



Speaker: Alex Misiats
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Tuesday, December 10, 2013
11:00 AM
258 Hurley Hall

Title: Ginzburg-Landau Model of Superconductivity with Prescribed Topological Degrees

Abstract:

Superconductivity is a complete loss of resistivity that occurs in most metals below a certain critical temperature. The key feature of this physical phenomenon is the vortices, or the points where the external magnetic field penetrates the bulk of a superconductor, thus destroying superconductivity. We model the superconducting vortices using the Ginzburg-Landau functional with a specific (degree) boundary condition that creates the same "quantized" vortices as the external magnetic field. In my talk, I will discuss the issue of well-posedness of such modelling, which reduces to the question of the existence of minimizers for a Ginzburg-Landau functional in certain functional classes. I will also describe the vortex structure of the Ginzburg-Landau minimizers, which may be useful in predicting the locations of the vortices depending on the geometry of a superconductor.