Postdoctoral Position in Field-Level Inference for Weak Lensing

Institution: CEA Paris-Saclay, Department of Astrophysics (CosmoStat Laboratory)
Location: Saclay, France
Position Duration: 2+1 years
Start Date: As early as April 2026, and no later than Fall 2026
Application Deadline: 15 December 2025

A postdoctoral position is available as part of the ERC-funded project OCAPi (PI: Natalia Porqueres), hosted at the CosmoStat Laboratory within the Department of Astrophysics at CEA Paris-Saclay. The researcher will join an international team developing advanced statistical and computational methods for the analysis of cosmological data from the *Euclid* space mission, working at the interface of cosmology, data science, and machine learning.

General science goal

The OCAPi project aims to maximise the scientific return of weak gravitational lensing by developing new techniques that can optimally extract the information from the data. Unlike standard analyses, which compress the data and discard information, OCAPi will analyse the lensing maps at the field level, without any data compression. This approach provides precise cosmological constraints and a reconstruction of the matter distribution at different cosmic times, effectively creating a digital twin of the Universe.

Main task

The postdoctoral researcher will work closely with Dr. Natalia Porqueres to develop field-level inference for cosmic shear and apply it to *Euclid*'s weak lensing data. The specific research direction will depend on the candidate's expertise and interests. Possible areas of contribution include:

- Developing models of systematic effects with sufficient accuracy for field-level inference;
- Building machine-learning emulators for gravity and baryons at the field level;
- Exploring advanced sampling methods for high-dimensional cosmological inference.

Qualifications

The candidate must have received their PhD in astrophysics, data analysis, computer science or equivalent before the start of the appointment. Previous experience in MCMC sampling, high performance computing and Bayesian statistics is advantageous for this project.

Application instructions
Applications should be sent as a single PDF file to Dr. Natalia Porqueres (Natalia.PORQUERESIROSA@cea.fr) and must include:

1. CV, including a publication list;
2. Summary of previous research (maximum 2 pages);
3. Research statement (maximum 2 pages) describing your interests and potential contributions to the project;

In addition, the applicant should arrange for up to 2 or 3 letters of recommendation to be sent directly to Natalia.PORQUERESIROSA@cea.fr

Early applications are encouraged. For full consideration, materials should be received by **15 December 2025**. Informal inquiries about the position are welcome.

About CEA Paris-Saclay and the Cosmostat Laboratory
CEA Paris-Saclay is located 20 km south of Paris, France. The CosmoStat group is a diverse and multi-disciplinary team working on various topics in astrophysics, cosmology, signal processing, and machine learning. The group develops innovative statistical tools for the analysis of astronomical and cosmological data and is heavily involved in several projects including the *Euclid* space telescope and the Vera C. Rubin Observatory.

CosmoStat is committed to diversity and equality and encourages applications from women and underrepresented minorities. We support a flexible and family-friendly work environment. Benefits for this position include retirement, health care, parental leave, vacation and sick days, subsidised meals, discounts for public transport, sports and culture, and French language classes.

Contact: Natalia Porqueres (Natalia.PORQUERESIROSA@cea.fr)