

# Special Issue

## Mathematical Foundations of Deep Learning for Imaging

### Message from the Guest Editor

This Special Issue aims to highlight advances at the intersection of deep learning, inverse problems, and mathematical imaging. We invite contributions that develop and deepen the mathematical theory underpinning modern learning-based imaging methods. Submissions addressing the following topics are particularly welcome:

- Inverse problems and regularization theory for learned reconstruction methods;
- Representation and approximation theory relevant to neural networks and data-driven priors;
- Hybrid reconstruction algorithms that combine physical forward models with learnable components;
- Stability, robustness, and error analysis of deep learning-based reconstruction schemes;
- Optimization and training methodologies, including fine-tuning strategies and architecture design informed by mathematical principles;
- Reliability and trustworthiness of AI methods, including frameworks to mitigate hallucinations and ensure predictable behavior;
- Applications demonstrating mathematically grounded approaches to CT, MRI, PET, ultrasound, and related imaging modalities.

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### Guest Editor

Prof. Dr. Jürgen Friel

Department of Computer Science and Mathematics, Ostbayerische Technische Hochschule Regensburg (OTH Regensburg), Regensburg, Germany

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### Deadline for manuscript submissions

15 September 2026



## Mathematics

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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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### Editor-in-Chief

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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).