University of Stuttgart
Institute for Theoretical Physics III

SIRPOL Seminar

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Thursday
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10:00 h
NWZ II,
Pfaffenwaldring 57
Room 5.331

Phase diagram of lattice bosons with cavity-mediated long-range interactions with uncorrelated disorder

Recent experiments with ultracold atoms in an optical lattice have realized cavity-mediated global range and observed the emergence of a supersolid and a density wave phase in addition to Mott insulator and superfluid phases. Here we consider theoretically the effect of uncorrelated disorder on the phase diagram of this system and study the two-dimensional Bose-Hubbard model with global range interactions and uncorrelated diagonal disorder. With the help of quantum Monte Carlo simulations using the worm algorithm, we determine the phase diagram of this model. We show that two kinds of Bose glass phases exist: one with and one without density wave order and discuss the nature of the various phase transitions that occur. We also find that weak disorder enhances the supersolid phase.

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