

Manipulation of levitated optomechanics for tests of fundamental physics

Thursday, 25 May 2017 09:30 (40 minutes)

We will discuss our trapping and cooling experiments of optically levitated nanoparticles at Southampton. We will report on the cooling of all translational motional degrees of freedom of a single trapped silica particle to $\sim 1\text{mK}$ simultaneously at vacuum of 10^{-5} mbar using a parabolic mirror to form the optical trap. We will further report on the squeezing of a thermal motional state of the trapped particle by rapid switch of the trap frequency. Such experiments are relevant to pave the way towards experimental test of both the quantum superposition principle and the interplay between gravity and quantum mechanics.

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