



ERASMUS MUNDUS



Education and Culture DG



## **PHOTONICS - EUROPHOTONICS MASTER COURSE**

### **MASTER THESIS PROPOSAL**

**Course 2014 –2015**

**Laboratory : ICFO (Institute of Photonic Sciences), Group nano-optoelectronics (Frank Koppens)**

**City, Country : Castelldefels (Barcelona), Spain**

**Title of the master thesis : Integrated optics with graphene plasmons**

**Name and affiliation of the tutor of the master thesis : Prof. Dr. Koppens**

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#### **Summary of the subject (maximum 1 page):**

Graphene is a new material that is only one atom thick and possess many remarkable electronic and optical properties. Among all its exceptional properties, graphene has been demonstrated to be a material of interest for potential photodetectors with the advantages of providing ultrafast response and having a broadband absorption covering the whole optical spectrum (ranging from the ultraviolet range up to terahertz frequencies).

In addition, graphene has excellent tunable optical and nano-photonics properties, providing a tool for ultrafast electro-optical switching and modulation. In this project, new concepts for integrating graphene with photonic integrated circuits will be explored. The goal is to show optical switching and modulation at very small lengths scales.

**Keywords : light modulation, graphene, plasmonics**

#### **Additional information :**

\* Amount of the monthly allowance (if it is the case):

\* Required skills:

\* Miscellaneous: