

AVVISO DI SEMINARIO

Mercoledì 30 Gennaio 2019 alle ore 11.30

presso l'Area della Ricerca di Pisa, Aula 27, Edificio A, Piano terra

Dott.ssa Maria Luisa Chiofano

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terrà un seminario sul tema:

Squeezing Forty Orders of Magnitude in Four Squared Meters

Abstract

Physics is in an era of unprecedented cross-fertilization: the length and energy scales characterizing the physics of quantum atomic gases cooled down to tens of nK, have fostered connections of ideas born in condensed matter with crucial concepts in fundamental interactions and cosmology. More than forty orders of magnitude in length from quarks to the estimated size of the universe, passing through condensed matter systems, can in principle be investigated in table-top experiments settled in a few squared meters.

Quantum gases represent a formidable platform to simulate analogs of condensed matter, fundamental interactions, and cosmology problems. In fact, they are a quantum system used to simulate a different quantum system, the coding being favored by highly controllable conditions for experimental setups and theoretical modelling.

In this talk, I will discuss this general idea via examples selected from different contexts of condensed matter and fundamental physics along with contemporary perspectives. After reviewing the basic tools available from the platform, I will focus on three applications: (i) the peculiar behavior of 1D quantum liquids, (ii) the BCS-BEC crossover physics in the context of quark-gluon plasma and neutron stars, and (iii) the novel paradigm of many-body entanglement for precision measurements.