



## Events

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Other - Adjunct Faculty Talk in the Material Worlds Focus Area

**Strange Bedfellows: Superconductivity Enabling Magnetism****Ilya Vekhter, Louisiana State University**

Associate Professor, Department of Physics and Astronomy

Digital Media Center Theatre  
October 18, 2013 - 11:30 am**Abstract:**

One of the major undertakings of condensed matter physics is to classify and understand not just the appearance, but also coexistence and competition of ordered phases in electronic matter. In this talk I will discuss one notable example of such cohabitation, that between magnetism and superconductivity. I will introduce the main concepts of the ordering phenomena in solids, discuss their origin, and review the physics of this competition. I will then explain why the case of heavy fermion CeCoIn5 has challenged our understanding: this is the only situation where (antiferro)magnetism appears under an applied magnetic field in the superconducting state, but vanishes as soon as superconductivity is suppressed. After reviewing various scenarios for this observation and comparing them with the experimental data, I will present a theory for this behavior, and discuss how to test its predictions in experiment.

**Speaker's Bio:**

Ilya Vekhter was an undergraduate student at Moscow Institute of Physics and Technology, and received both M. Sc. and Ph. D. from Brown University. He then spent several years as a postdoctoral researcher at University of Guelph in Canada and a Director's Postdoctoral Fellow at Los Alamos National Laboratory before joining LSU in 2004. His main interests are in the area of complex electronic materials, especially the compounds exhibiting unconventional superconducting, magnetic, and other electronic orders.

