Colloquium

Department of Physics

Cryomagnetic Scanning Tunneling Spectroscopy on Exotic Superconductors

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Abstract

Cryogenic scanning tunneling spectroscopy (STS) has long been useful for the study of superconductors, with its ability to measure the quasiparticle excitation spectrum down to atomic length scales. Its application in a magnetic field has also enabled the imaging of superconducting vortex lattices and probing of bound states inside vortex cores. Recent advances in cryomagnetic STS are helping to shed powerful light on a number of exotic superconductors, i.e. characterized by unconventional pairing symmetries, complex band structures and/or competing order parameters. In this talk I will briefly survey these advances, and report on a new class of cryomagnetic STS experiments -- performed at 300 mK and up to 9 Tesla -- designed to probe superconductivity under finite superfluid momentum, as well as exotic pairing states carrying spontaneous currents or driven by high magnetic fields.

Monday, March 23, 2015 at 3:00pm
SERC, Room 110A
Refreshments served at 2:45pm