



Job title

Research engineer in optics, photonics, physics
Typical job : Expert in experimental development

- **General information**

Contract duration: 12 months

Start of contract: March 2021

Desirable area of expertise: optics, photonics, lasers, general physics

Diploma or university title: Engineer diploma or PhD in Physics

- **Mission**

The engineer will ensure the design and implementation of the laboratory's instrumental projects in the fields of photonics and optical systems. He / she participates in the scientific projects of the laboratory related to the development, tuning, operation and applications of fiber and free space optical systems, near infrared lasers, semiconductor sensors and their associated electronics

- **Context and work environment**

The ARTEMIS laboratory is a joint research unit of CNRS, Côte d'Azur University (UCA) and Côte d'Azur Observatory (OCA). Its main scientific theme is the physics and the detection of gravitational waves (GW). In this context, researchers, engineers and laboratory technicians are deeply involved in the science and construction of detectors intended for the detection of GW.

Several experimental projects are at the heart of the laboratory's instrumental activities: Virgo and Einstein Telescope terrestrial detectors, as well as the future LISA space observatory.

The ARTEMIS laboratory and its researchers were pioneers in the development of the Franco-Italian Virgo detector, in particular they had major contributions in the development of the laser system. The Virgo detector, with the American double LIGO detector, has already revealed several observations of gravitational waves.

Mission of the European Space Agency, LISA (Laser Interferometer Space Antenna) will allow a considerable extension of the observation of the Universe through GWs. It will use laser interferometry, already exploited by LIGO and Virgo terrestrial detectors, but in space, and in a frequency band beyond the reach of terrestrial detectors:

<https://www.elisascience.org/articles/lisa-mission/lisa-mission-gravitational-universe>

The precision targeted for the phase measurement of the heterodyne interferometer in the LISA instrument implies a particularly detailed study of the sources of noise and systematic effects, and will make, of the phase of AIVT (Assembly, Integration, Validation and Test) in which France is involved, a particularly important step.

In this context, the engineer will participate in the development of the laboratory's instrumental projects around the AIVT activities of the LISA instrument. In particular, he/she will bring his/her contribution to the high precision metrology of optoelectronic devices called photoreceivers (PRs), devices intended for the detection of optical interference signals and their transformation into amplified electrical signals.

He/she will also support other laboratory projects, in particular the design, the realization of prototypes and the characterization of complex optical equipment for ground tests, intended on one side for the scattered light studies and to another side for the measurement of opto-mechanical

coupling, phenomena inherent in the optical benches of the LISA experiment.

- **Activities**

- Design, development, fine-tune and / or pilot innovative benches in the field of optical instrumentation and characterization of photoreceivers
- Carry out tests and calibrations of the various experimental benches
- Coordinate and control, until the acceptance, the studies, the achievements and the integrations
- Write documents of user procedures, technical specifications, design and production associated with the experimental devices
- Develop the qualification of the experimental device, carry out tests and calibrations, write user procedures
- Participate in working and team meetings devoted to these research activities
- Temporary missions in the LISA France collaboration laboratories are to be considered

- **Compétences**

- Have in-depth knowledge in at least one of the fields of optical instrumentation, semiconductor sensors and lasers
- Have basic knowledge of fiber optic systems, electronics and optics
- Have general knowledge of physics sciences
- Have knowledge of measurement techniques and instrumentation
- Have experience in the field of metrology
- Knowing how to control measuring instruments and master the tools for acquisition and processing of conventional signals such as Matlab and LabVIEW
- Know how to use optical simulation and design software (RP Photonics, Fiberdesk, Code V / Zemax, FRED)
- Know how to respect the conditions of use of experimental devices
- Be able to write procedures; knowledge of space qualification procedures will be appreciated
- English language: B2-C1 (Common European Framework of Reference for Languages)
- Know how to present and communicate on its technical developments in internal or even external seminars, intended for professional audiences or students

- **Job conditions**

Place of work: ARTEMIS Laboratory, Cote d'Azur Observatory, 96 Boulevard de l'Observatoire, Nice

- **Contact**

CV and Cover letter to be sent to

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