

## COMPUTATIONAL APPROACHES FOR HETEROGENEOUS MATERIALS

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### ABSTRACT

Computational approaches dedicated to heterogeneous materials (and multiscale problems in mechanics in general) have recently witnessed very significant developments. Models may be deterministic, or include some probabilistic features, in order to capture more and more complex phenomena. The purpose of this invited session is to review the recent advances in these two directions, and at the intersection of those. Our aim is to gather scientists from different communities working on these topics, in order to foster interdisciplinary exchanges, in particular concerning the methodological developments of these approaches.

Topics to be addressed within this session include (but are not limited to):

- numerical homogenization approaches
- multiscale computational approaches (including HMM, FE2 and MsFEM methods)
- the use of model order reduction methods (including reduced basis, POD and PGD techniques), in particular in the context of multiscale problems
- approaches concurrently coupling models at different scales
- weakly-invasive approaches
- data-driven and machine-learning based approaches