

Towards macroscopic quantum superpositions

Dirk BOUWMEESTER
Full Professor
Department of Physics
Broida Hall, Mail Code 9530
University of California
Santa Barbara, CA 93106-9530
U.S.A.

A strong motivation to investigate the quantum regime of mechanical resonators, objects of significant mass, is the question whether quantum mechanics holds up to the macroscopic level. I will first review arguments, in particular by R. Penrose, why there might be room for new physics to be discovered if the mass of objects in quantum superpositions gets larger and larger. Second, I will give an update on an experiment that aims at bringing a tiny optical mirror into a quantum superposition. The fact that such a system would have to operate at frequencies from 10-100kHz leads to very demanding experimental requirements. Best regards, Dirk Bouwmeester