



Research position on exoplanet characterization and knowledge management

Within the framework of the European H2020 project entitled « Exoplanet Atmosphere New Emission Transmission Spectra Analysis » (Exoplanets-A), coordinated by Pierre-Olivier Lagage (CEA, France), the CEA-Paris-Saclay Astrophysics Department is inviting applications for a two-years research position, whose main purposes will be to contribute to **1)** exoplanet research activities in the topics covered by Exoplanets-A and **2)** the knowledge management of scientific and educational resources related to Exoplanets-A. Candidates will have to demonstrate skills and great interest in both 1) and 2).

About Exoplanets-A project and its research topics

Exoplanets-A gathers experts from seven European laboratories (CEA, MPIA, SRON, INTA, University of Leicester, University of Vienna, UCL) and aims to:

- Establish new knowledge on the atmosphere of exoplanets by exploiting archived space data (HST, Spitzer, Kepler). More specifically, we are developing novel data reduction methods based on causal pixel model and produce a homogeneous set of atmospheric exoplanet spectra from HST and Spitzer archives, improve 'classical' atmosphere parameters (atomic, molecular composition, pressure-temperature profile) retrieval approaches, develop 3D modelling of exoplanet atmospheres, and use the novel data reduction and retrieval tools to prepare the analysis of JWST observations of exoplanet atmospheres to be conducted within the JWST Early Release Science program and immediately public.
- Establish new insight on the influence of the star on the planet atmosphere. In particular, we are exploiting archived space data (GAIA, XMM, Chandra, Herschel, IUE, HST), as well as complementary ground-based data to build a coherent and uniform database/catalogue of the properties of the host stars of the sample of exoplanets, use modelling tools to fill gaps in observational data and to develop diagnostics to evaluate the star - planet interaction in terms of tidal dissipation and magnetic field.
- Disseminate knowledge, which consists of our science products, public outreach and educational resources. In particular we will produce a knowledge server by designing a knowledge base containing the science resources and a user Web portal to access these science resources as well as external resources and educational resources, and to engage the scientific community and citizens through contributive research and educational tools.

The work has been organized in six work packages including a dedicated work package on knowledge management. See <http://exoplanet-atmosphere.eu> for a full description.

Duties and responsibilities

The postdoc or research engineer will contribute to both scientific research activities within the Exoplanets-A Work Packages 2 to 5 and knowledge management activities within Work Package 6 as follows.

- 1) Exoplanet research activities:
 - a. To apply the data reduction and retrieval methods developed within the Exoplanets A project to existing HST and Spitzer data on exoplanets, as well as on simulated JWST MIRI data.
 - b. To analyse the results.
 - c. To contribute to the drafting and submitting of papers to peer reviewed journals.
- 2) Knowledge management activities:
 - a. To contribute to the development of the knowledge server by designing and coding Web interfaces that will exchange data and files with the knowledge base hosted on a server at Centro de Astrobiologia (Madrid), by designing and coding interfaces to retrieve data from public astrophysical archives and virtual observatories.
 - b. To contribute to the development of the knowledge base by defining data formats related to science resources, by integrating Exoplanets-A products within the database.
 - c. To contribute to the development of educational resources and public outreach actions by specifying and designing digital resources and devices, including augmented and virtual reality mobile applications.

Degrees & skills:

- PhD in astrophysics with competences in data reduction, database management, software development and great interest in educational/outreach actions toward citizens.
- Or Engineer degree in computer science with great interest in exoplanet research field and in educational/outreach actions toward citizens.
- Other degrees in Physics or Engineering may be considered.

Location: CEA Paris-Saclay, 25 km south of Paris. Travel to Centro de Astrobiologia, Madrid and possibly to the other project nodes (London, Utrecht, Heidelberg, Vienna, Leicester).

Starting date: September/October 2019 depending on candidate availability.

Duration: 1+1 years.

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

Income: Depending on degrees and experience. Please contact us for further information.

In order to candidate to this position, please send us by email: CV, list of publications, letter of motivation, name and contact of two potential references, by March 31st, 2019.

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