Laboratory for Nanotechnology, Instrumentation and Optics (LNIO)

PhD title: BRIDGing quantum emitters with intEgraTed opTics (BridgETT)

BridgETT is an application-oriented project with the goal of engineering a versatile platform using integrated optics in order to achieve efficient interfacing between nanoemitters and photons. We propose to couple a nanoemitter (as a potential solid-state qubit) with a photonic waveguide in order to interface light and matter reversibly and efficiently. We propose an innovative hybrid system combining nanoemitters with glass waveguides via a plasmonic stage. For the first time, BridgETT combines integrated optics and quantum optics with photonics and plasmonics.
BridgETT will require three important aspects:

1) design and fabrication of the hybrid photonic system,
2) characterisation of the hybrid system
3) experimental determination of its quantum optics properties.

This project is mostly experimental including, fabrication and characterisation but some simulation aspects will be done as well.

BridgETT is part of a new research subject called Quantum NanoDevices (www.quantumnanodevices.com, qnD) which aims at developing devices at the nanoscale using quantum properties and its specificities.

This project will take place in one of the three French Technological Universities situated in Troyes, within the Laboratory for Nanotechnology, Instrumentation and Optics which is an associate CNRS lab as well as a member of the selected French National Laboratory of Excellence (Labex) called 'ACTION'. This project will benefit from National as well as Regional funding and will be using the regional nanofabrication platform "Nano'mat" (www.nanomat.eu). It will be in collaboration with Prof Alberto Bramati from the Laboratoire Kastler-Brossel at the University Pierre and Marie Curie in Paris.

Dates: Start in 2016 for 3 years.
Application deadline: 20th of May 2016
Preferred skills: quantum optics, nanooptics, photonics

Contact : Please send CV, Master's results (or equivalent degree), names of referees and a motivation letter to Dr Christophe Couteau, couteau@utt.fr An interview (physically or by visio) will be conducted.
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