# 226_24_ES_AC_R2

## Job Reference

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## Position

Postdoc on aerosol microphysics (R2)

## Data de tancament

Dilluns, 30 Setembre, 2024
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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
Let's stay connected with BSC Folks!

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 Earth Sciences Department at the Barcelona Supercomputing Center (BSC-ES) (www.bsc.es) is embarking on an umbrella of large-scale activities and developments linked to the implementation of a High-Resolution Emission System for Air Quality Prediction and Greenhouse Gas Monitoring. These activities are part of a large initiative on the “Modernization of observation networks and digitalization of production processes for the development of intelligent meteorological services in the context of climate change” in the framework of the European Recovery, Transformation, and Resilience Plan funded by the European Union - Next Generation EU.

In the frame of this ambitious project, we are offering a postdoctoral position on aerosol microphysics in the Atmospheric Composition (AC) group of BSC-ES. The overall objective is to investigate the microphysical processes affecting the aerosol population in the atmosphere. Aerosol aging plays a pivotal role in shaping atmospheric composition across a spectrum of environments, from pristine atmospheres to heavily polluted urban environments. These processes encompass a myriad of chemical and physical transformations that alter the size, composition, and optical properties of aerosol particles over time. In pristine environments, such as remote marine regions or unpolluted forests, aging processes are primarily driven by natural sources like biogenic emissions and photochemical reactions. In contrast, in urban areas characterized by high levels of anthropogenic pollutants, particle aging is accelerated due to the presence of abundant precursor emissions. Accurate representation of particle growth, coagulation, condensation, and chemical reactions in atmospheric models enables to simulate the complex interplay between aerosols and their surrounding environment, facilitating assessments of climate impacts, air quality, and human health effects.

The successful candidate will review, implement and evaluate state-of-the-art microphysics schemes within the weather-chemistry model MONARCH developed by the AC group. The microphysics scheme will be coupled with a flexible treatment for gas- and aerosol-phase chemical processes available in MONARCH. This will enable a wide range of multi-phase chemistry representations in the system to further advance our understanding on key processes controlling the lifetime and composition of aerosols in the atmosphere. The MONARCH model provides cutting-edge predictions of trace gases and aerosol from regional to global scale, and is currently used for both research and operational purposes. On the operational side, it participates to the Copernicus Atmospheric Monitoring Service (CAMS; https://atmosphere.copernicus.eu/air-quality) regional ensemble of air quality models, the International Cooperative for Aerosol Prediction (ICAP) global aerosol ensemble, and the World Meteorological Organization Barcelona Dust Forecasting Center (WMO-BDFC, https://dust.aemet.es/). The candidate will analyse episodes of nucleation and condensation and properly evaluate the microphysical schemes, taking benefit from the Consejo Superior de Investigaciones Científicas (CSIC) measurements campaigns (e.g. particule number, chemical composition) organised in north-western Spain over the recent years, the EMEP intensive measurement period (EIMP) campaign on summer 2022 and 2023 (e.g. volatile organic compounds, ozone, aerosol chemical composition) and the novel HORIZON-EUROPE RI-URBANs database.

The candidate will work in a highly collaborative environment, with tight links with other researchers in the AC and Computational Earth System group of BSC-ES. The researcher will have the opportunity to follow multiple training activities, including those aimed at improving coding and data analysis, scientific and project writing abilities, or project management. All this will be implemented via the formal courses organized by the Education and Training team and Human Resources, and the participation in the regular seminars organized by the department.

**Key Duties**

- Reviewing the existing literature on aerosol microphysics schemes
- Implementing state-of-the-art aerosol microphysics schemes within the weather-chemistry MONARCH model
- Designing experiments with the new developments and running them on the BSC's high performance computing (HPC) infrastructure (e.g. MareNostrum 5)
- Evaluating the implemented microphysics schemes against available observations
- Publishing results in peer-reviewed journals
- Communicating their results in workshops and conferences
- Participating in the intellectual life of the department
- Contributing to answer calls for research proposals related to atmospheric composition

**Requirements**

- Education
    - A PhD degree in atmospheric chemistry, physics, climate, remote sensing, environmental engineering, geosciences, or similar (previous experience in atmospheric composition modeling will be valued but is not mandatory)

- Essential Knowledge and Professional Experience
    - Advanced understanding of environmental, atmospheric, or chemistry sciences. (3-5 years)
    - Experience in atmospheric, climate, chemistry or aerosol model developments (0-2 years)
    - Demonstrated scientific expertise, including but not limited to a record of scholarly publications
    - Good computing skills in high-level computer languages (e.g. C, C++, FORTRAN) (3-5 years)
    - Good programming skills in Python or equivalent, experience with Unix/Linux and HPC environments

- Additional Knowledge and Professional Experience
    - Previous experience with an Earth System or regional climate model or its components will be valued
    - Experience in analyzing air pollution or climate information will be valued
    - Experience with atmospheric science data formats (NetCDF) and with scientific software and tools (CDO, NCO) will be valued
    - Experience working with version control systems, such as GitLab or GitHub, will be valued

- Competences
    - 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
    - Fluency in English (Spanish is optional, free lessons are available at BSC)

**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, support to the relocation procedures
- Duration: Open-ended contract due to technical and scientific activities linked to the project and budget duration
- Holidays: 23 paid vacation days plus 24th and 31st of December per our collective agreement
- Salary: we offer a competitive salary commensurate with the qualifications and experience of the candidate and according to the cost of living in Barcelona
- Starting date: asap

**Applications procedure and process**

All applications must be made through BSC website and contain:

- A full CV in English including contact details
- A Cover Letter with a statement of interest in English, including two contacts for further references - Applications without this document will not be considered

  In accordance with the OTM-R principles, a gender-balanced recruitment panel is formed for every vacancy at the beginning of the process. After reviewing the content of the applications, the panel will start the interviews, with at least one technical and one administrative interview. A profile questionnaire as well as a technical exercise may be required during the process.

  The panel will make a final decision and all candidates who had contacts with them will receive a feedback with details on the acceptance or rejection of their profile.

  At BSC we are seeking continuous improvement in our recruitment processes, for any suggestions or feedback/complaints about our Recruitment Processes, please contact recruitment [at] bsc [dot] es.

  For more information 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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