

Quantum nanophotonics in waveguides

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It is nowadays possible to place both natural and artificial few-level systems in the proximity of waveguides. This allows, for instance, the creation of quasiparticles with mixed exciton-photon characteristics, the modification (via the photons) of the emitter-emitter interaction and the generation (via the emitters) of photon-photon interactions.

In this talk I will (i) present a general numerical framework to investigate this kind of systems and (ii) use to study how to generate non-linear optical effects at the few-photon level, (iii) analyze the existence and properties of bound states that appear in this system.