



Postdoc position in cold-atom interferometry at the SYRTE laboratory

Starting date: July 1st, 2020 at the latest - Duration: 18 months (renewable). Location: Paris, France.

The laboratory and the team. The SYRTE laboratory, located on the Paris Observatory campus, is a joint research unit of CNRS, Sorbonne University and the French National Metrology laboratory (LNE). It is an interdisciplinary laboratory with expertise in time and frequency metrology, atom interferometry, astronomy for the definition of celestial reference frames and history of science, with an internationally renowned reputation in these fields. The atom interferometry and inertial sensor (IACI) group (about 20 researchers) has developed the field of cold atom inertial sensors for 20 years and is recognized worldwide for its expertise in the field, both on the fundamental and field applications of atom interferometers. Besides pioneering fundamental studies, the team is willing to create links with the industry, one prominent example being the creation in 2011 of the spin-off company *muQuans*. The team has strong international collaborations and is embedded in the Paris-area quantum technology network [SIRTEQ](#).

Context and goals of the project. Cold atom interferometers have reached sensitivity and accuracy levels competing with or outperforming inertial sensors based on different technologies. These sensors have several applications in geophysics, inertial sensing, metrology and fundamental physics. Enlarging their range of applications requires to constantly push further their performances in terms of sensitivity, stability, accuracy, dynamic range, compactness or robustness, ease-of-use, and cost. More than 40 research groups worldwide are actively developing cold-atom inertial sensors for different applications, and investigating techniques to improve their performances.

The project will be conducted on the cold atom gyroscope-accelerometer experiment of the IACI group, which has demonstrated several times [record performances](#). The first step in this project will be to use the experiment to perform a test of special relativity (Sagnac effect for matter-waves) in a so-far unexplored range of accuracy, in collaboration with the theory team of the laboratory. The postdoctoral researcher will then gradually work on the development of a new two-axis ultra-cold atom gyroscope experiment that achieves a stability of 1 prad/s for rotation measurements, representing an improvement of two orders of magnitude compared to the current level. This exquisite sensitivity level will allow to perform rotation rate measurements of high interest to the rapidly growing field of rotational seismology. The researcher will also participate to using this instrument for a test of gravitational decoherence models by atomic interferometry.

Profile of the applicant. We are looking for outstanding candidates strongly motivated by challenging experimental physics projects, preferably with a PhD experience in atomic physics (ideally atom interferometry) and with skills in instrumentation. The postdoctoral researcher is expected to work in a team and will gradually be in charge of the daily management (e.g. providing the students with guidance), while being involved in the scientific and strategical



decisions regarding the project. The researcher will also be invited to write research proposals to gain in autonomy and improve his track record (e.g. Marie Curie applications).

Future career development. The IACI team has a good track-record in employment of postdoctoral researchers whether in the academic or industrial sectors. Applications for permanent positions in the laboratory will be encouraged.

Conditions. The position is based on a full-time employment at the SYRTE laboratory, with a salary following the experience. It is funded for at least 18 months in the framework of the project “Precision Inertial Measurements by Atom Interferometry” of the French national research agency (ANR). The position is associated with the regular social package provided in France (e.g. health insurance). Help for finding an accommodation and settling in Paris will be provided.

The interested candidate should address a CV to Remi Geiger (email: remi.geiger@obspm.fr).