

Michele Fava

Title: Nonlinear sigma model description of monitored free Majorana fermions

Abstract: Quantum systems subject to monitoring can undergo an entanglement phase transition. As the monitoring frequency increases, the long-time entanglement changes from being volume-law to area-law. While the qualitative nature of the transition is nowadays understood, the quest for a field theory description of these novel types of phase transitions is still ongoing.

Models of monitored free fermions have been proposed and studied in the past few years as toy models where further progress can be made. Nonetheless, controlled derivations of a field theory description were missing even in this setting until recently. In this talk, I will describe a model of free Majorana fermions undergoing monitoring whose dynamics can be explicitly mapped, in an appropriate limit, to a $SO(N)$ nonlinear sigma model. I will then describe how the entanglement properties of the system can be inferred from the nonlinear sigma model.