SACRAMENTO STATE

Department of Physics & Astronomy Fall 2009

Physics Colloquium Series

"The Search for New Physics in New Materials"

Many important advances in the physics of strongly correlated electron systems have been driven by the development of new materials. For instance, the recently discovered Fe-*Pn* (*Pn* = P, As) high temperature superconductors (e.g. $LaFeAsO_{1-x}F_x$, $SrFe_2As_2$, Sr_2VO_3FeAs) are members of a much larger family of pnictide-based compounds which constitute a vast reservoir of novel strongly correlated electron ground states. In general, the occurrence of such a wide range of phenomena derives from a delicate interplay between competing interactions that can be tuned by partial or complete substitution of one element for another, as well as the application of pressure, and magnetic fields, resulting in rich and complex electronic phase diagrams in the hyperspace of temperature, chemical composition, pressure and magnetic field. Since the phase space in the search for unconventional phenomena is so large, the feedback loop between materials synthesis and characterization is fundamental to rapid development and understanding in condensed matter physics. In this seminar, I will elaborate upon materials synthesis and measurement techniques, after which I will give an overview of the new Fe-*Pn* high temperature superconductors.

Dr. Ryan Baumbach

UC San Diego, Department of Physics

Thursday, October 22, 2009

4:00-5:15 PM - MND 1015

Open & Free to all Students, Faculty & Public