Scientist – Data Assimilation and Integration

1. Position information

<table>
<thead>
<tr>
<th><strong>Vacancy No.:</strong></th>
<th>VN20-20</th>
<th><strong>Department:</strong></th>
<th>Research / Copernicus</th>
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<tbody>
<tr>
<td><strong>Grade:</strong></td>
<td>A2</td>
<td><strong>Section:</strong></td>
<td>Earth System Assimilation/Copernicus Atmospheric Monitoring Service Development</td>
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<td><strong>Job Ref. No.:</strong></td>
<td>STF-PL/20-20</td>
<td><strong>Reports to:</strong></td>
<td>Data Assimilation Methodology Team Leader/Head of Section</td>
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<tr>
<td><strong>Publication Date:</strong></td>
<td>23 October 2020</td>
<td><strong>Closing Date:</strong></td>
<td>19 November 2020</td>
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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](http://www.ecmwf.int/).

ECMWF has been entrusted to operate the Copernicus Atmosphere Monitoring Service (CAMS) and the Copernicus Climate Change Service (C3S) on behalf of the European Commission until the end of 2020 and is preparing plans for the follow-up Copernicus Programme activities (2021-2027). Copernicus is the European Union (EU) flagship Earth-observation programme. The Copernicus programme ensures operational monitoring of the atmosphere, oceans, and continental surfaces, and provides reliable, validated information services for a range of environmental and security applications. Based on the exploitation of space based and in situ observations and models, Copernicus provides information services for land, marine, atmospheric and climate monitoring, as well as emergency management and security. For details, see [www.copernicus.eu](http://www.copernicus.eu/).

The Copernicus Atmosphere Monitoring Service (CAMS) service provides consistent and quality-controlled information related to air pollution and health, solar energy, greenhouse gases and climate forcing, everywhere in the world. For details, see [www.atmosphere.copernicus.eu](http://www.atmosphere.copernicus.eu/)

The Copernicus Climate Change Service (C3S) service provides authoritative information about the past, present and future climate, as well as tools to enable climate change mitigation and adaptation strategies by policy makers and businesses. For details, see [www.climate.copernicus.eu](http://www.climate.copernicus.eu/)
3. Summary of the role

As part of the Copernicus programme, ECMWF is leading the development and implementation of an exciting new Earth monitoring service to monitor anthropogenic emissions of CO$_2$, CH$_4$ and various air pollutants. Converting satellite observations of atmospheric concentrations into emission estimates requires the development and implementation of novel hybrid-4D-Var data assimilation techniques to extend the capabilities of the current ECMWF data assimilation systems.

The role will support the development and testing of these new capabilities and carry out the technical efforts towards their seamless implementation in the ECMWF data assimilation system aligned with the broader development of the OOPS (Object-Oriented Prediction System) framework. OOPS is a unified, easy-to-use framework for running different variational data assimilation formulations with a variety of forecast models and is replacing the control layer of data assimilation code that has supported ECMWF for the past 20 years. The new emission monitoring capabilities will include parameter and flux estimation for anthropogenic emissions of atmospheric species including CO$_2$. The Scientist will work in a small team but also collaborate with other ECMWF teams.

The position is in the Earth System Assimilation Section of the Research Department. The Scientist will work in the Data Assimilation Methodology team and will be co-managed by the CAMS Development Section in the Copernicus Department.

The position is funded by the H2020 “Prototype system for a Copernicus CO$_2$ service” project (CoCO2), which is coordinated by ECMWF and supports the European Commission with building the prototype system of a future Copernicus CO$_2$ anthropogenic emissions monitoring system.

4. Main duties and key responsibilities

- Carrying out the technical developments required for the implementation in the ECMWF IFS assimilation (OOPS) and forecast system of new algorithms for the estimation of natural surface fluxes and anthropogenic emissions of atmospheric species
- Contributing to the assessment and testing of emissions estimation algorithms in the OOPS framework of the ECMWF IFS operational NWP system, with a view to their operational implementation
- Contributing to assessing the impact of various data assimilation developments on the observational constraint of CO$_2$ concentrations, fluxes and model parameters in the context of the IFS analysis system
- Contributing to evaluating the use of surface observations, from in-situ and remote sensing networks, on monitoring and constraining natural and anthropogenic CO$_2$ fluxes
- Contributing to delivering relevant project deliverables and to publications and reporting

5. Personal attributes

- Excellent analytical and problem-solving skills with a proactive approach, together with an interest in identifying, investigating and solving technical challenges
- Dedication, passion and enthusiasm to succeed both individually and as a fully integrated member of the team
- Good interpersonal and communication skills, particularly listening to and respecting the views of others
- Ability and willingness to collaborate with internal and external experts on related aspects of IFS data assimilation system development
- High level of organisation with the capability to work efficiently and complete diverse tasks to tight deadlines
6. Qualifications and experience required

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<tr>
<th>Education</th>
<th>A university degree, or equivalent, in a discipline related to atmospheric science, physics, or computational sciences. A PhD is desirable but not essential.</th>
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<tr>
<td>Experience</td>
<td>Demonstrated experience in data assimilation or inversion problems is essential. Experience with developing and maintaining large scientific codes in Fortran and/or C++ in High Performance Computing environments. Experience in working with global weather or climate models would be an advantage.</td>
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<td>Knowledge and skills (including language)</td>
<td>Ability to work in a Linux-based environment. 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.</td>
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7. Other information

The successful candidate will be recruited at the A2 grade, according to the scales of the Co-ordinated Organisations and the annual salary will be £60,590.64 net of tax.

This position is assigned to the employment category STF-PL 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](http://www.ecmwf.int/en/about/jobs), including the Centre’s Staff Regulations regarding the terms and conditions of employment.

**Starting date:** 1 January 2021, or as soon as possible thereafter.

**Length of contract:** Until 31 December 2023.

**Location:** The role will initially be based in the Reading area, in Berkshire, United Kingdom. However, ECMWF is currently in the process of selecting a location for a new duty station. Relocation to another ECMWF duty station in another country within the European Union may be required during the period of the contract.

Successful applicants and members of their family forming part of their households will be exempt from immigration restrictions

**Videoconference interviews (via Blue Jeans) are expected to take place on 10th December 2020.**

8. How to apply

Please apply by completing the online application form available at [www.ecmwf.int/en/about/jobs](http://www.ecmwf.int/en/about/jobs).

To contact the ECMWF Recruitment Team, please email [jobs@ecmwf.int](mailto:jobs@ecmwf.int).

Please refer to the ECMWF Privacy Statement. For details of how we will handle your personal data for this purpose, see: [https://www.ecmwf.int/en/privacy](https://www.ecmwf.int/en/privacy).
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.

Applications are invited from nationals from ECMWF Member States and Co-operating States, listed and all EU Member 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, Norway, North Macedonia, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Applications from nationals from other countries may be considered in exceptional cases.