

Plenary Talk PV I Mon 9:00 E415
Probing the quantum nature of gravity in table-top experiments — ●MARKUS ASPELMEYER — University of Vienna, Faculty of Physics, Vienna, Austria — Austrian Academy of Sciences, IQOQI, Vienna, Austria
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 en-

abling 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.