

Training Opportunity for Lithuanian Trainees

Reference	Title	Duty Station
LT-2019-TEC-EPB	Energy storage for Space applications	ESTEC

Overview of the unit's mission:

The Power Systems, EMC and Space Environment division (TEC-EP) is responsible for all aspects of power systems required for ESA spacecraft and payloads. The division's activities cover power generation, power management, electromagnetic compatibility, energy storage and space weather.

The energy storage section (TEC-EPB) provides specialist support in electrochemical energy storage (such as batteries, fuel cells and super capacitors) to current ESA missions and development projects. The section is also responsible for ESA R&D activities in the energy storage domain, working on internal activities as well as collaborating with industry and academia throughout Europe developing future energy storage technologies. The work of the section is supported by the Battery Life Testing Facility on site at ESTEC.

Energy storage is going through unprecedented change in the terrestrial market and cross-over into the Space sector is likely to accelerate significant development across the Space energy storage value chain. ESA activities are at the cutting edge of the technology development and our research covers a wide spectrum of activities; from engineering improvements in battery component design, advance analysis of limited telemetry to create a detailed picture of battery performance, to collaborating in development projects on fundamental material advances.

Overview of the field of activity proposed:

One of the major issues that we are encountering today when it comes to qualification of batteries for space is the lack of standardization of the relevant cell/battery tests. In order to be able to use the state-of-the-art batteries used in terrestrial applications for our satellites we need to optimize our test stream. Today we are at least three times slower than automotive, CET and military industry when it comes to battery qualification. The result of the latter is that by the time we qualify battery cells, they can be technology wise outdated or even obsolete.

We need to acquire knowledge from CET, automotive and military qualification testing and relevant standards and investigate whether and how we could spin in this knowledge to improve the space battery qualification.

A feasibility study on identifying and comparing the different qualification tests and relevant sequences required for CET, automotive and military sectors with the ones in space has to be carried out. The study should include identification and comparison of all existing battery standards. The goal of the study will be to propose a standard adaptation or a creation or specification of a new standard that could improve and accelerate the battery qualification test campaigns for space applications.

Required education:

The applicant should have completed higher study programme in electrochemistry or a related field in Energy Storage engineering. Being familiar with battery standards and having a solid knowledge in electrochemical measurements/techniques and battery qualification testing would be an asset.