Q 48 Gruppenberichte Stark korrelierte atomare Systeme

Zeit: Dienstag 16:30–17:00 Raum: HU Kinosaal

Gruppenbericht

Q 48.1 Di 16:30 HU Kinosaal

Strongly correlated phenomena in trapped ultracold gases — •Klaus Osterloh[1], Henning Fehrmann[1], Veronica Ahufinger[1], Adrian Kantian[1], Bogdan Damski[1], Mikhail Baranov[2], Laurent Sanchez-Palencia[3], Luis Santos[4], Anna Sanpera[1], Hans-Ulrich Everts[1], and Maciej Lewenstein[1] — [1]Institut für Theoretische Physik, Universität Hannover — [2]Van der Waals-Zeeman Institute, University of Amsterdam — [3]Laboratoire de Physique Théorique, Université Paris-Sud — [4]Instititut für Theoretische Physik, Universität Stuttgart

We demonstrate that strongly correlated ultracold gases reveal very rich physical features. It is possible to realize a large variety of models analogous to those studied in condensed matter physics, and to explore completely new physical effects. Hannover group was particularly involved in the following studies: a) mixtures of bosons and fermions in optical lattices and their complex phase diagram, b) spin glasses: mixtures in lattice systems with single-particle disorder and random magnetic fields, c) exotic lattices: the (trimerized) Kagomé lattice exhibiting (frustrated) quantum (anti-)ferromagnetic phases, d) dipolar rotating fermi gases: natural candidates of Laughlin-like quantum Hall states, e) dipolar Wigner crystals: criteria of stability, melting point analysis, and comparison with Laughlin states, f) fermi gases in lattices subject to artificial magnetic fields: generalized Hofstaedter butterfly spectra and non-Abelian gauge dynamics.