

# PARTICLE METHODS IN COMPUTATIONAL FLUID DYNAMICS AND FLUID-STRUCTURE INTERACTIONS

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## ABSTRACT

This Invited Organized Session aims to bring together researchers and scientists to present recent advancements in mathematical formulations, numerical methods, computational techniques, and their industrial applications. The focus is on **Computational Modeling in Fluid Dynamics and Fluid-Structure Interactions using Particle Methods**, including PFEM, SPH, DEM, VOF, PIC, MPM, LBM... i.e. any particle or meshless discretization methods.

The goal is to advance in the formulation and resolution of both fundamental theoretical challenges and practical real-world problems. This includes all complex phenomena involved in the physical description of the problem considering multidisciplinary and Multiphysics approaches.

In summary, invited session topics on computational modeling in fluid dynamics and fluid-structure interactions will include, but are not limited to:

- ✓ Mathematical formulations
- ✓ Numerical methods and discretization techniques
- ✓ Solution strategies and numerical implementation issues
- ✓ Multiscale and stabilization techniques
- ✓ Implementation of turbulence models in particle methods
- ✓ Constitutive modeling of fluids across macroscale, mesoscale, microscale and/or multiscale
- ✓ Coupled thermomechanical problems
- ✓ Phase change problems
- ✓ Surface tension and Marangoni forces
- ✓ Large scale simulation and high-performance computing
- ✓ Fluid-structure interactions problems in the broad sense