Special Issue

Advances in Numerical Mathematics for High-Performance Computing in the Exascale Era

Message from the Guest Editors

New exascale capabilities promise unprecedented potential for high fidelity, high confidence, and optimal solutions to complex multiscale and multiphysics problems at the heart of new challenging problems in science and engineering. However, the transition from current petascale computing to exascale computing will not be easy: new exascale-class machines (capable of at least 1018 floating-point operations per second) will see a massive increase in the number of computing units (into the millions) in the form of homogeneous cores or heterogeneous mixtures of multipurpose CPUs and specialized processing units. To respond to the new HPC systems complexity, it is to be expected that the upcoming of the exascale computing systems will require a reconsideration of all the aspects of numerical solution of science problems, including problems mathematical formulation, their discretization and scalable solution, the development of efficient and effective numerical software. This Special Issue aims to collect recent research results in all the above-listed aspects that will enable scientific applications to harness the potential of upcoming HPC computing systems.

Guest Editors

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Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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