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Theoriekolloquium

July 23, 2015 at 4 p.m.
Newton-Raum, Staudinger Weg 9, 01-122

Prof. Oriol Romero-Isart
IQOQI - Institute for Quantum Optics & Quantum
Information, Innsbruck

Levitated Nanospheres in the Quantum Regime

In this colloquium I will review current experimental effort and theoretical proposals for observing quantum phenomena with levitated nanospheres in high vacuum. Particular emphasis will be placed on discussing the opportunities that these systems offer; for instance, testing the quantum superposition principle at regimes where collapse models predict its breakdown by preparing quantum superpositions states where the center of mass is delocalized over distances larger than the radius of the sphere. Different scenarios with their distinctive features and applications, as well as the underlying theory, will be discussed: optical levitation of dielectric nanospheres in high-Finesse optical cavities, magnetic levitation of superconducting microspheres coupled to quantum circuits, and magnetic levitation of single-domain magnetic nanoparticles.

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