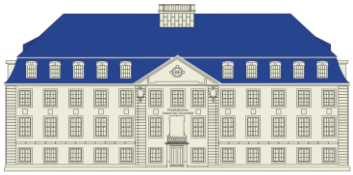
Institut für
Angewandte Physik



Physikalisches
Institut

UNIVERSITÄT BONN

RHEINISCHE
FRIEDRICH-WILHELMS-
UNIVERSITÄT BONN

COLLOQUIUM „OPTICS AND CONDENSED MATTER“

(Please note! Monday, May 30th, 12:15h, HS HISKP)

Witlef Wieczorek

Chalmers University of Technology, Göteborg, Sweden

Towards reaching new parameter regimes in controlling micromechanical motion

Mechanical resonators offer new opportunities for quantum technologies, such as for applications as quantum transducers or for fundamental experiments towards testing the limits of quantum mechanics. In this talk, I will present our recent work towards reaching new parameter regimes in the control over mechanical motion. First, we aim at reaching new coupling regimes in cavity optomechanical devices, in particular, the strong single photon or ultra strong coupling regime. These regimes would offer new methods to generate nonclassical optomechanical states. I will present our development of a fully integrated optomechanical microcavity using suspended photonic crystal reflectors, which could access these regimes. Second, we aim at performing quantum experiments with macroscopic objects of 10^13 atomic mass units. To this end, we employ magnetic levitation, which allows to greatly decouple the center-of-mass motion of a levitated mechanical resonator from its environment. We demonstrate first steps along the way via realizing chip-based magnetic levitation of superconducting microparticles. In the future, we aim to couple the levitated particle to superconducting circuits to perform quantum control of its center-of-mass motion.

May 30th, 12:15 h, live HISKP lecture hall and via Zoom
https://uni-bonn.zoom.us/j/98441612025?pwd=a01SSjlkY1Q3SDFhL09JQk1qc1V6dz09
Meeting-ID: 984 4161 2025
Kenncode: 294164