**PHYSICAL SEMINAR**  
**MONDAY,**  
**FEBRUARY 29, 2016**  
**4:00 P.M.**  
**HUTCHISON HALL 473**  
**DEPARTMENT OF CHEMISTRY**  
**UNIVERSITY OF ROCHESTER**

**Guest Speaker:**  
**Professor Dustin Froula**  
**University of Rochester**  
**Laboratory for Laser Energetics**

“Raman Amplification of High Power Laser Pulses”

**Abstract:** Exploring the physics at the laser-intensity frontier is an exciting challenge. Present-day petawatt-class lasers provide on-target focused intensities of $10^{22}$ W/cm$^2$. Raman amplification opens a potential route for focused intensities in the range $10^{23}$ to $10^{25}$ W/cm$^2$ as well as providing a cost-effective route for high-energy petawatt laser pulses. Raman amplification is a process by which a long energetic pump pulse transfers its energy to a counter-propagating short seed pulse through a resonant electron plasma wave. A recent comprehensive series of large-scale multidimensional particle-in-cell simulations has identified the optimal parameter space for this interaction. At the Laboratory for Laser Energetics (LLE), we plan to perform a careful and systematic experimental investigation, aided by state-of-the-art numerical modeling, into the physics of Raman amplification and the associated laser–plasma instabilities that are notorious for limiting the efficient energy extraction. (Professor Froula received a secondary appointment as an Assistant Professor in the Physics in Astronomy Department in 2013.)

**Host:** Professor Ignacio Franco, email: franco@chem.rochester.edu