**JOB DESCRIPTION**

**Ref:**

**Job Title: Postdoctoral position - Dust Modelling and Services**

**About BSC:**

BSC-CNS (Barcelona Supercomputing Center – Centro Nacional de Supercomputación) is the National Supercomputing Facility in Spain and was officially constituted in April 2005. BSC-CNS manages MareNostrum, one of the most powerful supercomputers in Europe, located at the Torre Girona chapel. The mission of BSC-CNS is to investigate, develop and manage information technology 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 400 staff from 41 countries. To get an idea of what it’s like to work at the BSC take a look at this video: <https://www.youtube.com/watch?v=VRkEii7OzRE>

**Context and Mission:**

The Department of Earth Sciences of the Barcelona Supercomputing Centre-Centro Nacional de Supercomputación (BSC-CNS), BSC-ES henceforth (bsc.es/earth-sciences) is one of the most active groups in air quality and atmospheric composition modelling, climate prediction and climate services in Europe. The department is currently composed of about 70 people, including scientists and technical and support staff, and is structured in four distinct but interacting research groups: Atmospheric Composition (AC), Climate Prediction, Earth System Services (ESS), and Computational Earth Sciences.

The AC group, led by Carlos Pérez García-Pando, aims at better understanding and predicting the spatiotemporal variations of atmospheric pollutants along with their effects upon air quality, weather and climate. The Earth System Services (ESS) Group, led by Albert Soret, aims to demonstrate the ongoing value of climate prediction services, atmospheric composition and weather forecasting to both society and economic actors.

We develop the Multiscale Online Non-hydrostatic AtmospheRe CHemistry model (MONARCH) and contribute to a variety of forecasting activities. The dust component of MONARCH runs operationally at the first WMO Regional Specialized Meteorological Center for Atmospheric Sand and Dust Forecast (i.e., the Barcelona Dust Forecast Center, [BDFC](https://dust.aemet.es)), 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](https://sds-was.aemet.es/forecast-products/dust-forecasts) RC) for Northern Africa, the Middle East and Europe, and the International Cooperative for Aerosol Prediction ([ICAP](https://www.nrlmry.navy.mil/aerosol/icap_date.9999.php?date=2017020600&field=aod&spec=dust&regc=global&icap=0&modir=icap_01&quad=0)). Both WMO Regional Centers are co-hosted by BSC and the Spanish Meteorological Agency (AEMET). The group also develops and maintains the [CALIOPE](http://www.bsc.es/caliope/en?language=en) air quality system (“CALIdad del aire Operacional Para España”), which provides high-resolution air quality forecasts over Europe and Spain using the in-house emission model HERMES. Since October 2016, the group hosts an AXA Chair on Sand and Dust Storms. This unique 15-year dust research programme is not only intended to support the two WMO SDS Regional Centers, but also to widen the scope and relevance of mineral dust research at BSC.

We are looking for an aerosol (preferably dust) modeler willing to contribute to the implementation several funded projects in the field of mineral dust. The successful candidate will develop different aspects of the MONARCH model, implement dust operational forecasts in different regions of the world, and undertake dust impact research in fields such as solar energy production.

The successful candidate will collaborate with scientists from the AC and ESS groups and will benefit from the training program and BSC staff benefits: international multidisciplinary scientific environment, advanced research training, and advanced computational facilities. We encourage applications from highly motivated physicists, engineers, mathematicians (and related disciplines) with outstanding qualifications.

**Key Duties**

1. Develop, implement, execute and monitor dust models in a High Performance Computing environments.
2. Analyze model results, prepare charts and report the results.
3. Perform innovative user-oriented research, understand user needs and facilitate technology transfer.
4. Interact with users and partners to understand their needs and develop user tailored products.
5. Communicate scientific results within the Department and in international conferences.
6. Write quality papers in scientific journals.
7. Interact with scientists from the different groups to favor synergies.

**Requirements**

Education

* PhD in Meteorology/Environmental Engineering or related disciplines.

Essential Knowledge and Professional Experience

* Previous experience in model development and application in parallel computing environments will be required.
* Experience in air quality and meteorological models and related analysis software.
* Ability to work in a professional environment and within a multidisciplinary research team.
* Demonstrated verbal communication and technical presentation skills (English is a must).

Additional Knowledge and Professional Experience

* Computing skills in high-level computer languages (especially FORTRAN 77/90 and C) and experience with UNIX/LINUX environments.
* Programming languages (C, C++, Fortran, Python, R, ssh, bash).
* Experience in data formats (NetCDF, GRIB, HFD5) and tools (CDO, NCO) used in Earth sciences.
* Experience in HPC environments.

Competences

* Experience in dust modeling will be certainly valued
* Willing to travel.
* Fluency in other European languages will be also valued.
* Experience in consultancy companies will be valued.

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 hours, extensive training plan, tickets restaurant, private health insurance, fully support to the relocation procedures

**Applications Procedure**

All applications must be applied in LINK including:

1. A motivation letter

2. A full CV including contact details

Diversity and Equal Opportunity Employment

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.