



CRC 1227  
Designed Quantum States of Matter



## GUEST LECTURE

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(Guest of Profes. Dr. E. M. Rasel and Dr. K. Hammerer)

Leibniz Universität Hannover  
DQ-mat Colloquium  
**29 October 2020, 3.30 pm**  
(via Zoom-Meeting)

### **"Testing gravity with cold atom interferometry: Results and prospects"**

The ability to control the quantum degrees of freedom of atoms using laser light opened the way to precision measurements of fundamental physical quantities. I will describe experiments for precision tests of gravitational physics using new quantum devices based on ultracold atoms, namely, atom interferometers and optical clocks. I will report on the measurement of the gravitational constant  $G$  with a Rb Raman interferometer, on experiments based on Bloch oscillations of Sr atoms confined in an optical lattice for gravity measurements at small spatial scales, and on new tests of the Einstein equivalence principle. I will also discuss prospects to use atoms as new detectors for gravitational waves and for experiments in space.

All DQ-mat members and all interested  
are cordially invited to attend.