

Joint Quantum Institute Seminar
May 7, 2007 at 12:30
Physics 1201

Cold Atoms in a two-period optical lattice: a tool for quantum information and correlated many body physics.

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I will describe recent experiments studying ultra-cold atoms in a dynamic, double-well lattice. Using this lattice, we are able to isolate arrays of atom pairs, and separately control the internal states of the atoms in each pair. By controlling interactions between the atoms we are able to induce controlled interchange of the spin and spatial quantum numbers between the two atoms, the essential feature of a quantum SWAP gate. Such a lattice provides a test-bed for ideas in neutral atom quantum computing, and a flexible platform for simulating correlated many-body physics.

Host UMD: Luis Orozco