

## Training Opportunity for Swiss Trainees

Reference	Title	Duty Station
CH-2019-HRE-XE	Lunar Exploration/ISRU – Spaceship EAC	EAC
<p><b><u>Overview of the unit's mission:</u></b></p> <p>Within the Directorate of Human Spaceflight and Robotic Exploration, the European Astronaut Center (EAC) at Cologne, Germany, hosts the European astronaut corps and is responsible for astronaut training and astronaut medical operations. In order to prepare for future (human) space exploration missions, EAC created the "Spaceship EAC" initiative, an innovation team which aims at developing technologies and concepts relevant for furthering human exploration of the Moon. The utilization of EAC as a test bed for exploration related technologies and operations is increasingly being developed. Concepts demonstrated within Spaceship EAC and the network of institutions involved can lead to such ideas being injected into larger funding ecosystems for TRL development.</p> <p>The implementation of related 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 external European partners which are part of the Spaceship network. Spaceship EAC is part of the EXPERT element of the E3P (European Exploration Envelope Programme).</p> <p><b><u>Overview of the field of activity proposed:</u></b></p> <p>The focus of the proposed National Trainee activity is to support EAC activities within the frame of the "Spaceship EAC" initiative in particular in the area of future mission technology and concepts related to ISRU (in-situ resource utilisation). Spaceship EAC, as part of EXPERT and focusing on human spaceflight activities, has been active in the domain of ISRU, investigating concepts and technologies for 3d printing with lunar regolith simulant, how regolith could be used for energy purposes (e.g. thermal storage) and recently carrying out tests on new concepts for oxygen extraction from regolith. Related topics include radiation shielding using regolith and even concepts around life support and ISRU.</p> <p>Within this opportunity, a number of tasks are envisioned. These include:</p> <ul style="list-style-type: none"> <li>• Become familiar with the roadmaps for exploration, in particular the ESA exploration roadmap, and the international approach to lunar exploration.</li> <li>• Support ongoing ISRU projects within Spaceship EAC relating to the thermal processing of regolith via microwave heating and thermal sintering.</li> <li>• Work on innovative techniques for the thermochemical extraction of water, oxygen and hydrogen from lunar materials, and define demonstration projects with the Spaceship team to further spaceflight applicability of ISRU</li> <li>• Liaise closely with the larger ESA wide efforts relating to ISRU</li> <li>• Become familiar with the "Spaceship EAC" project and - as far as relevant – with ESA's exploration technology programme. EXPERT and E3P</li> <li>• Support the Spaceship EAC project and activities within the centre, including</li> </ul> <p>The Spaceship EAC team is a dynamic environment, where we actively seek out innovative approaches to both work and the projects we undertake. A number of students also work as part of the team, in addition to post-doctoral researchers and EAC staff.</p>		

**Required education:**

Applicants should have just completed, or be in their final year of a University course at Masters Level (or equivalent) in a relevant technical or scientific discipline. Education relating to materials science, metallurgy, planetary or space science are in particular desirable for this role.

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 fast moving, innovative team. Demonstrated team leadership is considered valuable.

Applicants must be fluent in English and/or French, the working languages of the Agency. A good proficiency in English is required.