



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

## MASTER THESIS PROPOSAL

**Dates: April - September 2018**

**Laboratory: GEF: Group of Electro-Photonics**  
**Institution: Universitat de Barcelona**  
**City, Country: Barcelona. Spain**

**Title of the master thesis: DEVELOPMENT OF ZINC OXIDE WITH SILICON TECHNOLOGY FOR GREEN AND EFFICIENT PHOTOVOLTAIC APPLICATIONS**

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**Keywords: ZnO, memristor, solar cell, photodetector, optical switch, electro-optical modulator**

**Summary of the subject (maximum 1 page):** The development of new materials with extraordinary properties can solve or at least improve all the challenges that our society is facing today, including energy, climate and health. Integration of those innovative materials with existing mainstream technology is a way to benefit from them in a short term and cost-effective way. We attempt at improving electronic and photonic devices by introducing in silicon technology a very promising and versatile Transparent Conducting Oxides (TCO) as Zinc Oxide (ZnO). ZnO shows excellent performance in both electronics and optics and are disruptive for beyond CMOS nanoelectronics (TCOs for electronic switches and memristors), photovoltaics (TCOs and p-n heterojunctions for solar cells), optoelectronics (TCOs for LEDs and displays) and silicon nanophotonics (TCOs for switches and optical interconnects). Introduction of ZnO materials in Si technology would contribute to a number of improved devices in terms of performance, capability of miniaturization, cost reduction and energy efficiency.

**Additional information :**

\* Required skills :

\* Miscellaneous :