Advanced School on HPC Computing with GPU Accelerators

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30-31 March, 1-3 April 2026

AGENDA

The program could be subject to changes during the course.

Day 1 – 30 March 2026

Morning: 9:30-12:30

- Introduction to HPC and GPU architectures (Orlandini)
- Using Leonardo Cluster (Marani)

Afternoon: 14:30-17:30

- Intro to OpenX offloading - the OpenMP/OpenACC approach (Shukla)
- Examples/Exercises

Day 2 – 31 March 2026

Morning: 9:30-12:30

- More on OpenX offloading (Shukla)
- Examples/Exercises

Afternoon: 14:30-17:30

- Introduction to CUDA C/Fortran (Ferraro)
- CUDA execution model (Ferraro)
- Examples/Exercises

Day 3 – 1 April 2026

Morning: 9:30-12:30

- CUDA memory accesses, shared-memory, Matrix Product Enhanced (Ferraro)
- Examples/Exercises

Afternoon: 14:30-17:30

- CUDA Asynchronous operations, streams, multi-GPU (Orlandini)
- GPU programming with python (Orlandini)
- Examples/Exercises

Day 4 – 2 April 2026

Morning: 9:30-12:30

- GPU Computing with SYCL (Guarnieri)
- Examples/Exercises

Afternoon: 14:30-17:30

- GPU Computing with KOKKOS (Redenti)
- Examples/Exercises

Day 5 – 3 April 2026

Morning: 9:30-12:30

- Profiling MPI/GPU Applications (Bellentani)
- Examples/Exercises

Afternoon: 14:30-17:30

- Profiling and Debugging CUDA programs (Orlandini)
- Examples/Exercises
- Final Remarks and Conclusions