Seminar Series

Sponsored by
COMSET / School of Materials Science and Engineering
Thursday, October 11, 2007
8:00 AM – Sirrine Hall – Room 364

Optical Properties of Heavy-metal Oxide Glasses and Glass-Ceramics

Steven H. Morgan
Chair, Department of Physics
Fisk University

Dr. Morgan will be discussing some of his research on heavy-metal oxide (HMO) glasses and glass-ceramics. Some of his earlier work focused on HMO glasses with large optical nonlinearity for applications such as all-optical switches and stimulated Raman fiber amplifiers. These studies include the investigation of Raman scattering cross sections for the determination of the nuclear contribution to the nonlinear index of bulk glasses, and the investigation of the nonlinear optical properties of ion implanted glasses. More recently he has been working with rare-earth doped glasses and glass-ceramics for fiber laser and waveguide applications. Since the maximum vibrational energies of GeO_2 and TeO_2 based glasses are intermediate between those of the silicate and fluoride glasses, they intrinsically can have higher quantum efficiencies and provide more fluorescent emission than silicate-based glasses. At the same time, they are expected to have better mechanical strength, chemical durability, and thermal stability than fluoride glasses. He will also describe some of his current results on erbium- and cerium-doped transparent glass-ceramics, in which the rare-earth ion partitions into a low-phonon energy crystalline phase.