

Launching the International Journal of Computational Mechanics and Physics (IJCMP)

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Abstract: It is with great pleasure that I introduce the International Journal of Computational Mechanics and Physics (IJCMP), a new open-access platform dedicated to the dissemination of cutting-edge research in the rapidly evolving fields of computational physics and computational mechanics. This journal emerges at a time when computational modeling is not only complementing but often leading experimental and theoretical investigations across the physical sciences and engineering.

Keywords: mathematics; physics; mechanics; materials science; fluid dynamics; engineering

1. Aims and Vision

The vision of IJCMP is to become a leading forum for the publication of high-quality, peer-reviewed research that advances both the fundamental understanding and practical applications of computational techniques in solving complex physical problems. We aim to bridge disciplines—connecting applied mathematics, physics, materials science, fluid dynamics, and engineering—through a shared commitment to computational excellence and scientific rigor.

In a time where physical modeling increasingly relies on large-scale simulations, high-performance computing, and data-driven methods, our journal seeks to highlight both innovation in numerical methods and their application to real-world systems—from the micro- to macroscale, and from classical physics to quantum domains.

2. Scope and Topics

IJCMP welcomes submissions in a wide range of topics, including but not limited to:

Numerical Methods and Algorithms

- Development of novel algorithms for complex physical systems.
- Advances in finite element, finite difference, finite volume, and spectral methods.
- High-performance computing (HPC), parallel computing, and GPU acceleration.

Computational Fluid Dynamics (CFD)

- Modeling and simulation of fluid flows, turbulence, multiphase, and reactive flows.
- CFD applications in aerospace, energy, and environmental systems.

Computational Electromagnetics

- Wave propagation, scattering, antenna design, and metamaterials.
- Simulation techniques in optics, plasmonics, and photonics.

Quantum Mechanics and Quantum Computing

- Simulation of quantum systems, quantum field theory, and many-body problems.
- Quantum algorithms and their applications in physical sciences.

Molecular Dynamics and Materials Science

- Atomistic simulations using molecular dynamics and Monte Carlo methods.
- Computational studies of material properties, nanostructures, and soft matter.

Plasma Physics

- Modeling of magnetic and inertial confinement fusion plasmas.

- Simulations of space, astrophysical, and laboratory plasmas.

Computational Chemistry and Biophysics

- Simulation of chemical reactions, protein folding, and biomolecular dynamics.
- Computational approaches to drug design and molecular engineering.

Statistical Mechanics and Thermodynamics

- Computational studies of phase transitions, critical phenomena, and non-equilibrium systems.
- Applications of Monte Carlo and molecular dynamics in statistical physics.

Inverse Problems and Optimization

- Computational techniques for solving inverse problems in physics and engineering.
- Optimization methods for model calibration, control, and design.

Multiphysics and Multiscale Modeling

- Integrated models coupling multiple physical phenomena and scales.
- Hierarchical and concurrent multiscale simulation frameworks.

Machine Learning and Data-Driven Approaches

- Use of machine learning and AI for physical modeling and simulation.
- Surrogate modeling, reduced-order models, and data assimilation.

Visualization and Data Analysis

- Advanced visualization of high-dimensional and large-scale data.
- Computational tools for data interpretation and uncertainty quantification.

By covering both method development and application-driven research, we hope to serve as a comprehensive resource for scholars and practitioners engaged in the computational study of physical systems.

3. Editorial Philosophy and Community Building

As Editor-in-Chief, I am committed to upholding the highest standards of academic integrity, peer review, and editorial transparency. IJCOMP will operate under a rigorous review process, with timely and constructive feedback to authors. Our editorial board will include experts from across disciplines and geographic regions to reflect the diversity and depth of our scientific community.

In addition to research papers, IJCOMP will publish review articles, technical notes, and special issues on emerging themes. We strongly encourage early-career researchers and underrepresented voices to contribute and participate in the journal's development.

4. Open Access for Global Accessibility

IJCOMP is published by Open Access Press (OAP) and follows an open-access model to ensure that knowledge is freely accessible to researchers, practitioners, and students around the world. We believe that open access fosters broader dissemination, increased citation, and greater scientific collaboration.

To support this mission during our launch phase, we are offering reduced or waived Article Processing Charges (APCs) to encourage early contributions and help establish a strong foundation for the journal.

5. A Call to the Community

Launching a new journal is both a challenge and an opportunity. It requires the trust, collaboration, and shared vision of the scientific community. I invite you—researchers, educators, and professionals—to submit your best work, join our editorial and reviewer network, and help shape IJCOMP into a world-class platform for computational science.

Together, we can build a journal that not only reflects the current state of computational mechanics and physics but also shapes its future.

Van-Tu Nguyen,

Editor-in-Chief, International Journal of Computational Mechanics and Physics

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