# Special Issue

# Advancing Partial Differential Equations Solutions: Numerical Methods Meet Machine Learning

## Message from the Guest Editor

This Special Issue explores recent advances in solving partial differential equations (PDEs) and their inverse problems through both traditional numerical methods and emerging machine learning approaches. It highlights developments in classical techniques—finite element, finite difference, and spectral methods—while showcasing innovative data-driven methodologies, particularly physics-informed neural networks and operator learning frameworks. The collection examines the design of computationally efficient algorithms that leverage machine learning to overcome challenges in complex PDE systems. Contributors provide rigorous theoretical analysis, focusing on stability properties, convergence rates, and error estimation for both conventional and novel approaches. By bridging established numerical analysis with cutting-edge machine learning techniques, this Special Issue offers insights into the evolving landscape of computational mathematics. The featured studies demonstrate how this integration enhances our ability to effectively simulate and analyze PDE-governed systems across diverse scientific and engineering applications.


## Guest Editor

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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.

## Editor-in-Chief

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