SYRTE Observatoire de Paris | PSL
SYstèmes de Référence Temps-Espace

Post-doc vacancy

EMPIR EURAMET
The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

SYRTE, Observatoire de Paris, France, is opening a post-doc position in:

Ultrastable oscillator for atomic clocks at the Quantum Projection Noise limit

Position

Description: Optical lattice clocks have the potential to reach a fractional resolution better than 10^{-17} at one second, only limited by the atomic Quantum Projection Noise (QPN). In order to interrogate the metrological transitions of the 7 operational SYRTE atomic clocks, we are developing an ultrastable laser based on a long Fabry-Perot cavity (40 cm) equipped with crystalline mirrors at 1542 nm. The thermal noise of this source is projected to be compatible with the QPN limit, and its spectral purity will be forwarded to atomic clocks frequencies by the transfer oscillator technique applied to optical frequency combs.

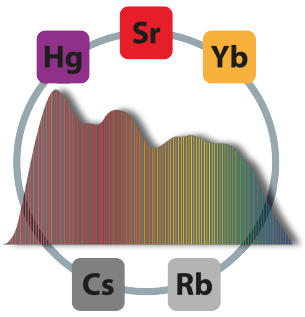
The candidate will be in charge of implementing optical and seismometric methods to reach the noise limit of the long cavity. He/she will also develop operational setups to transfer the stability obtained at 1542 nm to 265.5 nm/578 nm/698 nm (to probe respectively Hg/Yb/Sr cold atoms in the SYRTE optical lattice clocks), and to 6.8 GHz/9.2 GHz (respectively for Rb/Cs cold atoms in the SYRTE microwave fountains). He/she will quantify the metrological performance of the resulting signals, and closely work with the clock teams in order to experimentally and theoretically study the resolution clock comparisons can reach with the provided signal. The objective is to demonstrate a 1542 nm source bringing the entire SYRTE clock ensemble at the QPN limit, and opening the way towards an optically-based timescales.

Start date: Jan. 2023, to be discussed

Work place: Observatoire de Paris, France

Field: Ultrastable lasers, Transfer of spectral purity, Atomic clocks, High resolution spectroscopy.

Framework: The position is funded by the EURAMET Joint Research Project NEXTLASERS, a European collaboration focused on next generation laser sources.



Profile

The candidate must have completed a PhD in experimental physics. A strong interest for experimental work is necessary, expertise in optics, lasers, electronics and Python programming is required. Experience in optical frequency combs and ultrastable Fabry-Perot cavities is an asset. The candidate is expected to take responsibility in the project.
The SYRTE cavities/combs group is composed of approx. 4 people. This 1542 nm source will be at the heart of the SYRTE metrological architecture: a good team spirit, as well as a good knowledge of English, are therefore absolutely necessary.

Contact

Send a motivation letter, a CV with list of publications, and two references before Dec. 15th, 2022 to:

Rodolphe Le Targat
rodolphe.letargat@obspm.fr
Tel : +33 (0) 1 40 51 23 44

Jérôme Lodewyck
jerome.lodewyck@obspm.fr
Tel : +33 (0) 1 40 51 22 24