

Special Issue

High-Performance Numerical Methods for Geophysical Field Modeling

Message from the Guest Editor

Geophysical forward modeling—the process of computing theoretical observational responses given a known distribution of subsurface physical properties (density, magnetic susceptibility, wave velocity, resistivity, etc.) and source conditions—is the cornerstone of numerical modeling in geophysics. Geophysical forward modeling is not merely the starting point of numerical modeling, it is the hub connecting theoretical mathematics, computational science, and actual physical Earth processes. Without efficient and reliable forward modeling, inversion loses its foundation, understanding of complex systems remains qualitative speculation, and the full value of observational data cannot be realized. Therefore, strengthening forward modeling research—especially by incorporating new mathematical tools and high-performance computing strategies—is an essential path toward accurate, quantitative, multi-physics integrated geophysics. This Special Issue invites original research and reviews on state-of-the-art geophysical modeling, with a mathematical emphasis. Contributions on theoretical or practical models of any geophysical phenomena are welcome.

Guest Editor

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About the Journal

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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