

LTE is opening a PhD thesis position in:

Cavity-assisted non-destructive detection in strontium optical lattice clocks

Position

Description: The optical frequency group at LTE (Laboratoire Temps Espace, Observatoire de Paris) is developing Optical Lattice Clocks (OLCs) that are now more accurate and more stable than primary frequency standards. These clocks are among the main contenders for a possible redefinition of the SI second. Because OLCs 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. To reach and overcome this limit, several noise sources have to be controlled.

The candidate will be in charge of exploiting a non-destructive detection of the transition probability implemented in a Sr optical lattice clock. This detection is based on a cavity-enhanced dispersive interaction between light and cold atoms, with a signal-to-noise ratio below the standard quantum limit, hence able to produce Spin Squeezed States (SSSs) of the atomic ensemble. She/He will contribute to the implementation of a clock interrogation protocol taking advantage of the SSSs to improve the clock stability. Then, the candidate will work in a new version of the detection system suitable for operational metrological measurements.

Start date: At the latest in summer 2026.

Work place: Observatoire de Paris, France

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

Framework: The position is funded by the European Commission Doctoral Network QuRIOUS (Quantum Research and Innovation in Optical clocks for Upcoming Scientists) <https://www.quriousclocks.eu/>



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Quantum Research and Innovation in Optical clocks
for Upcoming Scientists

Profile

The candidate must have obtained a M2 degree in quantum physics, with knowledge in atomic physics (cold atoms), and quantum optics. Previous experience (e.g. M1 or M2 internships) in optics, lasers, electronics, and computer programming is an asset. Experience in quantum optics and cold atoms is an asset.

The SYRTE strontium clocks group is composed of approx. 5 persons. A good team spirit, as well as a good knowledge of English, are absolutely necessary.

Contact

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

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