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Host: Leo Zhigilei

**"Control of Material Ablation and Plasma Formation with
Femtosecond Laser Pulses"**

Date: Tuesday, May 19th, 2009

Time: 1:30 to 2:30 PM

Room: MSE 125

Abstract:

Laser interaction with materials is a highly complex phenomenon, involving light absorption by the surface layer, electron-phonon interactions that weaken bonds and cause the material to melt, superheating of the material to cause spallation and phase explosions, plasma formation, the launching of pressure waves in the material and shock waves in the plume, and the generation of ballistic electrons in the material and electron jets in the plasma, to mention just some of the processes that can occur. In this seminar I will describe three sets of experiments designed to probe the mechanisms of some of these processes. In the first, we use trains of laser pulses to ablate a material and study the effects of phonon excitation and melting on plasma emission. In the second set, we investigate the polarization of the plasma emission, which is both of fundamental interest as well as a useful tool for stand-off detection. In the last set of experiments, we show how to make light "turn corners" by energy exchange between laser beams interacting with a plasma.