ICFO Colloquium Series: How does a quantum object gravitate?

MARKUS ASPELMEYER

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15:00 to 16:00
ICFO Auditorium

PROFILE:
Markus Aspelmeyer is Professor of Physics at the University of Vienna and Scientific Director at the Institute for Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Sciences in Vienna. He studied physics and philosophy in Munich, Germany. After a PhD in solid state physics from LMU Munich he switched fields to quantum optics. By combining these two backgrounds he became one of the early pioneers of the field of quantum optomechanics. Aspelmeyer is co-founder of Crystalline Mirror Solutions (now Thorlabs Crystalline Solutions), which provides novel optics for laser precision measurements. He is a Fellow of the American Physical Society, and Member of the Austrian Academy of Sciences and the Academy of Sciences and Humanities in Hamburg. His current research is focused on the intriguing puzzles around quantum physics and gravity.

ABSTRACT:
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 will rely on delocalized motional quantum states of sufficiently massive objects and gravity experiments on the micrometer scale. I review the current status in the lab and the challenges to be overcome for future experiments.
Hosted by Prof. Dr. Oriol Romero-Isart
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