Montpellier, May 12\textsuperscript{th}, 2014

Postdoctoral position

“Spectroscopy of nitride-based photonic cavities for nanolasers and frequency conversion”

III-N materials (GaN, AlN, InN and related alloys) have become the dominant materials for UV to blue-green semiconductor light sources. Besides these conventional light emitters, these III-N materials will also be used in the future in less conventional emitters and for new applications (integration with electronics, integration with lab on chip, array of microsources, cryptography...). They are thus expected to play a significant role in novel photonic systems and, in this respect they are very good candidates to probe light-matter interaction in photon confining structures.

A close collaboration between four laboratories (L2C, CRHEA, IEF and INAC) achieved the demonstration of state-of-the-art AlN photonic cavities embedding GaN quantum dots over the past years [1,2]. Within the ANR-Quanonic project (QUAntum and Nonlinear Optics in NItride Cavities, 2014-2017) and the Labex GaNeX, new schemes for GaN-based microlasers and second-harmonic generation are presently developed.

The recruited postdoctoral fellow will be in charge of the optical spectroscopy of the photonic crystals designed for original frequency conversion configurations, such as backward second harmonic generation (SHG) and “all angle” SHG [3]. He/she will also be involved in the modeling of the photonic structures and the non-linear effects, based on already used commercial and home-made numerical codes.

He/she will work within the L2C “Physique de l’exciton, du photon et du spin” team, composed of experimentalists and theoreticians. Its transverse domain of research is the control of the coupling between photons and excitons. Its experimental platform includes a UV-specific micro-photoluminescence experiment based on a wide range of pulsed and continuous-wave excitation sources. This setup allows real-space, Fourier-space and confocal imagery. The modeling will be developed with the theoreticians, through standard codes (MIT-MPB and MEEP) as well as a model of second harmonic generation allowing for the rigorous resolution of Maxwell equations in complex nanostructures.


Requirements

The candidate should have a PhD in condensed matter physics or photonics, and a strong experimental background in optical spectroscopy of photonic crystals and/or semiconductor nanostructures.

The knowledge of photonic softwares such as MIT-MPB and MEEP would be greatly appreciated.

Conditions of employment

The fellowship at Université Montpellier 2 is funded by the french “Agence Nationale de la Recherche” (ANR) for one year, starting between september 2014 and january 2015. The gross salary is typically 2500€.

Contact: Thierry Guillet
(+33) 4 67 14 37 89
thierry.guillet@univ-montp2.fr