

Job Title: Internal Research Fellow (PostDoc) in Radiation Hardness Assurance processes for COTS EEE Components

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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 Radiation Hardness Assurance processes for COTS EEE Components

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

Location

ESTEC, Noordwijk, The Netherlands

Description

The Component & Materials Physics & Chemistry Evaluation & Standardisation Division, within the Product Assurance and Safety Department, is responsible for the evaluation, qualification and standardisation of Electrical, Electronic and Electromechanical (EEE) Components and Materials used in ESA spacecraft and Standardisation Activities. The division provides direct and indirect engineering and product assurance support to ESA projects and the European Space Industry. The work of the division covers a broad range of engineering and management activities via the reliability assessment of existing and new component technologies and part types, the definition of test standards and test methods, development of application and procurement requirements, technology and component development support, reverse engineering and failure analysis performed in a state of the art on-site laboratory (including radiation test facilities) and delivery of data to end users via public and restricted websites and databases. The focus is on the effects of exposure to the space environment such as vacuum, temperature, particles, ionising and non-ionising radiation.

Interested candidates are highly encouraged to visit the ESA website.

Field(s) of activities/research

Overview of the field of research proposed

Introduction:

EEE components flown on ESA spacecraft have to operate in the inhospitable space environment. An important part of this environment of concern to electronic components is the space radiation environment. The space radiation environment is composed of a large variety of particles with a complex energy spectrum. Particles of concern are electrons, protons and heavier ions. These particles may adversely affect electronic components via cumulative effects or transient effects. In the worst case, an electronic component may exhibit a catastrophic failure when exposed to the space radiation environment. Various Radiation Hardness Assurance processes are applied to ensure suitability of EEE components for flight on ESA spacecraft. These include:

- Radiation screening / characterisation
- Radiation evaluation / qualification
- Radiation hardening work
- Development of irradiation test methods
- Development of Radiation Hardness Assurance standards

Radiation Hardness Assurance also includes work in the field of dosimetry, in-flight EEE component radiation experiments, in-flight anomaly investigation, work at particle accelerator irradiation test facilities, etc.

Research area:

Specific research area concerns improvement of the understanding of the Radiation Hardness Assurance processes for Commercial-Off-The-Shelf (COTS) EEE Components (for Total ionizing Dose, Displacement Damage and Single Event Effects). This involves the characterisation of various EEE components during and after irradiation tests with the objective to improve existing methodologies and possibly to demonstrate new approaches.

The research area also includes development of In-Flight Cubesat payload experiments in the area of Radiation Hardness Assurance Verification. These experiments aim at measuring EEE Component performance when exposed to the natural space radiation environment.

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
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 studies in electronics or physics. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

Additional requirements

The applicant shall have a good knowledge of electronics (hands on experience with test set-up and electrical parameter measurements). An understanding of radiation effects in semiconductors and solid state physics is advantageous. Applicants should have good analytical skills and be able to work in a multi-cultural environment, both independently and as part of a team.

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 18 October 2017.

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