Training Opportunity for Luxembourgish Trainees

Reference	Title	Duty Station
LU-2021-TEC-EFE	**Radio Frequency Technologies and Techniques**	**ESTEC**

Overview of the 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 for either ESA projects and technology programmes or external customers.

The division consists of four sections covering the following domains:

- Payloads with RF interface for telecommunication and navigation exploiting different technologies (e.g. analogue, digital, optical) including design, performance analysis tools and testing;
- Earth observation and scientific RF active and passive instruments design, performance analysis, engineering & testing up to sub-millimetre waves;
- Wave-propagation and interaction relevant to space communications, navigation and remote sensing, including interference and regulatory aspects;
- Antenna systems, architecture, technologies and techniques for all space applications, including space vehicle TT&C and user segment terminals, as well as antenna engineering and RF testing of antenna and material;
- RF equipment and technologies, including RF passive technologies, RF active technologies, vacuum electronics and high power RF phenomena (multipactor, corona and passive intermodulation).
- Time and frequency references, modelling, design tools, measurements, performance characterisation and calibration techniques.

Overview of the field of activity proposed:

Within the RF equipment and technologies section, you will have the opportunity to perform practical and hands-on activities in one of the following disciplines, depending on your background and motivations:

1.Time and Frequency (T&F): T&F equipment and subsystems such as oscillators, atomic clocks used on board Galileo and ESTEC's unique UTC lab, require extensive characterization and performance analysis in a wide range of operational and environmental conditions. The proposed training opportunity will include the development of new tests beds and characterization techniques as required for the validation and verification of new equipment and subsystems for ground and space applications.

2. RF active technologies – W-band receiver station: The trainee will work on the assembly and characterization of a W-band RX station operating in 71-76 GHz band based on mm-wave and state of the art building blocks developed under ESA R&D industrial programs and under internal R&D. The characterisation will cover both, laboratory measurements as well as field G/T measurement

campaign using 60cm W-band dish antenna. Design work is anticipated in the area of 1) RX IQ signal combining and IF amplification&filtering (design and manufacturing of IQ combiners and IF amplifier using COTS) and 2) baseband processing (selection of SDR platform to sample and process the IF signal).

Required education and skills:

- Master's degree in a technical or scientific discipline
- 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