

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,...)

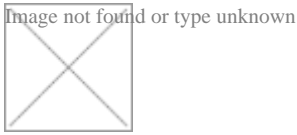
Knowledge of R and python

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



Course Conveners:

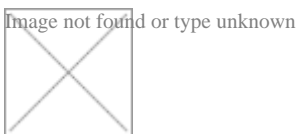
Julia Cannata. Project Dissemination Officer, BSC-ES, Earth System Sciences Group
Martí Galí. Research scientist, BSC-ES, Climate Prediction group

Lecturers

Francisco Doblás-Reyes. Head of BSC-ES Department
Rachel White. Research scientist, BSC-ES, Climate Prediction group
Mario Acosta. Researcher, BSC-ES, Computational Earth Sciences Group
Miguel Castrillo. Research engineer, BSC-ES, Computational Earth Sciences Group
Francesco Benincasa. Research engineer, BSC-ES, Computational Earth Sciences Group
Raffaele Bernardello. Research scientist, BSC-ES, Climate Prediction group
Daniel Beltran. Research engineer, BSC-ES, Computational Earth Sciences Group
Pablo Echevarria. Research engineer, BSC-ES, Computational Earth Sciences Group
Núria Pérez. Researcher, BSC-ES, Computational Earth Sciences Group
An-Chi Ho. Research engineer, BSC-ES, Computational Earth Sciences Group
Oriol Jorba. Research scientist, BSC-ES, Climate Prediction group
Francesca Macchia. Senior researcher, BSC-ES, Atmospheric Composition group
Gilbert Montane. Research engineer, BSC-ES, Computational Earth Sciences Group

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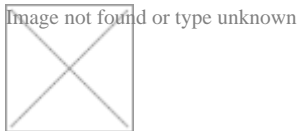
Materials



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[Further information](#)



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

Recommended Accomodation: Please follow [the link](#) for map of some local hotels.

[CONTACT US](#) 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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