Job Title: Internal Research Fellow (PostDoc) in Highly Autonomous Cubesat Systems

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EUROPEAN SPACE AGENCY

Research Fellow 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 Highly Autonomous Cubesat Systems

This post is classified F2 on the Coordinated Organisations' salary scale.

Location

ESTEC, Noordwijk, The Netherlands

Description

The Research Fellow will be working in the Cubesat Systems Unit of the Projects Office, Systems Department, Directorate of Technology, Engineering & Quality.

The Cubesat Systems Unit is responsible for the project management of cubesat satellite missions for technology in-orbit demonstration implemented within the Directorate. The Unit also provides technical support to Programme Directorates as required in the area of cubesat systems.

Field(s) of activities/research

Reporting to the Head of the Cubesat Systems Unit, the Research Fellow will conduct research activities aimed at raising the autonomy levels of cubesat systems suitable for a wide range of mission applications, particularly those utilising distributed system architectures. This is includes: constellations, swarm formations and aggregated systems in Low Earth Orbit, as well as fleets in deep space, where a high level of autonomy would either be enabling or significantly reduce operations costs.

The availability of high performance on-board processors utilising state-of-art Commercial Off The Shelf (COTS) electronics, coupled with advanced software tools (e.g. rapid auto-coding, system models/simulators, machine learning), robust control techniques and miniaturized sensors/actuators, are expected to enable rapid progress in cubesat systems autonomy in the near future.

This is an area particularly fertile for new innovative research which can actually be demonstrated in the near/mid-term at relatively low cost on in-flight demonstration cubesat missions like RACE (Rendezvous Autonomous CubeSats Experiment) and M-ARGO (Miniaturised Asteroid Remote Geophysical Observer) currently being defined under the Unit's responsibility. The Research Fellow will also contribute to defining, simulating and following up the autonomous Guidance Navigation & Control (GNC) and Failure Detection Isolation & Repair (FDIR) experiments to be conducted on these missions.

The research is intended to be cross-cutting, covering advanced/robust mission management, GNC and FDIR techniques aiming at a high level of system autonomy. Therefore, the Research Fellow will be expected to closely coordinate with the GNC, AOCS & Pointing Division and the Software Systems Division within the Systems Department, as well as utilise the ESTEC laboratories where appropriate (e.g. for hardware-in-the-loop tests).

Technical competencies

Ability to conduct research autonomously
Breadth of exposure coming from past and/or current research/activities
Research/publication record
Knowledge relevant to the field of research
General interest in space and space research
Ability to gather and share relevant information

Behavioural competencies

Innovation & Creativity
Continuous Learning
Relationship Management
Self Motivation
Communication
Problem Solving
Cross-Cultural Sensitivity

Education

Applicants should have recently completed, or be close to completion of a PhD in a related technical or scientific discipline, preferably in space systems engineering or space vehicle control engineering. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

Additional requirements

Research experience is required in the modelling/simulation of space missions & systems, particularly related to autonomous GNC and/or FDIR aspects of distributed systems (e.g. in rendezvous & docking, formation flying, or close inspection mission scenarios). Previous experience in cubesat missions/systems focused on these areas would be an asset.

The Research Fellow must be able to work in a team with other international investigators in a spirit of positive co-operation and, at the same time, be capable of working autonomously in his/her area of research. At the end of the fellowship, the Research Fellow will be required to summarize the work completed so that it can be included in papers to be submitted to relevant specialised conferences/journals.

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 03 May 2019.

In addition to your CV and your motivation letter, please add your proposal of no more than 5 pages outlining your proposed research. Candidates must also arrange for three letters of reference to be sent by e-mail, before the deadline, to temp.htr@esa.int. The letters must be sent by the referees themselves. The candidate's name must be mentioned in the subject of the email.

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, the United Kingdom and Canada and Slovenia as well as Bulgaria, Cyprus, Latvia, Lithuania, 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