Title of the job offer: Spectroscopic identification of clusters and proto-clusters of galaxies at z>1.5 from Euclid

Job offer from the institut de physique du globe de Paris | CNRS UMR 7154

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| **Researcher in** | Postdoctoral Fellow in Astrophysics |
| **Duration** | One year and a half, not renewable |
| **Affectation** | AIM |
| **Salary** | The salary will depend on experience |
| **Date of publication** | \*\*\* |
| **Starting date** | Before 31st December 2023 |
| **Location** | Laboratoire AIM, c/o Departement d’Astrophisique du CEA Saclay, Orme des Merisiers, 91191 Gif sur Yvette |

### The Astrophysics, Instrumentation and Modelization (AIM) laboratory in Saclay

The Astrophysics, Instrumentation et Modelization (AIM; <https://osups.universite-paris-saclay.fr/en/unit/aim>) laboratory hosted by the Departement d’Astrophysique du CEA Saclay seeks applications for a postdoctoral fellowship in the science with large galaxy surveys, with specific emphasis on participation in the European Space Agency’s (ESA) *Euclid* Mission. Launched in 2023, the *Euclid* mission is surveying the extragalactic sky from the Earth-Sun Lagrange point 2 with the aim of constraining the properties of dark energy and probing galaxy formation and evolution. Euclid will observe large numbers of forming galaxy groups and clusters at z>1.5 but their spectroscopic identification with the slitless Euclid spectroscopic data will be challenging and likely feasible only through stacking of spectra.

The research will be carried out in collaboration with the APC group at the Université Paris Cite. The Euclid groups at AIM and APC are involved in both the science analysis of the surveys and in the development of the Euclid science ground segment. We are particularly active in galaxy and galaxy cluster science and the postdoctoral fellow will study clusters and proto-clusters at z>1.5 in the Euclid survey by combining imaging and spectroscopy data and using stacking to enhance the signal from distant galaxy clusters. Experience with astronomical imaging and image analysis, scientific computing, statistics and data analysis in the context of galaxy formation and evolution, and cosmology is recommended.

### Team Department

The postdoctoral fellow will work in the Cosmologie et Evolution des Galaxies (LCEG) group at AIM.

### Missions

> Presentation of the missions within the context :Formation and evolution of galaxies, clusters of galaxies, estimation of photometric redshifts and processing and analysis of astronomical images in optics and/or infrared, and/or processing and analysis of galaxy spectra. Experience in scientific computing, statistics and data analysis in the context of cosmology and astrophysics is recommended.

> Number of agents 1

> Position of responsibility No

> For researchers: research project in the context of the Labex UniversEarth

### Activities

> Description of the activities

Analysis of spectra of galaxy clusters and proto-clusters galaxies at z>1.5. The postdoctoral fellow will work with Emanuele Daddi and David Elbaz at the AIM Laboratory in collaboration with Simona Mei and Jim Bartlett at the APC. S/he will study the galaxy spectra of clusters and protoclusters at z>1.5 detected with different techniques from observations by the Euclid Mission, identify candidate members distinguishing star-forming and quiescent galaxies, obtain stacked average spectra and model them with state-of-the-art software to measure the redshifts and stellar population properties.

> Main and Secondary

### Expected Skills

> Specific training PhD in astrophysics

> Computer tools : Candidates must have a Ph.D. in astrophysics with a specialization in one or several of the following scientific themes: formation and evolution of galaxies, clusters of galaxies, estimation of photometric redshifts and processing and analysis of astronomical images in optics and/or infrared, processing and analysis of galaxy spectra. Experience in scientific computing, statistics and data analysis in the context of cosmology and astrophysics is recommended.

> Professional qualities : team work skills

### Obligations and risks

> Work schedules 100% normal office hours, from Monday to Friday

> Work attendance at the laboratory

> Professional trips : conferences and collaboration meetings in France and abroad

### Training and experience required

> Maximum of 5 years experience

> Education level or diploma : PhD in astrophysics

### How to apply

> CV and cover letter

> A description of how the candidate understands his research project at the laboratory and the committment to conerge on the project goals.

> Deadlines for applications : December 15th 2024

> Contacts (2 contacts are required for the interview): two reference letters sent directly to Emanuele Daddi (edaddi@cea.fr)