



CRC 1227  
Designed Quantum States of Matter



## GUEST LECTURE

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(Guest of Prof. Klemens Hammerer)

Leibniz Universität Hannover  
DQ-mat Colloquium

**01 July 2021, 3.00 pm**  
(via Zoom-Meeting)

### **"Strong photon-photon interactions in atomic ensembles"**

Optical nonlinearities at the few-photon level bring together the fields of quantum optics and nonlinear optics. This regime, so-called quantum nonlinear optics, is described by effective strong interactions between individual photons. I will introduce the basic concepts and experimental arrangements realizing this regime using hot or ultracold Rydberg atoms. I will overview recent achievements, such as the observation of high-order photonic bound states, strong three-photon interactions, and photonic states with short-range crystal correlations. I will end with some intriguing prospects.

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