



*Preface*

**Special Issue: Innovative numerical approaches for problems in science and engineering**

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**The special issue webpage is available at:** <https://www.aimspress.com/era/article/6724/special-articles>.

The escalating complexity of real-world problems, as well as further breakthroughs in established computational theories, demands a spectrum of innovative approaches for numerical simulations to help unveil the underlying mathematical essence. This special issue aims to present recent developments at the intersection of classical numerical methods, scientific machine learning, and other numerical approaches. It serves as a platform for disseminating innovations in computational theories, numerical techniques, and applied studies that address problems in science and engineering through the lens of partial differential equations (PDEs) and data. The main topics of the published papers in this special issue include numerical methods for various partial differential equations and integral equations, scientific machine learning, data-driven approaches, control problems, and other numerical methods.

In the field of numerical methods for various partial differential equations and integral equations, several papers of this special issue study various interesting methods for the nonlinear fractional Schrödinger equation, the Ericksen-Leslie system, time-fractional convection-diffusion equation, biharmonic equation, Stokes equations, Allen–Cahn equation, Chandrasekhar quadratic functional integral equation, etc. Utilizing various neural networks in machine learning, several papers address the scientific challenges in solving PDEs and image reconstruction. Meanwhile, several other papers address different types of numerical methods and problems, such as iterative methods, hybrid methods, eigenmatrix methods, problems related to blockchain, time-fractional cable problems, etc. Furthermore, two papers about optimal control of PDEs and chaos control are also included in this special issue, while another two papers are devoted to data-driven problems.

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The guest editors expected that all the manuscripts published in this issue would enrich the readers' knowledge and stimulate researchers to extend, generalize, and apply the published results.



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