

Nonlinear Optics with a Few Photons and a Single Molecule

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I plan to start this presentation with an overview of our work over the past decade on the efficient coupling of light and single quantum emitters [1-7]. The long-term goal of these projects is to establish a platform for nano-quantum-optical operations and cooperative interactions in a mesoscopic system of photons and quantum emitters [8]. In order to achieve this, we have developed novel microcavity [9] and chip-based nanoguide circuitry [10] for use at cryogenic conditions.

The main discussion of this talk will be on nonlinear optical phenomena in a simple two-level atom. We will see that a single organic molecule can act as an efficient nonlinear medium for switching weak beams of light [9-11].

References:

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