The Mani L. Bhaumik Institute of Theoretical Physics presents the Winter 2018 Bhaumik Luncheon Seminar. The goal of this Seminar series is to learn about exciting new ideas from scientists in the department and around the world through short talks and discussions. The Seminar is held once per academic quarter. Come participate and enjoy a light lunch.

Pietro Musumeci, UCLA

“Time-resolved transmission electron microscopy using relativistic electrons”

After the discovery of the Higgs boson in 2012, the priority of the experiments at CERN’s large hadron collider is to search directly for new physics beyond the Standard Model at the highest energies attainable. The current data-taking at the LHC is at a center of mass energy of 13 TeV, about 1.6 times higher than in 2012, and has been extremely successful with twice as many proton collisions already recorded. This opens new frontiers in both energy and intensity enabling searches for heavy new particles with masses of several TeV, more than ten times heavier than the heaviest known elementary particle, the top quark. Meanwhile, precision measurements of Standard Model processes indicate that searching mass scales at least this high is probably required to find new physics. Our latest published results using the 2016 dataset of the Compact Muon Solenoid experiment will be presented.

Jay Hauser, UCLA

“Physics of the High Luminosity LHC”

The experiments CMS and ATLAS discovered the Higgs boson back in 2012 using colliding proton beams from the Large Hadron Collider (LHC). These experiments have continued to take data, and there is an upgrade program called the High Luminosity LHC that will provide much increased collision luminosity in the period 2026-2038. This talk will discuss simply and informally the physics motivations and the work to be done.