

Postdoctoral position at SYRTE
“Atom Interferometry and Inertial Sensors” Team

Large area cold atom gyroscope

The laboratory and the team. The SYRTE laboratory, located on the Paris Observatory campus, is a joint research unit of Paris Observatory - PSL, CNRS, Sorbonne University and Laboratoire National de Métrologie (LNE). The post-doctoral researcher will join the “Atomic interferometry and inertial sensors” team at SYRTE, a leading laboratory in the development of high sensitivity inertial sensors based on atomic interferometry, such as gravimeters and gyroscopes, using cold atoms trapped or in free fall. The atom interferometry team has a good track-record in training its postdoctoral researchers towards a permanent position, whether in the academic or industrial sectors. He or she will work under the direction of Arnaud Landragin, Research Director at CNRS, on an experimental setup operational today.

Context and goals of the project. Cold atom interferometers have achieved levels of sensitivity and accuracy that rival or surpass inertial sensors based on different technologies. These sensors have many applications in geophysics, inertial navigation, metrology and fundamental physics. To broaden their range of applications, it is necessary to constantly push back their performance in terms of sensitivity, stability, accuracy, dynamic range, compactness or robustness, ease of use and cost. The project will involve the study and development of SYRTE's very large-area dual-axis cold atom gyroscopes, in order to push its performance to a stability of 10 prad/s for rotational measurements, which represents an improvement of more than an order of magnitude on the current state of the art level. It will be based on the new methods to improve its sensitivity by reducing the contribution of vibration noise in order to reach the interferometer's detection limit, which is intrinsically linked to the quantum projection noise. This level of sensitivity will enable rotation velocity measurements of great interest to the rapidly expanding field of rotational seismology. It will also make it possible to test fundamental physics, and in particular gravitation, by measuring the Sagnac effect in a range of as yet unexplored accuracies.

Start date: Early 2024, as soon as possible

Profile: The candidate should hold a PhD in physics and have strong experimental skills in laser physics, atomic physics, electronics and instrument control. Research experience in the field of cold atoms is mandatory. Any experience in the field of atomic interferometry will be highly appreciated.

Nationality: No restrictions.

Contact: Send CV, publication list, motivation letter and references to the project leader, Arnaud Landragin: Arnaud.landragin@obspm.fr