

## WEEKLY CALENDAR

March 15, 2010

### Departmental Colloquium

#### "Table-Top General Relativity"

3:40 PM, March 18, 2010  
109 Nicholson Hall

John Howell  
University of Rochester

Host: Jonathan Dowling

• Refreshments served at 3:15 PM in 232 (Library) Nicholson Hall •

It is well known that a light beam is redshifted as it moves away from a gravitational field. However, the earth's gravitational field is so weak that frequency changes must usually be measured over very large distances. Slow light to the rescue! I will show how slow light can be used to achieve an enhancement in a redshift phase measurement. I will discuss some of the important principles of slow light and how it can be used to amplify a gravitational redshift signal on a scale of centimeters and even Angstroms.

#### Publications:

"Handbook of Optics, Third Edition Volume IV: Optical Properties of Materials, Nonlinear Optics, Quantum Optics," Edited By Michael Bass, Casimer Decusatis, Guifang Li, Vasudevan Lakshminarayanan, Eric Van Stryland, Virendra N. Mahajan; Chapter 23, "Quantum Entanglement in Optical Interferometry," **Hwang Lee**, Christoph F. Wildfeuer, **Sean D. Huver**, & **Jonathan P. Dowling** (McGraw-Hill, 2010).

"Quantum Metrology with Two-Mode Squeezed Vacuum: Parity Detection Beats the Heisenberg Limit," **Petr M. Anisimov**, Gretchen M. Raterman, **Aravind Chiruvelli**, **William N. Plick**, **Sean D. Huver**, **Hwang Lee**, and **Jonathan P. Dowling**, Phys. Rev. Lett. 104, 103602 (2010).

"Enhancing image contrast using coherent states and photon number resolving detectors," A. J. Pearlman, A. Ling, E. A. Goldschmidt, **C. F. Wildfeuer**, J. Fan, and A. Migdall, Optics Express, Vol. 18, Issue 6, pp. 6033-6039.

"Optimizing the multiphoton absorption properties of maximally path-entangled number states," **William N. Plick**, **Christoph F. Wildfeuer**, **Petr M. Anisimov**, and **Jonathan P. Dowling**, Physical Review A 80, 063825 (2009).

"Binary Black Holes' Effects on Electromagnetic Fields," Carlos Palenzuela, **Matthew Anderson**, **Luis Lehner**, Steven L. Liebling, and David Neilsen, Physical Review Letters 103, 081101 (2009).