

**Project:** TITAN – Frugal Artificial Intelligence and Application in Astrophysics. An ERA Chair HORIZON EUROPE grant funded by the EU.

**Position:** Post-doctoral researcher

**Start date:** Any date within the first semester of 2023

**Duration:** 2 years with possibility of extension

**Salary:** 45.000-50.000 €/year (gross income depending on family status)



**Description Weak lensing & High-Order Statistics:** Weak gravitational lensing is one of the most promising tools of cosmology to constrain models. Weak lensing probes the evolution of dark-matter structures and can help distinguish between dark energy and models of modified gravity. The Euclid satellite, to be launched in 2023, will observe the sky in the optical and infrared, and will be able to map large-scale structures and weak-lensing distortions out to high redshifts. Thanks to galaxy shape measurements, we will be able to reconstruct a dark matter mass map over 15000 square degrees.

The HORIZON project “TITAN – Frugal Artificial Intelligence and Application in Astrophysics”, funded under the HORIZON-WIDERA-2022-TALENTS-01 program aims to develop novel frameworks based on advanced signal processing and (deep) machine learning frameworks for distinguishing different cosmological models from such maps.

In this project, we seek one (1) Postdoctoral Researcher to explore and develop approaches for extracting cosmological information from high-order statistics using forward modelling techniques. The approach will rely on fast cosmological simulations, capable of simulating the Euclid survey under various cosmologies (e.g. using the FastPM N-body simulation code). The developed tool will be used to infer cosmological parameters from CFIS data. The post-doctoral researcher will be located at the premises of FORTH with a strong collaboration with the CosmoStat Laboratory at CEA Saclay. The post-doctoral researcher will be advised by [Jean-Luc Starck](#) (FORTH/CEA) and [Panagiotis Tsakalides](#) (FORTH).

**Required qualifications:**

- Ph.D. in Astrophysics, Computer Science, or related field
- Experience with the analysis of radio weak lensing data
- Publications in related fields
- Working experience in related European and/or national R&D projects

**Desired qualifications:**

- Decision-making and representation of the team at national and international levels

**FORTH** is the largest and most prestigious research center in Greece with modern facilities and highly qualified personnel. It comprises ten research institutes located throughout Greece. The Institute of Computer Science ([FORTH-ICS](#)) and the Institute of Astrophysics ([FORTH-IA](#)) are located in the main campus, around 5km south of Heraklion on the island of Crete, Greece. Members from both FORTH-ICS and FORTH-IA are involved in the TITAN project. The group is committed to diversity and equality, encourages applications from women and underrepresented minorities, and supports a flexible and family-friendly work environment. Benefits for this position include retirement, health care, and parental leave. [CEA Paris-Saclay](#) is located 20 km south of Paris, France, near various universities and other research centers. The CosmoStat group is a diverse and multi-disciplinary team of researchers working on various topics in cosmology and data science.



Learning, Research, Innovation

Interested candidates are invited to communicate with J.-L. Starck [jstarck@cea.fr](mailto:jstarck@cea.fr) and P. Tsakalides [tsakalid@ics.forth.gr](mailto:tsakalid@ics.forth.gr), sending a cover letter and their CV by **November 15, 2022**.