Title: **Density-Gradient Modeling and Complex Bandstructure Calculation of Tunneling Current in Device Simulation**

Speaker:
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Abstract:
Because of the nonlocal nature, tunneling current is difficult to evaluate in device simulation, yet it plays an increasingly crucial role in determining the characteristics of nano-scaled electronic devices. In addition to familiar WKB approximation to intraband tunneling and Kane's formula for band-to-band tunneling (BtBT), there are other less known methods in the tunneling calculation, namely, the macroscopic density-gradient (DG) quantum correction and microscopic calculation of complex bandstructure. This talk reviews the progress in these two approaches.

Biography of the speaker:
Prof. Zhiping Yu graduated from Tsinghua University, Beijing, China, in 1967 with B.S. degree, he received M.S. and Ph. D degrees from Stanford University, Stanford, CA, US in 1980, and 1985, respectively.

He is presently the professor of Institute of Microelectronics, Tsinghua University, Beijing, China and a visiting professor in EE Dept. at Stanford University, CA, USA (2008-2010, pending renewal for the next term of three years). From 1989 to 2002, he has been a senior research scientist in EE Dept. at Stanford, while serving the faculty member in Tsinghua. Between 2003 and 2005, he held Pericom (San Jose, USA) Microelectronics Professorship and since 2006 he holds Novellus (San Jose, USA) Microelectronics Professorship, both in Tsinghua.

His research interests include device simulation for nanoscale MOSFETs, quantum transport in nanoelectronic devices, compact circuit modeling of passive and active components in RF CMOS, and numerical analysis techniques.

Prof. Yu has published more than 300 technical papers and is the co-author of a book on TCAD (Technology CAD) in English. A co-authored book on RF CMOS circuit design (in Chinese) was published by Tsinghua University Press in 2006.

Prof. Yu is an IEEE Fellow and served as the Associate Editor of IEEE Trans. CAD of IC & Systems (ICCAD) from 1996 to 2005. He now serves as member of IEEE EDS Nanotechnology Committee since 2006.

Organizer: Dr. N. Wong