

Abstract Submitted
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Experimental Apparatus for Coupling Dielectric Nanospheres to Cold Atoms¹ APRYL WITHERSPOON, CRIS MONTOYA, GAMBHIR RANJIT, ANDREW GERACI, Univ of Nevada - Reno, GERACI RESEARCH TEAM TEAM — We are constructing an experiment designed to couple cold atoms to optically trapped nanospheres, in which our research team hopes to cool the nanospheres to their ground state. In this experiment, cold Rubidium atoms and optically levitated nanospheres are located in two separate vacuum chambers. The nanospheres will be coupled to the cold atoms by a one dimensional optical lattice. If successful, the cooled spheres can be used as a source for matter-wave interferometry. In the future, such matter-wave interferometry could be used for acceleration sensing, searching for Yukawa-type corrections to gravity, and for making Casimir force measurements between the spheres and a surface.

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