

Abstract:

Within the last ten years, ultracold atomic gases in optical lattices have emerged as an ideal playground for studying phenomena of quantum many body theory: quantum phase transitions, magnetic correlations, and much more.

A particularly interesting subfield is the study of the dynamics of quantum many body systems (transport, relaxation, equilibrium), in which new precision experiments and new simulation methods inspired by quantum information theory complement each other. This should give us first insight into the rich physics of strongly interacting systems far from equilibrium.