

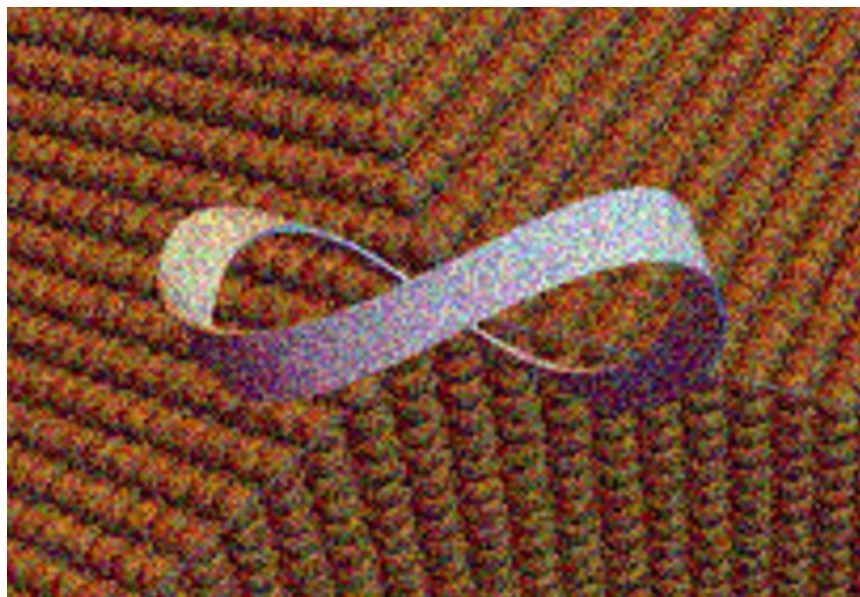


Charles Kane

University of Pennsylvania

April 25, 2024 at 3:30 pm in SPL 59

Special Physics Club: Topology of the Fermi Sea



The Fermi Sea in a metal is a topological object characterized by an integer topological invariant called the Euler characteristic, χ_F . In this talk we will argue that for a 2D fermi gas χ_F is reflected in a quantized frequency dependent non-linear 3 terminal conductance that generalizes the Landauer conductance in $D=1$. We will critically address the roles of electrical contacts and Fermi liquid interactions, and we will propose experiments on 2D Dirac materials, such as graphene, using a triple point contact geometry. We will go on to show that for a D dimensional Fermi gas, χ_F is also reflected in the multipartite entanglement characterizing $D+1$ regions that meet at a point. This generalizes a well-known result that relates the bipartite entanglement entropy of a $1+1D$ conformal field theory to its central charge c . We will argue that for an interacting 3D Fermi liquid, χ_F distinguishes distinct topological Fermi liquid phases.

Host: Meng Cheng

Connection info: <https://yale.zoom.us/j/93660628074>; Password: 595687

The Leigh Page Prize Lecture series are given each year by a distinguished physicist in honor of Leigh Page who received his PhD in Physics from Yale in 1913. He was later acting Chair and Director of the Sloane Physics Laboratory. Professor Page devoted his time to teaching (mostly graduate classes), research, and writing several textbooks. Since 1967, several speakers in the Leigh Page Prize Lecture series have later received Nobel Prizes and other notable awards. In connection with the lecture series, a prize is offered to first year graduate students in recognition of their fine academic record and for the promise of important contributions to the field of physics.

