

[Inici](#) > PATC: HPC and natural hazards: modelling tsunamis and volcanic plumes using European flagship codes

PATC: HPC and natural hazards: modelling tsunamis and volcanic plumes using European flagship codes

Objectives

This course focuses on modelling two of the highest impact natural hazards, volcanic eruptions and tsunamis. The objective is to give a succinct theoretical overview and then introduce students on the use of different HPC flagship codes included in the Center of Excellence for Exascale in Solid Earth (ChEESA). ASHEE is a volcanic plume and PDC simulator based on a multiphase fluid dynamic model conceived for compressible mixtures composed of gaseous components and solid particle phases. FALL3D is a Eulerian model for the atmospheric transport and ground deposition of volcanic tephra (ash) used in operational volcanic ash dispersal forecasts routinely used to prevent aircraft encounters with volcanic ash clouds and to perform re-routings avoiding contaminated airspace areas. T-HySEA solves the 2D shallow water equations on hydrostatic and dispersive versions. Based on a high-order Finite Volume (FV) discretisation (hydrostatic) with Finite Differences (FD) for the dispersive version on two-way structured nested meshes in spherical coordinates. Together with hands-on sessions, the course will also tackle post-process strategies based on python. In recent years, the Python programming language has become one of the most popular choice for geoscientists. Python is a modern, interpreted, object-oriented, open-source language easy to learn, easy to read, and fast to write. The proliferation of multiple open-source projects with libraries available every day, have facilitated a rapid scientific development in the geoscience community. In addition, the modern data structures and object-oriented nature of the language along with an elegant syntax, enable Earth scientists to write more robust and less buggy code.

Requirements

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

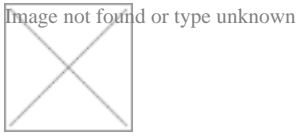
- Basic knowledge of LINUX
- Knowledge of C, FORTRAN, MPI or openMP is recommended
- Knowledge of Earth Sciences data formats is recommended (grib, netcdf, hdf,...)
- Basic knowledge of python

Learning Outcomes

Participants will learn and gain experience in installing SE codes and related utilities and libraries, running numerical simulations, monitoring the execution of supercomputing jobs, analyzing and visualizing model

results.

Academic Staff



Convener

Arnau Folch, CASE Department, BSC (afolch@bsc.es)

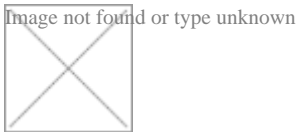
Lecturers

José Manuel González Vida, Malaga University

Matteo Cerminara, INGV Pias

Leonardo Mingari, CASE Department, BSC

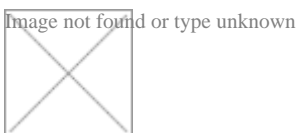
Materials



INTELLECTUAL PROPERTY RIGHTS NOTICE:

- The User may only download, make and retain a copy of the materials for his/her use for non-commercial and research purposes.
- The User may not commercially use the material, unless has been granted prior written consent by the Licensor to do so; and cannot remove, obscure or modify copyright notices, text acknowledging or other means of identification or disclaimers as they appear.
- For further details, please contact BSC CNS patc@bsc.es

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

Source URL (retrieved on 18 jul 2024 - 20:13): <https://www.bsc.es/ca/education/training/patc-courses/patc-hpc-and-natural-hazards-modelling-tsunamis-and-volcanic-plumes-using-european-flagship-codes>