

Unconventional Optical Lattices with Bosons

Andreas Hemmerich

Department of Physics, University of Hamburg, Germany

***Email of Presenting Author: Ahemmerich@physnet.uni-hamburg.de**

I will discuss two examples of optical lattices with bosons beyond the standard case of a BEC in the lowest band of an external periodic potential: 1. bosons condensed in the 2nd band of a checkerboard lattice, where quantum degeneracy of orthogonal p-orbitals leads to interaction-induced chiral order; 2. an optical lattice prepared inside of a high finesse optical resonator, resulting in infinite range cavity-mediated interactions.