



## **MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS-POESII”**

### **MASTER THESIS PROPOSAL**

**Dates: April - September 2018**

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

**Title of the master thesis: NANOMATERIALS FOR PHOTOCATALYTIC APPLICATIONS**

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**Keywords: Nanomaterials, Nanotechnology, H<sub>2</sub> production, CO<sub>2</sub> activation**

**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. The main challenges are to understand how to get new materials capable to obtain fuels such as hydrogen and carbon reduced forms based (i.e. methane, methanol) from the carbon dioxide re-utilization at low-cost and high-efficiency. The high efficiency solar to fuel energy conversion require features that must guarantee the device functionality: i) photon absorption, ii) charge separation and carrier current management, and iii) charge transfer involving catalyst for the expected chemical transformation.

**Additional information :**

\* Required skills :

\* Miscellaneous :