Job Title: Internal Research Fellow (PostDoc) on FLEX, Sentinel 2/3 missions

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EUROPEAN SPACE AGENCY

Research Fellowship Opportunity in the Directorate of Earth Observation Programmes.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. Applications from women are encouraged.

Post

Internal Research Fellow (PostDoc) on FLEX, Sentinel 2/3 missions This post is classified F2.

Location

ESTEC, Noordwijk, The Netherlands

Our team and mission

The holder of this post will report to the Campaign Section in the Earth and Mission Science Division within the Science, Applications and Climate Department of the Directorate of Earth Observation Programmes. In the execution of the tasks, the holder of this post will work in close cooperation with other staff of the Division and the Directorate of Earth Observation Programmes.

The Earth and Mission Science Division is a dynamic R&D team leading research and development activities, in partnership with European and international industry and academia, aiming at advancing science, developing future missions, novel applications, supporting industry growth and contributing to maximize the science impact of existing and future missions.

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

Field(s) of activities/research

The partitioning of incoming radiation into plant transpiration, soil evaporation and sensible heat flux is key for the accurate representation in weather and climate models. The representation of these processes in these large-scale models is still one of the largest sources of uncertainty in present and future scenarios and therefore it requires new approaches. In short, the components of radiation, surface responses and turbulent exchanges processes need to be treated with a holistic manner in order to understand and represent the land-atmosphere interface. This approach emphasizes that the carbon and water cycles are very closely linked over land. Particularly relevant is how vegetation regulates the carbon dioxide assimilation and its transpiration, and the atmospheric feedbacks. This vegetation response depends on the plant stress, and the atmospheric moisture deficit, but also on radiation perturbation and surface heterogeneities.

Several existing (e.g. Sentinel-2/Sentinel-3) and future missions (e.g. FLEX, BIOMASS) are addressing related topics. Furthermore there is a potential that High Priority Copernicus Missions (HPCM) (e.g. LST, L-Band SAR) will aid in the holistic treatment of relevant processes.

During summer 2018 the FLEXSense campaign is aiming at combining relevant, satellite, airborne and ground-based data in such a holistic manner. The basic objective of the campaign is to serve as a measurement and science benchmark for existing or upcoming missions with a strong focus on optical and radar remote sensing.

An original aspect of the proposed work is the intensive use of airborne remote sensing products (e.g. HyPlant, TASI, L-Band SAR) together with existing satellite data (e.g. Sentinel-2/3a&b). In a first stage, together with ground truth observational data, these products will be employed to process-driven development, to constrain numerical experiments performed with a single-column model and to validate the experiments. By utilizing the high spatial resolution data and frequency representative for coarser resolution will enable the candidate to determine the state of different ecosystem at the plot scale closely related to static heterogeneity, but also sudden changes on the vegetation responses. In a second stage, this remote sensing data can be assimilated to improve the assumptions and performance of the mechanistic models representing photosynthesis and stomatal aperture.

Due to its very innovative concept and unique data, the full exploitation of the gathered campaign data from FLEXSense 2018 will require a dedicated effort to explore its full potential from a scientific perspective. In this context, the candidate will be involved in three main activities:

- 1. Perform model simulations with a state of the art single-column soil-vegetation-atmosphere-transfer model at the core sites of the campaign for at least one growing season.
- 2. Carry out a dedicated research focusing on the scientific exploitation of the FLEXSense 2018 campaign data with special focus on the underlying physical processes, fostering new science results for the synergistic use of observations from existing and future missions.

Support the scientific and technical supervision of science projects, carried out by external teams of experts and scientists, addressing mainly vegetation processes (process understanding and characterization, enhancing models) and the study of the processes and interactions between the vegetation and the lower atmosphere.

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 Interest in space and space research Ability to gather and share relevant information

Behavioural competencies

Innovation & Creativity Continuous Learning Communication Relationship Management Self Motivation Problem Solving Cross-Cultural Sensitivity

Education

Applicants should have recently completed, or be close to completion of a PhD in a related technical or scientific discipline. In particular for this position, PhD or equivalent qualification in Physics, Engineering or Earth Science with research experience and peer-reviewed publications in relevant topics for the fields of research proposed.

Additional requirements

Experience with computing programing will be an asset.

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

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.

Preference will be given to applications submitted by candidates within five years of receiving their PhD.

Other information

For behavioural competencies expected from ESA staff in general, please refer to the ESA Competency Framework.

The Agency may require applicants to undergo selection tests.

The closing date for applications is 25 July 2018.

In addition to your CV and your motivation letter, please add your proposal of no more than 5 pages outlining your proposed research in the "additional documents" field of the "application information" section. Candidates are asked to arrange for 3 reference letters, to be sent by the referees themselves, before the closing date to temp.htr@esa.int. Please ensure your name is mentioned in the subject of the e-mail.

If you require support with your application due to a disability, please email 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, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom and Canada and Slovenia as well as Bulgaria, Cyprus, Latvia, Lithuania, Slovakia as European Cooperating States (ECS). Priority will first be given to candidates from under-represented Member States.

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