



College of
Science
Department of Physics
& Astronomy

202 Nicholson Hall
Louisiana State University
Baton Rouge, LA 70803
TEL: 225-578-2261
FAX: 225-578-5855
<http://www.phys.lsu.edu>

Weekly Calendar

January 19 - 22, 2016

Departmental Colloquium

"Surfaces of topological solids: the good, the bad, and the ugly"

3:30 PM Thursday, January 21, 2016

119 Nicholson Hall

Ilya Vekhter

Louisiana State University

HOST: Juhan Frank

• Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall •

One of the most rapidly developing areas of condensed matter physics in last few years has been the study of so-called topological matter: solids whose properties are controlled by the topological structure of their elementary excitations. Topological insulators and superconductors are the most prominent examples of this family of materials, and have been theoretically proposed to be uniquely useful in a variety of settings, from quantum computation to nano-electronics. I will review the nature and basic properties of these materials, and focus specifically on the surface states that are the defining signature of topological electronic matter. I will show that, while some properties of these states may follow from general considerations, their response to external fields is non-universal, and depends on the details of the bulk material and the surface preparation. I will discuss the importance of these conclusions for applications and future direction of research.

Announcement:

Due to the Martin Luther King Jr. holiday the University will be closed on Monday, January 18, 2016. Classes resume on Tuesday, January 19, 2016 at 7:30 am.

Publications:

1. "Phase diagram of a strongly interacting spin-imbalanced Fermi gas". Ben A. Olsen, Melissa C. Revell, Jacob A. Fry, **Daniel E. Sheehy**, Randall G. Hulet. Phys. Rev. A 92, 063616 (2015).
2. "Fulde-Ferrell-Larkin-Ovchinnikov state of two-dimensional imbalanced Fermi gases". **Daniel E. Sheehy**. Phys. Rev. A 92, 053631 (2015).
3. "The Impact of the Dimension of System Matrix and Object Support in Reconstruction for a Stationary Dedicated Cardiac SPECT with Truncated Projections", C. Chan, **J. Dey**, Y. Gromshtein, J. Wu, Y-H Liu, R. Lampert, A.J. Sinusas, C. Liu. Accepted *Medical Physics* on Nov 2015, in press; online publication Jan 2016.