

## **Scalable adaptive and multiscale algorithms for high performance computing**

Current and next-generation high performance computational hardware are increasingly heterogeneous: distributed and shared memory CPUs, co-processors (e.g. the intel MIC), and GPUs all present hardware advances that many algorithms are not capable of exploiting. Computational complexity, memory bandwidth, numerical precision, data locality, internode communication patterns, etc., are all factors that must be considered when developing efficient numerical algorithms for HPC. Physics-based simulations that use only local information in the solution scheme are inherently well suited for heterogeneous HPC implementations.

In this minisymposium we seek all topics relevant to the development of novel computational methods with application to high performance computing. We are especially interested in scalable methods capable of highly adaptive solution fidelity to resolve multiple length and time scales in a single simulation. Methods which possess locality in the solution algorithm and/or linear computational complexity are highly sought. Practical aspects of implementations, scaling and performance studies, asynchronous methods for time dependent problems, and reduction of globally coupled degrees of freedom are all aspects within the scope of this minisymposium.