

Mathematical Physics seminar

Speaker: Yu-An Chen, Joint Center for Quantum Information and Computer Science, University of Maryland

Thursday, Dec 2, 2021

10:30 am-11:30 am

on Zoom

<https://purdue-edu.zoom.us/j/>

Meeting ID: 953 1862 5523

Passcode: 184222

Title: Classification of invertible fermionic topological phases by G-crossed braided tensor category

The integer quantum Hall states, the quantum spin Hall insulator, and the p-wave topological superconductor each have an important place in condensed matter physics due to their quantized symmetry-protected topological invariants. These systems have a unique ground state on any closed manifold in (2+1) dimensions and are examples of 'invertible' topological phases of fermions. Here I will describe a general theory describing the universal properties of invertible phases, and classifies them based on their symmetries. This approach is 'categorical': it does not depend on microscopic models. Our theories can be considered as the symmetry-enriched Kitaev's 16-fold way. Some new applications of the theory include an interacting version of the 'tenfold way' classification of topological insulators and superconductors, and also the prediction of an interesting invertible phase.