

## **BSC Training Course: Advanced Heterogeneous Programming on GPUs with MPI & OmpSs**

### **Objectives**

The tutorial will motivate the audience on the need for portable, efficient programming models that put less pressure on program developers while still getting good performance for clusters and clusters with GPUs.

More specifically, the tutorial will:

- Introduce the hybrid MPI/OmpSs parallel programming model for future exascale systems
- Demonstrate how to use MPI/OmpSs to incrementally parallelize/optimize:
  - MPI applications on clusters of SMPs, and
  - Leverage CUDA kernels with OmpSs on clusters of GPUs

### **Requirements**

#### **Prerequisites:**

Good knowledge of C/C++

Basic knowledge of CUDA/OpenCL

Basic knowledge of Paraver/Extrae

### **Learning Outcomes**

The students who finish this course will be able to develop benchmarks and simple applications with the MPI/OmpSs programming model to be executed in clusters and clusters of GPUs, and with the OmpSs@FPGA, to be executed on FPGA boards, like the Zedboard, or Xilinx ZCU102 and Alveo.

## [Academic Staff](#)

Image not found or type unknown



**Course Convener:** Xavier Martorell

**Lecturers:**

**BSC - Computer Sciences department**

**Xavier Teruel** - Best Practices for Performance and Programmability - Recognised Researcher

**Xavier Martorell** - Programming Models - Parallel programming model - Group Manager

## [Materials](#)

Image not found or type unknown



### **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 [at] bsc [dot] es

## [Further information](#)

Image not found or type unknown



**BSC Training Courses do not charge fees.**

**NOTE: PLEASE BRING YOUR OWN LAPTOP.**

[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](#)

**Sponsor:**

- BSC

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

---

**Source URL (retrieved on 20 Oct 2024 - 07:04):** <https://www.bsc.es/es/education/training/bsc-training/bsc-training-course-heterogeneous-programming-gpus-mpi-ompss>