



EDITORIAL

When starting a new journal, one must define a specific focus and clear features that distinguish it from existing journals in the field. This is far from a trivial task in the vast panorama of journals in the areas of Computational Mathematics, Scientific Computing, and Computational Engineering. It is only after several weeks of careful thinking that we identified the three distinguishing characteristics of *Advances in Computational Science and Engineering* (ACSE): i) ACSE strives to be medium of exchange for interdisciplinary scientists that rely heavily on computations, ii) ACSE promotes reproducibility by strongly encouraging code and data sharing, and iii) ACSE's editorial board is diverse in terms of disciplines, affiliations, and gender. While we cannot claim that each one of these characteristics is distinguishing in and of itself, we believe that the combination of the three is unique in the aforementioned areas of research. Below we elaborate on each characteristic separately.

Successful **interdisciplinary research**, which happens when scholars share and combine knowledge from multiple (traditional) academic disciplines, leads to a better understanding of complex problems and the development of innovative solutions. Arguably, significant advances in Science and Engineering can only be done through interdisciplinary approaches. Evidence of this is that funding agencies are recognizing more and more the value of interdisciplinary work through programs that are specifically designed to be interdisciplinary. Despite its many merits, interdisciplinary research can sometimes be harder to publish. The fact that it requires researchers to navigate different disciplinary cultures and communicate their finding to audiences with diverse background and expertise can make it challenging to find appropriate journals. Interdisciplinary research often falls outside the scope of traditional disciplinary journals, which may not have the interest to publish or the expertise to review work that spans multiple fields. ACSE intends to fill this gap by welcoming submissions on interdisciplinary work that leverages on mathematical, numerical, and data-driven modeling and methods. Submissions are expected to discuss nontrivial applications arising in Natural Sciences, Engineering, or Social Sciences.

The second key feature of ACSE is the promotion of **Reproducibility**. Reproducibility is a crucial aspect of scientific research in general and Computational Science and Engineering are no exception. By using the same data and methods (and especially the same code), one must be able to reproduce the same computational results. There are several reasons why reproducibility is of paramount importance. First, reproducibility promotes transparency in research. By providing access to code and data, other researchers can assess the validity of the results. Reproducibility can save time and resources as it allows researchers to build upon the work of others. This is critical for the advancement of scientific research. Finally, reproducibility has an educational value as it educates students and early career researchers on good computational practices. By examining well-documented code, students can learn about best practices for code organization, data management,

and documentation. In order to promote reproducibility at the time of publishing, ACSE strongly encourages authors to share a (toy) version of the code and the data used for the results in the paper. The authors should provide minimal instructions to run the code and, if open-source software (e.g., FEniCSx) is used, the version should be specified. Obviously, there is no expectation that the code should work for versions other than the specified ones. The authors should specify the license (e.g., LGPL) with which they are sharing the material. Suggested platforms to share code and data are, e.g., GitHub, GitLab or other Git based platforms, Dropbox etc.

Let us now elaborate on the third distinguishing characteristic of ACSE, i.e., a **diverse editorial board**. According to a recent report by the U.S. National Science Foundation (National Center for Science and Engineering Statistics, *Diversity and STEM: Women, Minorities, and Persons with Disabilities 2023*. Special Report NSF 23-315, 2023), the U.S. STEM workforce gradually diversified between 2011 and 2021, with increased representation of women and underrepresented minorities, i.e., Hispanics or Latinos, Blacks or African Americans, and American Indians or Alaska Natives. In 2021, women made up about a third (35%) of people employed in STEM occupations, Hispanic workers represented 15% of the total STEM workforce, and Asian and Black workers were 10% and 9%, respectively. American Indians and Alaska Natives together made up less than 1% of the U.S. STEM workforce in 2021. These percentages refer to all STEM workers in the U.S. and reflect the increased participation of historically underrepresented groups many of us have witnessed in Academia. However, it is often the case that the editorial boards of academic journals do not reflect such growing diversity.

It has been recognized that diversity in the editorial boards of scientific journals can improve the quality and relevance of research and help to reduce biases and inequities in the scientific community. A diverse editorial board can bring different perspectives, experiences, and expertise, which all contribute to a more comprehensive and balanced review process. Increasing diversity in editorial boards of scientific journals is a crucial step towards promoting equity and inclusion in the scientific community. We have put special attention in gathering a diverse editorial board in terms of disciplines, affiliations, and gender. At the time of its launching, ACSE's editorial board counts 30 editors, 15 of which are women (2 being women of color). The editors work in universities, institutes, and research centers located in 9 countries spread across Europe, North America, and Asia. They are affiliated with departments of Mathematics of Applied/Computational Mathematics and Engineering (Structural and Earthquake, Civil and Environment, Mechanical and Aerospace).

Before concluding, we would like to reiterate that ACSE welcomes submissions featuring original and high-quality research on mathematical modeling and computational methods driven by specific applications arising in Natural Sciences (Physics, Biology, Earth and Atmospheric Sciences, etc.), Engineering (mechanical, civil, materials, naval, aerospace, biomedical, etc.) or Social Sciences (Finance, Economics, etc). While contributions are expected to focus on advances in mathematical, numerical, and data-driven modeling and methods, nontrivial applications should be discussed. The principal areas of are: Scientific computing and numerical methods for differential equations; Data-driven models and methods; Emerging methodologies for multi-scale, multi-physics or multi-disciplinary problems.

We conclude by acknowledging all the people who have helped us give shape to our ideas and bring ACSE to life. First, many thanks to the Director of AIMS, Prof.

Shouchuan Hu, for support and advice in the early stage of the process. We are grateful for his trust in our leadership. We thank the staff of AIMS for constant and prompt help with the many matters associated to launching and running a journal. Sincere thanks to our brilliant Editors for embarking on this adventure with us and sharing ideas and expertise. Finally, and most importantly, our gratitude goes to the authors that have and will contribute to ACSE. We are aware of the multitude of options to publish scholarly work and appreciate the trust and support.

Editors in Chief:

Antonia Larese
Università degli Studi di Padova, Italy
antonia.larese@unipd.it

Annalisa Quaini
University of Houston, USA
quaini@math.uh.edu