

**Editorial: Keeping the Field in Motion Over Ten Years
of *Physical Review Fluids***

It is with pride that we mark the tenth anniversary of publishing at *Physical Review Fluids*. In 2015, preparation began for the launch of a new (online) journal, firmly rooted in the American Physical Society's Division of Fluid Dynamics (DFD) and with a mission to publish high quality research in fluid mechanics; this community-driven initiative laid the foundations for a forward-looking journal serving the field. John Kim and Gary Leal brought a total of almost forty years of experience as Chief Editors of *Physics of Fluids* with them as they stepped into the roles of Founding Lead Editors. The first *Physical Review Fluids* papers appeared in Volume 1, May 2016, and set the tone for contributions with the potential to make substantial impact on the understanding of fluid physics and enable scientific and technological progress in problems governed by fluid mechanics principles.

It continues to take a community to energize and steward the journal and this is a timely moment to thank all those who have contributed and continue to devote time and efforts to *Physical Review Fluids*: those who were involved in the journal founding; authors who entrust their work to the journal; reviewers, editorial board members, and academic and managing editors who maintain its function; the Physical Review team who handle the publishing side of the journal; and finally APS and the DFD for the audacity to launch a new journal.

In the ten years of its existence, *Physical Review Fluids* has sought not only to be a place to publish and archive science, but also to participate in the full spectrum of scientific conversation within the field, to serve the many facets of the fluids community while maintaining a forward-looking perspective. The journal has solidified its partnership with the DFD and welcomed significant growth in its international reach, most notably a dramatic increase in contributions from Chinese researchers. We have published more than 5,000 research papers and count almost 78,000 citations to the journal. The recently added NEAT section (Methods: New Experiments, Algorithms, and Theory) provides a venue for innovative research methods that enable new discoveries in fluid dynamics. In turn, this positions *Physical Review Fluids* as a natural home for studies exploring the use of AI tools in fluid mechanics research. Alongside these developments, the journal has also

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strengthened expectations surrounding data availability and reproducibility, reflecting the increasing importance of accessible datasets and computational workflows in modern fluid mechanics research. Perspective articles, invited papers authored by leaders in particular areas, provide personal viewpoints and focused expositions on evolving branches of fluid dynamics, often associated with workshops or conferences. We invite you to visit our webpage [<https://journals.aps.org/prfluids/>] to review the range of paper types published by the journal.

The journal has also sought to foster scientific exchange beyond the printed page. Building on the *Physics Next* initiative from APS, each year, the journal has sponsored two *Fluids Next* sessions at the annual DFD meeting, either mini-symposia or focus sessions centered on emerging research directions. Related papers appear in online collections on the journal webpage. These activities sit alongside other signature, journal-sponsored elements associated with the DFD meetings, including the Frenkiel Award for best published paper from a team of early-career authors and the Gallery of Fluid Motion, which highlights compelling visualizations of fluid phenomena (also a staple of the journal social media activities). Authors of recent papers present their work in our monthly online Journal Club, generating lively discussions around active research topics and creating a growing online library of fluids-focused scientific exchange; recently, we reached the milestone of 50 such events. An energetic and growing online presence has also allowed the *Physical Review Fluids* to amplify discussion and excitement surrounding recent discoveries in fluid mechanics. We invite you to view our [#PRF10](#) series of author interviews, reflecting the range of paper types and some of the topics published in the journal.

However, these exciting activities centered on science, discovery, and impact are unfolding amid pressing challenges to fluid dynamics research. There are also many opportunities - ones where we hope that the future *Physical Review Fluids* can provide leadership. The last ten years have seen such rapid technological change, from advances in computational methods and data storage to entirely new modes of information dissemination, that the scientific publishing landscape has been transformed. Unique combinations of theory, experiments, computation, and synthesis of fundamental discovery and applications will facilitate tackling major scientific and technological challenges, increasingly aided by AI-supported analysis and discovery. Besides providing an existential challenge for science, AI also provides the most capable research tool ever created for human-in-the-loop investigation.

As the modalities evolve, the journal aims to continue to serve as a home for the complete spectrum of investigative research in fluid mechanics. The discipline is the physical foundation underlying many of the world's "grand challenges". Through optimizing energy resource utilization, uncovering the workings of the natural world on earth and on far planets, advancing understanding of the human

body, medical diagnostics and industrial safety, fluid dynamics impacts human well-being on both immediate and generational timescales. We must be able to communicate this in research forums such as *Physical Review Fluids* as well as to policy makers and the broader public, especially as the value of academic scientific research comes under scrutiny.

A key question to wrangle is “what is an impactful scientific contribution?”, when manuscript submissions in physics are experiencing extraordinary and rapid growth and barriers to creating research problems, performing research and writing manuscripts are substantially reduced by AI. Alongside the expansion of open-access initiatives, researchers now navigate an ever-growing number of journals and publishing models, and inevitable reviewer fatigue. We must also be responsive to the push and pull between the rapid dissemination required for scientific efficiency as well as career development, while also requiring deep and sound analysis that maintains broad and accessible scientific rigor in light of a diversity of fluid dynamics sub-communities. The best papers can take many forms: they may shape a field, open a new direction or simply solve a difficult problem in a way that changes how others think and work for years to come. These are the papers that *Physical Review Fluids* seeks to highlight. It is incumbent on us all to provide wise stewardship of the quality of science, to identify and promote genuinely novel advances relative to incremental ones.

We ask you, as citizens of the fluid dynamics community, to engage with these issues, as you can and in partnership with the journal, to help steward the field to continued scientific and societal impact.

We will celebrate the first 10 years of *Physical Review Fluids* over the coming months (events will be posted on the journal website and publicized to the community under the tag #PRF10), and here’s to the next 10²!

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