Fluid–structure interaction: methods and applications

Organizers:

Franco Auteri[1], Marco D. de Tullio[1] and Flavio Giannetti[2]

[1]Department of Civil and Environmental Engineering, Polytechnic University of Milan, Italy
[2]Department of of Industrial Engineering, University of Salerno, Italy

A wide range of phenomena in many scientific and engineering areas can be ascribed to the interaction between a fluid and moving (even deforming) bodies. Typical applications are encountered in wind engineering, energy industry, naval and offshore industry and, more recently, also in biomechanics and biomimetics.

The numerical simulation of fluid–structure interaction (FSI) problems is not a trivial task, requiring accurate and efficient algorithms able to handle complex geometries undergoing large deformations, while preserving accuracy. Despite the inherent complexity of the problems involved, accurate multi-physics computational models can provide an essential means in understanding the fundamental physics, with a virtually unlimited access to flow data and dynamical features of the system, thus reducing the time (and costs) needed for experiments.

This minisymposium aims to bring together researchers involved in the numerical modeling of different aspects of this broad discipline, in order to discuss progress and recent advances on new simulation techniques and applications. The final goal is to provide a forum to discuss and share ideas, techniques and results on the topic, fostering future multi-disciplinary collaborations.

Topics include:

• numerical techniques for FSI problems
• control techniques in FSI problems
• FSI in biological multi-physics problems
• FSI problems in renewable energy industry
• flow-induced deformation of vesicles and cells
• aero- and hydro-elasticity

Please note that the above list is by no means complete, and researchers should feel free to submit contributions on FSI topics even if not included in the list.