Seminarankündigung

Dienstag, 01. Februar 2011

17:15 Uhr

WSI, Seminarraum S 101

“Semiconductor sources of photon pairs”

Quantum information research has largely been catalyzed by quantum optics experiments on the founda-tions of quantum mechanics through the study of quantum entanglement. Spontaneous parametric down-conversion superseded the earlier atomic cascade sources and became the work horse of all kinds of quan-tum information technology. And yet, it is often still the sources that limit our ability to go beyond the current level of achievements.
With brighter, integrated sources that have the desired spectral and statistical properties we could imple-ment practical quantum key distribution and quantum repeaters. In our group, we are working on a variety of semiconductor implementations of photon pair sources. We study parametric down-conversion in Al-GaAs Bragg reflection and other waveguides, photon pair production via polariton scattering in strongly coupled quantum-well microcavity systems and alternative routes to entanglement from quantum dots. In my presentation I will discuss the requirements for entangled photon pair sources that arise from quantum information processing and our projects and results with these techniques.

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