UNIVERSITÀ DEGLI STUDI DI BERGAMO | Dipartimento di Ingegneria e Scienze Applicate

SOD2D: High-Order Continuous Galerkin Formulation Stabilized with Entropy Viscosity

SOD2D, "Spectral high-Order coDe 2 solve partial Differential equations", implements a numerical solution for the equations governing compressible and incompressible fluid flow in three dimensions. The code is based on the spectral element method (SEM) and is designed to be used for scale-resolving simulations (LES and DNS). It is written in Fortran, and uses MPI and OpenACC to provide parallelism at both coarse and fine-grained levels, and is accelerated to be able to use the newest GPU architectures. The code has been entirely developed within the **Barcelona Supercomputing Center (BSC)** and is available open-source through its git repository. The seminar will showcase how high-order continuous Galerkin methods can be used for solving complex fluid dynamics problems, focusing on stabilisation through entropy viscosity. Participants will learn how this approach ensures numerical stability and accuracy in simulations of turbulent flows and some of the strategies used for efficient parallelization of the code.

SPEAKER
Prof. Arnau Miró
Tenure-track professor at UPC with experience in high-fidelity computational fluid dynamics. He has specialized in HPC, machine learning, and reduced-order modeling for aerospace and environmental applications.

4 July 2025
14:00 - 15:30

Room B004
Engineering Campus
Via Marconi, 5
Dalmine (BG)
University of Bergamo

Hybrid format
(in-person and online)

Online event

Info:
Alessandro Colombo
alessandro.colombo@unibg.it