

# CMP Seminar

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## **Long-lived topology and edge states in open quantum systems**

While many exciting phenomena in isolated non-equilibrium quantum systems have been discovered in recent years, quantum systems are never truly isolated. Therefore, we study how two important examples of dynamical phenomena respond to the presence of environmental noise. First, we study stability of the topological response in the anomalous Floquet-Anderson insulator to a noisy drive, as naturally occurs due to laser fluctuations. Surprisingly, we find that this inherently non-equilibrium topological phase of matter remains stable at finite noise, with topological response that remains perfectly quantized on a time scale set by noise-induced diffusion. Second, we study stability of edge modes in the canonical transverse field Ising model coupled to a noisy boundary magnetic field. We uncover sharp singularities in the edge dynamics, which occur in both the noisy boundary field and static boundary field situations. We argue that these novel driven-dissipative phenomena may enable realization of non-equilibrium phases of matter in the solid state, where coupling to phonon bath is inevitable.

Monday, April 11<sup>th</sup>, 2022, at 4:10 p.m.  
Host: Mohammad Maghrebi