

Editorial Note

It is with a mixture of excitement and humility that I take over the stewardship of the Journal of Computational Physics. The Journal is, after all, the oldest and most eminent journal in its field. During the last decade, Jerry Brackbill has provided exemplary leadership as the editor of the Journal. Under his leadership the Journal has more than held its own at a time when competing publications have proliferated and computing has transitioned into a major tool in nearly all scientific disciplines. Jerry has, in particular, been very successful in engaging the services of some of the most distinguished members of our community as associate editors. Maintaining the high standards that Jerry has established for the Journal and continuing to enlist the services of outstanding associate editors will, indeed, be a challenging task.

Since its establishment in 1966—at the very dawn of the use of computers for scientific investigations—the Journal of Computational Physics has been the leading source for papers on new methods and methodologies. It can be argued, with considerable accuracy, that it has helped define what we currently think of as Scientific Computing. The emphasis on new methods and the demonstration of their utility in the solution of challenging problems, as opposed to the analysis of numerical methods or the applications of established methods, has become the hallmark of a “JCP article.” This approach has served the journal well. However, changes are unavoidable and while maintaining the preeminence of the Journal in areas where it has traditionally been the journal of choice (such as plasmas and fluids) will—of course—be a major concern, I hope that we will continue to broaden its scope and attract papers in new and growing areas. Computations, in particular the solution of mathematical models of physical systems, now includes diverse fields ranging from financial markets to living systems. The Journal of Computational Physics has traditionally played a unique role in providing a medium for communications across disciplinary boundaries and I am convinced that this role is even more important now.

Although computational science has come of age and is now an integral part of how we do science, its success is rapidly breeding new challenges. While the description of new methods that are more accurate, more efficient, and more robust than existing methods will continue to be one of the main topics of the journal, the state-of-the-art in our field is rapidly moving to large parallel simulations of three-dimensional multiphysics systems. The amount of knowledge that a new investigator must master before he or she can make meaningful contributions is rapidly increasing and one of the challenges of the next decade is to find new ways to transmit both knowledge and software efficiently. Much has already been done in developing standard numerical packages, but the urgency of finding even more efficient ways to enter the field is increasing. I hope that the Journal will provide both a forum for the exchange of ideas of how to deal with these and other emerging challenges, as well as a vehicle for communicating solutions.

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