

Advanced Numerical Strategies for the Design of Materials, Structures and Processes

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Efficient design of advanced materials, processes and structures require efficient numerical strategies able to address the solution of complex models, usually non-linear, multiscale and strongly coupled, defined in very complex and large geometries consisting of many parts (system of system). These complex models must be solved many times for example when addressing optimization or inverse analysis, or very fast when real time designs are envisaged.

In this session we consider techniques able to proceed in such direction:

- Adaptive strategies
- Multiscale techniques, advanced homogenization, ...
- Surrogate models
- Model reduction
- Domain decomposition
- Meshless methods
- Eulerian, Lagrangian & ALE
- Advanced optimization techniques
- Discontinuous Galerkin
- Linear solvers
- GPUs
- Augmented reality
- ...