

Abstract Submitted  
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**Novel Tests of Gravity Below Fifty Microns**<sup>1</sup> JEREMY JOHNSON<sup>2</sup>,  
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State University — Theories which attempt to unify the Standard Model and Gen-  
eral Relativity often include features which violate the Weak Equivalence Principle  
(WEP) and gravitational Inverse-Square Law (ISL). A violation of either the WEP  
or ISL at any length scale would bring into question our fundamental understanding  
of gravity. Motivated by these considerations, undergraduates and faculty at Hum-  
boldt State University are building an experiment to probe gravitational interactions  
below the 50-micron length scale. The experiment employs a torsion pendulum with  
equal masses of different material arranged as a “composition dipole.” We measure  
the twist of the torsion pendulum as an attractor mass is oscillated nearby in a  
parallel-plate configuration, providing a time varying torque on the pendulum. The  
size and distance dependence of the torque variation will provide a means to deter-  
mine any deviation from the WEP or ISL at untested scales.

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