Abstract Submitted
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Searching for non-Newtonian gravity at the micron scale with laser-cooled nanospheres GAMBHIR RANJIT, DAVID ATHERTON, MARK CUNNINGHAM, JOSE VALENCIA, ANDREW GERACI, University of Nevada, Reno, HART GOLDMAN, Stanford University — Several theories beyond the standard model predict the deviation of gravity from the Newtonian model at short range. An optically levitated and cooled silica nanosphere in vacuum has a high quality factor resulting in ultrahigh sensitivity; hence it provides a promising tool to measure such deviations [1]. I will discuss the experiment we are developing to test non-Newtonian gravity at the micron length scale. In addition, I will also present the prospect of sensing short-range forces between a surface and a free falling nanosphere in a Talbot matter-wave interferometer [2].

[1] Andrew A. Geraci, Scott B. Papp, John Kitching, Phys. Rev. Lett. 105,101101 (2010).
[2] Andrew A. Geraci, Hart Goldman, arXiv:1412.4482(2014).

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