

Training Opportunity for Irish Trainees

Reference	Title	Duty Station
IE-2019-TEC-QEE(1)	Quality and reliability of commercial off-the-shelf passive optical components for space applications	ESTEC
<p>Overview of the unit's mission: The Materials' Physics and Chemistry Section is responsible for assessing all materials w.r.t their physical and chemical properties and property evolution for ESA's mission. This entails a detailed understanding of effects caused by the environment (ground/space). The section operates a state of the art laboratory offering a wide selection of analysis and characterisation instruments as well as space simulation facilities to evaluate materials versus the effects of the space environment (vacuum, radiation, temperature, contamination, ATOX, charging etc.)</p>		
<p>Overview of the field of activity proposed: The aim of this project is to assess the quality and reliability of commercial off the shelf (COTS) passive optical components for use in space applications. Use of COTS is in general increasing in many space engineering disciplines, not only electronics, as space operators continue to reduce costs with the aim of improving overall access to space. For passive optical components, such as lenses, gratings and mirrors, critical aspects to be assessed include the substrate material, the optical coating and the optical mounts. Factors which will determine the overall quality and reliability of the optical component include the overall build quality, the stability of the optical mount (including adhesive bonding systems), the quality of the substrate material (for example the chemical purity), and the quality and durability of the optical coating. The long term behaviour of the component in the space environment also needs to be assessed. The trainee will use the analytical equipment and space environmental test facilities available in the Materials and Electrical Components Laboratory to analyse the physical and chemical properties of a variety of commercially available passive optical components, and to determine their potential suitability and overall limitations for use in space applications. A comparison will also be made with established passive optical components qualified for space use, especially with respect to the quality and reliability of the materials used. The incumbent will use state of the art space simulation facilities like the LEOX (Low Earth Orbit Atomic Oxygen), the STAR I/II facilities able to simulate radiation (electromagnetic as well as proton/electron particles) as well as temperature effects and the ESD (Electro Static Discharge) facility able to characterise charging behaviour of materials down to 20 Kelvin.</p>		
<p>Required education: Applicants should have completed a University course at Masters Level (or equivalent) in materials science, applied physics, applied chemistry, materials physics/chemistry. Applicants should have good interpersonal and communication skills and should be able to work in a multi-cultural environment, both independently and as part of a team. Hands-on experience within a laboratory environment is considered an asset. Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required. Specific requirements:</p> <ul style="list-style-type: none"> • good understanding of materials analysis techniques (microscopic analysis, physical & chemical materials analyses, surface analysis (SEM, XPS, AFM etc) • ability to perform experimental work in laboratory • knowledge of the space environment 		