Q 30 Poster Stark korrelierte Systeme

Zeit: Dienstag 16:30–18:30 Raum: Labsaal

Q 30.1 Di 16:30 Labsaal

Noise-induced quantum phase transitions in optical lattices — •Maria Eckholt, Juan Jose Garcia-Ripoll, and Ignacio Cirac — Max-Planck-Institut für Quantenoptik, Hans-Kopfermann Str. 1, 85748 Garching, Germany

We study the quantum phase transitions in ultracold atoms subjected to a noisy environment. The system is modeled by the Bose-Hubbard Hamiltonian, where periodic boundary conditions are considered. The study is based on the master-equation formalism and we apply different numerical techniques to estimate the phases of the atoms. Experimental realizations for different types of noise are also considered.

Q 30.2 Di 16:30 Labsaal

Ultracold Atomic Gases in 1D Superlattices — •Felix Schmitt, Markus Hild, and Robert Roth — Institut fuer Kernphysik, Technische Universitaet Darmstadt

We investigate the strongly correlated regime of ultracold quantum gases on 1D optical lattices via an exact diagonalization of the Hamilton matrix in the framework of the Hubbard model. By using a physically motivated, adaptive basis truncation scheme we reduce the dimension of the Hilbert space significantly, allowing for the description of experimentally relevant system sizes. We study the influence of the basis truncation on different observables for single-component Bose gases and two-component Bose-Fermi mixtures. As one application we investigate ultracold quantum gases in irregular lattice potentials, which are difficult to describe in other exact methods. Our main focus is on two-color superlattices and in particular the Mott-insulator to quasi Bose-glass transition. We also use these truncated bases as a starting point for dynamical calculations for moderate system sizes.