

## Invitation to IQ<sup>ST</sup> Seminar

on Wednesday, May 2nd, 2018, 10am  
University of Stuttgart  
Pfaffenwaldring 57, NWZ II, Room 2.136



**Dan Stamper-Kurn**  
UC Berkeley, CA, USA

### 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.