

Seminário, Quinta, 19/9/2024, 14:00h

Local: Auditorio DRCC

Marko Toros (University of Ljubljana)

Title: Searching for quantum gravity

Abstract: Finding experimental evidence for quantum gravity remains one of the major unresolved questions in contemporary physics. However, the next generation of matter-wave interferometry with nanoparticles might finally open the possibility of testing the quantum nature of the gravitational field [1]. We will first briefly review linearized quantum gravity and its signatures in laboratory experiments [2]. We will then discuss the phenomenology of gravitationally induced interference and entanglement [3], coherence protection from graviton emission [4], relativistic dips in the entangling power of gravity [5], and the quantum light-bending effect [6]. We will conclude with a short discussion about the implications for the foundations of physics.

[1] Bose et al. Phys. Rev. Lett. 119, 240401 (2017)

[2] Bose et al. Phys. Rev. D 105, 106028 (2022)

[3] Bose et al. Arxiv:2311.09218 (2024)

[4] Toroš et al. Phys. Rev. D 109, 084050 (2024)

[5] Toroš et al. ArXiv:2405.04661 (2024)

[6] Biswas et al. Phys. Rev. D 108, 064023 (2023)