Scientist to work on cloud and precipitation retrievals from the EarthCARE satellite

1. Position information

Vacancy No.: VN19-25		**Department:** Research	
Grade: A2		**Section:** Earth System Modelling	
Job Ref. No.: STF-PS/19-25		**Reports to:** Team Leader, Physical Processes	
Publication Date: 17 May 2019		**Closing Date:** 13 June 2019	

2. About ECMWF

ECMWF is both a research institute and a 24/7 operational service, producing and disseminating numerical weather predictions to its Member States. ECMWF carries out scientific and technical research directed to the improvement of its forecasts, collects and processes large amounts of observations, and manages a long-term archive of meteorological data. Satellite and in situ observations provide the information for up-to-date global analyses and climate reanalyses of the atmosphere, ocean and land surface. For details, see **www.ecmwf.int/**.

EarthCARE (Earth Clouds, Aerosol and Radiation Explorer) is a joint European/Japanese satellite due for launch in 2021 carrying a Doppler cloud radar, high spectral resolution lidar, multi-spectral imager and broad-band radiometer. EarthCARE offers significant opportunities for evaluation of cloud, precipitation and aerosol processes in the ECMWF model, and EarthCARE data are planned to be assimilated into the model in real-time after launch. ECMWF is a major partner in the DORSY project (Doppler Radar and Synergy Products for EarthCARE) funded by the European Space Agency (ESA), which also involves McGill University in Canada (the prime contractor) and the LATMOS laboratory in France. ECMWF's role in the first three years of DORSY has been to develop the synergy algorithm "CAPTIVATE" (Cloud, Aerosol and Precipitation from mulTiple Instruments using a VAriational TEchnique) that will be used by ESA after launch to provide operational products by combining EarthCARE's radar, lidar and imager.

3. Summary of the role

This position is in the Earth System Modelling Section of the Research Department and the successful candidate will work in the Physical Processes Team. The successful candidate will be funded through the second phase of DORSY to further develop the CAPTIVATE algorithm, evaluate it using available airborne and satellite data, and prepare its integration into EarthCARE's Ground Segment. The outputs obtained by applying CAPTIVATE to A-Train satellite data will be used to evaluate the quality of cloud and precipitation forecasts performed with ECMWF's Integrated Forecasting System (IFS).

4. Main duties and key responsibilities

- Improving specific aspects of the CAPTIVATE algorithm, such as the use of Doppler radar for snowfall estimation, the way that lidar and solar radiances are used in the liquid-cloud retrieval, and the treatment of the melting layer in the rain retrieval.
- Evaluating CAPTIVATE by running it on simulated EarthCARE data provided by collaborators both in the DORSY project and in other ESA-funded projects running concurrently to DORSY.
- Collaborating with those working in the EarthCARE Ground Segment, to make the technical changes needed for CAPTIVATE to work correctly in its operational configuration
- Working with the DORSY prime contractor (McGill University) to produce the project deliverables when needed, including computer code, documentation and other reports
- Running CAPTIVATE on A-Train satellite data (CloudSat, CALIPSO and MODIS), perform broadband radiative transfer on the retrieved profiles, and then evaluating the retrievals by comparing how well the computed top-of-atmosphere radiative fluxes agree with observations from the CERES instrument
- Working with the retrieved profiles to evaluate clouds and precipitation forecasts performed by the IFS

5. Personal attributes

- Excellent analytical and problem-solving skills with an independent and proactive approach, together with an interest in identifying, investigating and solving scientific and technical challenges.
- Good interpersonal and communication skills, particularly listening to and respecting the views of others, and ability to work as part of a team.
- Ability to collaborate with external DORSY partners on various project tasks and deliverables.
- Ability to work to tight deadlines, providing project deliverables to ESA at the specified time.

6. Qualifications and experience required

Education	A university degree in a mathematical or physical science is required. A PhD in atmospheric science or a closely related subject, or equivalent postgraduate research experience, is required.
Experience	Experience with developing and maintaining large scientific codes is essential. Experience with analysing large scientific datasets is essential. Postdoctoral research experience in atmospheric science is desirable. Experience in variational retrieval techniques or data assimilation is essential. Experience of performing research on clouds, precipitation, aerosol and/or radiative transfer is essential.
Knowledge and skills (including language)	Good programming skills in C++ is essential. Good programming skills in Python, Matlab or other interpreted language for data visualization is essential.

Ability to work in a Linux environment is essential.

Programming skills in Fortran would be an advantage.

Candidates must be able to work effectively in English and interviews will be conducted in English.

A good knowledge of one of the Centre's other working languages (French or German) would be an advantage.

7. Other information

Grade remuneration

The successful candidate will be recruited at the A2 grade, according to the scales of the Co-ordinated Organisations and the annual basic salary will be **£59,228.40** net of tax. This position is assigned to the employment category STF-PS as defined in the Staff Regulations.

Full details of salary scales and allowances are available on the ECMWF website at **www.ecmwf.int/en/about/jobs**, including the Centre's Staff Regulations regarding the terms and conditions of employment.

Starting date: As soon as possible.

Length of contract: 14 to 16 months, subject to funding and final contractual agreement with ESA.

Location: The position will be based in the Reading area, in Berkshire, United Kingdom.

Interviews for this position will take place in Reading, Berkshire, week commencing 17 June 2019.

8. How to apply

Please apply by completing the online application form available at **www.ecmwf.int/en/about/jobs**.

To contact the ECMWF Recruitment Team, please email jobs@ecmwf.int.

At ECMWF, we consider an inclusive environment as key for our success. We are dedicated to ensuring a workplace that embraces diversity and provides equal opportunities for all, without distinction as to race, gender, age, marital status, social status, disability, sexual orientation, religion, personality, ethnicity and culture. We value the benefits derived from a diverse workforce and are committed to having staff that reflect the diversity of the countries that are part of our community, in an environment that nurtures equality and inclusion.

Staff are usually recruited from among nationals of the following Member States and Co-operating States:

Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Germany, Greece, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Montenegro, Morocco, the Netherlands, North Macedonia, Norway, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Staff from other countries may be considered in exceptional cases.