Università degli Studi di Trieste
Dipartimento di Fisica
Seminar

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Dip. Fisica - Strada Costiera, 11 – Trieste

Testing the limits of quantum mechanics using micro-magnetomechanical systems

ABSTRACT
I propose to experimentally investigate micro-magnetomechanical systems made of superconducting particles with size in the micron range, levitated in a magnetic trap. These systems have been recently suggested as a possible platform for the exploration of the macroscopic limits of quantum mechanics. I will illustrate the advantages of this approach, compared to other techniques like matter-wave interferometry or optically levitated nanoparticles. In particular, it is argued that conventional decoherence can be radically suppressed by operation at subkelvin temperature, enabling to achieve a regime where spontaneous wavefunction collapse models may become testable in a relevant range of parameters. I will introduce some specific levitation schemes and discuss experimental prospects and potential issues.

References:
[1] O. Romero-Isart et al: "Quantum magnetomechanics with levitating superconducting microspheres", Phys. Rev. Lett. 109, 147205 (2012).
[2] A. Vinante: "Superconducting inductive displacement detection of a microcantilever",Appl. Phys. Lett. 105, 032602 (2014).

Organization by: dott. A. Bassi

Everyone interested in the topic is welcome