



SACRAMENTO STATE

Department of Physics & Astronomy Spring 2009

## ***Physics Colloquium Series***

### ***“Contact-free Optical Manipulation of Micro- and Nano-sized Objects Using Holographic Laser Tweezers”***

*Optical trapping provides fascinating experimental capabilities ranging from cooling atoms to sorting nanoparticles and to stretching biopolymer molecules. This lecture will discuss applications of laser trapping in soft matter and biological systems such as liquid crystals, colloids, and bacterial biofilms. Starting from the underpinning physical mechanisms, I will demonstrate that focused laser beams can be used for manipulation of a variety of very different nano- and micron-sized objects in both isotropic and anisotropic fluids. I will then discuss quantitative measurements performed using laser tweezers and will show how they allow one to control molecular orientation patterns in liquid crystals.*

## ***Ivan I. Smalyukh***

***Department of Physics & Liquid Crystal Materials  
Research Center,  
University of Colorado at Boulder***

**Thursday, April 9, 2009  
4:00-5:20 PM - MND 1015**

**Open & Free to all Students, Faculty & Public**