

Training Opportunity for Belgian Trainees

Reference	Title	Duty Station
BE-2022-HRE-AM	Spaceship EAC – In Space Manufacturing & Additive Manufacturing	EAC

Overview of the mission:

Within the Directorate of Human and Robotic Exploration, ESA, the European Astronaut Centre (EAC) in Cologne, Germany, hosts the European astronaut corps and is responsible for astronaut training and medical operations. In order to prepare for future Beyond Earth Orbit exploration missions, the directorate of Human and Robotic Exploration created the “Spaceship EAC” project, which aims at demonstrating low-TRL technologies and operational concepts with particular focus on Moon exploration. Spaceship EAC is part of the Exploration, Preparation, Research and Technology (ExPeRT) team and is based at the EAC.

As exploration activities within the agency amplify, the role of in-space manufacturing (ISM) is increasingly being examined and pioneered, representing a technology to increase the capability of the agency across all three exploration destinations (LEO, Moon and Mars). A key element of ISM relates to additive manufacturing (AM), a broad category of technologies that can allow for the fabrication of parts in-situ. ISM also includes topics related to material recyclability, micro-gravity printing and in-situ resource utilization (ISRU). Within Spaceship EAC and with our many collaborators, these concepts have been followed with our innovation driven focus, leading to the practical demonstration of new ideas in the linked areas of ISM, AM and ISRU. The YGT position would be aimed at supporting both the Spaceship EAC project, across the range of its varied activities, and innovative new activities related to ISM, AM and ISRU.

The activities under the “Spaceship EAC” project are executed by a team of highly motivated and capable young professionals under the support of the greater EAC and ESA teams. The implementation of projects is often done in cooperation with institutes of the German Aerospace Center (DLR), which has its headquarters and major facilities surrounding the EAC in Cologne, and with other ESA teams across the agency.

Candidates are encouraged to visit the ESA website: www.esa.int/ESA, and to also learn more about the Spaceship EAC team here: blogs.esa.int/exploration/category/spaceshippeac/

Overview of the field of activity proposed

The focus of the proposed opportunity is to support EAC activities within the frame of the "Spaceship EAC" initiative in the area of ISM/AM for human exploration (ExPeRT) and the EAC. These activities are in line with future exploration roadmaps and exploration scenarios related to possible human exploration to, and beyond, LEO. This opportunity would expand upon the past activities at the team in the area of ISM/AM. The opportunity will encompass:

- Familiarization with the "Spaceship EAC" project and - as far as relevant – with ESA's technology programme and exploration strategy;
- Supporting the ongoing 3d printing activities at EAC with our inventory of 3d printing systems
- Engaging in innovation focused demonstrations for new technology or concepts in the domain of ISM/AM and related ISRU
- Liaising with the HRE management team on Spaceship EAC and specific project progress, via meetings and discussions
- Engaging, collaborating with and support the Spaceship EAC team in their project activities

Required education and skills:

- Master's degree in a technical or scientific discipline
- Demonstrated skills in the area of mechatronics, additive manufacturing, related design or CAD tools, or equivalent technical skills relevant to the domain of In-space manufacturing
- 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