

Wednesday: Aditi Mitra

Title: Floquet spin chains: Strong Modes, Almost Strong Modes, and Topological Defects

Abstract: Floquet or periodically driven systems show topological phases that are qualitatively different from their static counterparts. I will show that the edge modes encountered in certain free fermion Floquet systems are remarkably robust to adding interactions, even in disorder-free systems where generic bulk quantities can heat to infinite temperature due to the driving. This robustness of the edge modes to heating can be understood in the language of strong modes for free fermion chains, and almost strong modes for interacting chains. I will present an analytic calculation for the lifetime of strong modes using both perturbative methods as well as non-perturbative methods, where the latter involves mapping the Heisenberg time-evolution of the edge operator to dynamics of a single particle in Krylov subspace. Following this I will introduce the concept of topological defects: non-local operators that can be deformed in the space and time direction without changing the physics. One of these topological defects is the "duality defect" that implements the Kramers-Wannier duality transformation. I will highlight the consequence of the duality defect on Floquet time-evolution.