

# Physics Colloquium

## Michigan Technological University

September 15 (Thursday) 2005, 4:00 to 5:00 pm  
Room 139, Fisher Hall

### Photonic Crystals and Magnetophotonic Crystals

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Photonic crystals are engineered photonic structures proposed for the first time in 1987. Interesting and novel physical phenomena are engendered in these crystals due to the formation of optical band gaps and band structures akin to the electronic bands that exist in silicon and other semiconductors. Examples are negative refractive index and the super-prism effect. The extension of photonic crystals technology to magnetic films was first developed about ten years ago by M. Inoue and by ourselves soon thereafter. Over the last few years we have demonstrated the existence of photonic band gaps and enhanced polarization rotation in magneto-optic on-chip waveguides. The talk will give a brief background on photonic crystals generally and then discuss some of the recent developments in magnetophotonic crystals.



Miguel Levy received his B.S. degree from Duke University, M.S. degree from Cornell University and Ph.D. degree from the City University of New York, all in Physics. Before coming to Michigan Tech he worked as a research professor in Applied Physics at Columbia University. Dr. Levy's field of expertise is in photonics, ferroelectric devices and materials engineering. In recent years he has focused his attention on the development of magnetic photonic crystals in planar geometries. Another area of interest in Levy's group is the fabrication and study of photonic crystals in ferroelectric materials, and the interplay between strain and optical properties.