

	JOB PROFILE
JOB TITLE	Research Engineer in Remote Sensing Applications Development
PLACE OF EMPLOYMENT	Maison de la Teledetection (Montpellier) UMR ESPACE-DEV at 60%; UMS Data Terra at 40%.
BODY	Research Engineer
BAP	E
TYPE OF EMPLOYMENT	E1E45 - Expert in scientific computing
QUOTITE	Full-time - over a period of 28 to 30 months (depending on experience)
BACKGROUND	The European project PHIDIAS (Prototype HPC / Data infrastructure for on-demand services) aims to develop a set of interdisciplinary services and tools based on High Performance Computing (HPC). More specifically, it aims to meet the needs of Earth system sciences in terms of data broadcasting and exploitation, by offering access and processing services for large public data sets acquired through satellite Earth observation. These services will provide FAIR (Findable, Accessible, Interoperable, Reusable) access to these datasets as well as value-added data services: from "standard" data processing (discovery, visualization, extraction) applied to heterogeneous and multidisciplinary datasets, to more advanced services involving Artificial Intelligence and HPC on demand. For this purpose, PHIDIAS will develop and propose a catalog allowing users to discover and access data, but also algorithms, processing chains, public APIs and interactive processing services. These achievements will be built from 3 use cases coming from the scientific issues and partners of the Data Terra Research Infrastructure. The research infrastructure "Pole of Data and Services for the Earth System" aims to observe, understand and predict in an integrated way the history, functioning and evolution of the Earth system subject to global changes. UMR ESPACE-DEV is coordinating the work of Work Package 5 (WP5) applied to the processing of Earth observation data, for which it is intended to offer on-demand processing services on very large collections of high and very high resolution optical and/or radar images (SENTINEL 1, 2, SPOT6, PLEIADES), taking advantage of the new hardware computing architectures made available by the project partners. The mission of the UMS CPST (Coordination Pôles de données et de services pour le Système Terre) is to support the activities of the IR Data Terra.

MISSION	Within the WP5 "Big data Earth Observations: processing on-demand and products dissemination for environmental monitoring" coordinated by UMR ESPACE-DEV on behalf of THEIA (French inter-agency initiative designed to promote the use of satellite data, primarily for environmental research on land surfaces but also for public policy monitoring and for management of environmental resources), the engineer will ensure the integration of remote sensing image processing applications in an HPC architecture. These applications are the result of research work carried out by the THEIA Scientific Expertise Centers, and take advantage of state-of-the-art approaches to machine learning, computer vision and signal processing on large volumes of heterogeneous data (optical, radar). The objective is to ensure the operational deployment of processing chains on HPC architectures, and to contribute to their integration with production and on-demand processing services. Specialized open-source libraries will be used/developed and shared with the Earth Observation community. This mission will be carried out in close collaboration with the researchers and engineers of UMR ESPACE-DEV and TETIS, the designers of the prototypes. The engineer will also take part in the follow-up and feedback of the work of WP5 of the PHIDIAS project.
ACTIVITIES	- Prepare the software environment dedicated to the PHIDIAS project on computing machines in collaboration with the engineers of the HPC center of CINES, - Porting the PHIDIAS project processing applications to HPC architectures, - Propose, implement and test solutions related to the deployment, evaluation and management of processing in an HPC environment (benchmarks, task planning, allocation of computing resources), - Contribute to specialized open-source libraries, - Write and maintain associated documentation, - To take part in the follow-up of the achievements of the WP5 of the PHIDIAS project.
SKILLS	• Programming languages C++ and python, • Code compilation and optimization techniques, • Knowledge of HPC paradigms and architectures, • Knowledge of space data and applications, • Machine learning/computer vision/signal processing desired, • Knowledge of the following technologies will be a plus: collaborative development, continuous integration, containerization, schedulers (e.g. slurm), • Knowledge of the Orféo ToolBox library will be a plus.
SKILLS AND ABILITIES	The candidate will have to demonstrate methodology. It must have the capacity to carry out prospective studies as well as be a source of proposals.
CONDITIONS	Ms. Eng. or PhD
SUBMISSION	please submit your application by email to Jean-Christophe Desconnets: jean-christophe.desconnets@ird.fr or Rémi Cresson: remi.cresson@inrae.fr