

SYRTE is opening a post-doc position in:

Enhanced frequency stability in strontium optical lattice clocks

Position

Description:

SYRTE is developing optical lattice clocks that are now more accurate and more stable than the primary frequency standards. These clocks are among the main contenders for a possible redefinition of the SI second. Because they simultaneously probe thousands of neutral atoms, their ultimate frequency stability – the quantum projection noise – is by far exceeding the stability of any other frequency reference. The project proposed here aims at reaching this quantum limit for the first time.

The candidate will be in charge of experiments with a non-destructive detection system of the transition probability in a Sr optical lattice clock, offering a SNR close to a single-atom detectivity. This detection is based on a cavity-enhanced dispersive interaction between light and cold atoms. The candidate will study the possibilities offered by this detection in order to reduce the effects currently limiting the clock stability, and demonstrate a Quantum Projection Noise (QPN)-limited optical lattice clock. The candidate will then implement techniques to demonstrate the quantum non-demolition probing of the atoms in the clock, and explore quantum engineered states suitable to overcome the QPN, such as spin-squeezed states.

In addition, the candidate will take part to the Sr clocks activities, in particular to international clock comparison campaigns, and to the ground segment of the Pharao/ACES space clock mission. For this, the candidate will work in close collaboration with the members of the optical frequency group at SYRTE.

More information: Project web page: <https://syrte.obspm.fr/spip/science/fop/experiences/article/anr-caoc>

Work place: Observatoire de Paris, France

Field: Cold atoms, Atomic physics, High resolution spectroscopy, Quantum optics.

Framework: The position is funded by the ANR.

Profile

The candidate must have completed a PhD in experimental physics. Experience in optics, lasers and electronics is required. Experience in cold atoms and in quantum optics is an asset. The candidate is expected to take responsibility in the project.

Contact

Send a motivation letter, a CV with publications, and the name and contact information of two references to:

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

Related projects:

- ▶ Sr clocks web page: <https://syrte.obspm.fr/spip/science/fop/experiences/article/horloges-optique-a-atomes-froids-de-strontium>
- ▶ Optical frequency group web page: <https://syrte.obspm.fr/spip/science/fop/>