Job Title: Intern in the Science and Operations Department

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EUROPEAN SPACE AGENCY

Internship Opportunity in the Directorate of Science.

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
Intern in the Science and Operations Department

Location
ESAC, Villanueva de la Cañada, Spain

Our team and mission
The Directorate of Science (D/SCI) is responsible for ESA's mandatory scientific programme including all missions for heliophysics, planetary science and astrophysics. It also provides scientifc support to the Human and Robotic Exploration and other programmes.

Within the Directorate of Science, the Science and Operations Department (SCI-S) host about 250 staff and contractors. It is the home of the Study and Project Scientists who provide the cradle-to-grave scientific oversight of the Directorate's missions. The department is further responsible for the overall management of the Directorate's missions once successfully commissioned in orbit, as well as for conducting the actual science operations activities. The department is also in charge of maintaining archive facilities of the missions and of ensuring the optimal scientific exploitation of these data.

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

Internship activities and learning areas
Topic 1. Exploring the data from the X-ray cameras on-board XMM-Newton with Machine Learning.

The X-ray Multi Mirror (XMM-Newton) observatory is one of the lead science missions of the European Space Agency (ESA). This space platform is able to perform simultaneous pointing observations with different instruments. Among these instruments, a set of three X-ray CCD cameras called the European Photon Imaging Camera (EPIC).
X-ray data events collected with the EPIC cameras are processed at the XMM-Newton Science Operations Centre following a strict set of algorithms and calibration methods. The main focus of this internship experience is to explore the same X-ray data by using machine learning techniques. The exploration of the data with these machine learning algorithms might yield a new vision of the instrument characterization or even find some patterns unnoticed from the regular processing methods.
Machine Learning clustering methods have been shown to be suitable to manage multidimensional data. Because the X-ray events collected by the EPIC cameras are registered as multidimensional arrays we have selected clustering algorithms to explore the data.

Desirable expertise or programming language:
* Python programming,
* Machine Learning clustering algorithms,
* XMM-Newton European Photon Imaging Camera (EPIC) data processing,
* Astronomical X-ray detection basics.

Competencies
Communication

Continuous Learning
Cross-Cultural Sensitivity
Self Motivation
Teamwork

Education

Applicants should preferably be in their final or second to last year of a University course at Masters Level (or equivalent) in a technical or scientific discipline.

Additional Requirements

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.

Topic 1 listed in Section 2 require such educational knowledge as:
- System engineering,
- Software development,
- Direct support to ESA science missions.

Other information

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

The closing date for applications is 2 April 2020.

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, and the United Kingdom. Nationals from Slovenia, as an Associate Member, or Canada as a Cooperating State, can apply as well as those from Bulgaria, Cyprus, Latvia, Lithuania and Slovakia as European Cooperating States (ECS).