Physics Colloquium – Fall 2018 schedule

See specific dates for specific times.
Joe Mack Wilson Student Center, A 216 (Marietta Campus)

Thursday, September 6, 2018

- Dr. Marco Guzzi, Department of Physics, Kennesaw State University (KSU)
  - "The Large Hadron Collider (LHC) Era: Protons and New Physics"
  - ABSTRSCT: The CERN Large Hadron Collider (LHC) is the world's biggest and most powerful particle accelerator where high energy beams of protons, traveling at approximately the speed of light, collide. I will discuss the physics of the LHC by using a simple language and I will highlight its role as a precision and discovery machine. I will discuss how our current knowledge of the structure of the proton has an impact on both precision observables and potential discovery of New Physics signals.

Friday, October 5, 2018

- Dr. Chetan Dhital, Department of Physics, KSU
  - "Electronic phase diagram of Sr_3 $(Ir_{1-x}$ $Ru_x)_2O_7$"
  - ABSTRACT: Iridium-based 5d transition metal oxides host rather unusual electronic/magnetic ground states due to strong interplay between electronic correlation, lattice structure and spin-orbit interactions. Out of the many oxides containing iridium in its 4+ valence state, the Ruddelsden-Popper (RP) series [Srn+1IrnO3n+1] oxides are some of the most interesting systems to study. I will discuss about the importance of electronic correlations in Sr3Ir2O7 (so called weakly correlated) by doping the iridium with ruthenium. Finally, I will present the electronic/magnetic phase diagram of the doped system Sr3 (Ir1-xRux) 2O7 resulting from electrical transport, magnetization and neutron scattering study.

Friday, November 9, 2018

- **Dr. Connie B. Roth**, Associate Professor, Department of Physics, Emory University
  - "Local Changes to the Glass Transition Temperature Near and Across Polymer Interfaces"
  - ABSTRACT: Polymers (aka plastics) are long chain molecules that are used for all sorts of applications because of their strong mechanical properties, low cost, ease of processing, and light weight. New technologies for energy, filtration, and bioengineering applications are creating nanostructured, hybrid, and nanoscaled materials where polymers are in contact with many different kinds of interfaces. The presence of these interfaces strongly affects the local material properties of polymers, which is especially true for polymer glasses. Glasses are non-equilibrium solids with amorphous (non-crystalline) molecular order, existing as window glass, clear plastics, and jammed particulate systems. Our lab tries to understand what about the molecular structure of polymers dictates their physical properties and how they change near interfaces. We use a fluorescence technique to measure the local value of the glass transition temperature (Tg), the temperature at which the material solidifies on cooling from an equilibrium liquid to a non-equilibrium glass. We have mapped out the local Tg profile near and across interfaces between two dissimilar polymers for a number of glassy/rubbery systems. These results show surprisingly large length scales that contradict traditional textbook understanding, and have implications for the physics behind engineering new materials at the nanoscale.

Friday, November 30, 2018

- Student Presentations