

Condensed Matter Theory Center Seminar



Tuesday, April 5
11:00 am – 12:30 pm
2205 Toll Physics Building

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“Topology of non-equilibrium dynamical quantum phases”

Abstract: Ultracold atoms, trapped ions, NV centers in diamond, and other quantum optical systems offer the possibility of exploring coherent quantum dynamics of many-particle systems, in the absence of external dissipation. However, due to internal dissipation, such quantum many-body systems typically rapidly thermalize and lose their quantum information to complex patterns of entanglement, resulting in classical incoherent dynamics. On the other hand, strong disorder can lead to the phenomena of many-body localization (MBL), in which isolated systems remain dissipationless and quantum coherent indefinitely. MBL enables sharp distinctions between different dynamical quantum phases, separated by new types of dynamical phase transitions. In this talk, I will discuss some recent progress in systematically understanding topological distinctions among MBL phases, focusing on non-equilibrium analogs of topological insulators and superconductors (i.e. symmetry protected topological or SPT phases). I will show that some (though not all) SPT orders typically found only in zero-temperature ground states can survive into the highly excited state dynamics of MBL systems. I will also discuss periodically driven MBL systems, which offer new types of dynamical topological phases with no equilibrium analogs.

Host: Jed Pixley & Xiao Li

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

