PHOTONICS - EUROPHOTONICS MASTER COURSE

PROPOSAL FOR A MASTER THESIS

2015 – 2016

Laboratory : ICFO - The institute of Photonic Sciences
City, Country : Castelldefels – Barcelona - Spain

Title of the master thesis :

Integrated photonic circuits for quantum applications

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Summary of the subject (maximum 1 page) :

Quantum key distribution (QKD) systems have drawn a strong interest and have been widely studied in the last decade. Besides increasing security using QKD, other applications can benefit from quantum devices, including random number generation for computation or gaming.

The main aim of the proposed project is to work on an integrated version of a recently proposed quantum random number generator (QRNG). Using state-of-the-art integrated photonic or fibre optic technology, the student will design, build and characterize a new QRNG.

The work involves in and out-coupling form a silicon photonic device, a nano-optical station and system performance tests including opto-electronic and quantum bit-rate measurements.

Further theoretical and experimental possibilities can be developed after successful accomplishment of the first part of the project.

Keywords :

Mach Zehnder Interferometer (MZI), Photonics Integrated Circuits (PCI), Random Number Generators (RNG), Quantum Key Distribution (QKD).

Additional information :

* Amount of the monthly allowance (if it is the case):
* Required skills : We are looking for a highly motivated student whit basic optics and electronics laboratory knowledge. Skills in matlab, labview and general programming are highly desirable.

* Miscellaneous :