

Research Fellowship in Space Materials and Component Evaluation

Directorate of Technical and Quality Management

ESTEC, Noordwijk, The Netherlands

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Overview of the Division's mission

The Space Materials and Component Evaluation Division, within the Product Assurance and Safety Department, is responsible for the evaluation, qualification and standardisation of Materials and Electrical, Electronic and Electromechanical (EEE) Components used in ESA spacecraft. 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 viz: EEE component Radiation Hardness Assurance activities, the reliability assessment of materials 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, particles, temperature, ionising and non-ionising radiation.

Overview of the field of research proposed

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.

Specific research area concerns improvement of the understanding of the Radiation Hardness Assurance processes that are currently ambiguous (for Total ionizing Dose, Displacement Damage and Single Event Effects). This involves the characterisation of various EEE components during and after irradiation with the objective to improve existing methodologies and possibly to demonstrate new approaches.

Who can apply

The programme is open to suitably qualified women and men. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

The Research Fellow Programme is open to nationals of the following states: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the UK, or Canada as a Cooperating State, Bulgaria, Estonia, Hungary, Latvia, Slovakia and Slovenia as European Cooperating States (ECS).

Required qualifications

Applicants must have recently completed their PhD studies in electronics or physics. The applicant shall have a good knowledge of electronics (hands on experience with test set-up and electrical parameter measurements). The candidate shall have an understanding of radiation effects in semiconductors and be familiar with solid state physics.

Applicants should have good analytical and communication skills and should be able to work in a multi-cultural environment in an autonomous manner.

Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required.

How to Apply

Please fill in the [online](#) application form attaching to it, **in one document only**, your CV, your motivation letter and your research proposal.

Candidates must also arrange for up to **three letters of reference** to be sent by e-mail, before the deadline, to the **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.

Applications satisfying the general conditions for eligibility, to be submitted **by 6 May 2015**, will be evaluated and successful applicants will be invited for an interview.

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