

Abstract Submitted  
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**Neutral Atoms for Quantum Registers** M.J. GIBBONS, S.Y. KIM, K.M. FORTIER, M.S. CHAPMAN, School of Physics, Georgia Institute of Technology — Individually trapped neutral atoms are one of the most promising candidates for long-term storage of quantum information. We are realizing a neutral atom register using a 1-dimensional optical lattice to confine ultracold  $^{87}\text{Rb}$  atoms. A high gradient MOT can collect a small number of atoms, which we transfer to an optical lattice. The atoms are imaged and individually counted by a high resolution CCD camera. We will discuss our experiments, as well as our strategies for generating atom-atom and atom-photon entanglements using high finesse cavities.

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