

TU Wien and the Austrian Academy of Sciences invite you to join the inaugural

HELMUT RAUCH LECTURE

by

MARK KASEVICH

(Stanford University)

“OBSERVATION OF A GRAVITATIONAL AHARONOV-BOHM EFFECT AND ITS IMPLICATIONS FOR QUANTUM SUPERPOSITIONS OF NEWTONIAN GRAVITATIONAL FIELDS”

The gravitational interaction of a tungsten source mass with atomic wavepackets has been observed in an atom deBroglie wave interferometer, in a regime where the separation distance between the interfering wavepackets is comparable to their distance to the source mass. We will discuss this experiment in the context of Aharonov-Bohm effects. We will describe the relevance of these results to the observation of quantum superpositions of Newtonian gravitational fields.

4TH OF MAY 2023 AT 4:00 PM

TU THE SKY (GETREIDEMARKT 9, 1060 VIENNA)

REGISTRATION: [VCQ.QUANTUM.AT/HELMUT-RAUCH-LECTURE/](https://vcq.quantum.at/helmut-rauch-lecture/)

Sabine Seidler (Rector, TU Wien)

Heinz Faßmann (President, Austrian Academy of Science)

Anton Zeilinger (IQOQI Vienna, Austrian Academy of Sciences, University of Vienna, VCQ)

Announcement of the Helmut Rauch Fellowship

Mark Kasevich (Stanford University)

Meet & Greet

The Helmut Rauch Lecture is dedicated to the memory of Helmut Rauch, his pioneering achievements, and his lasting impact on quantum physics in Austria. Helmut Rauch was one of the founding fathers of modern quantum physics in Austria. He built the first perfect-crystal neutron interferometer and from there established matter wave interferometry as a way to study fundamental concepts of quantum mechanics, including the direct test of the 4π symmetry of spin $1/2$ particle wave functions, the quantum spin superposition law, path entanglement of matter waves and various gravitational effects. As a long-time director of the Atominstitut at TU-Wien, President of the Austrian Science Fund FWF, and Full Member of the Austrian Academy of

Sciences he played an integral role in shaping the Austrian research landscape. He inspired the following generations with his intellectual leadership, his groundbreaking science, his openness to new ideas, and his unlimited confidence in the creativity of the young researchers.

The event is a joint initiative between TU Wien and the Austrian Academy of Sciences and is supported by The Vienna Center for Quantum Science and Technology (VCQ).
