

Job Title: Internal Research Fellow (PostDoc) in Low temperature radiation effects on space grade materials

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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 Low temperature radiation effects on space grade materials

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

Location

ESTEC, Noordwijk, The Netherlands

Description

The Materials' Physics & Chemistry Section is operating state of the art space simulation facilities (vacuum, temperature, electromagnetic & particle radiation) as well as physical and chemical materials' characterisation instrumentation within the Materials & EEE components laboratory.

It is providing engineering support to all ESA projects and development programmes in the area of Materials' Physics and Chemistry, associated processes and environmental effects. The section's laboratory covers: Physical analysis and characterisation of materials, chemical analysis and characterisation of materials, Cleanliness & Contamination Control, Environmental evaluation (ground/space effects) including laboratory testing work as well as performance prediction and verification (including in-orbit & post flight analysis) of materials and associated processes.

Interested candidates are highly encouraged to visit the ESA website.

Field(s) of activities/research

ESA is facing new challenges from its future cryogenic missions, such as JUICE or other lunar exploration missions, due to the extreme low temperatures external materials will encounter. In some cases, appendages of the Juice spacecraft are expected to reach 20 K while orbiting Jupiter.

Spacecraft charging can give rise to unwanted ESD (electro-static discharge) effects which can lead to a complete mission loss. Lower temperatures typically affect the charging potential detrimentally, i.e. the charging risk increases by a few orders of magnitude. This is why a careful selection of materials and charging mitigation strategies is required.

The aim of the activity is to work with ESA on the low temperature ESD facility (able to expose samples down to 20K) and analyse the charging behaviour at these low temperatures. In addition space-grade materials shall be assessed with a novel DDS (Dynamic Dielectric Spectrometer) able to characterise dielectric properties from cryogenic temperatures up to 500C.

In addition, the candidate will use the Materials and EEE Laboratory which is a state-of-the-art lab offering facilities which simulate the space environment, including thermal ageing, thermal cycling, UV/particle radiation, atomic oxygen and outgassing. The properties of the exposed materials will be analysed using a variety of techniques, such as thermal analysis, thermal conductivity, flexural properties, microscopy (optical and SEM), surface analysis (XPS, Raman spectroscopy, FTIR, contact angle) and mechanical analysis.

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 in a related technical or scientific discipline, preferably in materials science, physics/chemistry of materials or materials engineering, or applied physics. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

Additional requirements

Applicants should have good analytical skills, good understanding of materials analysis techniques. Ability to perform experimental work in laboratory, and knowledge of the space environment (vacuum, chemistry, temperature) would be an 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 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 05 December 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