

## [ONLINE] PATC: Earth Sciences Simulation Environments

### Objectives

The objective of this PATC course is to cover the basics of a high performance computing (HPC) environment oriented towards earth science applications, specifically chemical weather modelling and climate modelling.

More precisely, the course will cover:

- Introduction to earth science fundamentals and modelling;
- Basic usage of an HPC environment: shell, compilers, libraries, file systems, queuing system and parallel computing;
- Build and configure targeted earth science applications with the NMMB/MONARCH chemical transport model and with the EC-EARTH climate model;
- Execute and monitor numerical experiments using a workflow manager;
- Analyse and visualise model outputs with a wide set of tools.

**Learning outcomes:** Participants will learn and gain experience in accessing an HPC facility, installing earth science numerical models and related utilities and libraries, running numerical simulations, monitoring the execution of supercomputing jobs, analysing and visualising model results.

### Requirements

**Prerequisites:**

At least University degree in progress on Earth Sciences, Computer Sciences or related area

Basic knowledge of UNIX

Knowledge of C, FORTRAN, MPI or openMP is recommended

Knowledge of Earth Sciences data formats is recommended (grib, netcdf, hdf,...)

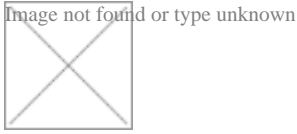
Knowledge of R and python

Please download and carefully read the following [recommendations](#) regarding the logistics that participants enrolling into the online PATC at BSC are expected to follow.

### Learning Outcomes

Participants will learn and gain experience in accessing an HPC facility, installing earth science numerical models and related utilities and libraries, running numerical simulations, monitoring the execution of supercomputing jobs, analysing and visualising model results.

## Academic Staff



## **Conveners**

Herve Petetin, Research Scientist, BSC-ES, Earth System Services Group

Vladimir Lapin, Recognized Researcher, BSC-ES, Climate Prediction Group

## **Course Lecturers**

Francisco Doblas-Reyes, Head of BSC-ES Department

Eleftheria Exarchou, Research Scientist, BSC-ES, Climate Prediction Group

Mario Acosta, Postdoctoral Researcher, BSC-ES, Computational Earth Sciences Group

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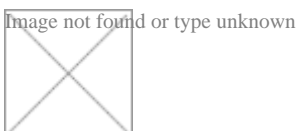
Francesco Benincasa, Research Support Engineer, BSC-ES, Computational Earth Sciences Group

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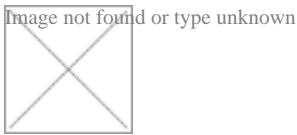
## Materials



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- For further details, please contact BSC?CNS patc [at] bsc [dot] es

#### [Further information](#)



**All PATC Courses at BSC do not charge fees.  
PLEASE BRING YOUR OWN LAPTOP.**

You can send us an e mail to [education@bsc.es](mailto:education@bsc.es) for further details about MSc, PhD, Post Doc studies, exchanges and collaboration in education and training with BSC.

For further details about Postgraduate Studies in UPC - Barcelona School of Informatics (FiB), visit the [website](#).

**Sponsors:** BSC and PRACE 5IP project are funding the PATC @ BSC training events. If you want to learn more about PRACE Project, visit the [website](#).

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

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