

PHOTONICS - EUROPHOTONICS MASTER COURSE

MASTER THESIS PROPOSAL

Course 2015 –2016

Laboratory : Institut de Microelectrònica de Barcelona (IMB-CNM, CSIC)/ Laboratori de Microbiologia Ambiental (UAB)

City, Country : Bellaterra, Barcelona, Spain

Title of the master thesis: Dynamically modifiable optical elements based on biological structures

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Summary of the subject (maximum 1 page):

Nature is an exhaustible source of material with interesting optical properties. Protein-based silk or saccharide-based alginates have already been demonstrated ideal optical properties to be used as biological optical fibres or components of optical systems. Additionally, depending on the fabrication conditions and/or the reversibility of the gelling/obtaining process, these materials can present variable optical properties. The mouldable nature of these materials, which can change their optical properties in response to several environmental or applied conditions, will be used, in this case, for sensing. The objective of this project will be the development of dynamically modifiable optical elements based on biological compounds for biological sensing. The student will be responsible for design, fabricating and optimization of optical elements based on biomaterials for biological sensing (e.g. urine pH determination).

Keywords : optical dynamic structures, biomaterials, cell-based optical elements.

Additional information :

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

* Required skills: knowledge in photonics, biomaterials and design/simulation software (COMSOL, TracePro, OSLO, AutoCAD, Inventor, etc.).

* Miscellaneous: