

Traineeship Opportunity for “Young Graduate Trainees”

Reference	Field of specialisation	Duty Station	Closing Date
ESA/YG-ESTEC(2016)070	Advanced Concepts for Space Architecture and Infrastructure	ESTEC	15 December 2016

Overview of the Division’s mission

The Advanced Concepts and Studies Office ensures the overall coordination, coherence and performance of programme and corporate studies in support to the preparation of the Agency’s future activities, in line with its long-term strategic objectives and priorities. In particular, it manages the General Studies Programme (GSP) and the Advanced Concepts Team (ACT).

The ACT is in charge of beyond-the-horizon multidisciplinary research for space, exploring new approaches to space-related R&D (including competitions, prizes, games), research for disruptive innovation, developing an expert network at academic level and providing a capability for fast first look analysis of problems, challenges and opportunities. The ACT engages in collaborative research relations with university institutes and research centres, focusing on advanced research topics of potential strategic interest to the space sector and in experimenting with new forms of teamwork. In order to achieve this goal, a multidisciplinary research environment is provided, in which young scientific and engineering post-doctoral and post-graduate researchers carry out work on emerging technologies and innovative concepts.

More information on the team is accessible on the ACT website (www.esa.int/act).

Overview of the field of activity proposed

Since the early years of space exploration, studies have discussed the possibility of building space habitats and very large space structures. Most of those early visions and designs did not materialise into space projects. They involved the orbital deployment of typically heavy infrastructures, which was only credible in a scenario of exponential increase of launching capacities. While launch capabilities have improved only gradually since then, space exploitation activities have evolved considerably. At the same time, fabrication techniques are changing and advancing at a considerable pace. The first 3D printed houses have been produced and a new generation of highly innovative ‘intelligent’ buildings are emerging, using new technologies and materials. Such new developments are merging contemporary architectural design with engineering, construction and natural sciences. This shift in design thinking and methods calls for a transition from Computer Aided Design (CAD) to Computational Design in order to generate integrated systems through computational processes.

The Young Graduate Trainee (YGT) will be encouraged to propose and carry out new projects in the fields of space architecture and infrastructure based on his/her own expertise, interests and insight. The following list contains examples of topics of potential interest:

- In-situ resource utilization and manufacturing of lunar/planetary surface structures and elements;
- Self-assembling systems for in-situ construction of structures and components;
- Application of smart materials, e.g. textiles, in adaptive structures.

Depending on the nature of the project, the trainee may also be required to interface with the academic community in these fields.

The YGT will be a full member of the ACT and is therefore expected to contribute to the development and assessment of new concepts and technologies for space applications in close interaction with ACT researchers who work on a broad range of disciplines, including informatics, artificial intelligence, climate modelling, energy systems, fundamental physics, biomimetics, computational management science and mission analysis. Based on her/his detailed background

and interests and the opportunities and needs of the team, the trainee will be involved in a number of other ACT initiatives, including studies conducted via the Ariadna scheme (www.esa.int/ariadna), and will also participate in reporting and communicating the results of the team, both internally and externally.

Educational and other requirements

Applicants should have just completed, or be in their final year of a university course at Masters Level (or equivalent) in architecture, building technology, civil engineering, industrial design, or related. Experience with computational design, simulation and fabrication, including design software, such as Rhino, Revit, Microstation, Generative Components, Grasshopper and Dynamo, is an asset.

Applicants should show a genuine interest in applied academic research, together with sound analytical skills, avid curiosity and a natural aptitude to self-motivation and teamwork. In addition, 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.

How can I apply?

Please fill in the [online](#) application form.

Please note that only one application may be submitted for the YGT Scheme.

The YGT Scheme is open to recently qualified young men and women who are 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 Canada as a Cooperating State, Bulgaria, Cyprus, Latvia, Lithuania, Slovakia and Slovenia as European Cooperating States (ECS).