

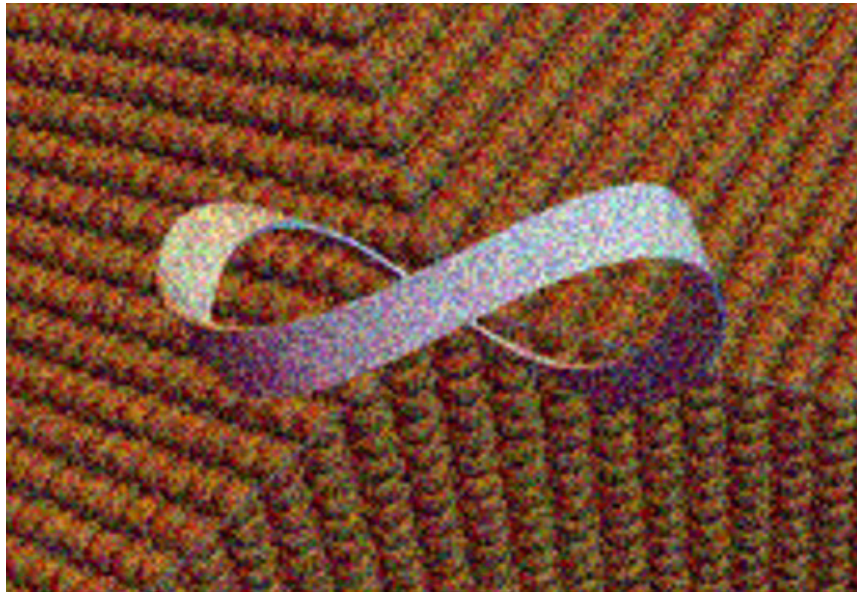
**Charles Kane**

University of Pennsylvania

Yale *Physics*

**April 24, 2024 at 3:30 pm in SPL 59**

**Special Physics Club: Symmetry, Topology, and Electronic Phases of Matter**



Symmetry and topology are two of the conceptual pillars that underlie our understanding of matter. While both ideas are old, over the past several years a new appreciation of their interplay has led to dramatic progress in our understanding of topological electronic materials. A paradigm that has emerged is that insulating electronic states with an energy gap fall into distinct topological classes. Interfaces between different topological phases exhibit gapless conducting states that are protected and are impossible to get rid of. In this talk we will discuss the application of this idea to the quantum Hall effect, topological insulators, topological semimetals and topological superconductors. The latter case has led to the quest for observing Majorana fermions in condensed matter, which opens the door to proposals for topological quantum computation. We will close by surveying the frontier of topological phases in the presence of strong interactions.

**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.*