

Abstract Submitted  
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**Probing Nagaoka ferromagnetism in optical superlattices** JAVIER VON STECHER, JILA and Department of Physics, University of Colorado, Boulder, Colorado, EUGENE DEMLER, MIKAHIL LUKIN, Physics Department, Harvard University, Cambridge-MA, 20138., ANA MARIA REY, JILA and Department of Physics, University of Colorado, Boulder, Colorado — In 1966, Nagaoka predicted that interaction-induced ferromagnetism occurs in lattices with specific geometry when there is one fewer electron than in the half-filled system (one hole). Here, we describe a controllable method for observing Nagaoka Ferromagnetism (NF) in cold atoms by loading them in optical superlattices. First, we discuss how to probe NF in an array of isolated plaquettes (four lattice sites arranged in a square). Next, we discuss the more generic case of an array of weakly coupled plaquettes and suggest a method for creating and detecting long range ferromagnetic correlations.

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