



Education and Culture DG

ERASMUS MUNDUS



EUROPHOTONICS-POESII MASTER COURSE

PROPOSAL FOR A MASTER THESIS

Dates: Feb 2018 – July 2018

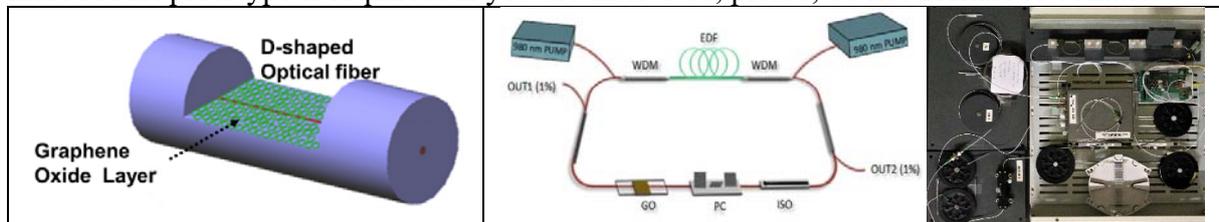
Laboratory: D4-S107, Optical Communications Laboratory
City, Country: Barcelona, Spain
Title of the master thesis: Graphene-Based Fiber Laser (with Potential Company Grant)
Name of the tutor of the master thesis: José Antonio Lázaro Villa, Samael Sarmiento
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Summary of the subject (maximum 1 page):

Optical Fiber permit transmission of an enormous transmission capacity of more than 10Tbps per single-core&mode fiber (new fibers having multiple cores multiply this capacity by e.g. x20), but also can be used to fabricate lasers. (And in fact, fiber lasers are used for “laser cutting machines” and commercial versions provide a continuous beam of, e.g., 10kW!:
https://en.wikipedia.org/wiki/Fiber_laser).

Well, we are not interested in such “Death Star” lasers, but on “high-speed” lasers thanks to the properties of Graphene. In fact, a 1st prototype is available in the Lab (D4-S107) thank to great work in a previous Final Degree Bachelor Thesis! (See Figure)

Unfortunately, ... we learn, thanks to cooperation with a company fabricating and commercializing super nice fiber lasers for sequencing DNA, food quality control, microscopy, etc., ... that the 1st prototype is nice of a Lab, but, for a potential commercial product, a new more robust prototype is required! If you are interested, please, do not hesitate to contact!



*: Images from Laura Rodriguez and Albert Peralta “Graphene-based Laser” Poster at Physics Engineering Degree (ETSETB-UPC).

Keywords: Optical Fiber, Laser, Graphene, Industrial applications.

Additional information:

* Required skills: Interest on collaborating with a company and developing laboratory prototype. At least some laboratory experience with optical fibers and Arduino.

IMPORTANT: an interview with the company before starting the Master Thesis is requested.