

Special Issue

The Mathematics of Statistical Mechanics and Its Applications

Message from the Guest Editors

Statistical mechanics is a powerful framework connecting microscopic laws, probabilistic structures, and emergent macroscopic behavior with applications in mathematics and physics, but also across many other disciplines, such as economics, social sciences, biology, etc. This Special Issue welcomes contributions that either involve the mathematical foundations of statistical mechanics and advance the analytical methods on which it relies, or focus on computational approaches, modeling, and simulation in complex systems across disciplines. We invite original research and high-quality reviews that clarify rigorous theory, develop new methods, or demonstrate the relevance of statistical-mechanical ideas in contemporary scientific and technological problems. Submissions may be theoretical, computational, methodological, or application-driven, provided that they make a clear connection to principles or methods of statistical mechanics.

- statistical mechanics: mathematical methods
- complex networks
- phase transitions and critical phenomena
- interdisciplinary methods and applications of statistical mechanics

Guest Editors

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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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manuscripts are peer-reviewed and a first decision is provided to authors approximately 17.3 days after submission; acceptance to publication is undertaken in 2.8 days (median values for papers published in this journal in the second half of 2025).