

Internal Research Fellow (Post Doc) in Adaptive Optics for Feeder Link Technologies

Job Req ID: 14101

Closing Date: 03 March 2022

Publication: External Only

Vacancy Type: Internal Research Fellow

Date Posted: 03 February 2022

Internal Research Fellowship Opportunity in the Directorate of Telecommunications and Integrated Applications.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. We therefore welcome applications from a qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, age, disability or other characteristics. Applications from women are encouraged.

This post is classified F2.

Location

ESTEC, Noordwijk, Netherlands

Our team and mission

Your field of research will be in a particular application of adaptive optics, namely the controlled wavefront pre-distortion of an optical communication beam, with the aim to minimize atmospheric turbulence effects. Your topic is applied research in optical satellite communications and a technology that promises data rates exceeding the capabilities of traditional radio communication systems by multiple orders of magnitude. Successful feasibility demonstration will enable the transformation of optical space to ground satellite communication from experiment to industrialization and commercial application.

You are encouraged to visit the ESA website: www.esa.int

Field(s) of activity/research for the traineeship

Your field of research is in the area of Adaptive Optics with Laser Guider Stars, with the first application of laser communications through the atmosphere. Laser beams characteristics are degraded due to detrimental effects like scintillation, beam spreading, beam wandering, angle of arrival fluctuations and wavefront distortion, caused by the propagation through a turbulent media like the atmosphere. In practical terms, the laser beam is distorted such that the detection and recovery of the communications signal modulating the optical carrier is severely affected in terms of quality of service (bit error probability and availability).

In particular, your tasks will be to:

- Perform the agreed applied research, contributing to advancing adaptive optics technology for its application to satellite communications

- Participate in international conferences in the field and contribute to Scientific Organization Committees
- Disseminate the research progress and achievements to both the scientific community and the general public through communication activities like seminars and outreach
- Provide the theoretical background and framework for the developments
- Analyze the operability of Sodium laser guide stars for wavefront determination outside the isoplanatic angle centered on the downlink beam
- Investigate alternative launch geometries for Sodium laser guide stars
- Investigate the application of polychromatic laser guide stars
- Liaise with both consortia by inspecting their hardware developments (at their premises) and by supporting bidirectional space to ground optical communication experiments at ESA optical ground station (OGS).

Technical competencies

Knowledge relevant to the field of research

Research/publication record

Ability to conduct research autonomously

Breadth of exposure coming from past and/or current research/activities

General interest in space and space research

Ability to gather and share relevant information

Behavioural competencies

Result Orientation

Operational Efficiency

Fostering Cooperation

Relationship Management

Continuous Improvement

Forward Thinking

Education

You should have recently completed, or be close to completion of a PhD in a related technical or scientific discipline (i.e. optical communications, adaptive optics, laser technology, etc.). Preference will be given to candidates awarded their doctorate within the past five years.

Additional requirements

You should also have:

- An adequate network within the reference community
- Proven experience of leading research in an international environment
- Demonstrated engagement with non-academic institutions
- Innovative thinking.

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.

Other information

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

For further information on the Internal Research Fellowship Programme please visit: [Internal](#)

In addition to your CV and your motivation letter, please add your proposal of no more than 10 pages outlining your proposed research in the "additional documents" field of the "applicant information" section.

At the Agency we value diversity and we welcome people with disabilities. Whenever possible, we seek to accommodate individuals with disabilities by providing the necessary support at the workplace. The Human Resources Department can also provide assistance during the recruitment process. If you would like to discuss this further please contact us at 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, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom. Nationals from Latvia and Slovenia, as Associate Member States, or Canada as a Cooperating State, can apply as well as those from Bulgaria, Cyprus and Slovakia as European Cooperating State (ECS).

According to the ESA Convention, the recruitment of staff must take into account an adequate distribution of posts among nationals of the ESA Member States*. When short-listing for an interview, priority will first be given to candidates from under-represented or balanced Member States*.

(<https://esamultimedia.esa.int/docs/careers/NationalityTargets.pdf>)

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.

*Member States, Associate Members or Cooperating States.