IN MEMORIAM

HASSAN AREF (1950–2011)

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The world of fluid mechanics and nonlinear dynamics has suffered a great loss — on 9th September 2011, Hassan Aref died suddenly at his home in De Land (Illinois, USA) while in his favorite chair, a cup of coffee and his laptop by his side. Thus prematurely passed away one of the most prominent present-day scientists in the field of fluid mechanics, a distinguished scholar in vortex dynamics, the creator of the paradigm of chaotic advection, an excellent teacher and a remarkable human being.

Hassan Aref was born on 28 September 1950 in Alexandria (Egypt) as the son of Moustapha Aref and Jytte Adolphsen. He graduated from the University of Copenhagen in 1975 with a Candidatus scientiarum degree (roughly the equivalent of an MS with a thesis) in physics and a minor in mathematics. It was during that time he met Susanne Aref née Eriksen, who was to be his lifelong companion and mother of his two sons. Hassan received his PhD degree in physics, with a minor in mechanical and aerospace engineering, from Cornell University in 1980. His research advisor was Eric D. Siggia, a member of the US National Academy of Sciences since 2009. A recent update of the Mathematics Genealogy Project has revealed that Hassan Aref was an academic descendant of Hermann von Helmholtz, who introduced the concept of the point vortex, a fitting lineage given Hassan’s passion for vortex dynamics.

Hassan Aref started his professional academic career in the Division of Engineering at Brown University in 1980, first as an assistant professor from 1980 to 1984, and then as an associate professor from 1984 to 1985. In 1985 Hassan Aref was recruited to the faculty of the University of California, San Diego (UCSD), where in 1988 he was promoted to Professor of Fluid Mechanics (as a successor of John Miles). His appointment there was split between the Department of Applied Mechanics and Engineering Science and the Institute of Geophysics and Planetary Physics. In 1992 Professor Aref became Head of the Department of Theoretical and Applied Mechanics at the University of Illinois at Urbana-Champaign (UIUC), a position that he held until 2003. In that year he was appointed to the position of Reynolds Metals Professor in the Department of Engineering Science and Mechanics at Virginia Tech, where he also served as Dean of the College of Engineering from 2003 to 2005. The College of Engineering at Virginia Tech is one of the largest programs of its kind in the USA, with more than 300 faculty, 6,000 undergraduates, 1,800 graduate students, and 200 staff in 11 departments. In addition, from 2006 to 2010 Hassan Aref held the position of Niels Bohr Visiting Professor at the Technical University of Denmark, one of six such visiting professorships in different fields of science filled in 2005 through an open competition by the Danish National Research Foundation between all institutions of higher education in Denmark. In May 2011 he was awarded the doctor technices honoris causa degree from that University. The citation reads: “Outstanding and highly innovative achievements in fluid dynamics, particularly for his work on chaotic advection and vortex dynamics.”

Throughout his career Hassan Aref has been committed to scientific and organizational work, with a special concern for university education and raising the level of its computerization. Hassan was a theoretician, with a keen interest in and vast knowledge of the literature in mathematics and mechanics, including the papers of scientists of the 19th century. Yet, he seamlessly combined his tremendous love of analytical solutions to various nonlinear equations with a vision for practical use of large- and small-scale computing. While at UCSD, he was Chief Scientist at the San Diego Supercomputer Center from 1989 to 1992. He was interim Chief Information Officer at UIUC from 1999–2000. In his role as dean at Virginia Tech, he was instrumental in the development of System X, a cluster supercomputer constructed in 2003 from 1,100 Apple PowerMac G5 computers. System X was the third supercomputer in history to exceed the 10 Tflops/s mark\(^1\) and the first academic computer to do so.

Professor Aref was a distinguished lecturer at numerous symposia. His oral presentations and talks were always brilliant in form and profound in content. In 1988 Hassan Aref gave the first of many named lectures, the *Stanley Corrsin Lectureship* at Johns Hopkins University, and he continued to lecture widely thereafter. These many lectures included the *Westinghouse Distinguished Lectureship* at University of Michigan in 1991; the *Midwest Mechanics Seminar* tour of nine institutions in 1992; the *Toshiba Keio Lecture* at Keio University in Japan in 1994; the *Otto Laporte lecture* in Washington, D.C. in 2000; and the *Zhou-Pei Yuan* memorial lecture in Sri Lanka in 2004. In addition, he received a constant stream of invitations to give keynote lectures at congresses, conferences, workshops and summer schools around the world.

\(^1\)www.top500.org/lists/2003/11