The Department of Electrical and Computer Engineering Presents

A DISTINGUISHED SEMINAR

YAROSLAV TSERKOVNYAK

TOPOLOGICAL HYDRODYNAMICS IN INSULATORS

ABSTRACT

I will discuss transport phenomena in nonmetallic solid-state systems, which are engendered by the order-parameter topology. Unlike the traditional conservation laws that are rooted in a global symmetry, the hydrodynamics here are governed by the topological structure of the field configurations. I will consider several illustrative examples, including superfluid-like winding dynamics in 1D, vorticity transport in 2D, and skyrmionic flows in 3D, with a discussion of relevant materials and magnetoelectric tools to control and detect the emergent neutral transport.

BIOGRAPHY

Originally from Ukraine, Dr. Yaroslav Tserkovnyak earned a Ph.D. in physics at Harvard University in 2003. Following a stint as a Harvard Junior Fellow, he has been on faculty at the University of California, Los Angeles, since 2006 (tenured in 2009, full professor 2013). His main interests are in the theory of quantum transport and nonequilibrium dynamics in low-dimensional electron systems, with a focus on spin and topology.

April 22, 2019

WCH 205/206
11:10 a.m. - 12:00 p.m.