Tests of quantum mechanics and gravitation with atom interferometry

P. Asenbaum, J. Martinez, B. Pichler, Y. Wu, T. Kovachy, J. Hogan and M. Kasevich
Dept. of Physics and Applied Physics, Stanford University, Stanford CA

Abstract: Recent de Broglie wave interference experiments with atoms have achieved wavepacket separations as large as 54 cm over time intervals of 2 sec [1, 2]. These experiments, and their impact on gravitational and quantum physics, will be discussed.

[1] Kovachy, T. *et al.* Quantum superposition at the half-metre scale. *Nature* **528,** 530–533 (2015).
[2] Asenbaum, P. *et al.* Phase Shift in an Atom Interferometer due to Spacetime Curvature across its Wave Function. *Physical Review Letters* **118,** (2017).