

“Atoms Caged by Light: When the World’s Coldest Gas Acts Like a Solid”

*Séminaire général du Département de Physique
de l'École Polytechnique*

Ultracold atoms, just nanodegrees above absolute zero, can be held in an optical lattice, a periodic array of traps created by interfering light beams. Such atoms mimic the familiar problem of electrons in the periodic structure of a solid-state crystal lattice, but new possibilities for control and measurement produce quite unfamiliar results. These cold atoms hold promise for simulating important unsolved problems in condensed matter physics where strong interactions and quantum entanglement in many-body systems make calculations intractable. Good control and strong interactions also allow lattice-trapped atoms to be used as “qubits” for quantum information.



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