PHOTONICS - EUROPHOTONICS MASTER COURSE

MASTER THESIS PROPOSAL

Course 2014 –2015

Laboratory : ICFO - Optoelectronics Group
City, Country : Castelledefels, Spain

Title of the master thesis : New masking methods for nano-structured optical surfaces for antireflective and superhidrophobic properties.

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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 nano-photonics 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 :