#### **Job Title**

Research scientist position on sea ice modelling, variability and predictability – 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 by Dr Virginie Guemas and Dr. Pablo Ortega, aims at developing climate prediction capability for time scales ranging from a few weeks to a few decades into the future, from regional to global scales. This objective relies on expanding our understanding of the climate processes responsible for the predictable part of the climate variability through a deep analysis of the strengths and weaknesses of state-of-the-art climate forecast systems in comparison with the most up-to-date observational datasets, and on exploiting these detailed analyses to refine the representation of these climate processes in our climate forecast systems and their correct initialization.

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 services group within the department providing top-notch climate information to 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 early-career scientists. This position requires participation in several projects funded by the European commission such as:

1 – APPLICATE, which aims to develop an 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 focuses on improving the climate model reliability through the use of ground-breaking resolutions, novel approaches to represent physical processes and their uncertainties, original sensitivity experiments to diagnose strengths and weaknesses of state-of-the-art climate models.

3 – MEDSCOPE, which aims to improve climate forecast capabilities and related climate services on seasonal-to-decadal timescales over the Mediterranean region.

#### **Key duties**

The successful applicant will generate initial sea ice conditions for the EC-Earth climate model, perform sensitivity experiments to these initial conditions and investigate sources of sea ice predictability. The successful applicant will also investigate the linkages between sea ice and mid-latitudes such as to further our understanding of the role of sea ice as a predictor for mid-latitude atmosphere and to improve climate predictions, especially over the Mediterranean region. Finally, she/he will assess the sensitivity of the mean state of the sea ice (and its variability) to new physics schemes introduced in EC-Earth.

The assessment will be done using tools already developed by the group members and on the implementation of new process-based diagnostics to be included in these tools. The applicant will be involved in collaborative work with members of the other groups of the department and other partners within the EC-Earth consortium.

**Requirements**

Education

* PhD in physical oceanography, climate physics, applied mathematics 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 setups that address specific climate modelling problems.
* Experience in ocean/atmosphere modelling or environmental modelling
* Programming skill: scripting (e.g. bash, python), data analysis and visualization software (e.g. CDO, NCO R. Python, NCL)
* Experience in handling large databases, and a minimum knowledge of NetCDF encoding

Additional Knowledge

* Interest and capacity in participating in the writing in and, when possible, leading the preparation of research and computing proposals
* Knowledge of version control systems (git, svn, cvs…)
* Experience in HPC and parallel computing (multi-threaded applications)

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 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.

#### **Application procedure**

All applications must be uploaded before September 24th to XXXX, including:

1. A motivation letter.

2. A full CV including contact details.

3. Two reference contacts.