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202 NICHOLSON HALL
Louisiana State University
Baton Rouge, Louisiana 70803-4001

WEEKLY CALENDAR

September 27, 2010

Departmental Colloquium

3:40 PM, September 30, 2010
109 Nicholson Hall

"Nonlinear and Quantum Optics with the Whispering Gallery Mode Resonators"

Dmitry Strekalov
California Institute of Technology, Jet Propulsion Laboratory

Host: Gabriela Gonzalez

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

Whispering gallery mode (WGM) resonators guide waves along their curved and smooth surface by continuous reflection. Discovered early in the XXth century in acoustics, WGMs have been observed also in microwaves and in optics. The most important feature of the optical WGM resonators is their exceptionally high quality factor, which is due to the fact that the total internal reflection can be intrinsically lossless. The combination of high quality factor, small mode volume, continuously variable input and output coupling, and good mechanical stability has made optical WGM resonators unique systems both for the fundamental optics research and technological applications.

Particularly impressive results are achieved in nonlinear and quantum optics. Experimental research in these areas is typically associated with high-power lasers, required to achieve a measurable interaction between photons. With WGM resonators, we achieve strong photon-photon interaction at the orders of magnitude weaker optical powers which opens up fundamentally new possibilities for the experimentalists.

In this talk, I will review the experimental demonstrations of various nonlinear optical phenomena in WGM resonators recently carried out at the Jet Propulsion Lab and the Max Plank Institute for Physics of Light. Focus will be made on the unique aspects of WGM resonators as sources of entangled and squeezed light.

PUBLICATIONS:

1. "Photometry of a Group of Stars in the Direction of NGC 1746/1750/1758", **Arlo U. Landolt** and John L. Africano, III, 2010, Publications of the Astronomical Society of the Pacific, 122, 1008.
2. "Mergers of Magnetized Neutron Stars with Spinning Black Holes: Disruption, Accretion, and Fallback", **Sarvnipun Chawla, Matthew Anderson**, Michael Besselman, Luis Lehner, Steven L. Liebling, Patrick M. Motl and David Neilsen, Physics Review Letters, 105, 111101 (2010).