



UNIVERSITÀ  
DEGLI STUDI DI TRIESTE

INFN Sezione di Trieste & Dipartimento di Fisica

Joint Seminar

**Dr. Hendrik ULBRICHT**

University of Southampton, U.K.

Monday May 11, 2015 – 11:00 AM - room 204, 2<sup>nd</sup> floor  
Dip. di Fisica – Strada Costiera, 11 – Trieste

## Experimental Tests of Macroscopic Quantum Superposition

### Abstract

New technological developments allow to explore the quantum properties of very complex systems, bringing the question of whether also macroscopic systems share such features, within experimental reach. The interest in this question is increased by the fact that, on the theory side, many suggest that the quantum superposition principle is not exact, departures from it being the larger, the more macroscopic the system. Testing the superposition principle intrinsically also means to test suggested extensions of quantum theory, so-called collapse models. We will report on three new proposals to experimentally test the superposition principle with nanoparticle interferometry, optomechanical devices and by spectroscopic experiments in the frequency domain. We will also report on the status of optical levitation and cooling experiments with nanoparticles in our labs, towards an Earth bound matter-wave interferometer to test the superposition principle for a particle mass of one million amu (atomic mass unit).

**Organizzazione a cura di: Dr. A. Bassi**

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**Everyone interested in the topic is welcome to attend**

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