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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 METAL
OXIDE NANOMATERIALS**

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Keywords: Nanomaterials, Nanotechnology, MOXs, Photoluminescence.

Summary of the subject (maximum 1 page): There is a worldwide rising concern about air quality monitoring and toxic gas emissions. In this field, extensive efforts have been made in order to discover or manufacture sensors, with the ability to detect a specific gas among a mixture of gases or sensors having the ability to continuously monitor an atmosphere. Semiconductor metal oxides (MOXs) have risen as an outstanding family of promising materials due to their inexpensiveness, outstanding properties, such as chemical resistance, endurance and time stability. MOXs are employed as sensitive layers for sensors in many fields, they are present mostly in the automotive industry, the petrochemical industry and for safety monitoring in domestic premises. 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 MOXs nanomaterials are an emerging class of nanomaterials with unique optical properties, which have an advantage of being nontoxic and environmentally friendly.

Additional information (if needed):

* Required skills :

* Miscellaneous :