



Seminar

Putting magnetic vortices to work in spintronics



Prof. Yaroslav Tserkovnyak

University of California

Time: 10: 00 am, Dec. 12, 2019 (Thursday)

时间: 2019年12月12日 (周四) 上午10:00

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Magnetic vortices in thin (anti)ferromagnetic films can realize mobile objects, which can be injected, manipulated, and detected by electrical currents. We develop a nonequilibrium thermodynamic perspective on the emergent topological hydrodynamics of vorticity, as a new paradigm for yielding spintronic functionality. A flow of vorticity injected across a magnetic strip, which can be controlled by the interfacial spin torques, builds up a magnetic winding density along the strip, which is akin to charging a capacitor by an impinging electrical flow. We thus show how a simple insulating magnetic strip can realize an effective RC circuit for vorticity transport and discuss how it can be used for (topological) energy storage.

About the speaker

Brief Bio

2013– Now, Professor, Department of Physics and Astronomy, University of California, Los Angeles, USA

2006 – 2013, Assistant and Associate Professor, Department of Physics and Astronomy, University of California, Los Angeles, USA

2003 – 2006 Junior Fellow, Harvard Society of Fellows, Harvard University, USA

2003 Doctor of Philosophy, Department of Physics, Harvard University, USA

AWARDS

Many prestigious awards including Humboldt Research Award, Germany (2017); Breakthrough Prize in Fundamental Physics (as part of SNO collaboration), USA(2016); American Physical Society Fellow (2015); Simons Fellow in Theoretical Physic (2014); Simons Fellow in Theoretical Physics, USA (2012); National Science Foundation Early Career Award, USA (2009) Alfred P. Sloan Research Fellow, USA (2008).