

Chez Pierre

Presents ...

Monday, November 15, 2021

12:00pm Noon



Chez Pierre Seminar

Darius Torchinsky—Temple University

"The Nonlinear Electrodynamics of Weyl Semimetals"

At the heart of the Weyl semimetal are massless, chiral quasiparticles that derive from electronic band-crossings split by either spatial inversion or time-reversal symmetry breaking. The resulting nodal points in the bulk band structure serve as sources and sinks of “topological charge” that are responsible for the phenomenology usually associated with these materials, including open Fermi arc surface states and the chiral anomaly. However, Weyl semimetals with acentric crystal structures can also support second order nonlinear optical responses that reveal characteristics of their band structure in surprising ways. In this talk, I will discuss our recent work using laser-driven currents in an attempt to try to study this topological charge directly, as well as our experiments on the Fermi arc surface states that uncover an unexpected emergent symmetry in the material response.