Internship (5 months) - Pôle R&D (Calern) Geoazur - MetroCom

Title of the proposal:

Metrologie du temps et des distances basée sur une liaison optique télé**Com** en espace libre

(Time and Distance **Metro**logy base on free-space laser **Com**munication link)

Laboratory: Pôle R&D – **Géoazur – Observatoire de la Côte d'Azur**
Address: Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS, IRD, Géoazur,
2130 route de l'Observatoire, 06460 **Caussols, France**
Contact scientifique: julien.chabe@geoazur.unice.fr, duy-ha.phung@geoazur.unice.fr

Duration **5 months** (Spring - Fall 2021)

Deadline for application: **31 March 2021**

The proposed internship is in the field of Time & Frequency Metrology base on a laser communication (lasercom) link – MetroCom project. It consists in development and demonstration of a calibration system (based on high-speed fiber optical switch) that carries out time & frequency measurements. The objectives of MetroCom project are to identify the elementary bricks needed for the implementation of this new metrology technique and to demonstrate metrology performance on a real 10Gbps free space telecom link at 1550nm. The work proposed in this internship will be positioned in double tasks: participation to the devices testing (high-speed fiber optical switch) of timing **measurement/calibration process** and to the experiment demonstration of two-way timing jitter measurement based on lasercom link (5km free-space slant path). The internship can be extended by a thesis proposal in the same project.

To carry out the internship works, the student will work in the context of a research group working on the theme of timing measurement (or laser ranging). For information, a complete optical bench (in the coudé of 1.5 m telescope) and a platform with reflector (5 km away) have been developed and upgraded to establish two-way 10 Gbps telecom link. The student can perform all test/development/demonstration with this bench.

Context of the PhD and lab presentation:

The Pôle R&D (https://geoazur.oca.eu/fr/organ-geoazur/pol-ing-tech-geoazur/745-pole-r-et-d-geoazur) of the Geoazur laboratory (https://geoazur.oca.eu/fr) is composed of about fifteen people, one of four laboratories of Côte d'Azur Observatory (https://www.oca.eu/fr/) and it is joint research unit (UMR 7329) of CNRS (http://www.cnrs.fr/), of IRD (https://www.ird.fr/) and Côte d'Azur University (https://univ-cotedazur.fr/). The research team is located in an Observatory's observation site near Caussols-France, based on 1.54 m telescope platform (MeO telescope - Grasse Station, https://www.oca.eu/fr/meo). The Grasse SLR station, part of the ILRS network (ID7845) participates to various free-space laser applications including Satellite Laser Ranging Lunar Laser Ranging, Time Transfer by Laser Link, high-resolution imagery, debris detection and research in fundamental physics (finding dark matter, testing equivalent Principe, Moon physics…). The research carried out from the the proposed internship concerns the improving of laboratory performance on timing measurement and laser ranging.

Candidate profile

Competencies required: Physics (Photonics), background in metrology & Data analysis

He/she have received a training M2 or 3rd year of engineering school in Physics (Photonics), Lasers, and interested in Metrology and experiment measurement with optical fiber components.

Application should include a detailed CV, a letter of motivation, letters of reference if possible, (to be sent to: Julien Chabé, julien.chabe@geoazur.unice.fr, and Duy-Hà Phung, duy-ha.phung@geoazur.unice.fr).