

Condensed Matter Theory Center Seminar



Wednesday, February 7
11:00 am – 12:15 pm
2205 John S. Toll Physics Building

Mark Rudner
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“Quantized transport, topology and thermalization in anomalous Floquet insulators

Abstract: Periodic driving provides means to dynamically alter the topological properties of many-body systems. The range of phenomena that are possible in such systems, and the conditions needed for observing robust quantized transport, remain important open questions in the field. In this talk I will focus on so-called anomalous Floquet insulators (AFIs) -- topologically nontrivial fermionic phases which cannot be realized in any static (nondriven) system. Remarkably, we find that in the presence of periodic driving there is a family of topologically distinct, fully-localized phases in two dimensions. These phases are distinguished by the micromotion exhibited by particles in the bulk, within the driving period. I will present a local observable (the magnetization density), whose value is quantized in any fully-localized phase, and which serves as a topological order parameter to distinguish the different localized phases. In the absence of interactions, the AFI features chiral edge states coexisting with localized bulk states at all values of quasienergy. With interactions, the chiral AFI edges exhibit "protected thermalization" due to their topological nature. Using this feature, and by tuning sample geometry, the AFI can be used as a platform for studying the competition between thermalizing and many-body localized regions.

Host: Jay Sau

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

