

Abstract

Jaeyoon Cho (Asia Pacific Center for Theoretical Physics)

Correlation length, mutual information, and entanglement area law in strongly-correlated systems

Proving or disproving the entanglement area law in high dimension is one of the central open problems in quantum many-body theories. In this talk, I introduce a certain structure of mutual information in many-body states as a sufficient condition for the state to obey the entanglement area law in arbitrary dimension. I then argue that in one dimension, such a structure follows from a finite correlation length, which proves that in one dimension, a finite correlation length alone implies the entanglement area law.