



CRC 1227  
Designed Quantum States of Matter



## **GUEST LECTURE**

**Prof. Dr. Dan Stamper-Kurn**

UC Berkeley  
Ultracold Atomic Physics Group  
(Guest of Prof. Dr. Silke Ospelkaus and  
Prof. Dr. Klemens Hammerer)

Leibniz Universität Hannover  
Welfengarten 1, 30167 Hannover  
(building 1101)  
**Seminar room D326**  
at the Institute of Quantum Optics  
03 May, 2018, 3:30 pm

### **"Detecting and coupling quantum objects with quantum light"**

An assortment of quantum technologies are being developed, for purposes such as precise sensing, quantum information processing, and quantum simulation of complex systems, in which light is used to cause quantum objects to interact and to allow their properties to be measured. By combining techniques of ultracold atomic physics and quantum optics, we have developed a system in which both mechanical oscillators and also spin oscillators, both comprised of small batches of atoms trapped in vacuum, interact with the electromagnetic modes of a high-finesse optical cavity. I will describe the use of this system for realizing quantum-limited force detection, for cavity "cooling" of spin ensembles, and for exploring light-induced coupling between mechanical and spin oscillators.

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