1.5-year Postdoctoral Position in exo-planet atmosphere modelisation at CEA and IPGP

Contract:

1.5-year based at CEA/DRF in the Astrophysics Division (AIM) and in Maison de la Simulation, at CEA Paris-Saclay, in collaboration with the Institut de physique du globe de Paris (IPGP). The position is funded by the Labex UnivEarthS at Université de Paris.

Context & Role:

The successful candidate will coordinate and contribute to the modeling of exoplanet atmospheres in the context of the Labex project EXOATMOS. The goal is to produce 1D/2D atmospheric models of lava worlds: hot rocky exoplanets that will be observed with the next generation of space and ground-based telescopes (JWST, E-ELT). He/She will contribute to the development of the 1D/2D atmospheric modeling tool ATMO in order to account for gas/liquid thermodynamic equilibrium between the lava ocean and the atmosphere. He/She will also implement the physics needed to account for a surface in the model.

The final aim is to produce synthetic spectra to analyse JWST/MIRI data. The candidate, will have, access to MIRI data, in which the CEA team is involved also.

He/she will be also part of a team of experts from the Astrophysics Division of CEA (AIM), from Maison de la Simulation and from Institut de Physique du Globe (IPGP) and will work in collaboration with an international scientific community. He/she will have the opportunity to work on state-of-the-art tools for the modeling of exoplanet atmospheres in conjunction with laboratory experiments conducted at IPGP.

The EXOATMOS Project:

Numerical and experimental study of hot and warm rocky exoplanet atmospheres' in preparation of JWST observations

Exoplanets studies enter a new era where atmosphere of exoplanets can be characterized through spectroscopic observations during transits. Whereas atmosphere of giant exoplanets is already studied, hot, warm rocky exoplanets constitute a new class of planets in the reach of modern instruments. Our project aims to model (experimentally -using ovens- and numerically) atmosphere of hot and warm rocky exoplanets in contact with magma ocean to understand the physics of lava planets. We will also study moderate temperature exoplanets to establish potential biosignatures, in order to prepare to JWST observations. We will beneficiate from a cross-disciplinary culture coming from Earth and planetary science (IPGP team) in addition to a strong involvement in the forthcoming JWST/ MIRI instrument (AIM team)

The ATMO code:

ATMO is a 1D-2D atmospheric code for the study of the atmosphere of brown dwarfs and giant exoplanets. The code has originally been developed at the University of Exeter and is currently a collaboration between different groups across the globe, hosted at Maison de la Simulation in the context of the ERC project ATMO.

Required skills :

- PhD in astrophysics or planetology
- Operational knowledge of techniques and programming language (Fortran90, python) for application development
- Skills to work in a team

Salary

Gross salary between 2700 € and 3000 € per month (based on the experience of the candidate).

Included Benefits:

Additional funding for collaborations and personal equipment is available. The positions include comprehensive benefits packages such as transportation and lunch subsidies, medical insurance, maternity leave and retirement benefits.

Application:

To apply, please send a CV, a publication list to charnoz@ipgp.fr and pascal.tremblin@cea.fr and arrange to have 2 letters of reference forwarded to the same email address.

The expected start date is September 2021 or earlier.

Please note that the deadline for applications is 01/07/2021.