



Kolloquium

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Interacting Fermi-Bose mixtures in optical lattices

Interactions in quantum gases are the key to many fascinating correlation phenomena and quantum phases. In particular quantum degenerate mixtures of fermionic and bosonic atoms offer mixed statistics and intriguing interaction features, ranging from mean-field collapse effects to phases with strong interspecies correlations. Following an introduction to Fermi-Bose interactions in mixtures of harmonically trapped ^{40}K and ^{87}Rb atoms in harmonic trapping potentials the talk will concentrate on recent experimental investigations in 3d optical lattice potentials. In particular we discuss the first experimental observation of a localized phase of the mixture in a 3d optical lattice. This phenomenon becomes evident in the reversible loss of visibility in the interference pattern of the bosonic component, which already for a small "impurity" fraction of fermions takes place for a shallower lattice than needed to reach the Mott insulating phase of a comparable pure bosonic system. These measurements introduce a new system to the area of strongly correlated physics and potentially connect to polaron and disorder physics.

Wann? Freitag, 02.06.2006, 14:00 Uhr

Wo? Universität Stuttgart, NWZ II, Raum 2.136