Chez Pierre

Presents ...

Monday, April 4, 2016
12:00pm Noon
MIT Room 4-331

Chez Pierre Seminar

Mohit Randeria – Ohio State University

”Skyrmions in chiral magnets“

Research on skyrmions in chiral magnetic materials spans the range from fundamental science to potential device applications. I will begin with an introduction to these topological spin textures, their unusual properties and new experimental advances. I will show how skyrmion crystal phases can be stabilized over a much larger regime of parameter space in systems that break surface inversion or mirror symmetry, in contrast to broken bulk inversion materials that have been the focus of previous research. We find that the spin texture and topological charge density of skyrmions develops nontrivial spatial structure, different from conventional skyrmions, with a quantized topological charge given by a Chern number rather than by homotopy theory. Our theory predicts how spin orbit coupling and magnetic anisotropy should be tuned to stabilize skyrmion phases in thin films, surfaces, and interfaces.