

PHOTONICS - EUROPHOTONICS MASTER COURSE

PROPOSAL FOR A MASTER THESIS

2015-2016

Laboratory : Dep of Physics, UPC, Campus Terrassa;
City, Country : Terrassa, Barcelona, Spain

Title of the master thesis : Spatial beam manipulation by photonic crystals

Name of the tutor of the master thesis : Kestutis Staliunas, Crina Cojocaru, Jose Trull
Email address : kestutis.staliunas@icrea.es
Phone number : +34-937 398 739
Mail address : Colom 11, E-08222 Terrassa, Barcelona, Spain

Summary of the subject (maximum 1 page) :

In the proposed project a spatial beam transformer (an integrated spatial Fourier filter & a focalizing element), based on woodpile-type Photonic Crystal (PhC) will be developed, in theoretical, numerical, and in experimental level.

The idea of spatial beam manipulation in specially designed photonic crystals is to be developed, with the final aim to bring the proposed idea to a commercial optical element, or device. In the project, depending on the theoretical/experimental inclination of the student/students, all chains of this development are possible. The student can participate in development of the theoretical description of the spatial filtering process, by investigating the spatial propagation aspects of in photonic crystals. The student can participate in the numerical FDTD (finite difference time domain) study, FDTD-design, and FDTD-optimization of the photonic crystal for optimum beam formation. The student can also participate in experimental studies of the spatial filtering and focalisation-imaging process with the woodpile PhCs.

Keywords : Photonic crystals, flat lens imaging, sub-wavelength imaging, spatial filtering

Additional information :

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