

Condensed Matter Theory Center Seminar



Tuesday, April 18
11:00 am – 12:15 pm
2205 John S. Toll Physics Building

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“Chiral Majorana fermion edge state in a quantum anomalous Hall insulator-superconductor structure”

Abstract: Majorana fermion is a hypothetical fermionic particle which is its own anti-particle. Intense research efforts focus on its experimental observation as a fundamental particle in high energy physics and as a quasi-particle in condensed matter systems. In this seminar, the transport measurement to ascertain the one-dimensional chiral Majorana fermion in the hybrid system of a quantum anomalous Hall insulator thin film coupled with a conventional superconductor will be presented. A series of topological phase transitions are controlled by the reversal of the magnetization, where the half-integer quantized conductance plateau ($0.5 e^2/h$) is observed as a compelling signature of the Majorana fermion as theoretically predicted. This transport signature can be well repeated during many magnetic reversal sweeps, and can be tracked at different temperatures, providing direct evidence of the chiral Majorana edge modes in the system. The above observations demonstrate the experimental evidences of the chiral Majoranas edge state in a topological superconductor, which may lead to the development of topological quantum computation.

Host: Ching-Kai Chiu

Web: <http://www.physics.umd.edu/cmte/seminars.html>

