

Joint Quantum Institute Seminar
February 21, 2007 at 12:30
Note special day
Physics 1201

Searching for Exotic Quantum Phases in Cold Atom Optical Lattices

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Ultracold atoms confined to optical lattices represent nearly ideal manifestations of Hubbard models predicted to harbor a variety of novel quantum phases of matter including supersolids and topological insulators. It is important to ask how or if these phases can be observed experimentally once realized. I will first review experimental techniques used to probe many-body states in optical lattices. I will then discuss theoretical results from realistic simulations of Bose-Hubbard models with an emphasis on experimental observables. The exciting possibility of observing an optical lattice supersolid is critically analyzed. I will also discuss the possibility of using edge states in rotating two dimensional optical lattices to experimentally characterize insulating phases, including topological insulators.

Host UMD: Steven Rolston