Job Reference

152_21_ES_AC_RE2

Position

Atmospheric chemistry model developer (RE2)

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, and is a hosting member of the PRACE European distributed supercomputing infrastructure. 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 700 staff from 49 countries.

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Context And Mission

We are looking for software atmospheric modeler to join the Atmospheric Composition group within the Earth Sciences department at the BSC-CNS. The AC group aims at better understanding and predicting the spatiotemporal variations of atmospheric pollutants along with their effects upon air quality, weather and climate. This is addressed through the continuous development and application of numerical models over multiple scales, from weather to climate and from global to urban scales. The AC group is the research backbone of the Multiscale Online Non-hydrostatic AtmospheRe CHemistry model (MONARCH), which contains advanced chemistry and aerosol packages coupled online with a meteorological driver. MONARCH runs operationally at the first WMO Regional Specialized Meteorological Center for Atmospheric Sand and Dust Forecast, the Barcelona Dust Forecast Center, and contributes to multi-model ensemble forecasts both
at the WMO Sand and Dust Storm Warning Advisory and Assessment System Regional Center (WMO SDS-WAS RC) for Northern Africa, the Middle East and Europe, and the International Cooperative for Aerosol Prediction (ICAP). MONARCH is currently a candidate model for the Copernicus Air Quality Regional Production Service of the European Commission.

The successful applicant will contribute to the continuous development of the aerosol and chemistry packages in the MONARCH model. Specifically, the applicant will update and enhance current model parameterizations and implement a flexible treatment for multi-phase chemical processes based on a recently developed package by the group that allows a run-time model configuration through a combination of input files. These new developments are expected to ease the challenges of flexibly incorporating new knowledge on fundamental aerosol chemistry processes in the model while improving the computational performance of the system targeting new heterogeneous architectures (i.e., CPU/GPU). The candidate will have access to cutting edge supercomputing resources to run the necessary experiments to validate and verify new implementations. The performance analysis and optimization tasks will be conducted in close collaboration with the Computational Earth Sciences group of the department.

**Key Duties**

- Maintain and enhance aerosol and chemistry schemes within the MONARCH model including: the multi-phase chemistry infrastructure, photolysis and deposition schemes, online emission modules (e.g. pollen), numerical formulations (e.g., explicit/implicit sedimentation schemes)
- Support the integration and consolidation of new developments by other group members
- Maintain the code and associated documentation in the department shared repository
- Run model experiments on BSC supercomputers to validate and verify new parameterizations and numerical methods
- Improve the efficiency of the code performance on HPC platforms, in collaboration with the Computational Earth Sciences group
- Contribute to the intellectual life of the AC group, including meetings and collaborations
- Other duties include providing support on modeling aspects to the research projects of the group; presenting model developments and research findings; writing manuscripts in peer review publications; and other duties as assigned

**Requirements**

- **Education**
  - PhD in Atmospheric Chemistry, Environmental engineering, Meteorology, Physics, or related discipline

- **Essential Knowledge and Professional Experience**
  - Advanced knowledge of atmospheric chemistry fundamentals (multi-phase chemistry, emission, transport, and sinks)
  - Excellent computing skills in high-level computer languages (such as FORTRAN or C)
  - Experience with UNIX/LINUX environments and with scripting languages (such as bash) are required.
  - Knowledge of atmospheric science data formats (GRIB, NetCDF)
  - Experience with scientific software and tools (CDO, NCO, Python or R)
  - Experience on atmospheric chemistry modelling (3-5 years)
  - Experience on developing numerical models (0-2 years)
  - Experience with revision control systems (e.g., SVN or Git) (0-2 years)
Additional Knowledge and Professional Experience
- Programming skills in parallel programming models (MPI, OpenMP) will be valued
- Previous experience running codes in GPU environments will be valued
- Experience in model evaluation with observations will be valued
- Fluency in English

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

Conditions
- The position will be located at BSC within the Earth Sciences Department
- We offer a full-time contract, a good working environment, a highly stimulating environment with state-of-the-art infrastructure, flexible working hours, extensive training plan, tickets restaurant, private health insurance, fully support to the relocation procedures
- Duration: Temporary - 2 years renewable
- 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 of rejection of their profile.

For more information follow this link

Deadline
The vacancy will remain open until 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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