

**Caltech/MIT Enterprise Forum
February 10, 2007**

**Will Biologists Give Moore More Life?
Opportunities as Biology and Circuitry Meet**

SPEAKERS

Dr. George Thompson

Technology Strategy Group
Intel Corporation

Prior to becoming a member of Intel's Technology Strategy Group, Dr. Thompson managed projects for new product launches and pathfinding, enterprise platform enabling, materials development, and high-volume manufacturing. His main interests in silicon processing were etch process development and diagnosis, process integration, and yield analysis. His past research interests include applied optics, solid-state laser development, solar energy research, precision frequency control, and molecular spectroscopy.

Dr. Erik Winfree

Associate Professor in Computer Science and Computation & Neural Systems
Caltech

Dr. Winfree's research concerns the theory and engineering of autonomous biochemical algorithms using in vitro systems of DNA and enzymes, including programmable DNA self-assembly, DNA and RNA conformational switches and devices, and RNA transcriptional circuits. Such systems are envisioned as embedded information-processing and control elements for bottom-up nanofabrication, nanorobotics, biochemical diagnostics, and other biochemical processes. Winfree is the recipient of numerous awards, including the Feynman Prize for Nanotechnology (2006), the NSF PECASE/CAREER Award (2001), the ONR Young Investigators Award (2001), a MacArthur Fellowship (2000), and MIT *Technology Review's* first TR100 list of "top young innovators" (1999). Prior to joining the faculty at Caltech in 1999, Winfree was a Lewis Thomas Postdoctoral Fellow in Molecular Biology at Princeton, and a Visiting Scientist at the MIT AI Lab.

Dr. Paul Rothmund

California Institute of Technology

Paul W.K. Rothmund is a graduate of Caltech, where he dual majored in biology and computer science. His undergraduate project in information theory was one of the first designs for a DNA computer, and became one of the first patents for DNA computation. He has a long standing interest in problems at the interface of biology, chemistry, and computer science: he would like to understand what parts of biology may be best viewed as computation and he would like to turn the process of chemical synthesis into an exercise in programming. After receiving his Ph.D. under Leonard Adleman at the University of Southern California, he was awarded a Beckman postdoctoral fellowship and returned to Caltech to work with Professor Erik Winfree on

algorithmic self-assembly of DNA. Dr. Rothmund currently continues this work as a senior research fellow at Caltech.

Dr. H. Kumar Wickramasinghe

Henry Samueli Endowed Chair and Professor of Electrical Engineering and Computer Science
UC Irvine

IBM Fellow and Member

IBM Academy of Technology

Prior to joining UC Irvine, Dr. Wickramasinghe managed nanoscience and technology research at IBM's Almaden Research Center in San Jose, Calif. Holding 70 patents, some of his most significant inventions and contributions to the nano field include the development of the vibrating mode atomic force microscope (AFM), the magnetic force microscope, the electrostatic force microscope, the Kelvin probe force microscope, the scanning thermal microscope, and the apertureless near-field optical microscope. Most of these scanning probe microscopes are standard instruments used today for nano-scale characterization.

In 1984, Wickramasinghe joined IBM Research at the T. J. Watson Research Center in Yorktown Heights, New York. There, he led the team that developed atomic force microscopes (AFMs) into fully hardened instruments that could be used both within IBM and outside. He invented a number of novel scanning probe microscopes and near-field optical instruments and applied them to data storage and in-situ measurements that improve the yield and/or throughput of manufacturing lines.

His AFM jet device for rapid molecule sorting and delivery was recently named one of the 25 most innovative products of 2006 in the inaugural "Micro/Nano 25" competition held by the editors of *R&D* magazine and the *Micro/Nano Newsletter*. He has recently been recognized by *Scientific American* magazine as part of their 2006 Scientific American 50 – the magazine's prestigious annual list recognizing outstanding acts of leadership in science and technology from the past year.

Wickramasinghe is an IBM Fellow, and a member of the IBM Academy of Technology, as well as a Fellow of the American Physical Society, the Institute of Physics, the Institute of Electrical and Electronics Engineers, and the Royal Microscopical Society. He was elected to the National Academy of Engineering in 1998.

Dr. James K. Gimzewski

Professor

Dept. of Chemistry and Biochemistry

UCLA

Dr. Gimzewski is a Member of the California NanoSystems Institute (CNSI). Previously, he worked 20 years at the IBM Corporate Research Laboratories in Zurich, Switzerland. His achievements include: the Feynman Prize in Nanotechnology (1997), the Discover Award (1997), the 'Wired 25' Award (*Wired* magazine, 1998), and the Institute of Physics' "Duddell" prize and medal (2001). He is recognized by the *Guinness Book of Records* for the world's smallest calculator. He is a Fellow to the Royal Academy of Engineering, a Fellow of the Institute of Physics and a Fellow of the World Innovation Foundation. He has served on the board of reviewing editors of *Science* and the editorial board of *Nanotechnology*, as well as the *Nanotechnology Opportunity Report* by CMP Cientifica, which publishes state-of-the-art analysis of nanotechnology companies and organizations. He has joined the scientific boards of

several nanotechnology companies, including Veeco-DI Instruments, Quantum Precision Instruments and the Kentucky Initiative in Nanometer Scale Science and Technology.

Professor Gimzewski was a co-director of “NANO,” an interactive exhibit held from December 2003 until September 2004 at LACMA Lab, Los Angeles County Museum of Art. The exhibit was comprised of nine installations that presented nanotechnology using a hybrid of art and science that spanned 10,000 square feet of exhibition space in an installation that attracted hundreds of thousands of visitors.

With over 180 papers published and more than 200 invited international talks, Professor Gimzewski’s research continues to appear in journals, such as *Science* and *Nature*. Approximately 300 press articles reporting highlights of his work have appeared in various print media including *Nature*, *Science*, *Scientific American*, *The Economist*, *The New York Times*, *The Wall St Journal*, *The London Times*, *Financial Times*, *New Scientist*, *Discover Magazine*, *Smithsonian Magazine*, *Los Angeles Times*, and he was featured on the cover story of *LA Weekly*.

PRODUCER

Lynn Foster

Emerging Technologies Director

Greenberg Traurig, LLP

Author of *Nanotechnology: Science, Innovation & Opportunity*

Prentice Hall PTR(December 21, 2005)

Lynn E. Foster is the Emerging Technologies Director of Greenberg Traurig, L.L.P, one of the largest law firms in the United States. In this position he advises technology companies on technology transfer, patent licensing, strategic partnerships and raising capital.

Prior to joining Greenberg Traurig Mr. Foster held technology industry positions in corporate, entrepreneurial and government settings, among them managing software development in the aerospace industry, heading a startup, and managing a seed stage commercialization grant program. He serves on Advisory Boards for the Nano Science and Technology Institute and the International Engineering Consortium, as well as the Executive Committee of the Caltech/MIT Enterprise Forum. He authored the first *Nanotechnology Trade Study* and has directed eight Nanotechnology conferences and trade missions. He holds an MBA and a B.S. in Production and Operations Management.

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