# Condensed Matter Theory Center Seminar

Thursday, October 22
11:00 am – 12:30 pm
2205 Toll Physics Building


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# "Finite temperature mobility edge in many-body localized systems"


**Abstract: The ergodic hypothesis for an isolated quantum system has been a subject of intense investigation in recent years. Under what conditions does a quantum system thermalize in the absence of a heat bath? It has been argued that in the presence of strong disorder, a system loses its ability to equilibrate itself even at infinite temperature, a phenomena now known as many-body localization (MBL). I will review the basic notions of this new phase of matter characterized by its dynamics. Due to the violation of equilibrium statistical physics in this phase, MBL protects topological and symmetry-breaking orders in situations where they are destroyed at thermal equilibrium.**

**In this talk I will discuss the phase transition between MBL and ergodic phases tuned by energy density, leading to a finite temperature mobility edge. As concrete examples I will focus on the one-dimensional random-field Heisenberg and the *infinite*-dimensional quantum random energy models. The latter has been a useful mean-field model for analyzing the thermodynamic spin-glass transition. Its tractability allows the comparison between analytical and numerical study of a finite temperature mobility edge.**


Host: Jed Pixley

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