

ME DEPARTMENTAL SEMINAR

Friday, January 13, 2006

1:00pm – 2:00pm

2233 GG BROWN

**Professor Michael J. Aziz
Gordon McKay Professor
Division of Engineering and Applied Sciences
Harvard University**

“Nanoscale Morphology Control Using Ion Beams”

Abstract:

Low energy ion irradiation of a solid surface can be used to control surface morphology on length scales from 1 micron to 1 nanometer. Focused or unfocused ion irradiation induces a spontaneous self-organization of the surface into nanometer-sized ripples, dots, or holes; it also induces diameter increases and decreases in a pre-existing nanopore by a tradeoff between sputter removal of material and stimulated surface mass transport. Experiments will be reviewed that illuminate the kinetics of evolution of the surface morphological instability; the influence of initial and boundary conditions on guiding the self-organization; the development of shock fronts that sharpen features at sufficiently steep angles; and the kinetics governing the fabrication of nanopores for single-molecule detectors.

Bio:

Michael J. Aziz is Gordon McKay Professor in the Division of Engineering and Applied Sciences at Harvard University. Dr. Aziz received his Ph.D. from Harvard University in 1984. His research interests include nanoscale structures, thin films and kinetics, such self-organization and kinetics of formation, thermal stability, and decay of nano-scale structures in wafer-compatible processes, nanoscale morphology control using ion beams, thin film growth mechanisms in pulsed laser deposition and molecular beam epitaxy, semiconductor alloys formed by pulsed laser melting, kinetics of interface motion far from equilibrium, pressure and stress effects on kinetic processes in materials. Dr. Aziz has held several visiting professorships and research appointments worldwide, and offices in professional organizations such as board of directors and executive committees of the Materials Research Society. Among his many awards include the creativity award by the National Science Foundation and presidential young investigator award. He is a fellow of the American Association for the Advancement of Science and American Physical Society.