



COLLOQUIUM INAUGURALE DEL DOTTORATO IN FISICA, A.A. 2025/2026

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How does a quantum object gravitate?

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No experiment today provides evidence that gravity requires a quantum description. The growing ability to achieve quantum optical control over massive solid-state objects may change that situation -- by enabling experiments that directly probe the phenomenology of quantum states of gravitational source masses.

This can lead to experimental outcomes that are inconsistent with the predictions of a purely classical field theory of gravity. Such "quantum Cavendish" experiments require to explore extreme regimes of both quantum and gravity phenomena, specifically: delocalised motional quantum states of sufficiently massive objects, as well as gravity experiments on the microscopic scale. This seminar reviews the current status in the lab and the challenges to be overcome for future experiments.