Seminarankündigung

Dienstag, 12. November 2013
15:00 Uhr

WSI, Seminarraum S 101

“Controlling single photon emitters by plasmonic antennas hybridized with structured dielectric environments”

State of the art nanophotonics uses either ultra-high Q microcavities or broadband plasmonic antennas to achieve strong coupling between photons and matter. First I introduce you to the challenges and results obtained when using simple plasmonic antennas to control single emitters such as quantum dot nanocrystals, NV centers or single molecules. Next I will discuss plasmonic antennas in structured environments. The motivation is that plasmon antennas would only be useful for, e.g., quantum information processing if they could succesfully interface emitters to waveguide circuits, while also in more immediate fields such as LED's and photovolotaics antennas are used on highly structured dielectric media.
The question hence arises how an antenna is modified by its larger dielectric photonic environment. In particular, I will show how the mode structure, Purcell enhancement factor and the spontaneous emission beta-factor, emerge from the properties of constituent systems: the an tenna placed in a dielectric environment such as a dielectric cavity. Ultimately, plasmon antennas placed inside tructured dielectric environments, such as moderate-Q resonators may allow to obtain strong coupling at practical quality factors (Q ~ 100-1000).

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