

Internship in photonics & microsystems

Photonic sensors for microwave radiations detection

Key words : photonics & microwave, micro & nanotechnologies, microsystems, optoelectronic characterization, F.E.M. (Finite Element Method) calculation

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Location : FEMTO-ST (Besançon), with experiments at Kapteos site (Ste Hélène du Lac)

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SYRAH-lab is a joint research laboratory resulting from the collaboration between the FEMTO-ST institute and the kapteos company.

In the context of an ever-increasing demand for very high data rates, the measurement of electromagnetic fields (EM) over ultra wide spectral bands (10 Hz to 100 GHz) is of paramount importance for various applications including health, safety and telecommunications. The proposed mission concerns the development of a new generation of probes dedicated to the sensitive and high-resolution detection of electromagnetic (EM) microwave fields. The scientific and technological challenges will be to develop and integrate compact integrated photonic architectures [1-3] into the low-invasive electromagnetic probes developed by Kapteos. The objectives will include the development of original photonic architectures but also characterization platforms combining ultra-resolution spectrometry, fast polarimetry and photo-robotic alignment.

More specifically, in collaboration with a multidisciplinary team, the trainee will carry out the following missions:

- Follow-up of the technological developments within the MIMENTO platform
- Characterization of the probes with advanced optoelectronic technics, and analysis of the electro-photonic phenomena
- Development of a finite element model of the components.
- Follow-up of pigtailing, encapsulation, packaging and on-site testing will also

If your background includes physics and/or engineering and optics, if you like working with a pluridisciplinary team, and if you are interested in micro and nanotechnologies, don't hesitate to apply.

References:

- [1] N. Courjal, F. Henrot, C. Guyot, E. Fizaine, *WO2016097658A1*
- [2] N. Courjal, A. Gerthoffer, F. Henrot, J.-Y. Rauch, C. Guyot, B. Edouard, *WO20115114060 A*
- [3] V. Calero, R. Salut, M. Suarez, B. Robert, A. Caspar, N. Courjal, M.-P. Bernal, *Scientific Reports*, **9**, (2019)

Application: send a CV and motivation letter to nadege.courjal@femto-st.fr.