

Atomic Physics Approaches to Quantum Critical States

Abstract: Quantum critical states exhibit unconventional spectral function, algebraically decayed spatial correlation, and log-volume law entanglement. They broadly exist in quantum critical regimes and low-dimensional systems in condensed matter and cold atom physics. This talk will highlight several cold atom physics approaches to study quantum critical states. These approaches bring out the connection between quantum thermalization and criticality, utilize dissipation to measure anomalous dimensions, and uncover unconventional spatial correlation functions that emerge at critical regimes by quantum computers.