

Job title:

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

1) General informations

Contract duration: 12 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. €2300 net per month

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

2) Missions

The ANR-supported TranStab project brings together two academic laboratories (LPL/CNRS-USPN and Institut FOTON/CNRS-UR) and one industrial company (Thales TRT) over a three-year period to design and demonstrate compact devices for stability transfer from a 1.5 μm optical frequency reference to wavelengths of interest ranging from near-IR to visible. The aim is to meet the growing need for stable laser sources in both research and industry for applications in high-sensitivity detection and quantum technologies.

The approach developed in TranStab involves stabilizing a fiber-optic interferometer on a reference, then locking one or more “target” lasers onto this transfer device at other wavelength(s).

As part of the project, LPL will study an initial architecture based on a ring cavity. The expected level of stability is in the 10^{-15} range for stability transfer in the C+L band.

A second architecture enabling extended transfer down to 1 μm will use wavelength multiplexing couplers at the cavity input. The use of fiber components developed for the optical telecommunications market will make these devices compact and transportable.

These transfer tools will be characterized for near transfer (<30 GHz) by directly measuring the beat between the reference and the target laser. They will be characterized for long-distance transfer by comparing the performance of two identical prototypes. These tests will enable us to check compliance with specifications and identify physical phenomena limiting the transfer.

3) Activities

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 Emeritus) as part of the TranStab project (ANR funding 2024-2027).

The candidate will be responsible for monitoring the project and organizing all experimental developments:

- 1) Production of prototype cavities based on the two architectures described above,
- 2) Characterization of their metrological performance.

4) Skills

The candidate should have knowledge of 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 and highly motivated for his/her project.

5) Context of work

The candidate will be responsible for monitoring the progress of prototypes produced at LPL in the mechanical and electronics workshops. He/she will be responsible for implementing and characterizing them.

6) Constraints and risks

The candidate will be required to make various trips inherent in a collaborative research project, such as project reviews and technical visits to project partners.

7) Supplementary information

Closing date for the receipt of applications: 15/10/2024

Contact : Dr. Vincent RONCIN, Principal Investigator of the TranStab project

vincent.roncin@univ-paris13.fr

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