MAR07-2006-004964

Abstract for an Invited Paper
for the MAR07 Meeting of
the American Physical Society

Quantum simulation of magnetism using optical lattices[1]

BRIAN DEMARCO, UIUC

Physical simulation as a means for resolving outstanding quantum many-body problems was first proposed by Feynmann in 1981. Since then, physicists have dreamed of using physical quantum simulation as a quantitative tool. Ultra-cold atoms trapped in an optical lattice are now emerging as an ideal tool for quantum simulation of a wide range of many-body quantum models, including the Hubbard model and quantum magnetism. I will review the developing field of quantum simulation using ultra-cold atoms and highlight our progress on simulating quantum magnetism.

[1]supported by the ONR, NSF, and Sloan Foundation