

Scope of the WP- 5 on Computational Fluid and Solid Mechanics

Computational modeling of elastic, elasto-plastic and visco-plastic one- or multi-phase continua.

Heterogeneous materials and homogenization computational techniques; composite materials.

Computational multiscale idealisation and modeling of solid or fluid materials; interaction with chemistry; smart materials.

Computational modeling of fracture.

Contact and friction.

Crashworthiness and impact engineering.

Computational techniques in stability analysis.

Computational techniques in earthquake engineering; active and passive control of structures.

Computational modeling in fluid mechanics; computational dynamics of complex fluids: polymers, glasses, suspensions and emulsions.

Fluid-structure interaction.

Computational modeling in the mechanics of biologic tissues and biologic fluids.

Computational optimization of mechanical systems shape and topology, and of mechanical systems analysis.

Validation of computational models.

Numerical analysis techniques for solving mechanical models equations, with or without passages to the limit; convergence and error analysis.

Computational techniques for automatic numerical analysis.

Automatic mesh generation techniques; mesh optimization; adaptive methods; meshless techniques.

Free and moving boundaries in mechanics problems; free-surface flow.

Inverse problems in computational mechanics.

Application of knowledge-based techniques to the automation of processes such as the computer-aided engineering design, and computer-aided learning.

History and methodology of computational mechanics.