

Chez Pierre

Presents ...

Monday, October 21, 2013

12:00pm

MIT Room 4-331



Willie Padilla
Boston College

“Terahertz Compressive Imaging with a Single Pixel: Applications in Metamaterials”

Metamaterials are engineered artificial materials that consist of subwavelength, periodic metallic inclusions, and can exhibit exotic electromagnetic properties not readily available in nature. Over the past decade, the interest of the scientific and engineering communities for developing such metamaterial structures has been continuous and increasing. Experimental realizations of negative index of refraction, invisibility cloaks, and perfect lenses all served to ignite the field. As metamaterial research continues to mature, demonstrations of practical devices will become increasingly important for continued growth. Recently near unity absorption has been achieved with metamaterials and results show that the fundamental light interactions of surfaces may be dynamically controlled. We show metamaterials which achieve total absorption of electromagnetic waves and present several methods capable of tuning absorption values with high dynamic range. Metamaterial spatial light modulators are fashioned and demonstrated capable of achieving compressive imaging at terahertz frequencies.