

UNH Materials Science Seminar

11:00-12:00, Thursday, October 26, 2006

DeMeritt Hall 209B

University of New Hampshire

Thermal and Electromigration-induced Stresses and Composition Changes from Real-time X-ray Microdiffraction and Microfluorescence

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Electromigration is mass transport caused by flow of an electrical current. Since the 1960's it has been recognized as a reliability problem in metal conductor lines of integrated circuits. Stresses from thermal cycling of integrated circuits can also affect reliability. Better understanding of electromigration and thermal stresses in thin, narrow, passivated conductor lines is important for continued technological advances in integrated circuit size reduction, performance enhancement, and reliability improvement. This seminar will describe how x-ray microbeam diffraction and fluorescence measurements are providing new answers to long standing questions, and are raising new questions, about electromigration, stress and composition evolution in polycrystalline metal alloy conductor lines.

Slade Cargill is the Sherman Fairchild Professor and past chair of the Department of Materials Science and Engineering at Lehigh University. He came to Lehigh in 1997 from Columbia University, where held a joint appointment in materials and in applied physics. Previously, he was a senior manager in the Physical Sciences Department at IBM's Thomas J. Watson Research Center, where he spent 18 years. Cargill also served on the engineering and applied science faculty of Yale University, as a Senior Visiting Fellow at the Cavendish Laboratory and an Overseas Fellow of Churchill College, Cambridge. He is presently on sabbatical leave as Visiting Scholar in Applied Physics at Harvard University. He received his BS degree in physics from Georgia Tech (1966) and SM (1966) and PhD (1969) degrees in applied physics from Harvard.