

Chez Pierre

Presents ...

Monday, April 29, 2019

12:00pm Noon

MIT Room 4-331

Chez Pierre Seminar

Weida Wu – Rutgers University

“Chiral fluctuation driven topological Hall effect in two-dimensional ferromagnets”

The topological Hall effect (THE) is a real-space Berry phase phenomenon associated with non-coplanar spin textures with scalar spin chirality. As such, it provides a powerful probe of the ground state and low-energy excitations of magnetic metals. In this talk, I will present a surprising discovery of a substantial THE around the ferromagnetic transition temperature in 2 different ferromagnetic ultra-thin films, SrRuO₃ and V doped Sb₂Te₃ in the two dimensional (2D) limit.[1] The temperature, magnetic field, and thickness dependences of the THE signal, along with our Monte-Carlo simulations, provide compelling evidence that the emergence of net spin chirality due to thermal fluctuations is a universal phenomenon in 2D ferromagnets. Our discovery opens up possibilities of exploring the spin chirality with topological Hall transport in 2D magnets and beyond.

[1] Wenbo Wang, Matthew W. Daniels, Zhaoliang Liao, Yifan Zhao, Jun Wang, Gertjan Koster, Guus Rijnders, Cui-zu Chang, Di Xiao, Weida Wu, “Universal chiral fluctuation in two-dimensional ferromagnets”, arXiv:1812.07005, (2019).

