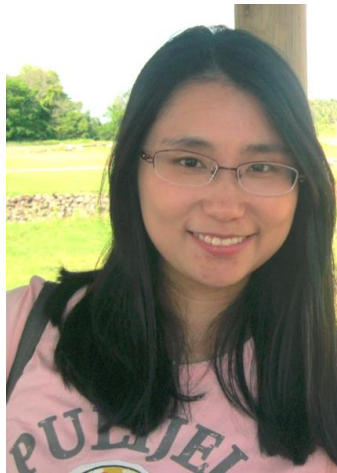


Center for
Nanoscale
Systems
Harvard University



CNS SEMINAR

October 27, 2017

Dr. Chunhui Du

*Prof. Yacoby Group
Harvard University*

Control and Local Measurement of the Spin Chemical Potential in a Magnetic Insulator

Abstract: In recent decades, a large scientific effort has focused on harnessing spin transport for providing insights into novel materials and low-dissipation information processing. We introduce single spin magnetometry based on nitrogen-vacancy (NV) centers in diamond as a new and generic platform to locally probe spin chemical potentials which essentially determine the flow of spin currents. We use this platform to investigate magnons in a magnetic insulator yttrium iron garnet (YIG) on a 100 nanometer length scale. We demonstrate that the local magnon chemical potential can be systematically controlled through both ferromagnetic resonance and electrical spin excitation, which agrees well with the theoretical analysis of the underlying multi-magnon processes. Our results open up new possibilities for nanoscale imaging and manipulation of spin-related phenomena in condensed-matter systems.

About the Speaker: Chunhui Du earned B. S. degree in physics and physics education from East China Normal University in China in 2010. She obtained a Ph.D. degree in Physics at the Ohio State University in 2015 under the mentorship of Prof. P. Chris Hammel with thesis titled “Probing Spin Dynamics and Transport using Ferromagnetic Resonance based Techniques”. She started to work with Prof. Amir Yacoby as a postdoctoral fellow in the Physics Department at Harvard University from 2015 Fall. Her current research interests include developing a new and generic platform to characterize and image spin properties on the nanometer scale. She is using single spin associated with NV centers in diamond to probe local spin transport and excitations in magnetic insulators.

Geological Museum 102 –Haller Hall

12pm