

**PROFESSOR HASSAN AREF**  
**28 SEPTEMBER 1950–9 SEPTEMBER 2011**



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On 9 September 2011 the fluid mechanics community unexpectedly lost one of its most creative members. Hassan Aref was the Reynolds Metals Professor in the Department of Engineering Science and Mechanics at Virginia Tech and the Niels Bohr Visiting Professor at the Technical University of Denmark. Prior to being at Virginia Tech as Dean of Engineering (2003–2005). Aref was Head of the Department of Theoretical and Applied Mechanics at University of Illinois at Urbana-Champaign for a decade (1992–2003). Before that he was on the faculty of University of California, San Diego, split between the Department of Applied Mechanics and Engineering Science and the Institute of Geophysics and Planetary Physics (1985–1992), and Chief Scientist at the San Diego Supercomputer Center for three years (1989–1992).

Aref was born in 1950 in Alexandria, Egypt, and was educated at the University of Copenhagen Niels Bohr Institute, graduating in 1975 with degrees in Physics and Mathematics. Subsequently he received a PhD in Physics from Cornell University in 1980. He started his faculty career in the Division of Engineering at Brown University, (1980–1985), and it was there that I met him in September 1982 when he invited me to give a seminar at Brown. Our paths have crossed many times since, with invitations back and forth. One point deserves special thanks: Hassan was the founding editor of Cambridge Texts in Applied Mathematics with David G. Crighton, and he persuaded me to publish my first book on mixing with Cambridge University Press.

Aref was connected with editorial activities throughout his career. He was an Associate Editor of *Journal of Fluid Mechanics* (1984–1994), served on the editorial board of *Theoretical and Computational Fluid Dynamics*, *Physics of Fluids*, *Physical Review E* and *Regular and Chaotic Dynamics*, and was co-editor of *Advances in Applied Mechanics*. He was also involved in several professional societies, chairing

the Division of Fluid Dynamics of the American Physical Society and the US National Committee on Theoretical and Applied Mechanics, and being a member of the Executive Committee of the Congress Committee of the International Union of Theoretical and Applied Mechanics (IUTAM), the National Academies Board on International Scientific Organizations, and the Board of the Society of Engineering Science. I had the opportunity to have organized a few events with him including the IUTAM Symposium on Fluid Mechanics of Stirring and Mixing, at La Jolla, in August 1990, resulting in an edited volume of the *Physics of Fluids*, which included Andreas Acrivos as editor.

Aref was president of the 20th International Congress of Theoretical and Applied Mechanics held in Chicago in 2000. In the same year he received the 2000 Otto Laporte Award from the American Physical Society for this work and for his work on vortex dynamics. He was due to be on the Northwestern University campus this October to receive the G. I. Taylor Medal from the Society of Engineering Science. Aref's wife, Susanne Eriksen, accepted the award.

Aref is well-known for groundbreaking and pioneering work advancing the concept of chaotic advection. This particular point of view has had a transformative impact on how we view transport and mixing in fluids, as well as granular matter. Aref was among the world's foremost authorities on point-vortex dynamics but his interests extended to theoretical and computational fluid mechanics as well as the mechanics of foams.

It was my privilege to have shared part of this journey when fluid mechanics intersected with the mathematical machinery of dynamical systems. Many things came together and there was the excitement of charting new territories resulting in a community that has had an impact on areas ranging from Earth Sciences to Microfluidics. Hassan enriched these early and influential meetings and workshops with remarkably crisp and lucid presentations. This translated to his writing. In fact, when people discuss his work a word that is often used is elegant, a word used sparingly in our circles to describe work of the highest calibre.

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