

Transferring two massive mirrors into a single quantum object

Tuesday 12 February 2019 15:30 (1 hour)

When a single quantum object decays into two, the new objects show quantum entanglement. For the experimental demonstration of this entanglement, a large number of identical decays need to be available and specific measurements on the new objects performed. This talk considers the opposite direction of evolution and describes an experiment, in which two laser mirrors that are suspended as pendulums might be transferred to a single quantum object. The unification goes hand in hand with the mirrors losing the realism of their individual positions and momenta. Here, the definition of (local) realism is according to the 1935-discussion by Einstein, Podolsky and Rosen. In the envisioned experiment, the two mirrors will have masses of about 100g and are located close to each other such that they sense the mutual gravitational potential. If successful the experiment might be a probe system for Newtonian quantum gravity theories.

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