

Research Fellow Opportunity at ESTEC (The Netherlands)

Internal Research Fellow (post-doc) in Advanced Space Systems Dynamics and Control (Directorate of Technical and Quality Management)

The European Space Agency's Advanced Concepts Team (<http://www.esa.int/gsp/ACT/index.html>) is looking for a highly motivated young researcher in the field of Advanced Space Systems Dynamics and Control (Mission Analysis).

Team

The Advanced Concepts Team (ACT) is a group of research fellows (post-docs) and young graduates who originate from a broad variety of academic fields and aim at an academic career. Its task is to monitor, perform and foster research on advanced space systems, innovative concepts and working methods. It interacts externally almost exclusively with academia and operates as a truly interdisciplinary team bound to high scientific standards. Via its research, the team acts as a cross-departmental pathfinder to explore novel, potentially promising areas for ESA and the space sector, ranging from applied to basic fundamental research topics. An important task of the team is to communicate scientific trends and results, as input to the strategic planning of the Agency.

The Research Field

The team has entered the field of advanced space systems dynamics and control (previously mission analysis) in 2002, with projects related to automated interplanetary trajectory optimisation (see the [GTOC competitions](#), the [Humies awards](#)), asteroid deflection missions, efficient algorithms for dynamics and control (see the [PyKEP project](#)), swarm intelligence as a paradigm for formation flying, the use of vision to aid guidance and navigation, optimality principles in mission planning. Candidates are highly encouraged to get familiar with the research done in this field by the team (<http://www.esa.int/gsp/ACT/mad/index.html>) as well as on the overall research of the ACT and the main activities lines of ESA.

Duties and Tasks

The successful candidate will carry out research in advanced space systems dynamics and control with emphasis on the algorithmic side.

Areas of research are partly chosen by the successful candidate based on his/her own expert judgements and insight into trends and developments, partly chosen by the team as to follow strategic directions of the Agency.

Scientifically she/he will in particular:

- Propose and perform research in the field of Advanced Space Systems Dynamics and Control, where appropriate together with universities of ESA Member States (in particular through the *Ariadna* programme);
- Propose and perform research in the field of automated interplanetary mission design, where appropriate together with universities of ESA Member States (in particular through the *Ariadna* programme);
- Maintain and develop the [GTOP database](#) (Python) ensuring a continuous release of new problems to the community.
- Perform research on, mature and investigate advanced concepts in guidance, navigation, dynamics and control, starting new trends and research lines within the team.
- Maintain and expand the PyKEP open source project (C++, Python) ensuring its high level software engineering quality.

As ACT researcher, she/he will:

- Publish results in peer-reviewed publications and use modern communication tools to communicate with broader audience inside and outside ESA;
- Lead and assist interdisciplinary projects with other ACT Research Fellows and Young Graduate Trainees;
- Participate together with the team in the assessment of proposed space system concepts and propose new concepts and assessment studies;
- Perform and participate in studies on subjects of strategic interest to provide in-house expertise to strategy development and ESA's General Studies Programme.

Required Qualifications

Required academic qualifications:

- a degree in Engineering, Informatics, Computer Science, Celestial Mechanics;
- PhD (completed before take up of duty) in Celestial Mechanics, Aerospace Engineering, subject of the thesis being relevant to the description of the tasks outlined above and aim at an academic/research career.

Additional Requirements:

- interest in space science and technology;
- ability for and interest in prospective interdisciplinary research;
- aptitude to contextualise specialised areas of research and quickly assess their potential with respect to other domains and applications;
- academic networking to add functioning links to universities and research institutes;
- ability to work in a team, while being able to work individually and autonomously regarding his/her own personal research plans and directions;
- natural curiosity and a passion for new subjects and research areas;
- good methodological and organisation skills.
- Knowledge of 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.

Research Fellowship in the Advanced Concepts Team

The position of Research Fellow at ESA's Advanced Concepts Team is similar to a regular academic Post-Doc placement, however with a few notable key differences:

1. ACT RFs have no teaching obligations. However, they will be involved in the mentoring of Young Graduate Trainees and stagiaires (student interns) within the team.
2. As the team does not have a professor-like position, ACT RFs are academically more independent than most post-docs. This implies more freedom but also more responsibility for their research directions and approaches.
3. ACT RFs are joining a diverse, changing and interdisciplinary research team embedded in a large space agency, in contrast to a more specialised, focused research group with close or similar competences.
4. ACT RFs need to actively reach out to other disciplines, to bring in their competences to interdisciplinary research projects and to encourage other researchers to join them in their core research projects.
5. ACT RFs need to communicate their expertise and research results internally and externally, including potential implications and importance for ESA's long-term strategy.

Application Process and Deadlines

Information on the ESA Research Fellowship Programme and the application form can be found [here](#).

Applicants should send their CV, a covering letter stating their research interests, the filled-out RF application form and 3 reference letters to: act@esa.int as well as temp.htr@esa.int. If not possible by email, the reference letters can also be sent via post to: Human Resources Support Services Division, HFC-HOM, ESA/ESTEC; Keplerlaan 1, PO Box 299, 2200AG Noordwijk ZH, The Netherlands. The general eligibility criteria of the ESA Research (Internal) Fellowship Programme apply.

All applications will be considered until the available post is filled. A first round of interviews is expected to take place in September/October 2014, with the option of screening interviews via videoconference; to enter this call please submit your applications **no later than 2 September, 2014**. Starting dates are relatively flexible.

Interested candidates are highly encouraged to visit the teams website: <http://www.esa.int/act> as well as: www.esa.int.