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**ICFO**  
The Institute  
of Photonic  
Sciences



## **Master in Photonics – “PHOTONICS BCN” Master ERASMUS+ “EuroPhotonics”**

### **MASTER THESIS PROPOSAL**

**Dates: April - September 2022**

**Laboratory: ENPHOCAT: ENergy, PHOtonics & CATalisys**  
**Institution: Universitat de Barcelona**  
**City, Country: Barcelona. Spain**

**Title of the master thesis: PHOTOLUMINESCENCE PROPERTIES OF  
ZnO/GRAPHENE NANOMATERIALS**

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**Keywords: Nanomaterials, Nanotechnology, ZnO, Graphene, Photoluminescence.**

**Summary of the subject (maximum 1 page):** This project is based on the development of advanced nanomaterials that hold the key to open a new generation of products for clean, renewable and sustainable energy. These breakthroughs will be reached through the control of material properties and understanding of mechanisms and phenomena at the nanoscale and atomic level. Photoluminescent ZnO/Graphene nanomaterials are an emerging class of nanomaterials with unique optical properties. They each, ZnO and carbon nanomaterials, have an advantage of being nontoxic and environmentally friendly. Moreover, ZnO presents photoluminescence emission in the UV and visible region depending on the synthesis routes, shape, size, deep level, and surface defects. When combined with carbon nanomaterials, modification of surface defects in ZnO allows tuning of these photoluminescence properties to produce, for example, white light.

**Additional information (if needed):**

\* Required skills :

\* Miscellaneous :