Title

“Measurement induced entanglement transitions”

Abstract

The resilience of quantum entanglement to a classicality-inducing environment is tied to fundamental aspects of quantum many-body systems. The dynamics of entanglement has recently been studied in the context of measurement-induced entanglement transitions, where the steady-state entanglement collapses from a volume-law to an area-law at a critical measurement probability~p_{c}. Interestingly, there is a distinction in the value of p_{c} depending on how well the underlying unitary dynamics scramble quantum information. For strongly chaotic systems, $p_{c} > 0$, whereas for weakly chaotic systems, such as integrable models, $p_{c} = 0$.

In this talk, I will discuss the measurement induced transitions in 2 classes of underlying unitary dynamics given by

1. Many-body localized Hamiltonians (MBL)
2. Random Clifford circuits

They are both efficiently simulable on classical computers. Eigenstates of MBL systems are area-law entangled, therefore can be expressed as shallow quantum circuits while polynomial-time algorithms exist for simulation of Clifford circuits. I will highlight the nature of measurement induced transitions in these systems and discuss some of the open questions.