

Training Opportunity for Belgian Trainees

Reference	Title	Duty Station
BE-2019-OPS-SW(1)	SmallSat/CubeSat studies for Space Weather Monitoring	ESOC
<p><u>Overview of the unit's mission:</u> ESA's Space Safety Programme Office is aiming to detect, predict and assess threats from space and their potential risk to life, property and infrastructure. The Space Weather Office under Space Safety Programme Office is addressing those 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. ESA's Space Weather Office is responsible for defining and implementing European space based observation systems to enable operational space weather services.</p>		
<p><u>Overview of the field of activity proposed:</u> 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. Such satellite systems should benefit from the continuously improving performance of CubeSat, NanoSat and SmallSat systems currently under development in different application areas. An important aspect for the realisation of miniaturised satellite observation systems for Space Safety is the need of high reliability, sufficiently long lifetime and low data latencies because the data will be used in operational purposes. Space weather instrumentation traditionally is highly miniaturised, and therefore appears to be well suited for small satellite systems, which could become competitive to the usually followed hosted payload approach while allowing for more flexibility with respect to the flown payload and orbital requirements. The Trainee will be involved in D3S projects and will study the possibilities of including CubeSat/NanoSat projects within the D3S structure addressing the benefits of increasing number of measurement points with the trade-off of reliability and functionality. For this study an analysis of the coverage of planned measurements within Earth's Magnetosphere will be set up to identify gaps in current operational measurements. Possibilities to fill these gaps with dedicated small space missions will be explored and mission opportunities assessed.</p>		
<p>Required education: Applicants shall have a degree in aerospace engineering or physics preferably with a background and interest in satellite systems. Software engineering skills will be considered as an asset. Applicants should have just completed, or be in their final year of a University course at Masters Level (or equivalent) in a technical or scientific discipline. 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. Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required.</p>		