

## **PHOTONICS - EUROPHOTONICS MASTER COURSE**

### **MASTER THESIS PROPOSAL**

**Course 2015 –2016**

**Laboratory : ICFO - Optoelectronics Group  
City, Country : Castelldefels, Spain**

**Title of the master thesis : Nano-structured optical surfaces for antireflective and superhydrophobic properties.**

**Name of the tutor of the master thesis : Valerio Pruneri  
Email address : Valerio.pruneri@icfo.es  
Phone number : +34 93 553 4052  
Mail address : ICFO**

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

**The synthesis of new materials and the advances in controlling new masking fabrication processes at the nanoscale are the basis for the development of new designs and added functionalities in surface engineering. Despite the intensive academic research in nanophotonics and the demonstration of its potentials in various fields, significant effort is still needed to fully exploit it at industrial level. In particular an essential feature for mass production of devices is to find reliable techniques, other than classical optical and e-beam lithography, that allow precise nanostructuring of large surfaces at low cost.**

**The research will focus on developing optical surfaces and interfaces with unprecedented properties by using advanced concepts and nano-fabrication techniques scalable at industrial level. These include but are not limited to Nanosphere Lithography with Latex Polystyrene beads, dual size roughness by silica nanospheres assembly and Block Copolymer Micelle Lithography within the nanometer range. Additionally, etching techniques such as Reactive Ion Etching and Wet etching will be used to micro and nano-structure different glass types.**

**The trainee will closely work with Researchers and PhD students of the Optoelectronics group at ICFO: <http://www.icfo.es/optoelectronics>**

**Keywords : Nanosphere Lithography, Polystyrene Beads, Block Copolymer Micelle Lithography, Silica Nanospheres, Dry etching, antireflective nanostructured surfaces, superhydrophobicity, oleophobicity.**

**Additional information :**

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

**\* Required skills : applied research, industrial project skills, knowledge in materials science and physics**

**\* Miscellaneous :**