

# Colloquium Notice

## Dr. Ping-Chuan Wang

**IBM Microelectronics**

### *Electromigration - A Reliability Challenge in Microelectronics*

Over the last few decades with more and more devices have been required on integrated circuit (IC) chips, the dimensions of these devices have been reduced dramatically. As the density of IC devices is increased, the fabrication of circuit elements meeting both performance and reliability requirements become ever more challenging.

Electromigration, as one of the major reliability challenges, is the transport of matter in a conductor as a result of momentum transfer from electrons to atoms, and it was first recognized as a failure mode in microelectronics in the late 1960's [1]. As a result of this phenomenon, voids are formed at the cathode end of a conductor wire and cause open-circuit; while extrusions can occur at the anode end to cause short-circuit.

In this seminar, electromigration will be explained from a material science point of view. Methods of engineering materials and structures to enhance the electromigration reliability in product lifetime will also be introduced.

[1] I. A. Blech and H. Sello, "The Failure of Thin Aluminum Current-Carrying Stripes on Oxidized Silicon," *Physics of Failure in Electronics*, edited by T. S. Shilliday (USAF Rome Air Development Center Reliability Series Proc. Vol. 5, Rome, NY, 1967), p. 496.

Monday

**December 11, 2006**

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326