Training Opportunity for Belgian Trainees

Reference	Title	Duty Station
BE-2021-OPS-SWa)	**Distributed Space Weather Monitoring**	**ESOC**

Overview of the mission:

The goal of ESA's Space Safety Programme is to contribute to the protection of our planet, humanity and assets in space and on Earth from threats originating in Space and to contribute to Europe's ability to safeguard its affected infrastructure from such threats as a service to its society. The Space Weather Office within the Space Safety Programme is addressing the risks associated to the activity of our Sun with the goal of providing owners and operators of critical spaceborne and ground-based infrastructure timely and accurate information that will enable mitigation of the adverse impacts of space weather. The term space weather refers to the environmental conditions in the Earth's magnetosphere, ionosphere and thermosphere due to the Sun and the solar wind that can influence the functioning and reliability of space-borne and ground-based systems and services or endanger property or human health.

ESA's Space Weather Office is responsible for developing a network of space weather products and services geared towards mitigating the effects of space weather on infrastructure located in space and on ground and defining and implementing European space based observation systems to enable operational space weather services.

Overview of the field of activity proposed:

Monitoring of the Earth's and Sun's environment is an essential task for the now- and forecasting of Space Weather and the modelling of interactions between the Sun and the Earth. Due to the asymmetry and complexity of Earth's magnetosphere, the involved particle environment and its dynamics, it is necessary to capture the state of the magnetic field and the particle distribution in a sufficiently large number of sampling points around the Earth, such that it allows state-monitoring and modelling of the involved processes with sufficient accuracy and timeliness.

ESA is implementing a space weather monitoring system, including the establishment of a Distributed Space Weather Sensor System (D3S) to observe the effects of solar activity within Earth's magnetosphere. An important aspect for the realisation of observation systems for Space Safety is the need of high reliability, sufficiently long lifetime and low data latencies as the data will be used in operational purposes. Two precursor hosted payload missions of D3S have been realised with a radiation monitor and a magnetometer flying on two different GEO satellites providing near-real time information on current space weather conditions. Serval additional hosted payload flight are in preparation with additional radiation monitors flying on GEO missions in 2022 and missions planned for the lunar environment in 2023/24. In addition to hosted payload missions ESA is studying options for dedicated small satellite constellations.

In this training opportunity you will contribute to various aspects of the implementation of D3S:

- consolidation of the D3S observation requirements,
- instrumentation development targeting D3S measurement requirement needs,
- monitoring of the hosted payload missions that are ongoing,
- preparation of the operations of upcoming hosted payloads, including ERSA on the Lunar Gateway.

Required education and skills:

- Master degree in a technical or scientific discipline.
- Good interpersonal and communication skills
- Ability to work in a multi-cultural environment, both independently and as part of a team
- Fluency in English and/or French, the working languages of the Agency. Good proficiency in English will be required.