



## **Physics Colloquium**

**Friday January 25th, 2013**

**4:10 - 5:00 pm, EPS108**

**“Laser Remote Sensing at Spectrum Lab”**

**Zeb Barber, Director of MSU-Spectrum Lab**

### **Abstract:**

For the past several years Spectrum Lab has been developing a program in laser remote sensing including: remote sensing of chemicals in the Mid IR and two high resolution laser ranging technologies. The first high resolution ranging technology is based on the active stabilization of broadband linear frequency chirps and was co-developed with Bridger Photonics Inc. This technology allowed the demonstration of the highest resolution, long range, ladar measurements to date (~100 microns at ~1km) and the demonstration of table-top synthetic aperture ladar (SAL) imaging techniques for 2D and 3D imaging. Compressive Ranging is the second laser ranging technology being pursued at Spectrum Lab. This technique uses ideas from the field of compressive sensing and utilizes high bandwidth pseudo-random waveforms and low bandwidth detection to achieve high resolution laser ranging with particular application to sparse scenes. Finally, the results of a project investigating the application of information theory to understand and improve the photon information efficiency (PIE) of laser ranging will be presented.

### **Host:**

Rufus Cone

Refreshments served in the EPS second floor lobby at 3:45, prior to the talk.