

INVITADO: Silke Weinfurtner (SISSA, Trieste, Italy)

TITULO: Quantum gravity laboratory: Cosmological particle production in Bose-Einstein condensates

LUGAR: FACULTAD DE CIENCIAS FÍSICAS UCM

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AULA: Seminario Depto. Física Teórica I, Planta 3ª

ABSTRACT

A major problem of quantum field theory in curved spacetime, and quantum gravity more generally, is the lack of sufficient observational and experimental guidance. To address this issue I am proposing to explore various phenomena of semi-classical gravity in table-top experiments. After an introduction to the general idea of analogue models for gravity, I will focus on the possibility of mimicking cosmological particle production in parametrically excited Bose-Einstein condensates. Applying classical field methods via the truncated Wigner approximation I will argue that the experimental implementation is within reach. Then, if time permits, I will discuss the possibility of adapting the general principles underlying analogue gravity models to full quantum gravity.