



– PhD Position at LAM –

Prototype instrument for the direct characterization of young giant exoplanets

Location: Laboratoire d'Astrophysique de Marseille (LAM; <https://www.lam.fr/>)
Funding: [ERC HiRISE](#) (PI Arthur Vigan, grant agreement #757561)
Duration: 3 years
Starting date: October 2019 (flexible)
Deadline: 15 March 2019
Supervisor: Arthur Vigan (CNRS/LAM)
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Context

The atmospheric composition of giant gaseous exoplanets provides essential markers of their most fundamental properties, such as their formation mechanism, formation location in the protoplanetary disk or internal structure. The new-generation exoplanet imagers on 8-meter telescopes equipped with extreme adaptive optics, VLT/SPHERE and Gemini/GPI, have been designed to detect very faint planetary companions (contrast ratio $> 10^5$) at small angular separations ($< 0.5''$) in the near-infrared, but they only provide very low spectral resolutions ($R < 100$) for their characterization.

Since a few years, high-dispersion spectroscopy (HRS) at resolutions up to $R = 10^5$ coupled with high-contrast imaging (HCI) appears as one of the most promising pathways for the detection of exoplanets. The potential of HRS ranges from molecules identification, improved orbital constraints, atmospheric variability or even Doppler imaging of the photosphere. The goal of [ERC project HiRISE](#) is to bring high-spectral resolution to the SPHERE exoplanet imager at the Very Large Telescope (VLT). We will implement a fibre coupling with CRIRES+, the high-dispersion near-infrared spectrograph for the VLT, which we will use for the characterization of a sample of known young giant exoplanets.

PhD project

The selected applicant will be at the very heart of the instrumental part of HiRISE.

We are now in the design phase of the prototype fiber injection module that will be installed inside VLT/SPHERE. The implementation and testing of the prototype will start at the end of 2019. The proposed PhD project will be to follow and to participate to all the technical activities related to this development:

- Participating to the final design phases of the module
- Integrating, testing and validating the module in laboratory
- Participating to the final installation of the coupling at the VLT
- On-sky commissioning and analysis of the first science data



Over the course of the PhD, the student will work in close collaboration with the HiRISE team (6 people at LAM, plus >10 external collaborators) on the implementation of the coupling and its scientific preparation.

The PhD will be done at LAM in the instrumental R&D group (GRD). The selected applicant will benefit from the rich local scientific environment, working with world-leading experts in adaptive optics, high-contrast instrumentation and exoplanet imaging. The student will also have the opportunity to disseminate the results of her/his research in the international community and reinforce the collaboration between the national and international institutions involved in the project.

Application

The candidate should have a background in practical physics, optics or instrumentation, and should be highly motivated to work on a technical project in astronomical instrumentation.

Applicants should send a PDF file by e-mail containing:

- A 1-page letter of motivation;
- A curriculum vitae;
- A copy of the highest-level diploma;
- Marks and ranking at the Master's level

to Arthur Vigan (arthur.vigan@lam.fr). Please also arrange for 2 letters of recommendation to be e-mailed directly.

Applications received before 15 March 2019 will be fully considered. Past this date applications will be considered upon availability of the position.

LAM and CNRS are actively committed to equal opportunity in employment regarding gender, origin, religion or orientation. We strongly encourage people from underrepresented communities to apply.