



MASTER IN PHOTONICS – “PHOTONICS BCN” ERASMUS+ “EUROPHOTONICS”

MASTER THESIS PROPOSAL

Dates: April - September 2019

Laboratory : Quantum Nano-Optoelectronics group of Prof. Frank Koppens (Websites: Graphene.icfo.eu
Koppensgroupicfo.es)

Institution: ICFO
City, Country : Castelldefels, Spain

Title of the master thesis: Diffuse optical spectrometry using graphene photodetectors

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Keywords : Spectroscopy, medical optics, diffuse optics, graphene

Summary of the subject (maximum 1 page) :

Light provides a medium to safely and non-invasively probe the content of biological tissue. With this in mind, flexible graphene (one-atom thin layer of carbon) photodetectors have previously been used to extract a range of vital signs including heart rate, and respiration rate. This projects aims to widen the number of vital signs measured by graphene photodetectors through spectroscopy. Tissue properties are simulated by creating a diffusive medium called a phantom. Using these phantoms, the project aims to extract concentrations of compounds to provide measurements such as oxygenation content in a local tissue.

Previous implementations include:

UV Sensor: <https://youtu.be/e2MjyN8OIbg>

Wearable vision: https://youtu.be/_Wb0qCnMObw



Additional information :

* Required skills : fiber

* Miscellaneous :

optics, low-noise electronics