EUROPEAN SPACE AGENCY

Internal Research Fellow (PostDoc) in Quantum Computing for Earth Observation

Job Req ID: 12498
Closing Date: 02 March 2022
Publication: External Only
Vacancy Type: Internal Research Fellow
Date Posted: 02 February 2022

Research Fellowship Opportunity in the Directorate of Earth Observation Programmes.

ESA is an equal opportunity employer, committed to achieving diversity within the workforc and creating an inclusive working environment. For this purpose, we welcome applications from all qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, ag disability or other characteristics. Applications from women are encouraged.

Post (for 2 posts)
Internal Research Fellow (PostDoc) in Quantum Computing for Earth Observation

This post is classified F2.

Location
ESRIN, Frascati, Italy

Our team and mission
You will be based at Φ-lab at ESRIN, whose mission is to accelerate new developments ir Earth observation (EO) by helping ESA, European industry, start-up and research communities rapidly adopt transformative technologies. You will be part of a multi-disciplinary team of researchers and data scientists passionate about innovation, and will work in an inspiring and collaborative environment.

Φ-lab is focusing on exploring the use and impact of new technologies such as artificial intelligence (AI), quantum computing (QC), Internet of Things (IoT), and blockchain activiti which have promise in terms of delivering visible impact in the field of Earth observation.

Find more information about research and innovation at Φ-lab here:

1. philab.phi.esa.int
2. esamultimedia.esa.int/docs/EarthObservation/phi_lab_explore_research_innovation_202

Interested candidates are encouraged to visit the ESA website: www.esa.int

Field(s) of activity/research for the traineeship
You will carry out applied research in quantum computing with particular emphasis on developing new methods applicable to Earth observation. You will define and lead researc projects addressing the objectives of the Φ-lab Quantum Computing for Earth Observatior

In particular, you will :

- perform the agreed applied research, contributing to current and future Φ-lab QC4EO use cases or methodologies (e.g. SAR phase unwrapping by quantum annealing, pattern recognition in EO data, quantum machine learning, quantum solving of differential equations);
- develop algorithms and tools to take account of the specific characteristics of EO data sets and physical measurement principles, and apply them to a variety of EO data applications, (e.g. translate EO problems into QC algorithms);
- prepare, validate and maintain large-scale training data sets, to be used for the development and evaluation of QC algorithms by international research and industrial communities;
- organise and lead QC4EO challenges on proposed topics;
- collaborate with academia and industrial partners on transferring research results to applications;
- support the team in rapidly prototyping and evaluating solutions for application to EO data sets and challenges, particularly those relevant to ESA EO missions;
- publish your research in top-ranked, peer-reviewed journals and conferences;
- communicate and disseminate widely your results and tools (through social media, blo posts, open-source repositories, etc.).

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 Earth Observation

Behavioural competencies
Result Orientation
Operational Efficiency
Fostering Cooperation
Relationship Management
Continuous Improvement
Forward Thinking

Education
You should have recently completed, or be close to completing a PhD in a relevant field or engineering discipline, e.g. computer science, AI, geospatial.
Preference will be given to applications submitted by candidates within five years of receiving their PhD.
A PhD (completed before take-up of duties) with a thesis subject of your thesis relevant to the description of the tasks outlined above.

Additional requirements
The following skills would be an asset:

- An adequate network within the reference community
- Proven experience of leading internationally recognised research
- Experience with one or more general purpose programming languages e.g. Python, an with deep learning / quantum computing frameworks e.g. Tensorflow, PyTorch, Qiskit
- Curiosity and passion for new topics and research areas, including AI, QC, and New

- Ability to think outside the box and explore new paths
- Ability to focus on applied research delivering tangible short-term results.

The working languages of the Agency are English and French. A good knowledge of one o 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.

In addition to your CV and your motivation letter, please add your proposal of no more thar pages outlining your proposed research in the "additional documents" field of the "applicat information" section.
At the Agency we value diversity and we welcome people with disabilities. Whenever possible, we seek to accommodate individuals with disabilities by providing the necessary support at the workplace. The Human Resources Department can also provide assistance during the recruitment process. If you would like to discuss this further please contact us at contact.human.resources@esa.int.

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