Physics Seminar: Dominic Else Wednesday, February 7 · 2:00 – 3:00pm

Location: 313

Title: On Fermi surfaces: emergent symmetries and anomalies

Abstract: Metals are one of the most common states of matter occurring in condensed matter physics. They also serve as highly non-trivial examples of (non-Lorentz invariant) effective field theories. A key feature (arguably *the* defining feature) of a metal is the Fermi surface, a codimension-1 surface in momentum space. In a non-interacting metal it is simply the boundary between occupied and unoccupied single-particle states. However, I will argue for a general non-perturbative definition of Fermi surface through the language of emergent symmetry and ('t Hooft) anomaly. I will argue that much of the key physics of metals can be extracted as a consequence of this definition, without needing to assume that the low-energy effective field theory is weakly coupled as in the so-called "Fermi liquid theory". I will also discuss some applications and generalizations.