

Condensed Matter Theory Center Seminar
Tuesday, October 21 at 11:00 AM
2205 Physics Building

Speaker: Shinsei Ryu (University of Illinois)

Title: Gravitational anomalies in topological insulators and superconductors

Abstract:

Topological superconductors are fermionic (symmetry-protected) topological phases of matter where fermionic superconducting quasiparticles have topologically non-trivial wave functions. They exist in all spatial dimensions (one, two and three), and can be protected by various kinds of discrete symmetries, such as time-reversal or spatial symmetries. Unlike topological insulators where non-trivial topology of electron wave functions can show up in their electrical transport properties, in topological superconductors, one needs to resort on more intricate probe such as thermal transport due to the lack of conserved $U(1)$ quantities (e.g., electric charge). I will discuss various kinds of responses of topological insulators to thermal and mechanical perturbations, which allows us to identify their non-trivial topological properties. I will also argue that, similarly to the role played by $U(1)$ gauge invariance in Laughlin's thought experiment, the invariance under coordinate transformations (diffeomorphism invariance) can be used to study interaction effects on (symmetry-protected) topological states of matter.

Host: Philip Brydon

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