



Post-doctoral research fellow

NONLINEAR PHOTONIC NANOSYSTEMS

Context & summary:

We are hereby announcing a post-doctoral fellowship within the topic of nonlinear hybrid integrated photonics for sensing and laser applications. Non-linear photonic components have known an ever growing success for more than 20 years in fields as varied as lasers, biomedicine and high-speed telecommunications. In this context, reducing the footprint down to a micrometric scale is a crucial issue. This challenge can be addressed by exploiting materials with high non-linear properties, or by employing specific photonic architectures that enhance non-linear effects. The post-doctoral project will aim at exploring both ways in the view of developing photonic sensors and highly coherent lasers.

The project is funded both by the multiply european platform and by the french national research agency. The post-doctoral fellow will be in charge of the project, and will have to ensure that three successive milestones are achieved in two years:

- COMSOL® modeling for the development of 3D photonic hybrid sensors and lasers.
- Design and manufacturing by clean room micro and nanotechnologies (e-beam, reactive ionic etching, focused ion beam milling...).
- optoelectronic characterization, evidence of enhanced non-linear effects (Brillouin and Kerr effect)

The project will be carried out with the combined resources of the MIMENTO technology center and the FEMTO-ST research institute.

Eligibility and conditions:

In order to be eligible, candidates have to comply with the following requirements:

- Be in possession of an internationally recognized PhD-degree at the time of the application deadline, or provide evidence of its completion in the next 3 months (required before the start of the fellowship, October 1st). The fellowship can begin between October 1st and December, 15th.
- Have a significant track-record.
- Provide CV and motivation letter to the contact below before September, 15th.

References :

- [1] A. Caspar, M. Roussey, M. Häyrynen, J. Laukkanen, A. Pérignon, F. Behague, V. Calero, G. Ulliac, M.-P. Bernal, M. Kuitinen and N. Courjal, *High-Aspect-Ratio LiNbO3 ridge waveguide with vertical buffer layer and enhanced electro-optical efficiency*, Journal of Lightwave Technology, **36**(13), 2702-2709 (2018).
- [2] A. Godet, A. Ndao, T. Sylvestre, V. Pecheur, S. Lebrun, G. Pauliat, J.-C. Beugnot, Kien Phan Huy, *Brillouin spectroscopy of optical microfibers and nanofibers*, Optica, **4**, 1232 - 1238 (2017).

Keywords:

Photonics, Optoelectronics, Micro & nanotechnologies, Nonlinear photonic systems

Information:

Net Salary: ~ 2250 €/month,

Beginning: 1st of october

Supervisors: **Nadège Courjal** and **Jean-Charles Beugnot**

Location : MIMENTO technology central and FEMTO-ST institute, Besançon

Contact:

Send an email with CV to **Nadège Courjal**: nadège.courjal@femto-st.fr