

## 589\_24\_ES\_AC\_R3

### Job Reference

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### Position

Researcher - Advancing atmospheric emission estimation (R3) - AI4S

### Data de tancament

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### About BSC

The Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS) is the leading supercomputing center in Spain. It houses MareNostrum, one of the most powerful supercomputers in Europe, was a founding and hosting member of the former European HPC infrastructure PRACE (Partnership for Advanced Computing in Europe), and is now hosting entity for EuroHPC JU, the Joint Undertaking that leads large-scale investments and HPC provision in Europe. The mission of BSC is to research, develop and manage information technologies in order to facilitate scientific progress. BSC combines HPC service provision and R&D into both computer and computational science (life, earth and engineering sciences) under one roof, and currently has over 1000 staff from 60 countries.

Look at the BSC experience:

[BSC-CNS YouTube Channel](#)

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We are particularly interested for this role in the strengths and lived experiences of women and underrepresented groups to help us avoid perpetuating biases and oversights in science and IT research. In instances of equal merit, the incorporation of the under-represented sex will be favoured.

We promote Equity, Diversity and Inclusion, fostering an environment where each and every one of us is appreciated for who we are, regardless of our differences.

If you consider that you do not meet all the requirements, we encourage you to continue applying for the job offer. We value diversity of experiences and skills, and you could bring unique perspectives to our team.

## Context And Mission

The Atmospheric Composition (AC) group within the Earth Sciences department at BSC-CNS is dedicated to advancing our understanding and prediction of the spatiotemporal variations of atmospheric pollutants and their impact on air quality, weather, climate, and health. This mission is accomplished through the ongoing development and application of sophisticated numerical models across multiple scales, from local weather to global climate, and from urban to regional environments. The AC group is an international team of approximately 45 members, including researchers, engineers, and students from diverse backgrounds. A critical focus of the AC group is the development and maintenance of advanced emission modeling tools and datasets. These include various versions of the High-Resolution Modelling Emission System (HERMES), which supports global to urban air quality research; the near-real-time national emission monitoring system (PHENOMENA); and a collection of emission temporal profiles and point source databases that underpin air quality and greenhouse gas modeling activities within the Copernicus Atmosphere Monitoring Services (CAMS).

We are seeking an experienced researcher to drive the scientific advancement of these emission modeling tools and datasets. The successful candidate will propose and implement innovative methods to enhance current emission estimation techniques, integrating Earth observation data and adopting cutting-edge AI technologies for process analysis.

The successful candidate will lead a small group of motivated engineers, will have access to state-of-the-art systems and computational infrastructures, and will establish collaborations with experts in different areas both at the national and international levels.

The funding for these actions/fellowships and contracts comes from the European Union Recovery and Resilience Facility - Next Generation, within the framework of the General Invitation by the public business entity Red.es to participate in the talent attraction and retention programs within Investment 4 of Component 19 of the Recovery, Transformation, and Resilience Plan.

For more information, please check: <https://www.bsc.es/join-us/excellence-career-opportunities/ai4s>



## Key Duties

- Update and develop the input information underpinning the emission modeling tools and emission datasets
- Develop methodologies to update and improve emission estimates, with a special focus on air pollutants of emerging concern (i.e., NH<sub>3</sub>, BC, UFP, NMVOC).
- Provide quality assessment, evaluation and services of the emission modelling tools and emission datasets
- Support the implementation and application of the emission modelling tools in the context of air quality modelling activities.
- Advance current emission estimation methodologies making use of earth observations and top-down emission products derived from them.
- Evaluate emission estimates using air quality modeling techniques
- Further develop and apply AI knowledge and skills
- Conduct original research and dissemination in high impact peer reviewed publications, internal and external meetings and conferences.

- Provide scientific support for the preparation of competitive applications for research and/or innovation projects.

## Requirements

- Education
  - A Ph.D. degree in environmental engineering, physics, data science, remote sensing or similar.
- Essential Knowledge and Professional Experience
  - Strong experience in atmospheric emissions and characterization of emission sources (6 year minimum)
  - Strong experience in the development of bottom-up emission inventories, emission inventory intercomparison and evaluation of emission estimates by means of air quality modelling (6 year minimum)
  - Demonstrated scientific expertise, including but not limited to a record of scholarly publications.
  - Experience in programming and code development (python, R).
  - Originality and critical thinking in assessing the quality of data from different sources.
  - Previous experience managing or coordinating a team of researchers (1 year minimum)
- Additional Knowledge and Professional Experience
  - Fluency in English is essential. Proficiency in Spanish and other European languages would be advantageous.
  - Experience in machine learning / AI will be valued
  - At least 5 years experience in similar fields
  - Knowledge of atmospheric science data formats (GRIB, NetCDF) and previous experience with scientific software and tools (CDO, NCO, Python or R)
  - Experience with revision control systems (e.g., SVN or Git)
  - Good record in obtaining grants / research funds
- Competences
  - Ability to work in a team and in a multi-cultural environment.
  - Very good interpersonal skills
  - Excellent written and verbal communication skills
  - Ability to take initiative, prioritize and work under set deadlines
  - Ability to work both independently and within a team
  - Capacity to work in multidisciplinary environments

## Conditions

- The position will be located at BSC within the Earth Sciences Department
- We offer a full-time contract (37.5h/week), a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, restaurant tickets, private health insurance
- Duration: 4 years
- Holidays: 23 paid vacation days plus 24th and 31st of December per our collective agreement
- Salary: 55.000,00 €
- Additional Expenses Grant: Each fellowship will be associated with a grant for additional expenses, such as IT equipment, travel, training, stays, etc.
- Starting date: asap - the incorporation for this vacancy must be before the 16th of December 2024

## Applications procedure and process

All applications must be submitted via the BSC website and contain:

- A full CV in English, including contact details.
- A cover/motivation letter with a statement of interest in English, clearly specifying for which specific area and topics the applicant wishes to be considered. Additionally, two references for further contacts must be included. Applications without this document will not be considered.

## Development of the recruitment process

The selection will be carried out through a competitive examination system ("Concurso-Oposición"). The recruitment process consists of two phases:

1. **Curriculum Analysis:** Evaluation of previous experience and/or scientific history, degree, training, and other professional information relevant to the position. - **40 points**
2. **Interview phase:** The highest-rated candidates at the curriculum level will be invited to the interview phase, conducted by the corresponding department and Human Resources. In this phase, technical competencies, knowledge, skills, and professional experience related to the position, as well as the required personal competencies, will be evaluated. - **60 points**. *A minimum of 30 points out of 60 must be obtained to be eligible for the position.*

The recruitment panel will be composed of at least three people, ensuring at least 25% representation of women.

In accordance with OTM-R principles, a gender-balanced recruitment panel is formed for each vacancy at the beginning of the process. After reviewing the content of the applications, the panel will begin the interviews, with at least one technical and one administrative interview. At a minimum, a personality questionnaire as well as a technical exercise will be conducted during the process.

The panel will make a final decision, and all individuals who participated in the interview phase will receive feedback with details on the acceptance or rejection of their profile.

At BSC, we seek continuous improvement in our recruitment processes. For any suggestions or comments/complaints about our recruitment processes, please contact recruitment [at] bsc [dot] es.

For more information, please follow [this link](#).

## Deadline

The vacancy will remain open until a suitable candidate has been hired. Applications will be regularly reviewed and potential candidates will be contacted.

## **OTM-R principles for selection processes**

BSC-CNS is committed to the principles of the Code of Conduct for the Recruitment of Researchers of the European Commission and the Open, Transparent and Merit-based Recruitment principles (OTM-R). This is applied for any potential candidate in all our processes, for example by creating gender-balanced recruitment panels and recognizing career breaks etc.

BSC-CNS is an equal opportunity employer committed to diversity and inclusion. We are pleased to consider all qualified applicants for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, disability or any other basis protected by applicable state or local law.

For more information follow [this link](#)

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