

Recruits a

Postdoctoral researcher (F/H)

Reference n° FOCUS-1103-LAM

	Contract type	Location
<p><i>2 years fixed-term contract</i> <i>Working time : 100%</i> <i>Starting date : as soon as possible</i></p>	<p><i>Post-doctoral contract</i></p>	<p><i>LAM - Laboratoire d'Astrophysique de Marseille</i> <i>Pôle de l'Étoile Site de Château-Gombert</i> <i>38, rue Frédéric Joliot-Curie</i> <i>13388 Marseille cedex 13 FRANCE</i></p>

Work environment

The LabEx FOCUS who funds this postdoctoral position is hosted by Univ. Grenoble Alpes (UGA). UGA is one of the major research-intensive French universities, that enjoys an international reputation in many scientific fields, as confirmed by international rankings. It benefits from the implementation of major European instruments (ESRF, ILL, EMBL, IRAM, EMFL). The vibrant ecosystem, grounded on a close interaction between research, education and companies, has earned Grenoble to be ranked as the 5th most innovative city in the world. Surrounded by mountains, the campus benefits from a natural environment and a high quality of life and work environment. With 7000 foreign students and the annual visit of more than 8000 researchers from all over the world, Univ. Grenoble Alpes is an internationally engaged university.

The person will be working at the Laboratoire d'Astrophysique de Marseille (LAM) in the research and development group called GRD, under the authority of the group responsible. The project will be done at LAM at the interface between the instrumentation R&D group (GRD) and the Space and Ground Instrumental Department (DISS). The successful participant will benefit from the local expertise in adaptive optics, in particular on wavefront sensing for ELT instrumentation, and from the mechanical, optical assembly and test expertise of technical services of the laboratory. This work will be done in parallel of the development of the ELT instrument HARMONI with strong link and discussion with the project as the prototype represents a solid back-up solution for the HARMONI LGS detector module. Collaboration with the Institut de Planétologie et d'Astrophysique de Grenoble (IPAG) are foreseen, with possibilities for short term visits during the contract.

Missions

A postdoctoral position is offered at Laboratoire d'Astrophysique de Marseille (France) to work with Dr. Benoit Neichel and Dr. Anne Costille on the development and the validation of a prototype of a Laser Guide Star (LGS) Wave-Front Sensor (WFS) for Extremely Large Telescope (ELT). In addition to these development, the candidate will explore alternative wavefront sensor schemes in order to prepare the future generation of Laser assisted AO systems on the ELT. This work is supported by the labex FOCUS (FOCal plane array for Universe Sensing) and is part of the technology development for the ELT, as the French laboratories are responsible for the delivery of the LGS WFS for two ELT instruments (HARMONI and MAORY). The key elements of the prototype (microlens array, type of detector) have already been identified thanks to European scientific program and the different parts are currently being purchased for a delivery before summer at LAM.

Main activities:

The successful applicant will be the heart of the development of the LGS WFS prototype. He will be the instrument scientist of the WFS prototype to ensure the link between the design, the development and the performance of the WFS. The expected work will be done during 24 months with the following foreseen steps:

- Hand-over of the scientific and technical context for LGS WFS sensing,
- Development of simulation tools for WFS analysis,
- Responsibility of the assembly and integration of the complete WFS prototype (microlens array, optical relay and detector),
- Definition of the prototype verification and test plan,
- Definition and follow-up of the development of the test tools for the prototype,
- Responsibility of the test of the prototype:
 - o Optical quality,
 - o Wavefront sensing,
 - o Test of adapted and innovant algorithms for wavefront sensing,
 - o Calibration and operation schemes,
 - o Analysis of the results obtained.
- Delivery of reports for the WFS validation,
- Participation to conference to present the results obtained during the post-doctoral position and publication of scientific articles.

Based on the expertise acquired during the prototype development, the candidate will propose new concepts to further improve the ultimate performance (in terms of sensitivity and linearity of LGS wavefront sensors)

First results on the prototype are expected in early 2020 and a final and complete demonstration of its performance and characteristics is expected by the end of the post-doctoral position.

Requested profile

Expected /recommended skills are:

- Adaptive optics with knowledge on wavefront sensing,
- Signal processing and Data analysis (data analysis software skill like for example IDL, Python, Matlab...),
- Basics in optics and mechanics, and assembly, integration and tests,
- Project organisation / management.

Background/diploma :

Recruitment qualification is expected at the level of a PhD degree in astronomy, physics, optics or related field or at the level of a young French research engineer (BAC+5 or MSc degree) with at least 1 year experience in the domain of optical instrumentation. The applicants must have demonstrated their capacity for independent work and for conducting independent research.

General information

Gross monthly income : from 2379€ and depending on the candidate's profile.

Paid annual leave : 45 days.

Recruitment process

✉ Please send your application to Benoit Neichel (benoit.neichel@lam.fr) and provide:

- A one page letter of motivation,
- A curriculum vitae and list of publications,
- A short (2 pages) statement of research and experience.

Applications sent before 15/05/2019 will receive full consideration.

Past this date, applications will be considered upon availability of the position.