**Job Title**

Research position for an atmospheric scientist – R2

#### **About the host institute - BSC**

BSC-CNS (Barcelona Supercomputing Center – Centro Nacional de Supercomputación) combines unique high performance computing facilities and in-house research departments on computer, life, and Earth sciences, and computational applications, counting more than 400 researchers and students from more than 40 different countries. BSC-CNS has been accredited as one of the first eight Severo Ochoa Centers of Excellence. This award is given by the Spanish Government as recognition for leading research centers in Spain that are internationally well known institutions in their respective areas. BSC-CNS is the National Supercomputing Facility in Spain and manages MareNostrum, one of the most powerful supercomputers in Europe. The mission of BSC-CNS is to investigate, develop and manage information technology in order to facilitate scientific progress. To get an idea of what it is like to work at the BSC take a look at this video:<https://www.youtube.com/watch?v=VRkEii7OzRE>

#### **Context**

Within the Earth Sciences Department of Barcelona Supercomputing Center (BSC-ES), led by Prof Francisco Doblas-Reyes, the climate prediction group, led Dr. Pablo Ortega and Dr. Louis-Philippe Caron, aims at developing climate prediction capability for time scales ranging from a few weeks to a few decades (sub-seasonal to decadal climate prediction) and from regional to global scales. This objective relies on a deep analysis of the strengths and weaknesses of state-of-the-art climate forecast systems, via a thorough comparison with the most up-to-date observational datasets, and on exploiting these detailed analyses to refine the representation of processes relevant to climate in our forecast systems and their initialization. The group activities focus both on understanding climate variability and the sources of predictability and improving forecast quality.

Positioned at the cutting-edge of climate prediction research, the climate prediction group is composed of nearly 20 scientists, most of which are early-career scientists, and combines a large variety of expertise on climate processes from the stratosphere down to the deep ocean and from tropical to polar latitudes, together with expertise in climate modelling and data assimilation.

The group can rely on a team of more than 15 engineers and technicians to support the computer infrastructure in place, improve the computational performance of the climate model and develop new tools required by the scientific team. It also collaborates closely with the climate services group within the department, providing top-notch climate information to a large variety of stakeholders. Finally, the group is part of the development team and a key user of the EC-Earth European global climate model ([http://www.ec-earth.org](http://www.ec-earth.org/)) and as such collaborates closely with all the members of the EC-Earth consortium.

Particular attention is paid to the career path of the scientists, who are given gradually increasing responsibilities within the group and in the context of both national and international projects. Outstanding opportunities exist for establishing links with other international climate research institutions and, if interested, to participate in the tutoring and monitoring of master students and early-career scientists.

#### **Key duties**

This position requires participation in two projects funded by the European commission as part of the H2020 programme:

1. **APPLICATE**, whose overarching goal is to develop enhanced predictive capacity for weather and climate in the Arctic and beyond, and to determine the influence of Arctic climate change on Northern Hemisphere mid-latitudes, for the benefit of policy makers, businesses and society.
2. **PRIMAVERA**, which aims at improving the representation of climate processes in climate models through the use of ground-breaking resolutions, novel approaches to represent physical processes and their uncertainties and original sensitivity experiments to diagnose strengths and weaknesses of state-of-the-art climate models.

The selected applicant will contribute to a coordinated multi-model initiative to assess the impact of increased Arctic sea ice depletion (as expected in the coming decades) on the atmospheric and oceanic circulation. This includes the realisation and analysis of both coupled and atmosphere-only experiments with EC-Earth. The applicant will also perform specific atmosphere-only experiments to further explore whether and how the response to Arctic sea ice depletion depends on the background flow (especially the climatological location and strength of the jet stream).

In addition, the applicant will perform sensitivity experiments to investigate the influence of Arctic Sea Ice on European climate at decadal time scales, with a particular focus on the identification of the underlying mechanisms, both thermodynamic and dynamic, and their robustness to climate model resolution and physics.

The advertised position also involves developing and applying advanced metrics and diagnostics to assess the role of key physical processes, including the influence of wave-mean flow, the potential for sea ice anomalies to initiate Rossby wave trains with subsequent downstream impacts over Europe, and the interactions with the ocean circulation.

The applicant will be involved in collaborative work with other partners within the EC-Earth consortium, APPLICATE, and PRIMAVERA partners.

The candidate will work closely with scientist within the Earth System Service group of the Earth Science Department, and other partners within the EC-Earth consortium, APPLICATE and PRIMAVERA.

**Requirements**

Education

* PhD in physics, applied mathematics, engineering, atmospheric science or in a related discipline

Essential Knowledge and Professional Experience

* Proven ability to prepare and submit manuscripts to peer-review journals
* A demonstrated ability to develop experimental set ups that address specific climate modeling problems
* Experience in ocean/atmosphere modelling (or environmental modelling) and in handling climate model output
* Programming skills: scripting (e.g. bash, python), data analysis and visualization software (e.g. CDO, NCO, R, Python, NCL)
* Experience in handling large datasets, and a minimum knowledge of NetCDF encoding
* Experience in HPC and parallel computing (multi-threaded applications)

Additional Knowledge

* Interest and capacity in participating in the writing and, when possible, leading the preparation of research and computing proposals
* Knowledge of version control systems (git, svn, cvs…)
* Interest in tutoring and/or advising master and PhD students

Competences

* Fluency in spoken and written English, while fluency in other European languages will be also valued
* Highly collaborative spirit and ability to work as part of a large, strongly-coordinated team and to continuously share both knowledge and tools
* Ability to work as an active and collaborative team member to help in the delivery of shared objectives and to efficiently communicate results

#### **Conditions**

* The contract will be for two years initially, with the possibility of renewal depending on performance
* A competitive salary will be offered, matched to the cost of living in Barcelona, and commensurate with the value and experience of the candidate
* The applicant will work at the BSC (Barcelona, Spain) within the Earth Sciences Department
* The position will start as soon as possible

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#### **Application procedure**

All applications must be uploaded before November 19th (2017) to XXXX, including:

1. A motivation letter.
2. A full CV including contact details.
3. Two reference contacts.