

Research Fellowship in Telecommunication, TT&c Systems and Techniques

Directorate of Technical and Quality Management

ESTEC, Noordwijk, The Netherlands

ESA/RF-ESTEC(2015)010

Overview of the Division's mission

The RF Systems, Payload and Technology Division is part of Electrical Engineering Department and of Technical and Quality and Management Directorate.

The RF Systems, Payload and Technology Division is responsible for space instrumentation and end to end communication systems, subsystems, equipment and technologies which cover the following domains:

- Communication systems and subsystems design and validation;
- Commercial ground and user segment products for navigation, telecommunications and remote sensing;
- Systems for TT&C communication, navigation, remote sensing and scientific applications;
- Satellite payloads (e.g. repeaters for telecommunications or navigation instruments, earth remote sensing instruments for scientific applications);
- Microwave and millimetre wave equipment and technologies;
- Complex on-board payloads for communications and remote sensing, and processing core of such systems, including optically based implementations;
- Systems testing for performance evaluation or validation;
- Laboratories to test/proof concepts soundness and validation.

The Division consists of five sections and the divisional laboratory unit. They are:

- 1) Telecommunication - TT&C systems and techniques
- 2) Radio Frequency Equipment and Technology Section
- 3) Payload engineering
- 4) Radio navigation systems and techniques
- 5) Commercial Ground and User Segment Products
- 6) Laboratory

Overview of the field of research proposed

1. TT&C

In the field of TT&C the candidate shall be working on tasks related to the following topics:

- Satellite TT&C systems, techniques and transponders both for near earth and to distant planets.

- Communication systems and novel ranging techniques for deep space missions.
- Advanced Digital Signal Processing techniques for future MODEM implementation in particular for miniaturized transceivers for proximity link.
- Novel modulation and access techniques for in-situ (on planet surface) communications.

2. Telecom Systems

In the field of Telecom Systems the candidate shall be working on tasks related to the following topics:

- Study of advanced broadband fixed and mobile telecommunication systems with particular emphasis on modulation, coding, access methods, synchronisation, medium access control resource allocation, high layer protocols, advanced signal processing techniques applied to on-board and ground satcom system design, system and sub-system simulation tools as well as current multimedia application validations both in the field of fixed and mobile communications.

3. Security

In the field of Security the candidate shall be working on tasks related to the following topics:

- Assessment of the needs for protection of communication networks of current and future ESA programmes;
- Analysis of the impacts of changes on the design of the system stemming from integration of security modules, and proposing cost effective implementations;
- Analysis and simulations of satcom end-to-end secure equipments as well as dedicated security modules;
- Study and experiment on the communications performance of secure TT&C communications links
- Analysis and simulations of modern cryptography mechanisms and key management systems.

4. Telecom Laboratory

In the field of telecommunication applications and laboratory experimentations the candidate shall carry out tasks related to the following topics:

- Definition of satellite communication applications test campaigns
- Experimentation on the performance of advanced satellite communication systems in the division telecom laboratory
- Validation of advanced application platforms targeting next generation satellite communication networks
- Set-up and validation of satellite communication networks
- Analysis and simulations of communication networks for QoS verification

Who can apply

The programme is open to suitably qualified women and men. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

The Research Fellow Programme is open to nationals of the following states: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the UK, or Canada as a Cooperating State, Bulgaria, Estonia, Hungary, Latvia, Slovakia and Slovenia as European Cooperating States (ECS).

Required qualifications

Applicants must have recently completed their PhD studies in either Telecommunications, Electrical, Computer or Aerospace Engineering

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

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

How to Apply

Please fill in the [online](#) application form attaching to it, **in one document only**, your CV, your motivation letter and your research proposal.

Candidates must also arrange for up to **three letters of reference** to be sent by e-mail, before the deadline, to **temp.htr@esa.int**. The letters must be sent by the referees themselves. The candidate's name must be mentioned in the subject of the email.

Applications satisfying the general conditions for eligibility, to be submitted **by 6 May 2015**, will be evaluated and successful applicants will be invited for an interview.

Interested candidates are highly encouraged to visit the ESA website: www.esa.int.