



Seminarankündigung

**Dienstag, 13. Dezember 2011
17:15 Uhr**

ZNN, Seminarraum EG 0.001

“Quantum optics with quantum dots in photonic nanowires: Basics and application to “ultrabright” single- photon sources”

Over the last 20 years, major efforts have been devoted to the tailoring of the optical properties of semiconductor emitters using optical microcavities and photonic crystals.

We have recently introduced photonic wires as a novel resource for solid-state CQED. I will review recent studies which demonstrate an excellent control over the spontaneous emission of InAs quantum dots (QDs) embedded in single-mode GaAs photonic wires. On the basic side, we have demonstrated a strong inhibition ($\times 1/16$) of QD SpE in thin wires ($d < \lambda/2n$), a nearly perfect coupling of the SpE to the guided mode ($\beta > 0.95$ for $d \sim \lambda/n$). A single QD in a photonic wire is thus an attractive system to explore the physics of the “one-dimensional atom” and build novel quantum optoelectronic devices. Quite amazingly, this approach has for instance permitted (*unlike* microcavity-based approaches) to combine for the first time a record-high efficiency (72%) and a negligible $g^{(2)}$ in a QD single photon source.

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