

## Job Title: Young Graduate Trainee for Mission Operations (ExoMars 2020)

Req ID 3967 - Posted 19/01/2018



### EUROPEAN SPACE AGENCY

Young Graduate Traineeship Opportunity in the Directorate of Operations.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. Applications from women are encouraged.

#### Post

**Young Graduate Trainee for Mission Operations (ExoMars 2020)**

This post is classified F1.

#### Location

ESOC, Darmstadt, Germany

#### Our team and mission

The YGT will be part of the Exomars Rover and Surface Platform Spacecraft Operations Unit, Solar and Planetary Missions Division, Mission Operations Department.

The Solar and Planetary Missions Division is responsible for mission preparation and flight operations for the ESA fleet of solar and interplanetary spacecrafts. The division currently operates three missions (Cluster, Mars Express, Exomars TGO) and prepares for the launch of four others (Bepi-Colombo, Solar Orbiter, Exomars Rover and Surface Platform, JUICE).

Interested candidates are encouraged to visit the ESA website: <http://www.esa.int>

#### Field(s) of activities

ExoMars 2020 (aka RSP – Rover and Surface Platform) will deliver a European Rover and a Russian Surface Platform to the surface of Mars. In July 2020, a Proton rocket will launch the mission, which will arrive to Mars after a eight-month journey. During launch and cruise phase, a Carrier Module (provided by ESA) will transport the Surface platform and the Rover within a single aeroshell. A Descent Module (provided by Roscosmos with contributions by ESA) will separate from the Carrier shortly before reaching the Martian atmosphere. A fully automated Entry, Descent and Landing phase will allow a controlled landing on Mars.

After landing, the Rover will egress from the Platform to start its science mission: it will travel across the Martian surface to search for signs of life, collect samples with a drill and analyse them with next-generation instruments. The ExoMars Trace Gas Orbiter (TGO), launched in 2016, will support communications. The Rover Operations Control Centre (ROCC) will be located in Turin, Italy. The Surface Platform Operations Control Centre (SPOCC) will be located near Moscow, Russia. Commands to the Rover and to the Surface Platform will be transmitted through the Orbiter and the ESA space communications network operated at ESA's European Space Operations Centre (ESOC).

The Young Graduate Trainee (YGT) will report to the ExoMars RSP Spacecraft Operations Manager and will integrate the FCT – Flight Control Team. The FCT is responsible for the mission operations from launch until Mars Arrival, and will operate the Surface Platform until the Rover is safely on the Mars surface, before handing over the control to the SPOCC.

The Trainee's primary tasks in support of the operations preparation will be related to the planning and execution of relay overflights of the Exomars Rover and Surface Platform by the TGO and other (NASA) orbiters:

- Improvement of an existing Relay Support Tool to generate relay scenario geometry and data volume predictions for various operational timelines: (i) for the critical Egress period, allowing quick replanning; and (ii) for the Surface science mission, applying overflight sharing rules;
- Definition and implementation of a UHF link budget tool, including models of Rover, Surface Platform and orbiter antenna patterns, in view of predicting the data volume returned by each relay session;
- Using these tools, assessment of relay scenarios serving multiple landers with multiple relay orbiters and multiple Earth Stations.

The YGT shall take advantage of existing link budget assessments between Mars-bound assets, as well as previous tools for scenarios and planning support. The YGT will interact with Flight Dynamics, Relay coordination and Ground Station teams. The Trainee will also participate in interface tests with the spacecraft avionics bench or flight model, focused on, but not limited to testing Relay activities and related interfaces on ground.

This traineeship will grant the YGT wide insight into the different aspects of spacecraft operations preparation, including spacecraft platform, space communications and ground segment for a complex interplanetary mission.

#### Technical competencies

Knowledge of relevant technical domains

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

#### Behavioural competencies

Self Motivation

Communication

Continuous Learning

Cross-Cultural Sensitivity

Teamwork

#### Education

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, preferably Aerospace, electronics, computer science or physics.

#### Additional requirements

Knowledge in the following areas would be an asset:

- Orbital dynamics
- Radio wave propagation and link budgets
- Mission planning
- Programming
- Spacecraft design and related sub-systems

The working languages of the Agency are English and French. A good knowledge of one of these is required. Knowledge of another Member State language would be an asset.

In addition, applicants should demonstrate good interpersonal skills and the capacity to work both independently and as part of a team.

During the interview the candidates' motivation and overall professional perspective/career goals will also be explored.

**Other information**

For behavioural competencies expected from ESA staff in general, please refer to the [ESA Competency Framework](#).

**The closing date for applications is 04 February 2018.**

If you require support with your application due to a disability, please email [contact.human.resources@esa.int](mailto:contact.human.resources@esa.int).

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Please note that applications are only considered from nationals of one of the following States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the UK, or Slovenia as an Associate Member, Canada as a Cooperating State, Bulgaria, Cyprus, Latvia, Lithuania and Slovakia as European Cooperating States (ECS).  
Priority will first be given to candidates from under-represented Member States.

In accordance with the European Space Agency's security procedures and as part of the selection process, successful candidates will be required to undergo basic screening before appointment