

MASTER IN PHOTONICS – PHOTONICS BCN EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: April - September 2017

Laboratory : Nano-optoelectronics group of Prof. F. Koppens
Institution: ICFO – The Institute of Photonic Sciences
City, Country : Castelldefels, Spain

Title of the master thesis: Nano-photonics with two-dimensional materials

Name of the master thesis supervisor:

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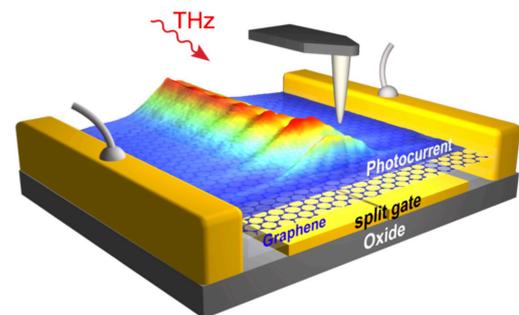
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Summary of the subject:

The control of polaritons are at the heart of nano-photonics and opto-electronics. Two-dimensional materials have emerged as a toolbox for in-situ control of a wide range of polaritons: plasmons, excitons and phonons. By stacking these materials on top of each other, heterostructures of these materials can be controlled at the atomic scale, with extremely high quality and clean interfaces. Recently, ultrafast photodetectors, LEDs, and solar cells have been demonstrated consisting only of a few atomic layers.

The goal of this master thesis project is to fabricate, simulate and measure heterostructures of 2d materials, in order to study the coupling between infrared light, electrons and plasmons. The goal is to design new types of devices for infrared light emitters, photodetectors and modulators. The project can have a more applied or fundamental character, depending on the profile of the student. Experiments will be performed with a near-field microscope, and simulations with the software Lumerical.



The student will be part of a team consisting of a PhD student and postdoc, and work closely together with other group members and participate in group meetings in order to maximize the learning experience.

For any questions or more information please visit this website

https://www.icfo.eu/research/groups-details?group_id=31

Please do not hesitate to contact Prof. Frank Koppens (frank.koppens@icfo.eu)

Keywords :

Nano-photonics

Nano-electronics

Nano-technology

2D materials

Near-field microscopy

Additional information :

* Required skills : background in physics or engineering and experience in the laboratory and/or with simulations is a plus

* Miscellaneous :

