



Tuesday, March 26, 2017 - 14:00 h
CFEL Seminar room IV (O1.111)

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"Coherent states of light and ordered states of matter in cavity QED"

Collective phenomena originating from interactions between light and matter have become a major focus of interest spanning different fields of research.

By allowing the creation of entangled quantum states of light and collective matter excitations, cavity quantum electrodynamics offers a fascinating platform in this context. Intriguing phenomena are expected when ordered phase of matter are strongly coupled with vacuum fluctuations of the electromagnetic fields in a cavity.

In this talk I will review my recent research activity along this direction focusing, in particular, on the simultaneous appearance of coherent states of light in the cavity field and condensation of excitons in the material. The formation of coherent states in the cavity field is usually known as photon superradiance, while condensation of excitons can be realised in the so called excitonic insulators materials.

I will characterize this "superradiant excitonic insulator" (SXI) phase discussing probes by coupling with external fields bringing the system out of equilibrium as well as possible realisations in real materials.

Host: Angel Rubio

