X International Conference on Particle-Based Methods, PARTICLES 2027
October 18-20, 2027, Barcelona, Spain

SPH: ADVANCES WITH APPLICATIONS IN RESEARCH AND TECHNICAL FIELDS

S. MANENTI *

* Department of Civil Engineering and Architecture – University of Pavia
Via Ferrata, 3 – 27100 Pavia (Italy)
sauro.manenti@unipv.it

ABSTRACT

Many fields of advanced research and technical applications deal with the analysis of complex turbulent flows involving fluid-structure interactions (FSI), multiphase dynamics, heat and mass transfer.

Among Lagrangian meshfree particle methods, Smoothed Particle Hydrodynamics (SPH) has gained increasing diffusion thanks to its versatility and ability to handle fast and large deformations, tracking interfaces and free-surfaces, and couple with dynamic solvers for FSI.

However, accuracy and efficiency are still crucial aspects for reliable predictions and advanced applications involving complex geometrical domains, high resolution, and multifaceted physical phenomena.

This thematic session is focused on the advances and applications of the SPH method to the analysis of flows and FSI in research and technical application fields, including advanced industrial problems.

The session aims to bridge experts in the SPH field and showcase the latest research and advanced applications. Also, the intrinsic limitations of numerical schemes (e.g., stability, consistency and convergence) will be discussed, pointing out possible strategies to improve model reliability and result accuracy.