

## Training Opportunity for Luxembourgish Trainees

| Reference  | Title                                 | Duty Station |
|--|---------------------------------------|--------------|
| LU-2022-OPS-S  | Space Debris Monitoring or Cleanspace | ESOC         |
| <p><b><u>Overview of the mission</u></b></p> <p>ESA's Space Debris Office coordinates research activities in all major debris disciplines: measurements, modelling, protection, and mitigation. It supports activities in the Space Safety Programme for tasks, amongst others, the development of sensor technology for debris monitoring using laser, ground- and space-based optical telescopes and radar systems, as well as developing data processing software in a community approach and the establishment of expert centres for sensor qualification.</p> <p>The goal of the activities of ESA's Clean Space office is to minimise environmental impacts of space activities on Earth and in space. To achieve this goal, it covers the fields of ecodesign, management of end of life, active debris removal and in-orbit servicing.</p>   |                                       |              |
| <p><b><u>Overview of the field of activity proposed</u></b></p> <p>You will be involved in activities of the Space Debris Office or the Clean Space Office.</p> <p>The tasks foreseen by the Space Debris Office entails the development of a simulation environment for the assessment of tracking sensors. Tracking sensors, e.g. laser ranging stations, are used to refine the trajectory of debris. They support the prediction of re-entries, the assessment of close approaches and confirmation of new debris generated in fragmentation events. Part of the sensor technology development is the derivation of requirements for such sensors, e.g. determining the needed detection and accuracy performance. The foreseen work includes modelling the detection, system constraints (e.g. maximum slewing velocity), scheduling, and orbit determination. For this purpose, you will have access to existing simulation tools and flight dynamics software libraries.</p> <p>The tasks foreseen by the Clean Space Office address work in the field of space debris neutrality, encompassing a series of technical and programmatic tasks such as:</p> <ol style="list-style-type: none"> <li>1) Supporting evaluation of the impacts of more stringent rules on space debris mitigation on projects;</li> <li>2) Supporting the trade-offs and analyses on the advantages of the different technical solutions including removal;</li> <li>3) Supporting the detailed preparation of the technological roadmap to achieve this goal;</li> <li>4) Mapping the in-orbit servicing solutions being developed and support the setting up of the vision towards a circular economy in space.</li> </ol> <p>In both foreseen scenarios you will support the definition of study work in that field and contribute to the technical follow-up of such studies. You will attend regular team meetings and you will have the opportunity to actively contribute to ongoing projects and research activities, develop new tools, and present results to an international community.</p> |                                       |              |

**Required education and skills**

- Master degree in a technical or scientific discipline
- Programming skills (preferably Python)
- Background in orbital mechanics and estimation theory is an asset
- Relevant experience gained during internships/project work
- Breadth of exposure coming from past and/or current research/activities
- Knowledge of ESA and its programmes/projects
- Knowledge of relevant technical domains
- 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