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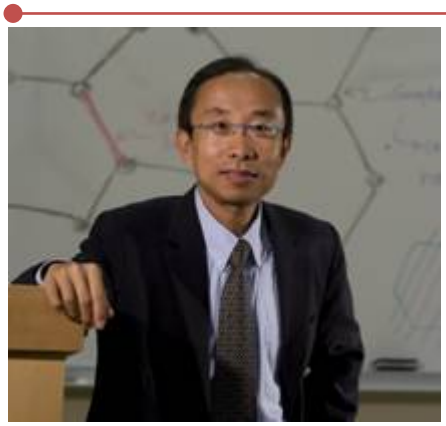

Thursday, July 11, 2013
10am, 260 Dreese Laboratories

Prof. H.S. Philip Wong
Electrical Engineering
Stanford University

Nanotechnology 101: Part 1

Abstract: This tutorial is an introduction to the emerging opportunities in novel nanoscale devices and fabrication techniques, with particular emphasis on the implications for circuit and system designers. Topics covered include:

- Fundamentals of device physics and materials science at the nanoscale
- The ITRS Emerging Research Devices (memory & logic)
- Nanotubes, nanowires, and nanoparticles
- Molecular devices
- Nanofabrication techniques and their impact on device layout

An assessment of the level of maturity for the proposed devices will be given. Part I provides an introduction, outlines key challenges, and covers ITRS emerging research devices, nanotubes and nanowires

Bio: H.-S. Philip Wong is the Willard R. and Inez Kerr Bell Professor in the School of Engineering. He received the B.Sc. (Hons.) in 1982 from the University of Hong Kong, the M.S. in 1983 from the State University of New York at Stony Brook, and the Ph.D. in 1988 from Lehigh University, all in electrical engineering. He joined the IBM T. J. Watson Research Center, Yorktown Heights, New York, in 1988. In September, 2004, he joined Stanford University as Professor of Electrical Engineering.

While at IBM, he worked on CCD and CMOS image sensors, double-gate/multi-gate MOSFET, device simulations for advanced/novel MOSFET, strained silicon, wafer bonding, ultra-thin body SOI, extremely short gate FET, germanium MOSFET, carbon nanotube FET, and phase change memory. He held various positions from Research Staff Member to Manager, and Senior Manager. While he was Senior Manager, he had the responsibility of shaping and executing IBM's strategy on nanoscale science and technology as well as exploratory silicon devices and semiconductor technology.

Professor Wong's research aims at transforming discoveries in science into useful technologies. His work contributed to the advancements in nanoscale science and technology, semiconductor technology, solid-state devices, and electronic imaging. He explores the use of nano-materials, nanofabrication techniques, and novel device concepts for nanoelectronics systems. Novel devices often enable new concepts in circuit and system designs. His research also includes explorations into circuits and systems that are device-driven. Currently, his research covers a broad range of topics including carbon electronics, biosensors, self-assembly, exploratory logic devices, nanoelectromechanical relays, device modeling, and non-volatile memory devices such as phase change memory and metal oxide resistance change memory.

He is a Fellow of the IEEE and served on the IEEE Electron Devices Society (EDS) as elected AdCom member from 2001 – 2006. He was the Editor-in-Chief of the IEEE Transactions on Nanotechnology in 2005 – 2006. He is a Distinguished Lecturer of the IEEE Electron Devices Society (since 1999) and Solid-State Circuit Society (2005 – 2007).

Hosted by: Paul R. Berger