# Ingénieur de recherche (IR) to support scientific analysis and software development for ESA's Euclid satellite mission

**Context of the advertised position:**

The Lagrange laboratory (Nice, France) offers a research engineer position ("IR = Ingénieur de Recherche") to help on the implementation, execution and analysis environment of a software comparison platform, for the "Clusters of Galaxies" work package (WP CG-I) of the Euclid spatial mission. This WP is part of the "Level 3" (i.e. reduced data) organisation unit, within the Euclid Science Ground Segment (SGS) .

The evolution of the distribution of clusters of galaxies will constitute one of the cosmological probes of the satellite mission. This study requires the construction of a cluster catalog derived from a calibrated catalogue of galaxies and associated measurements. Various algorithms for performing cluster detections are being coded and will need to be systematically tested, compared and evaluated in a unified environment and over a broad range of parameters. The tests will be based on various sets of simulated galaxy catalogues ("mock data"), before the launch of Euclid satellite (foreseen in 2020). This constitutes the "Cluster Finder Challenge" (CFC), planned to take place at Lagrange laboratory.

**Mission:**

Development of the software environment for the execution and analysis of a «Cluster Finder Challenge» within the "Clusters of Galaxies" work package of the Euclid SGS.

**Activities:**

- Collaborate on the interface definition for the softwares participating in the CFC.
- Ensure the compliance of software interfaces, with the local team and the authors of CF codes
- Participate in the choice of the hardware architecture, and develop the software layer allowing the execution of the CFC with the computation center at the Observatoire de la Côte d'Azur and possibly in collaboration with the development & processing platform center resp. at APC and CC-IN2P3.
- Ensure and follow the actual execution of CFC codes, and adapt the hardware and software environments if necessary.
- Participate in the development of tools (statistical, graphic, web-based,...) for the analysis, the comparison and communication of results issued from the CFC
- Interact with the Euclid science team at Lagrange to follow the scientific coherence of the analysis system.
- Interact with Cluster Finder authors within the (international) Cluster Working Group
- Begin an adaptation of the selected codes to the Science Data Center computing standards (C++ & Python languages, use of tests, unified development platform,...)

- Report the technical choices and results in a dedicated documentation

**Competences :**

- Strong background and experience in programming and in scientific computation (C++/Python coding skills is mandatory, Fortran is asset)
- Experience in software architecture and software development under Unix/Linux environment, and possibly on clusters and in parallel/distributed systems
- Theoretical and practical knowledge of data processing and statistical analysis
- Knowledge of database principles and/or web-based interface is an asset
- An ability to interact both with computation engineers and with Euclid Scientists
- Good level in spoken and written English

**Workplace Context :**

The Lagrange laboratory is under the tutorship of the University of Nice-Sophia Antipolis, the CNRS and the Observatoire de la Côte d'Azur (OCA). The Euclid scientists at Lagrange laboratory are associated with the Cosmology group and work at the OCA Mont-Gros site in Nice.

The engineer recruited will work at the OCA Mont-Gros site and will be integrated in the engineering team, but will also work closely with both the science team involved in the Euclid mission and the computation service at OCA. The successful candidate will also interact with the French space agency (CNES) and other French laboratories implied in the SGS, as well as with scientists from the “Clusters of Galaxies” work package, located all over Europe.

URL links :

Lagrange laboratory : https://lagrange.oca.eu/

Euclid : http://sci.esa.int/science-e/www/area/index.cfm?fareaid=102

**Contractual conditions:**

We offer a contract with Laboratoire Lagrange (mixed CNRS/UNS/OCA institute) at the level of “Ingénieur de Recherche” for a duration of 1 year, with the possibility of extension up to a total of 3 years. The contract may start as soon as May 2014 (negociable).

A computation or engineering degree of major schools or University, or equivalent qualification to fulfil these functions, is required. Professional experience will also be a strong asset.

Please submit your complete application before March 30th, 2014 to: Martin Vannier (mvannier@unice.fr) or Sophie Maurogordato (sophie.maurogordato@oca.fr).