

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 4 May 2017

17:00 -18:00

3rd Floor Seminar Room

" Manipulating polariton condensate on a chip "

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Abstract

A new field of "polaritonics" is emerging as a highly promising alternative to purely photonic and electronic systems. In particular in semiconductor microcavities, huge nonlinearities can be obtained, when excitons are strongly coupled to cavity photons producing new exciton-photon states called polaritons. The bosonic nature of these particles makes them ideal candidates to investigate the physics of Bose condensates in a solid state system, while their mixed light-matter nature allows us to directly optically visualize and manipulate them. I will review several material systems including hybrid organic-inorganic systems in which polariton lasing and condensation has been observed up to room temperature. I will introduce the concept of optical trapping of exciton-polariton condensates and show how such trapped condensates can spontaneously magnetize to emit strongly circularly polarised light. I will describe how we exploit this new phenomenon to controllably align the spins of neighbouring polariton condensates and demonstrate a sub-femtojoule polariton condensate spin switching. These discoveries open a breath-taking perspective for the practical use of polaritons in a new generation of opto- and micro-electronic devices.