Vacancy Notice

Internal Research Fellow (post-doc) in Planetary System Science and Climate Engineering

The European Space Agency's Advanced Concepts Team (www.esa.int/act) is looking for a highly motivated young researcher in the field of advanced renewable energy systems, with good analytical and communicational skills and an excellent aptitude for teamwork.

The 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. The team is in constant evolution and attempts to lead and embrace changes and new trends. Each member is therefore encouraged and expected to contribute to and suggest changes to its research orientation and even internal functioning.

An important task of the team is to communicate scientific trends and results, as input to the strategic planning of the Agency.

In the specific field of planetary system science, the team has been active since 2009, including mainly exploratory research on climate engineering. Climate engineering is understood as a specific branch of Earth or planetary system science, an area which transcends disciplinary boundaries to treat the Earth or planetary climates as an integrated system seeking a deeper understanding of the physical, chemical, biological and human interactions that determine the past, current and future states.

Exploratory research has been conducted in the areas of using adapted climate system models to specific cases, to assess geo-engineering concepts and analyse the potential of Martian climate engineering concepts based on recent 3D Martian climate models. These include:

- Evaluating different proposed climate engineering concepts involving space systems with respect to their value and impact for a global view of the dynamics of Earth and in particular Earth climate, based on a preliminary trade-off of different options;
- Assessing the long-term impact of potential, planned or conceivable space activities on the climate.
- Evaluation of the potential of increasing Martian surface temperatures (e.g. studying the effect of introducing greenhouse gases).

Many of these subjects have been considered as being in the realm of science fiction until recently, when earlier academic work is gradually reaching mainstream science, helped by reports such a the Royal Society Report on “Geoengineering the climate: science, governance and uncertainty” (RS Policy document 10/09, September 2009).

Duties and tasks

Successful candidates will carry out research in planetary systems science and climate engineering and will in particular carry out the following tasks (details and emphasis between tasks to be agreed):

- Propose and perform research in the field of planetary system and climate engineering modelling, where appropriate together with universities of ESA member States (in particular through the *Ariadna* programme)
- Propose and perform research specifically in the field of Mars climate engineering with a goal to better understand different methods to increase the habitability of Mars
- Propose and perform research specifically in the field of Earth Climate engineering, aiming at a better understanding of options for space to contribute to potential engineering options to limit or reduce global warming and its effects
- Identify the trends and needs of the research communities involved in climate change and Earth systems science and the potential roles of space to address these
- Publish results in peer-reviewed publications and additionally use modern communication tools to communicate with broader audience inside and outside ESA
- Lead and assist interdisciplinary projects with other ACT Research Fellows.
- Participate, with the rest of the team, in the assessment of proposed space system concepts - these not being restricted only to the planetary system sciences - 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.
- Follow and monitor the progress of research in areas of advanced energy research of interest to the team in order to derive and report strategic trends.

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.

Qualifications

The candidate should hold a degree in either meteorology, physics, geology, chemistry, biology. physics, mathematics, informatics or engineering. He or she should also have completed (or be about to complete) a PhD in meteorology, planetary/Earth system sciences, physics or engineering, subject of the thesis being relevant to the description of the tasks outlined above and aim at an academic/research career.

The candidate is expected to bring to the team functioning links to universities and research institutes. The candidate should demonstrate an interest in space science and / or technology as well as the ability and interest to get actively involved in prospective interdisciplinary research.

Successful candidates are expected to show an aptitude to contextualise specialised areas of research and to quickly assess their potential with respect to other domains

and applications. An avid, natural curiosity and a passion for new subjects and research areas are essential. As member of an interdisciplinary, multicultural team of peers, the candidate should have a natural aptitude to teamwork, while being able to set-up, follow, monitor and be responsible for his/her own personal research plans and directions. Good methodological and organisation skills are therefore a valuable asset.

Application

Information on the ESA Research Fellowship Programme and the application form are available at:
http://www.esa.int/SPECIALS/Careers_at_ESA/SEMICLRTJRG_0.html.
Applicants should send their CV, a covering letter stating their research interests and the filled-out RF application form to: act@esa.int as well as temp.htr@esa.int. (if not possible by email, the reference letters can also be sent via normal mail to: ESTEC HR Division, HFI-HTR, 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 January/February 2012, with the option of screening interviews via videoconference; to enter this call it is recommended to submit applications no later than **December 18**, 2011.
Interested candidates are highly encouraged to visit the teams website: www.esa.int/act as well as: www.esa.int .