Title: Metamaterial based single photon emitters

Abstract: Single photon emitters that can work on demand, that is, emit when triggered are of utmost importance for practical implementation of quantum information processing. For efficient single photon emitters, one would need to optimize the overall efficiency that includes both the quantum efficiency as well as the collection efficiency. Solid-state equivalent of 2-level systems like quantum dots or nanoparticles and colour centres in materials like nanodiamonds, SiC, among others are studied as dipole emitters that are embedded in different hosts. For higher quantum efficiency, manipulation of the photonic local density of states in the host medium is necessary to achieve maximum Purcell factor. Further design would require efficient out-coupling of photons to the far-field which is, typically, air or an optical fiber. In this talk, I will present dipole emitters in photonic crystal microcavity as well as metamaterials to enhance their overall emission efficiency in particular directions.

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