Mercoledì 20 Dicembre, alle ore 15:30, presso l'aula B del Dipartimento Di Fisica e Chimica, via Archirafi 36, il

Prof. Harold Baranger
(Duke University, USA)

terrà un seminario dal titolo:

Waveguide QED:
Quantum Transport of Strongly-Correlated Photons

Tutti gli interessati, inclusi studenti e dottorandi, sono invitati a partecipare.

Abstract

Strong coupling between a local quantum system and extended bosonic states has recently become experimentally feasible in a variety of plasmonic, photonic, circuit-QED, and cold-atom contexts. This has opened up a new field dubbed "waveguide QED". I first introduce several of the experimental systems and the basic quantum non-linear optics problems they can address. Then, turning to our own results, I present an exact solution of the quantum transport problem of photons in a waveguide strongly coupled to a two-level system (qubit). We explore the dramatic quantum optics effects in these systems. In particular, multi-photon correlated states emerge in the scattering of two or more photons, which can lead to phenomena such as photon blockade or photon capture into bound states. Such nonlinear phenomena in open systems can play a critical role in the manipulation of individual, mobile quanta, which is a key goal of quantum information processing and communication.