

# Job Title: Internal Research Fellow for New Space Data Quality Assessment

Req ID 10170 - Posted 16/07/2020



## EUROPEAN SPACE AGENCY

Research Fellowship Opportunity in the Directorate of Earth Observation Programmes.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. Applications from women are encouraged.

### Post

#### Internal Research Fellow for New Space Data Quality Assessment

This post is classified F2.

### Location

ESRIN, Frascati, Italy

### Our team and mission

This activity will be conducted in the Directorate of Earth Observation Programmes, within the ESA EO Mission Management and Product Quality Division, in the EO Mission Management and Ground Segment Department, whose responsibilities cover the mission management of Copernicus and Earth Explorer missions and the management of sensor performance, data and product quality for EO missions, including Copernicus, Earth Explorer and third-party missions. You will join the section in charge of sensor performance, data quality, algorithm development, calibration and validation for ESA EO missions.

The Sensor Performance, Products and Algorithms (SPPA/EOP-GMQ) Section at ESA's Earth observation centre, ESRIN, has a wide range of functions, the objective of which is to provide Earth observation mission end-users with the best possible product quality. Among the tasks managed by the Section are in-orbit sensor calibration, product validation and verification activities and the routine quality monitoring of data generated by the mission scientific payloads, as well as the improvement of processing algorithms during the exploitation phase of a mission.

The research field is associated with the quality assessment of so-called New Space, in particular New Space as it relates to high-resolution observation. Since the 1970s, the ESA Earthnet Programme has been providing the framework for "integrating" non-ESA missions (third-party missions) in the overall ESA Earth observation (EO) strategy, enabling a complete, coherent system for observing our planet. The Earthnet programme, together with the ESA missions, is also a major contribution to the Global Earth Observation System of Systems (GEOSS). This system is being put in place through the GEOSS initiative.

GEOSS will provide decision-support tools to a wide variety of users. This 'system of systems' will proactively link together existing and planned observing systems around the world and support the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different instruments can be combined into coherent data sets. In order to ensure proper knowledge of the data content, Quality Assurance for Earth Observation (QA4EO) principles have been developed; QA4EO has been endorsed by CEOS as a contribution to facilitate the GEO (Group on Earth Observations) vision for GEOSS. The aim of GEOSS is to deliver comprehensive and timely knowledge/information products worldwide to meet the needs of its nine "societal benefit areas". This can only be achieved through the synergistic use of data derived from a variety of sources (satellite, airborne and in situ) and the coordination of GEO member resources and efforts. A system of systems can be coherent only if the information provided by the various systems comes with documented, traceable uncertainty, making synergetic use of the information possible and meaningful.

Some of these new missions are potential candidates for third-party or contributing missions. As EO system architect in Europe, ESA assesses the quality and suitability of these missions in anticipation of their launch or by using the first data sets produced by the new missions. In particular, the aspects related to quality in general – data content, calibration, validation and characterisation – which is a major component of the system, needs to be carefully assessed, following

QA4EO guidelines.

Candidates interested are encouraged to visit the ESA website: [www.esa.int](http://www.esa.int)

### **Field(s) of activities/research**

You will be in charge of developing procedures, methods and tools to assess, in a coordinated manner, the various data sets. You will further develop the Maturity Matrix concept by proposing/developing standardised criteria for quality assessment. In addition, the growing availability of missions/products together with the diversity of applications and users has led to the concept of Analysis-Ready Data. You will develop a specific approach for developing and assessing Analysis-Ready Data maturity from various data sets and data sources. You will also propose/develop approaches for fostering the synergetic use of various data sets, including harmonisation in terms of algorithms and characterisation (knowledge of uncertainties associated with measurement/retrieval).

You will be involved in the following activities:

- reviewing the calibration, validation and quality reports from various high-resolution missions in optical and SAR domains;
- developing approaches/methods/criteria for assessing the quality of high-resolution products in optical and SAR domains;
- developing a Quality Maturity Matrix for various data sets in optical and SAR domains, based on standardised criteria;
- developing the concept of Analysis-Ready Data, in particular for high-resolution (spatial) data sets in optical and SAR domains;
- developing procedures/methods to assess Analysis-Ready Data maturity;
- proposing innovation in the area of EO product algorithm development, calibration and validation, through a collaborative framework with remote-sensing scientists, aiming to introduce more flexibility into the ESA services to EO users;
- continuously assessing evolving user requirements regarding ESA EO optical missions in terms of data quality, calibration and validation, exploring potential synergies with missions under EOP-G responsibility;
- fostering the ESA strategy and innovation in terms of algorithms, calibration and validation of ESA EO optical and SAR data products, including harmonisation and standardisation with European, international scientific partners.

### **Technical competencies**

Knowledge relevant to the field of research

Research/publication record

Ability to conduct research autonomously

Breadth of exposure coming from past and/or current research/activities

General interest in space and space research

Ability to gather and share relevant information

### **Behavioural competencies**

Communication

Problem Solving

Relationship Management

Innovation & Creativity

Continuous Learning

Self Motivation

Cross-Cultural Sensitivity

### **Education**

You should have recently completed, or be close to completing, a PhD in a related technical or scientific discipline.

Preference will be given to applications submitted by candidates within five years of receiving their PhD.

For this position, the following in particular is required:

You should have a PhD in physics, engineering or Earth sciences, with particular emphasis on data-processing algorithms, image processing and calibration and validation applied to EO missions.

### **Additional requirements**

You should provide a track record of peer-reviewed scientific publications.

You should also have :

- General background and specific experience in the technical domains covered by the position
- Knowledge in image processing
- Knowledge of scientific discipline, including calibration and validation

The working languages of the Agency are English and French. A good knowledge of one of these is required. Knowledge of another Member State language would be an asset.

### **Other information**

For behavioural competencies expected from ESA staff in general, please refer to the [ESA Competency Framework](#).

The Agency may require applicants to undergo selection tests.

### **The closing date for applications is 30 September 2020.**

In addition to your CV and your motivation letter, please add your proposal of no more than 5 pages outlining your proposed research in the "additional documents" field of the "application information" section.

If you require support with your application due to a disability, please email [contact.human.resources@esa.int](mailto:contact.human.resources@esa.int).

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Please note that applications are only considered from nationals of one of the following States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom. Nationals from Slovenia, as an Associate Member, or Canada as a Cooperating State, can apply as well as those from Bulgaria, Cyprus, Latvia, Lithuania and Slovakia as European Cooperating States (ECS).

Priority will first be given to candidates from under-represented Member States.

In accordance with the European Space Agency's security procedures and as part of the selection process, successful candidates will be required to undergo basic screening before appointment