

Job title:

Post-doctoral researcher / Research engineer in physics and optoelectronics (M/F)

General informations

Contract duration: 24 months

Quota of work: Full time

Hiring date (expected): 15/01/2025

Diploma required: Level 8 - (PhD in Physics)

Desired experience: PhD or Engineering degree in physics / electronics / instrumentation

Indicative remuneration: approx. €2400 net per month (full cost of €3000 gross per month)

Workplace: Laboratoire de Physique des Lasers / Institut Galilée / Université Sorbonne Paris Nord - 99
Av Jean-Baptiste Clément - 93430 VILLETANEUSE

Missions

The candidate will be part of the Embedded Metrology team of the Metrology, Molecule and Fundamental Tests axis of the Laser Physics Laboratory (UMR7538). He/She will work under the supervision of Vincent Roncin (MCF, HDR) and Frédéric Du-Burck (Pr Emerite) as part of the BRIOCHE project (ANR ASTRID 2024-2027 funding), the aim of which is to study, produce and characterize a transportable 1.5 μm frequency reference for on-board metrology instrumentation applications.

The reference consists of a laser diode whose frequency is locked to transitions of Acetylene C12 (@1535 nm) and C13 (@1542 nm) detected by saturated absorption spectroscopy in cell. Except the cell, the device will be fully fibered and packaged so that it can be moved to the project partners' sites. Qualification of the reference's metrological performance (frequency stability) will be carried out at 1542 nm by comparison with the REFIMEVE signal available in the laboratory and by direct comparison of two identical setups at 1542 nm or 1535 nm.

Activities

The candidate will be responsible for managing the project and organizing all the experimental studies involved:

- 1) Progress on two prototypes of transportable metrological references produced in collaboration with project partner Silentsys [1],
- 2) Improvement of noise rejection techniques for the detection of weak signals in Acetylene spectroscopy [2],
- 3) Study of an original technique for detecting saturated absorption signals in interference-insensitive fibered devices [3].

[1] <https://silentsys.com/>

[2] K. Manamanni, et al., "Limitations due to residual interference in a fiber-based optical frequency reference at 1.55 μm ," J. Opt. Soc. Am. B 39 (2), 438 (2022) 10.1364/OL.472887.

[3] V. Roncin, et al., "Stability Improvement of a Fiber-Based Frequency Reference at 1.5 μm Using an Original Detection Technique for Interference Cancellation," 2023 CLEO Europe & EQEC, Munich, Germany, 2023, pp. 1-1, doi: 10.1109/CLEO/Europe-EQEC57999.2023.10231821.

Skills

The candidate should have knowledge in physics, photonics and fiber devices, laser instrumentation, as well as notions of analog electronics and signal processing (modulation and detection).

He/she must have a taste for experimentation and teamwork, project management (reporting, organization and management of meetings), and be punctual, available to other partners and highly motivated for his/her project.

Context of work

The candidate will carry out experiments at the LPL (in-cell molecular spectroscopy, modulation and detection using fiber-optic components at 1.5 μ m). He/she will also monitor the progress of prototypes produced at Silentsys (packaging and control electronics)

Constraints and risks

The candidate will be required to travel to various locations inherent to a collaborative research project, such as project reviews and technical visits to project partners (Paris region, Le Mans). He/she will also present his/her results in national and international conferences.

The research project is linked to the DGA (defense), **the candidate should preferably be of a European nationality.**

Supplementary information

Closing date for the receipt of applications: 15/12/2024

Contact: Dr. Vincent RONCIN, BRIOCHE project local manager

vincent.roncin@univ-paris13.fr

Application: CV and cover letter to vincent.roncin@univ-paris13.fr