



ERASMUS MUNDUS



## EUROPHOTONICS-POESII MASTER COURSE

### PROPOSAL FOR A MASTER THESIS

Dates: April 1<sup>st</sup>, 2016 – September 30<sup>th</sup>, 2016

**Laboratory : Functional Optoelectronic Nanomaterials**  
**City, Country : Barcelona, Spain**

**Title of the master thesis : Tailoring the optoelectronic properties of 2D materials for electronic and optoelectronic applications.**

**Name of the tutor of the master thesis:** Gerasimos Konstantatos

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### **Summary of the subject (maximum 1 page) :**

The aim of this project is to control the electronic properties of 2D materials at the atomic scale in order to allow controlled, tunable and robust electronic doping. Doing so, a whole new range of applications will be enabled by this new material platform, from all-2D homo- and hetero-junctions for photodetectors, solar cells and light emitting devices. The candidate will work in close collaboration with senior material scientists in the group to develop novel doping schemes in 2D materials and characterize devices made thereof. Depending on the progress of the project specific applications will be sought in the field of all-2D LED architectures or photodetectors, also depending on the candidate's preference.

**Keywords :2D materials, doping, transistors, LEDs, photodetectors**

### **Additional information :**

\* Required skills :

Strong knowledge of semiconductor physics and devices as well as optoelectronics or chemistry and material science. Very good marks in the undergraduate course curriculum.

Desired but not required: prior expertise with microfabrication and cleanroom exposure (spincoating, thermal evaporation, photolithography etc.) or characterization (I-V, transistor characterization etc.) or wet chemistry processing.

\* Miscellaneous: Candidates with interest to continue at a Ph.D. level are strongly encouraged to apply and will be seriously considered.

This topic can accommodate more than one candidates.