

Theory of Condensed Matter: Hard Condensed Matter

Nov. 13, 2018 at 2 p.m.
Galilei Room, 01-128 (Staudinger Weg 9)

Inti Sodemann
Max-Planck-Institut für Physik komplexer Systeme
Dresden

The Berry curvature dipole and the shear sound of metals

The Hall effect is often thought to be a hallmark of broken time reversal invariance. I will describe how a Hall-like effect can appear beyond linear response theory in time reversal symmetric metals. These metals can have a non-linear Hall effect that is controlled by the "Berry curvature dipole": an average of the gradient of the Berry curvature over the occupied states. I will describe recent experimental observation of this effect in 2D materials and our predictions for the effect in 3D materials, including Weyl semimetals. I will also comment on the role of other extrinsic mechanisms and on an ongoing effort to try to understand the Berry dipole as a kind non-linear version of the Drude weight. If time permits, I will also describe our recent predictions of a novel shear collective mode in strongly interacting metals.