Job Title: Young Graduate Trainee for Radio Frequency Technologies and Techniques

Req ID **3806** - Posted **20/11/2017**

EUROPEAN SPACE AGENCY

Young Graduate Traineeship Opportunity in the Directorate of Technology, Engineering and Quality.

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 Radio Frequency Technologies and Techniques

This post is classified F1.

Location

Noordwijk, Netherlands (NL)

Our team and mission

The Radio Frequency Payloads & Technology Division is responsible for RF payloads, instruments and technologies for space and ground applications, including all equipment having a Radio Frequency space/ground interface and its associated Laboratories. The division supports the definition, specification and development/ procurement of laboratories either for ESA projects and technology programmes or external customers.

Within the Division, the Payload Engineering Section responsibilities encompasses payloads with Radio Frequency interface for telecommunication and navigation exploiting different technologies (e.g. analogue, digital, optical) including design and performance analysis tools and testing. In addition, the Section is also responsible for Earth observation and scientific Radio Frequency active and passive instruments, including design and performance analysis, engineering and testing.
The RF Equipment and Technology Section responsibilities encompass RF technologies and RF equipment, also including vacuum electronics and high power RF phenomena (multipactor, corona and passive intermodulation), as well as time and frequency references, modelling, design tools, measurements, performance characterisation and calibration techniques.

Interested candidates are encouraged to visit the ESA website.

Field(s) of activities

Within the present Traineeship several possible fields of research are proposed which are detailed below. The candidate should indicate his/her preferred field and one of more options inside the selected field when applicable.

1. Analysis, modelling and performance assessment of Radio Frequency Interference counteraction mission concepts, sub-systems, techniques and algorithms.
   Nowadays, Radio Frequency Interference (RFI) issues represents a serious threat for Telecommunication, Navigation and Earth Observation satellite systems, causing detrimental effects ranging from degradation in the Quality of Service to the complete loss of the satellites.
   Counteracting RFI is a challenging task to be performed at multiple levels, encompassing regulatory

and technical aspects. On the technical aspects, a RFI counteraction strategy may be defined, consisting in several steps: RFI monitoring, detection/isolation, classification, localisation and mitigation. Since RFIs are expected to increase in following years, due to several concurrent aspects (e.g., the increase of satellites in orbit), the International (commercial, scientific, (inter-) governmental) Community is very active in looking for effective solutions. To this aim, ESA is currently supporting several R&D studies with European satellite and ground equipment manufacturers, research institutions and satellite operators.
The YGT tasks will encompass:

- Technical support for the definition of RFI counteraction satellite missions
- Definition, modelling and trade-off of Radio Frequency and Digital sub-systems (on-board and/or on-ground) for RFI counteraction
- Identification, definition, analysis, trade-off and performance assessment of Radio Frequency Interference counteraction techniques and algorithms

2 - RF Equipment and Technologies

The selected candidate will be offered a task related to one of the domains indicated below. The candidate's background will be duly considered when assigning the task.

1. RF active component characterisation
2. PCB design, packaging and integration of high frequency circuits and assemblies
3. Millimetre wave vacuum tubes amplifiers
4. Time and Frequency subsystems and equipment
5. RF/Microwave filters design and implementation
6. Additive manufacturing for RF/Microwave part
7. Passive Intermodulation Product prediction and mitigation techniques

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:

- for field 1 preferably in Mathematics, Physics or Electrical Engineering. Preference will be given to applicants skilled in mathematics and/or signal processing and/or radio frequency and digital sub-systems. Knowledge and/or experience in computer programming (e.g., Matlab) is requested.
- for field 2 preferably in in Telecommunications / Electrical/ Microwave Engineering. Knowledge of design tools such as HFSS, CST, FEST or MICIAN would be an asset. Experience in computer programming and MATLAB would be an asset.

Additional requirements

In addition to the above competencies, applicants should demonstrate good interpersonal skills and the capacity to work 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. Knowledge of another Member State language would be an asset.

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

Applicants should have good analytical and communication skills and should be able to work in a multi-cultural environment in an autonomous manner.

Other information

For behavioural competencies expected from ESA staff in general, please refer to the ESA Competency Framework.

The closing date for applications is 17 December 2017.

If you require support with your application due to a disability, please email contact.human.resources@esa.int.

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