

Abstract Submitted  
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**BEC-Cryostat Interface: A Novel Platform for Hybrid Quantum Systems**<sup>1</sup> ADITYA DATE, California Institute of Technology, YOGESH SHARAD PATIL, Cornell University, KEITH SCHWAB, California Institute of Technology, MUKUND VENGALATTORE, Cornell University — We present our experimental progress towards the implementation of a unique BEC-cryostat interface. This apparatus allows for the control and manipulation of ultracold atoms in close proximity to cryogenic surfaces. Such a system enables us to realize a hybrid quantum system consisting of a BEC strongly coupled magnetically to an ultra-high Q mechanical resonator, thus enabling precise atomic sensing of mechanical motion [1]. Furthermore, the unprecedented sensitivities afforded by our atomic system open avenues to surface studies of correlated electronic systems at cryogenic temperatures.

[1] S. K. Steinke *et al.* PRA 84, 023841

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