

Spécialité de Master « Optique, Matière, Paris »

Stage de recherche (4 mois minimum, à partir de début mars)

Proposition de stage (**ne pas dépasser 1 page**)

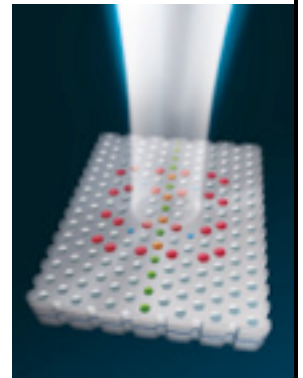
Date de la proposition :

Responsable du stage / internship supervisor:			
Nom / name:	GIACOMOTTI	Prénom/ first name :	ALEJANDRO
Tél :	0170270448	Fax :	
Courriel / mail:	alejandro.giacomotti@c2n.upsaclay.fr		
Nom du Laboratoire / laboratory name: C2N			
Code d'identification :	UMR9001	Organisme :	CNRS/Université Paris Saclay
Site Internet / web site:	https://www.c2n.universite-paris-saclay.fr/fr/		
Adresse / address:	Avenue de la Vauve, 91120 Palaiseau		
Lieu du stage / internship place:	C2N		

Titre du stage / internship title: **Quantum nanolaser sources**

Résumé / summary

A Master position is open at C2N (France). This project aims at realizing quantum photonic sources based on nonlinear interactions in optical nanocavities with few photons. Unlike conventional semiconductor quantum sources that require deterministic coupling of cavity modes to single nanoemitters (i.e. quantum dots) and operate at ultralow temperatures, this PhD thesis will focus on the realization of nanophotonic devices capable of achieving quantum correlations with few photons using material optical nonlinearities at room temperature, in coupled nanocavities. Such capabilities will rely on a few recent observations at C2N of highly nonlinear phenomena in laser nanocavities with moderate to low photon numbers [1,2]. Building blocks will be hybrid III-V semiconductor photonic crystal nanocavities and nanolasers, incorporating active materials such as InP-based quantum wells. The candidate will explore innovative technological developments that will ultimately enable room-temperature, single photon sources in the telecommunication C-band, with a high potential for integration. The student work will include design and modeling, clean room fabrication, and experimental characterization.



The candidate should ideally have a strong background in physics, with particular emphasis on experimental skills. Previous experience in quantum optics and/or nanofabrication will be appreciated.

The candidate may send a CV and/or request further information to:

- Alejandro Giacomotti (C2N): alejandro.giacomotti@c2n.upsaclay.fr

- Ariel Levenson: juan-ariel.levenson@c2n.upsaclay.fr

[1] P. Hamel et al, *Spontaneous mirror-symmetry breaking in coupled photonic-crystal nanolasers*, Nat Photon. **9**, 311 (2015).

[2] M. Marconi, et al, *Far-from-equilibrium route to superthermal light in bimodal nanolasers*, Phys. Rev. X **8**, 011013 (2018).

Toutes les rubriques ci-dessous doivent obligatoirement être remplies

Ce stage pourra-t-il se prolonger en thèse ? Possibility of a PhD ? : OUI

Si oui, financement de thèse envisagé/ financial support for the PhD: Bourse Ecole Doctorale

Lumière, Matière, Interactions	<input checked="" type="checkbox"/>	Lasers, Optique, Matière	<input checked="" type="checkbox"/>
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Fiche à transmettre (fichier pdf **obligatoirement**) sur le site <http://stages.master-omp.fr>