

Job Title: Internal Research Fellow (PostDoc) in Computer Science and Applied Mathematics

Req ID 9081 - Posted 29/11/2019



EUROPEAN SPACE AGENCY

Research Fellowship Opportunity in the Directorate of Technology, Engineering and Quality.

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 (PostDoc) in Computer Science and Applied Mathematics

This post is classified F2.

Location

ESTEC, Noordwijk, The Netherlands

Our team and mission

This research fellowship will be carried out within ESA's Advanced Concepts Team (ACT): a group of research fellows (post-docs) and young graduates from a broad variety of academic fields aiming for an academic career. Its task is to monitor, perform and foster research on advanced space systems, innovative concepts and working methods. It interacts externally almost exclusively with academia and operates as a truly interdisciplinary team bound to high scientific standards. Via its research, the team acts as a pathfinder exploring novel, potentially promising areas for ESA and the space sector, ranging from applied to fundamental research topics. An important task of the team is to communicate scientific trends and results, as input for the strategic planning of the Agency.

The team entered the field of computer science and applied mathematics in 2004, performing research projects related to distributed-parallel-GPU optimisation (e.g. pagmo2), fast computer algebra (e.g. piranha, obake), differential algebra and automated differentiation (audi), to name just a few. The open science approach was pursued in all these research projects, it being considered a very valuable paradigm by the team.

Candidates are highly encouraged to familiarise themselves with the research done by the ACT (<https://www.esa.int/gsp/ACT/>), in particular in the field of artificial intelligence and computer science.

Field(s) of activities/research

If recruited to this post, you will carry out research in the field of computer science and applied mathematics. Areas of research would then be chosen partly by you, based on your own expert judgement and insight into trends and developments, and partly by the team, so as to follow the Agency's strategic directions.

Scientifically, you will, in particular:

- Propose and perform novel research in the field of computer science and applied mathematics, where appropriate together with universities of ESA Member States (in particular through the Ariadna scheme <https://www.esa.int/ariadna>)
- Propose and lead open-source projects, possibly building upon past ACT projects (pagmo2, audi, pykep, obake, d-CGP etc.). See <https://www.esa.int/gsp/ACT/resources/software.html>
- Organise and lead competitions rooted in computer science or applied maths via ESA's Kelvins platform (<https://kelvins.esa.int>);
- Coordinate the team's participation in coding initiatives, such as Google summer of code (GSOC), ESA Summer of Code (SOCIS) and Frontier Development Lab (FDL).

- Provide project support to all ACT science projects by proposing advanced computational paradigms and high-performance computing solutions.

As ACT researcher, you will:

- Publish results in peer-reviewed publications and use modern communication tools to communicate with the broader audience inside and outside ESA;
- Lead and assist interdisciplinary projects with other ACT researchers;
- Participate together with the team in the assessment of proposed space system concepts - these not being restricted to artificial intelligence and computer science - and propose new concepts and assessment studies;
- Perform and participate in assessments on subjects of strategic interest to ESA, provide in-house expertise for strategy development;
- Benefit for their research from the technology and engineering expertise available at ESTEC.

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

Innovation & Creativity

Continuous Learning

Communication

Relationship Management

Self Motivation

Problem Solving

Cross-Cultural Sensitivity

Education

- PhD (completed before take-up of duty) in computer science, mathematics or informatics, the subject of which should be relevant to the description of the tasks outlined above and aim at an academic/research career.
- Degree in mathematics, computer science, informatics, artificial intelligence, engineering or a related field;

Additional requirements

Solid programming skills in C++ and Python programming languages.

Experience in open source projects, GPU programming, distributed computing or cloud computing is considered a strong asset.

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 requirements are:

Ability and interest in prospective interdisciplinary research;

Aptitude for contextualising specialised areas of research and quickly assess their potential with respect to other domains and applications;

Academic networking to add functioning links to universities and research institutes;

Ability to work in a team, while also being able to work individually on personal research plans and directions;

Natural curiosity and a passion for new subjects and research areas.

Specificities

The position of Research Fellow in ESA's Advanced Concepts Team is similar to a regular postdoctoral academic placement, with a few notable differences:

1. ACT RFs have no teaching obligations. However, they are likely to be involved in mentoring Young Graduate Trainees and student interns (*stagiaires*) within the team.
2. As the team does not have a professor-like position, ACT RFs are academically more independent than most post-docs. This implies more freedom but also more responsibility for their research directions and approaches.

3. ACT RFs join a diverse, changing and interdisciplinary research team embedded in a large space agency, in contrast to a more specialised, focused research group with similar competences.
4. ACT RFs need to actively reach out to other disciplines, contribute their competences to interdisciplinary research projects and encourage other researchers to join them in their core research projects (research at the intersections of disciplines).
5. ACT RFs need to communicate their expertise and research results internally and externally, including potential implications and importance for ESA's long-term strategy.

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 03 January 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.

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