongly encouraged.



COVER: from top clockwise,

- **A Synthetic Self-Assembling Spherical Complex**
J. Rebek and M. Pique
The Scripps Research Institute
- **Nanotube Junctions for Nanoelectronic Devices**
D. Srivastava, NASA Ames, MRJ
M. Menon, University of Kentucky
- **Molecular Manipulator Design: A Fine Motion Controller**
K. E. Drexler, Institute for Molecular Manufacturing
- **Supramolecular Chemistry of Addressable Biostructures**
J. Wendel and S. Smith
City of Hope Medical Center

Tutorial

Foundations of Nanotechnology

Thursday 2 November 2000 • 9 am to 5 pm

The tutorial will serve as an introduction to several important areas in nanotechnology and is ideal for newcomers to the field or experienced researchers who wish to strengthen their interdisciplinary knowledge.

Powerful new concepts and capabilities such as atomic-scale imaging, nanometer-scale structure manipulation, and biological machines, together with increasingly powerful computational capabilities, are rapidly converging from disparate research fields to enable a viable molecular nanotechnology. Those with science, engineering, or software backgrounds are invited to participate either to begin new careers in nanotechnology or to expand their expertise. Topics and Instructors:

SCANNED-PROBE MICROSCOPY

Phillip Russell, North Carolina State University

Phillip Russell is a Professor of Materials Science and Engineering and Director of the Analytical Instrumentation Facility at North Carolina State University. He has been an innovator in the development of scanned-probe microscopy techniques, instrumentation and applications. His recent research has emphasized nanomechanics, metrology, self-assembled monolayers and *in situ* studies of nucleation and growth.

NANO/MATERIALS AND MECHANICS & MANIPULATION

James Heath, UCLA

James Heath is a Professor of Chemistry and Biochemistry at the University of California at Los Angeles. He is a leading researcher in the design, fabrication and utilization of nanometer-scale structures. His current interests include the development of new materials from chemically synthesized quantum dots, the design of new computer architectures based on molecular-level logic circuitry, and the development of a new scanning nonlinear optical microscope to study biological electrical functions.

THEORY/MODELING AND COMPUTATIONS

Susan B. Sinnott, University of Kentucky

Susan Sinnott is an Assistant Professor of Materials Science and Engineering at the University of Kentucky. Her research emphasizes the application of high performance scientific computing to design and study materials at the nanometer scale. Her interests include developing predictive isotherms to describe the behavior of fluids in nanometer-scale pores, investigating nanometer-scale mechanisms responsible for material modification through polyatomic ion bombardment, and studying of the synthesis and properties of carbon nanotubes.

BIOLOGICAL MACHINES AND MATERIALS

Peter G. Gillespie, Oregon Health Sciences University

Peter Gillespie is an Associate Professor in the Oregon Hearing Research Center with a joint appointment at the Vollum Institute. His research focuses on mechanisms of converting mechanical stimulation (through sound) into electrical signals in the ear. He is particularly interested in biological motors involved in the transduction process, and has recently engineered a novel motor protein that can be selectively regulated. He is also an innovator in the area of highly sensitive biochemical detection methods.

Registration Fees

Registration fee includes the scientific program; Thursday evening welcoming reception; and optional Friday, Saturday, Sunday lunch. For academic and student attendees there is a "no lunch" option that does not include lunch on Friday, Saturday or Sunday.

Optional Items:	by Aug. 30	after Aug. 30
Feynman Prize Banquet		
Saturday Dinner 5:30-7:30 pm	\$50	\$70
Senior Associate Reception		
Saturday 8:00-10:00 pm	\$40	\$60
(Senior Associate membership not required to attend the reception)		
Journal Special Conference Issue	\$40	\$40

The registration for the tutorial is separate from the conference registration. The tutorial registration fee includes Thursday lunch. You may register for the conference only, the tutorial only, or both the conference and tutorial.

Tutorial space is limited, therefore early registration is recommended. For additional information, see the web site or contact the Conference Office at 1(650) 917-1122, inform@foresight.org or Susan B. Sinnott, Dept. of Chemical & Materials Engineering, University of Kentucky, email: sinnott@enr.uky.edu

Amounts over \$175 are tax-deductible in the U.S. as a charitable contribution, excluding option items.

Site and Accommodations

Hyatt Hotel • One Bethesda Metro • Wisconsin Ave. at Old Georgetown Road • Bethesda, Maryland 20814

Reservations: 1 (800) 233-1234 or + 1 (301) 657-1234 or www.hyatt.com

Attendees are responsible for making their own reservations by **Monday, October 16**. Mention the **Foresight Nanotechnology Conference** to obtain the reduced room rate.

Group Rate: Single occupancy **\$115** or double **\$140** plus tax. Rooms at this rate are limited; reserve early.

Location: The Hyatt is located at Metro Center, Maryland's high tech corridor, 6 miles to downtown Washington, D.C., within walking distance to restaurants, theaters and world-class shopping; 5 miles to National Zoo, 18 miles to Washington/National Airport, 32 miles to BWI airport and 18 miles to Dulles International Airport. For complete directions: http://www.hyatt.com/usa/bethesda/hotels/map_bethe.html

Airport Transportation: Royal Airport Shuttle (800) 653-0888 or +1 (301) 657-0888 is available from Washington National, Dulles or BWI airports. Reservations are required. The Metro is available from Washington National Airport only.

Refund Policy

Refunds of registration fees can only be made upon receipt of a written request, postmarked no later than August 30, 2000, and are subject to a \$100 administrative fee.

Special Needs

Participants with special needs should notify the organizers at least one month in advance. Please contact Foresight Institute inform@foresight.org, +1 (650) 917-1122, fax +1(650) 917-1123.

8th Foresight Conference and Tutorial Registration

Registration form available at www.foresight.org/conference/MNT8

Please **print** and fax or mail this form to:

Foresight Institute • Box 61058 • Palo Alto CA 94306 USA

Tel: +1 (650) 917-1122 • Fax: + 1(650) 917-1123

Name: _____

Address: _____

City, State: _____

Zip/Postal Code, Country: _____

Phone: _____

Fax: _____

Email: _____

Position (Professor, Director, Programmer, etc.): _____

Organizational affiliation (for your badge): _____

For future notification about this conference do you prefer:

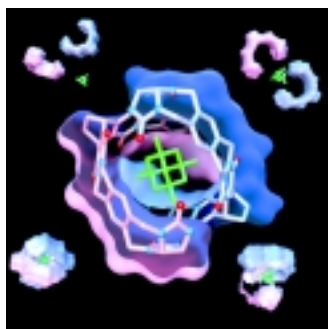
email postal mail: _____

other: _____

Senior Associates of Foresight Institute or IMM may register at the academic rate, regardless of their employment status. For more information about becoming a Senior Associate, see www.foresight.org/SrAssoc



Box 61058
Palo Alto, CA 94306 USA



Synthetic Self-Assembling Spherical Complex by Dr. Julius Rebek, Jr., Director of the Skaggs Institute for Chemical Biology, The Scripps Research Institute, and Michael Pique, The Scripps Research Institute

8th Foresight Conference on
Molecular Nanotechnology

by Aug. 30 after Aug. 30

Conference Only (Nov. 3-5) Lunch included in fees

Academic, Nonprofit, Govt.	<input type="checkbox"/> \$425	<input type="checkbox"/> \$550
Corporate, Individual	<input type="checkbox"/> \$550	<input type="checkbox"/> \$675
Full-time Student**	<input type="checkbox"/> \$225	<input type="checkbox"/> \$350
One day <input type="checkbox"/> Fri <input type="checkbox"/> Sat <input type="checkbox"/> Sun	<input type="checkbox"/> \$125	<input type="checkbox"/> \$250

Conference Only (Nov. 3-5) No lunch included in fees*

Academic, Nonprofit, Govt.	<input type="checkbox"/> \$325	<input type="checkbox"/> \$450
Full-time Student**	<input type="checkbox"/> \$ 95	<input type="checkbox"/> \$195

Tutorial Only (Nov. 2) (w/lunch) \$450 \$575

Optional Items:

Feynman Prize Banquet	<input type="checkbox"/> \$ 50	<input type="checkbox"/> \$ 70
Senior Associate Reception (Senior Associate membership not required to attend the reception)	<input type="checkbox"/> \$ 40	<input type="checkbox"/> \$ 60
Journal Special Conference Issue	<input type="checkbox"/> \$ 40	<input type="checkbox"/> \$ 40

Conference \$ _____

Tutorial \$ _____

Feynman Prize Banquet \$ _____

Senior Associate Reception \$ _____

Journal \$ _____

TOTAL \$ _____

Please make checks payable to the Foresight Institute. Checks and bank drafts must be in U.S. dollars drawn on a U.S. bank.

VISA or MasterCard Number: _____ Exp. Date: _____

Signature _____

Printed Name _____

* No lunch option omits lunch on Friday, Saturday, Sunday.

** Full-time students must provide copy of undergraduate or graduate ID.

Non Profit Org.
US Postage
Paid
Los Altos, CA
Permit No. 32

www.foresight.org/conference