



Lecturer at Sorbonne University assigned to laboratory SYRTE

Cold atom quantum sensors

Laboratory: SYRTE - Observatoire de Paris, 77 avenue Denfert Rochereau, 75014 Paris, France

Director: Arnaud Landragin, arnaud.landragin@obspm.fr

Website: <https://syrte.obspm.fr/>

Research:

The Lecturer will join the SYstèmes de Référence Temps-Espace laboratory to develop research on the development of quantum protocols specific to cold atom sensors, pushing back their limits in terms of sensitivity and strengthening the laboratory's position in a highly competitive field at international level.

The research project, whether experimental or theoretical, must be directly linked to the laboratory's experimental projects. The Lecturer will join one of the three teams concerned: FOP, IACI and RefMET (Optical frequency metrology, Atom interferometry and inertial sensors, Microwave references and time Scales).

SYRTE is a pioneering laboratory in the development of quantum sensors. It studies different types of cold atom sensors: microwave clocks, optical clocks and inertial sensors (gyrometer, gravimeter, gradiometer, on-chip interferometer). These have proved remarkably effective in creating measuring instruments with unequalled performance, for original applications in various fields: geophysics, fundamental metrology, testing the fundamental laws of physics, navigation & positioning. In order to push further the sensitivity limits of these sensors, or improve their compactness to make them transportable, or even on-board, with identical performance, it is important to take advantage of the resources offered by quantum mechanics, which are currently little or not used for space-time measurements. These various protocols include, for example, optimal quantum control, non-destructive measurement methods and the preparation of compressed states for measurements below the standard quantum limit, or even entanglement between sensors. Their implementation for sensors still remains a challenge.

Contacts:

Team FOP : Jérôme Lodewyck ; jerome.lodewyck@obspm.fr

Team IACI : Franck Pereira Dos Santos ; franck.pereira@obspm.fr

Team RefMET : Stéphane Guérandel ; stephane.guerandel@obspm.fr

Teaching: teaching will take place at Sorbonne Université's [Physics Department](#), on the Pierre et Marie Curie campus.

All physics teaching from Licence 1 to Master 2, including teacher training courses and courses shared with other Sorbonne University departments

Contact:

Director of the Physics Department: Jérôme Tignon; jerome.tignon@sorbonne-universite.fr