

Multilevel and multiscale methods for PDEs

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Short Description

Classical discretization methods can reach their limits in the presence of heterogeneous structures that are not resolved by, e.g., the underlying mesh size. To avoid costly computations on very fine scales, multilevel and multiscale techniques may be used to effectively bridge scale differences. The goal of such strategies is to provide a reasonable speedup and/or to make problems with a huge number of unknowns accessible. This is achieved by using a hierarchy of discretizations or by incorporating a whole continuum of fine-scale quantities into coarse approximation spaces. Such methods are particularly useful in time-dependent or multi-query settings (e.g., in statistics), where the multiscale construction can be used multiple times to really exploit the possibility to reliably simulate on (a hierarchy of) coarse scales.

The goal of this minisymposium is to bring together researchers that have contributed to different aspects of the development of multiscale methods and multilevel methods in the context of partial differential equations.