The Kavli Prize Scientific Symposium in Honor of Dr. Mildred Dresselhaus

Speaker Profiles

Joanna Aizenberg

Professor of Materials Science at Harvard University
Co-Director, Kavli Institute for Bionano Science and Technology at Harvard University

Professor Aizenberg's research is aimed at understanding some of the basic principles of biomineralization and the economy with which biology solves complex problems in the design of functional inorganic materials. She then uses biological principles as guidance in developing new, bio-inspired synthetic routes and nanofabrication strategies that would lead to advanced materials and devices. Aizenberg is one of the pioneers of this rapidly developing field of biomimetic inorganic materials synthesis.

Paul Alivisatos

Chair in Nanoscience and Nanotechnology in UC Berkeley's College of Chemistry
Director, Lawrence Berkeley National Lab
Director of the Kavli Energy NanoSciences Institute (Kavli ENSI) at UC Berkeley

Paul Alivisatos is an award-winning chemist and internationally recognized authority on the fabrication of nanocrystals and their use in solar energy applications.

As director of Berkeley Lab, Alivisatos has launched two major scientific initiatives, "Carbon Cycle 2.0," a multidisciplinary approach to developing ways to help restore the balance in Earth's carbon cycle, which has been adversely affected by human activity, and the "Next Generation Light Source," the world's first facility capable of producing x-ray pulses measured in attoseconds, the timescale needed to capture the movement of electrons.

As director of the new Kavli ENSI, Professor Alivisatos will lead the effort to explore the basic science of how to capture and channel energy on the molecular or nanoscale, with the potential for discovering new ways of generating energy for human use.

Ching-Hwa Kiang

Associate Professor of Department of Physics & Astronomy and Department of Bioengineering at Rice University.

- Postdoctoral Associate, Massachusetts Institute of Technology (Dresselhaus lab)

Professor Kiang received her Ph.D from Caltech while performing experiments at the IBM Almaden Research Center. She works in the area of nanomanipulation of single biomolecules and carbon nanotubes. She and her co-workers Donald Bethune and Robert Beyers at IBM discovered single-walled carbon nanotubes in 1993. This discovery has opened a door for modern nanoscience development.

Her current research focuses on single-molecule manipulation and nanobiology, focusing on understanding and quantification of the force measurements and its application to medicine. She uses atomic force microscope to stretch proteins and DNA to study their dynamic states and interactions.

Philip Kim

Professor, Physics Department, Columbia University

Professor Kim's research area is in experimental condensed matter physics with an emphasis on physical properties and applications of nanoscale low-dimensional materials. The unique properties of low dimensional systems are generally understood by considering enhanced quantum effects and increased correlations due to the reduction of available phase space.

The focus of Professor Kim's research is the mesoscopic investigation of transport phenomena, particularly, electric, thermal and thermoelectrical properties of low dimensional nanoscale materials. Notably in recent years, Prof. Kim has demonstrated novel transport phenomena in low-dimensional graphitic nanomaterials such as carbon nanotubes and graphene.

Michal Lipson

Professor at the School of Electrical and Computer Engineering at Cornell University
Member, Kavli Institute at Cornell for Nanoscale Science

Professor Lipson is an optical physicist working at the intersection of fundamental photonics and silicon fabrication engineering to develop devices that harness the information-processing capabilities of light.

Professor Lipson's continued refinement of both opto-electronic and purely optical circuits has decreased their size, increased their efficiency, and accelerated their switching speed. The resulting silicon-based photonic integrated circuits have the potential to improve signal transmission and processing dramatically. Lipson's elegant solutions to a variety of theoretical and engineering challenges in silicon photonics are paving the way for the future development of practical and powerful optical computing devices.

Nai-Chang Yeh

Professor of Physics at Caltech (She was the first female professor in that department)
Co-Director of Kavli Nanoscience Institute at Caltech

Ph.D., Massachusetts Institute of Technology (Dresselhaus lab)

Professor Nai-Chang Yeh is a world-renowned physicist specialized in experimental condensed matter physics.

Her research emphasis is the fundamental physical properties of strongly correlated electronic systems. She is best known for her work on a variety of superconductors, magnetic materials, and superconductor/ferromagnet heterostructures.

As co-director of the KNI, she will guide the effort to emphasize research in nanobiotechnology, nanophotonics, and large-scale integration of nanosystems by pushing the state-of-the-art beyond current capabilities in nanofabrication.

Alex Zettl

Professor of Physics at UC Berkeley and Senior Scientist at LBNL

Alex Zettl's research into the properties of novel materials has produced significant advances in the field. He is part of a Nanotechnology group at UC Berkeley, the Center of Integrated Nanomechanical Systems. He holds patents on the nanoradio, the nano mass sensor and other developments from this center's research.

Professor Zettl's research interests are in experimental condensed matter physics. They synthesize and characterize novel materials with unusual electronic and magnetic ground states, including low-dimensional and nanoscale structures.

The research of Zettl, Kenneth Jensen, Jeff Weldon and Henry Garcia culminated in a single nanotube mounted on the tip of a metal electrode. When an electric current is passed between that nanotube and another, shorter, nanotube mounted nearby, an FM radio-frequency signal can be sensed by the nanotube, and the signal is converted into an audible signal without any other circuitry required. This remarkable phenomenon was first described in the November 2007 issue of Nano Letters, a monthly publication of the American Chemical Society.