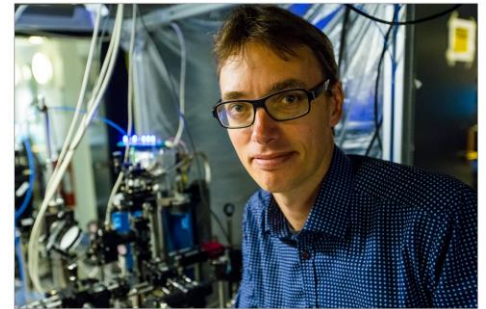


### TRR Guest Scientist Lecture / Seminar

Date/Time: 12.04.2016 / 11am  
Location: UPB, Alter Senatssitzungssaal  
P1.301



#### Peter Lodahl

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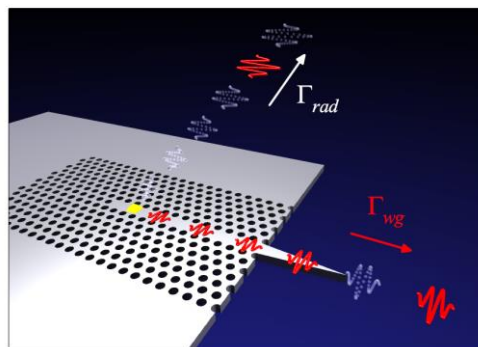
## Quantum-information processing with solid-state single-photon sources

#### Abstract:

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We review the recent experimental progress on the use of quantum dots coupled to photonic-crystal waveguides enabling unique ways of engineering light-matter interaction [1]. We show that single photons and single quantum emitters can be deterministically coupled as a basis of single-photon sources [2] and single-photon nonlinearities [3]. We furthermore discuss how chiral emission can be achieved in specifically prepared construction of non-reciprocal devices [4]. Finally, we discuss the platform to larger quantum applications in quantum-information processing. One particular application involves using nonlinear conversion to achieve photon sorting enabling deterministic Bell-state measurements [5]. Other possible applications include boson sampling or the generation of large-scale entangled photon-cluster states.



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