Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Realization of a cryogenic interface to an ultracold atomic chamber[1] ADITYA DATE, California Institute of Technology, KE WANG, AIRLIA SHAFFER, YOGESH SHARAD PATIL, Cornell University, KEITH SCHWAB, California Institute of Technology, MUKUND VENGALATTORE, Cornell University — The control and manipulation of ultracold atoms in close proximity to cryogenic material surfaces opens up novel avenues for quantum sensing with cold atoms. However, integrating cryogenics with cold atomic systems presents the dual challenges of reducing thermal radiation load while allowing optimal optical access. Here, we present the realization of a unique interface between a cryogenic system and a room-temperature ultracold atomic chamber which allows for the optical trapping of cold atoms within microns of a sub-10 K cryogenic surface. Our interface serves as a platform for a cold-atoms based precision magnetic microscope for probing exotic condensed matter systems such as correlated electronic materials, as well as a platform for the realization of hybrid quantum systems.

[1]This work is supported by the DARPA QuASAR program through a grant from the ARO.

Yogesh Sharad Patil
Cornell University

Date submitted: 27 Jan 2016 Electronic form version 1.4