



Master in Photonics – “PHOTONICS BCN” Master ERASMUS Mundus “EuroPhotonics”

MASTER THESIS PROPOSAL

Starting full time from April 2025

Presentation at the end of July or beginning of September 2025

Laboratory: D4-S107, Optical Communications Laboratory
Institution: UPC and collaboration with company NVIDIA
City, Country: Barcelona, Spain

Title of the master thesis: Characterization and control of NVIDIA Photonic Integrated Switch for SDN networks

Name of the master thesis supervisor and co-supervisor: José Antonio Lázaro
Email address: jose.antonio.lazaro@upc.edu
Phone number: +34 934 017348
Mail address: UPC, Campus Nord, D4-007

Keywords: Integrated Photonics, Optical Fiber Networks, Mach-Zehnder Switch

Summary of the subject (maximum 1 page):

We are developing with NVIDIA a new Photonic Switch, with the recently developed NVIDIA technology. This master's degree project focuses on developing a Photonic Integrated Switch. A controller based on DACs (Digital Analog Converters) is already available from a previous final degree thesis. This master thesis will focus on the photonic characterization of the Photonic Integrated Switch in collaboration with NVIDIA.

Objectives:

- Collaboration with NVIDIA and the UPC professors involved in the project, for the measurement and characterization of the integrated photonic circuits provided by NVIDIA.
- Testing the switching capacities (speed, energy consumption) of the prototype using the previously developed controller.

Additional information (if needed):

- * Required skills: Knowledge about optical fibers communications and about integrated photonics
- * Miscellaneous: Use of photonic laboratory equipment