Reliability / CPMT / ED Singapore Chapter

NUS National University of Singapore

IEEE / NUS TECHNICAL TALK

Jointly Organized by NUS Department of Mechanical Engineering and IEEE Rel/CPMT/ED Singapore Chapter

"Multiscale Modeling of Evolving Voids, Inclusions and Cracks: Enabling Nanoscale Design of Geometry and Materials"

Speaker:	Prof Ganesh Subbarayan, School of Mechanical Engineering, Purdue University
Date:	25 June 2009 (Thursday)
Time:	3:30pm to 5:00pm
Venue:	Seminar Room EA-06-03, Blk EA Faculty of Engineering, National University of Singapore, *Maplink: http://www.street-directory.com/nus/campus2.cgi?x=254&y=688&level=2&heading=Department%20of%20Mechanical%20Engineering&star=1* *(directional map in another pdf file)*
Admission:	Free (no registration required)

ABSTRACT

Many microelectronic problems involve evolving boundaries driven by complex physical processes. Examples include fatigue cracks in solder joints, interfacial debonding of thin films, cracks through porous dielectrics, void evolution under electromigration, intermetallic phase evolution in SnAgCu solder alloys. The challenge in these problems is the need to describe complex geometrical changes in addition to the need to model complex physical processes that underlie the observed behavior. Studying phase arrangements, cracks and their evolution requires an ability to describe geometrical shape evolution as well as topological modification in a computationally efficient manner. In this talk, I will first describe several recent examples of this research covering void evolution, wrinkling of dielectric thin films, interfacial debond, and fatigue crack propagation. I will then describe how this multiscale modeling capability can serve as an enabler for designing nanoscale systems, including nanoscale films and nanoparticulate composites.

ABOUT THE SPEAKER

Ganesh Subbarayan is a Professor of Mechanical Engineering at Purdue University. He was previously at University of Colorado (1994-2002) and at IBM Corporation (1990-1993). He holds a B.Tech degree in Mechanical Engineering (1985) from the Indian Institute of Technology, Madras and a Ph. D. (1991, direct PhD program) degree in Mechanical Engineering from Cornell University. Dr. Subbarayan's research is in Computational Modeling and Design of objects over multiple length scales with applications to reliability of Microelectronic Interconnects and Packages. The recognition of Dr. Subbarayan's research includes among others the 2005 Mechanics Award from the ASME EPP Division, 2005 University Faculty Scholar Award from Purdue University, and the NSF CAREER award. He is a Fellow of ASME and he currently serves as the Editor-in-Chief of IEEE Transactions on Advanced Packaging.