Q 51: Hertha-Sponer Preisträgervortrag

Zeit: Donnerstag 11:30–12:00 Raum: 5L

Preisträgervortrag Q 51.1 Do 11:30 5L

Quantum communication based on photon counting and integrated optics — •Christine Silberhorn — Max Planck Forschungsgruppe IOIP, Günther Scharowskystr 1 / Bau 24, 91058 Erlangen

Conventional quantum communication systems are typically either based on single photon protocols or on so-called continuous variable states with Gaussian phase space representations. The characterisation of multi-photon states of most experimental work in the field is based on homodyne detection where photon numbers cannot be distinguished. A recent development employs conditioning single-photon detection to generate highly non-classical non-Gaussian states from Gaussian single-mode squeezed states. Photon number resolved detection can be accomplished in cost-effective linear fibre networks and provides a new promising tool for conditioning state preparation and applications in quantum communication. In this talk we present a new method to measure directly the photon statistics of non-classical light. We exploit a priori information of the state generation process to obtain loss-tolerant photonic state characterization, which is crucial for the observation of many quantum characteristics. For the generation of non-classical light we employ highly efficient wave guided parametric down conversion sources. In conjunction with number resolved photon counting these sources can be utilized to implement effective quantum key distribution.