Abstract Submitted
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Progress towards measuring gravity on the micrometer length scale with optically levitated silica microsperes[1] DAVID ATHERTON, GAMBHIR RANJIT, JORDAN STUTZ, MARK CUNNINGHAM, ANDREW GERACI, University of Nevada,Reno — Discrepancies between the strength of gravity and other Standard Model forces suggest corrections to Newtonian gravity at the sub-millimeter length scale. In this poster, we present progress towards the realization of a system capable of measuring gravity at micrometer length scales. In ultra-high vacuum, optically-trapped and cooled microspheres show great promise as force sensors. They are completely decoupled mechanically from their environment and can have high Q factors. We are developing an apparatus to trap and cool spheres in a combined optical dipole-cavity trap. Ultimately, with a sphere trapped in an anti-node close to an end-mirror of the cavity, Non-Newtonian gravity-like forces will be tested by monitoring the displacement of the sphere as a mass is brought behind the cavity mirror.

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