北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Hydrodynamics of topological spin textures and their applications

Dr. Shu Zhang

Time: 2:00pm, Sept. 21, 2020 (Monday)

时间：2020年9月21日 （周一）下午2:00

Meeting URL：https://pku.webex.com.cn/meet/seminar921

Meeting ID: 102 119 2837

Abstract

Topological spin textures, such as domain walls in one dimension, vortices in two dimensions and magnetic hedgehogs in three dimensions, are promising candidates for nonlocal transport due to their stability against local fluctuations. We formulate their hydrodynamics based on topological conservation laws, and discuss the physical principles to drive, transport, and detect them. Our perspectives have inspired possibilities in various applications in hardware realization of neurotrophic computing, energy storage, and three-dimensional nonlocal transport. The recognization of the full conserved currents of topological textures has also enabled us to make revealing connections to quantum electrodynamics and chromodynamics.

If time permits, I will briefly talk about a magnetoelastic coupling induced topological structure in the hybridized magnon-phonon bands of two dimensional antiferromagnets and its experimental signatures.

About the speaker

Shu Zhang received her Bachelor's degree from Tsinghua University, Beijing, China in 2014. She got her Ph.D. degree of physics at Johns Hopkins University, where she worked with Prof. Oleg Tchernyshyov, focusing on quantum spin liquids and dynamics of topological defects. She was a graduate fellow at the Kavli Institute for Theoretical Physics at University of California, Santa Barbara in 2019. She joined University of California at Los Angeles as a postdoc since Sept. 2019 to work with Prof. Yaroslav Tserkovnyak. Recently she is working on hydrodynamics of topological spin textures and quantum sensing of spin noise.