

## Einladung zum Physikalischen Kolloquium

Montag, 18.05.2015  
16:15 Uhr in N24/H13

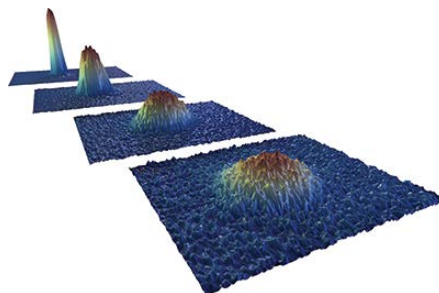


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### **Long-time atom interferometry for precision measurements**

The last two decades have witnessed a remarkable progress in the use of atom interferometry (AI) for high-precision measurements with a wide range of applications to gravimetry, geodesy and fundamental physics. In the first part of the talk I will explain the key underlying physics of atomic clocks and AI-based measurements of the fine-structure constant as well as AI-based inertial sensors (accelerometers and gyroscopes) and their use for gradiometry, measurements of the Newtonian gravitational constant and tests of the equivalence principle.

In many of these cases the sensitivity grows with the square of the interferometer time. Therefore, a substantial breakthrough can be achieved by employing longer interrogation times, and microgravity platforms offer a unique environment for reaching such long times (up to tens of seconds or more) with compact set-ups. On the other hand, long-time AI must confront a number of challenges connected with the growing size of the atom cloud as well as the effects of rotations and gravity gradients. I will describe some of the research efforts pursued in our group in order to tackle those issues and briefly present the experiments employing ZARM's drop tower, sounding rockets and future space missions in which we are actively involved.



Ab 15.45 Kaffee, Tee und Kekse vor dem Hörsaal H13

**Organisation:** Prof. Dr. F. Jelezko, Tel. 23750

**Host:** Prof. Dr. W. Schleich, Tel. 23080, off.: 23081