FALL 2011

Division of Fluid Dynamics Newsletter

DFD News

A Division of the American Physical Society

THE 64TH ANNUAL DFD MEETING

November 20-22, 2011 Baltimore, Maryland

Photo courtesy of Visit Baltimore

IN THIS ISSUE

The articles in this issue represent the views of the Division of Fluid Dynamics (DFD) publication committee and are not necessarily those of individual DFD members or the APS.

The 64th Annual Meeting of the American Physical Society's Division of Fluid Dynamics (DFD) will be held in Baltimore, Maryland, from November 20th to 22nd, 2011. The meeting will be hosted by the Johns Hopkins University, the University of Maryland, the University of Delaware and the George Washington University, with participation by Howard University, the US Naval Academy and the Naval Research Laboratory.

Meeting Venue

The meeting will be held at the Baltimore Convention Center within very easy walking distance from all the conference hotels. Oral presentations will be held in rooms on the 3rd and 4th levels of the Convention Center. Exhibits, the Gallery of Fluid Motion, and refreshment breaks will be on the 4th level.

Baltimore

With a total population in excess of 2.7 million, Baltimore ranks 20th among the US urban areas. It is located 100 miles SW of Philadelphia and 40 miles NNE of Washington DC, to which it is connected by two freeways and a rail line used by both local commuter and Amtrak trains. In addition to the two Washington airports, the city is served by the Thurgood Marshall International Airport (also known as the Baltimore-Washington International Airport, BWI). The Baltimore Convention Center is within walking distance of the famous National Aquarium, the inner harbor area with shops and restaurants, and many attractions: the 1854 USS Constellation, the 1945 submarine Torsk, the Baltimore & Ohio Railroad Museum, the Walters Art Museum, the Visionary Art Museum, the Edgar Allan Poe tomb and others. The historic Fort McHenry and the Baltimore Museum of Art are also within easy reach.

See **http://baltimore.org/** for further information.

Housing and Meeting Registration

Registration for the meeting and housing information are available through the meeting web site **http://www.dfd2011.jhu.edu** (also accessible from **http://www.aps.org/units/dfd/meetings/index.cfm**). Links to registration and the conference hotels (Hyatt Regency Baltimore the Inner Harbor, $151 per night; Sheraton on the Inner Harbor, $139; Days Inn Inner Harbor, $129; Holiday Inn Inner Harbor, $129) are provided together with instructions on how to make reservations at the discounted conference rate. Participants are urged to stay at one of these hotels as this helps considerably contain the registration fees for the meeting. Rooms can be reserved at the reduced rate as long as space is available or until October 17th.

Key Dates and Registration fees:

Registration is open now: **http://www.dfd2011.jhu.edu**

2011 Rates	Early (on/before Oct 11)	Regular * (Oct 12-28)	On-Site (Opens Nov 19)
APS Member	$380	$445	$525
Non-APS Member	$625	$685	$765
Undergraduate Student	$35	$35	$75
Graduate Student	$185	$205	$295
Retired	$185	$205	$295
Minisymposia	$205		

*After Oct 28th, you will no longer be able to register on-line and will have to register on-site at the increased rate.

Cancellation deadline (no refunds after this date):
November 7

Abstract submission is now closed.

The deadline to submit a notice of intent to submit a video to the Gallery of Fluid Motion has now passed.

The deadline to submit a notice of intent has now passed.

Child Care Grant Application Deadline
(see information below):
September 30

Video submission deadline:
October 14

Scientific Program

The scientific program will include four award lectures, eight invited lectures, minisymposia, focus sessions, contributed papers, poster sessions, exhibits and the Gallery of Fluid Motion poster and video entries. Well over 2000 contributed papers, divided into up to 28 concurrent sessions, will be presented.

Awards Program

Each year the APS Division of Fluid Dynamics presents the Fluid Dynamics Prize, the Francois Frenkiel Award, and the Andreas Acrivos Dissertation Award. This year a new award, the Stanley Corrsin Award, instituted ``to recognize and encourage a particularly influential contribution to fundamental fluid dynamics'' will also be awarded for the first time. The 2011 award winners, each one of whom will give a lecture at the meeting, will be announced in the Fall.

Invited Lectures, Minisymposia, and Focused Sessions

Eight invited lectures on topics of broad interest to the DFD community will be given by experts in each field. The list can be found on the meeting web site. The program also includes three minisymposia:

- Electrokinetic Flows about Ion-Selective Surfaces
- Cardiac Fluid Dynamics: Translating Fundamental Insights into Clinical Practice
- Fluid Dynamics of Geological CO_2 Sequestration

and three focus sessions:

- PIV Uncertainty
- Evaporative Self-Assembly of Micro- and Nano Particles
- Wind Energy Fluid Dynamics

Gallery of Fluid Motion

The 29th Annual Gallery of Fluid Motion will be held as part of the meeting. The Gallery consists of posters and videos submitted by attendees illustrating the science—and very often also the beauty—of fluid motion. Both computational and experimental entries are encouraged. Poster and video entries must not duplicate one another. Outstanding posters, selected by a panel of referees, will be recognized during the meeting, will be displayed at the Annual APS meeting in March, 2012 and will appear in the September 2012 issue of the Physics of Fluids. Please see the meeting web site for information on how to submit Gallery of Fluid Motion entries.

Audiovisual Equipment

All rooms will be equipped with an LCD projector, screen, microphone, and pointer. Speakers must provide their own laptop computer to use with the projector. A Speaker Ready Room with technicians will be available to help attendees ensure that their presentations work smoothly with the LCD projection equipment.

Exhibitor and Sponsorship Opportunities

Exhibits will be centrally located near the refreshments area on the 4th floor of the Baltimore Convention Center in a large foyer outside the rooms where sessions are held. Sponsorship opportunities are listed on the meeting website: **http://www.dfd2011.jhu.edu/exhibitsponsor.html**. For more information on exhibits or sponsorship, please contact Meetings and More (301-641-4150, **peggy@meetingsandmore.net**).

Conference Reception

The Conference Reception will be held at the Baltimore Convention Center on Sunday evening, November 20, 2011. The reception is included in the registration fee for those who register as APS Members, Nonmembers, Graduate Students, and Retired Members. Additional tickets may be purchased for $75 each.

Additional Events at the DFD Meeting:

Several receptions and special meetings are organized at the DFD Meeting including the Geophysical Reception, Meet the Editors Reception, the Student Lunch, and others. Full details are available on the meeting website at **http://www.dfd2011.jhu.edu/program.html**

Fluids Education Luncheon

Once again, the APS/DFD will be holding a workshop focused on Fluids Education during its annual meeting. This year it will be held during lunch time on Monday, November 21, 2011, in the Hyatt Regency Baltimore. This workshop will provide an opportunity for fluids educators to discuss topics of mutual interest, such as curricula comparisons, best practices, simple experiments and demos, use of concept questions, and more. Thematic "Table Questions" will be provided to guide conversation, and we will harvest "Best of the Table" highlights at the end of the lunch. Results from previous workshops are posted: **http://www.youtube.com/watch?v=BEieyRSzkJg** for 2010, and **http://www.youtube.com/watch?v=OxK_fCkjhbQ** for 2009.

Please register by November 4 (or sooner) for the workshop at the following website: **http://www.surveymonkey.com/s/FluidsEdWorkshop**. Lunch sponsorship is made available from the APS DFD Baltimore meeting organization.

Child Care

The American Physical Society/Division of Fluid Dynamics has initiated a special child care grant program designed to provide financial assistance to APS/DFD members who have additional child care expenses that are required to enable them to attend and participate in the annual November meeting. The child care grant application form (at **http://www.dfd2011.jhu.edu/travelinfo.html**) should be completed, signed (electronically or personally) and sent by September 30, 2011 to the Chair of the APS/DFD, Prof. Ann Karagozian (email: **ark@seas.ucla.edu** or fax: 801-697-7370).

Accompanying Persons Program

If there is sufficient interest, the organizers plan to offer a day trip for accompanying persons on Sunday, Nov. 20 to the National Gallery of Art in Washington.

Meeting Hosts

The meeting is hosted by:
Johns Hopkins University
University of Maryland
University of Delaware
George Washington University

with participation from:
United States Naval Academy
Howard University
Naval Research Laboratory

Meeting Chair

Andrea Prosperetti
Johns Hopkins University
prosperetti@jhu.edu

Meeting Co-Chair

Charles Meneveau
Johns Hopkins University
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Meeting Information

Meetings and More
General Information
Monica Malouf
Phone: (301) 526-8129
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Exhibiting and Sponsorship Information
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Registration Information

Don Wise, Meetings Registrar
American Physical Society
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College Park, MD 20740-3844
Phone: 301-209-3289
E-mail: **wise@aps.org**

2011 Meeting Website

http://www.dfd2011.jhu.edu

Future APS/DFD Meetings:

2012 San Diego, CA
Prof. Juan Lasheras, Meeting Chair
University of California San Diego

2013 Pittsburgh, PA
Prof. Nadine Aubry, Co-Meeting Chair
Carnegie Mellon University,
Peyman Givi, Co-Meeting Chair
University of Pittsburgh

2014 San Francisco, CA
Prof Sanjiva Lele, Meeting Chair
Stanford University

Candidates for APS/DFD Officers and Executive Committee Positions

The following individuals are nominees for APS/DFD Officer and Executive Committee positions. Please remember to vote online by October 15th 2011. Look for an APS/DFD Email with complete online voting instructions.

Candidates for Vice-Chair (vote for one)

Nadine Aubry
Carnegie Mellon University

Background: Nadine Aubry is the R.J. Lane Distinguished Professor and Head of Mechanical Engineering at Carnegie Mellon University (CMU). She received a Diplôme d'Ingénieur (B.S. degree) from the National Polytechnic Institute of Grenoble (France) in 1984, a Master's degree from Joseph Fourier University in Grenoble in 1984, and a Ph.D. from the Sibley School of Mechanical and Aerospace Engineering at Cornell University in 1987, where she stayed as a post-doctoral research associate for one year. Prior to joining CMU in 2006, she was on the faculty at the Levich Institute and Mechanical Engineering Department at the City College of the City University of New York until 1996. She then joined the New Jersey Institute of Technology as Jacobus Professor, where she served as Chair of the Mechanical Engineering Department for five years and as Founding Director of the New Jersey Center for Micro-Flow Control for six years. Nadine has addressed a broad range of problems in fluid dynamics, including low dimensional modeling of turbulent and other flows, microfluids, chaotic mixing, hydrodynamic stability, electro-hydrodynamics, and multiphase flows. She was elected a Fellow of the American Physical Society in 2005, of the American Society of Mechanical Engineers in 2005, and of the American Association for the Advancement of Science in 2007. In 2011, she was elected to the National Academy of Engineering. She has been an active member of the Division of Fluids Dynamics by regularly participating in the annual meetings over the years as well as by serving the Division as member of various committees, including the Executive Committee (1994-97), the ad hoc Prize Committee (1996-97), the Acrivos Dissertation Award Committee (2000), the Publications Committee (2002-04), the Nominating Committee (as Vice-Chair and Chair, 2003-04), and the Fellowship Committee (2005-07). In addition, she was a member of the Organizing Committee of the 1998 annual meeting in Philadelphia and is currently chairing, with Peyman Givi, the 2013 meeting to be held in Pittsburgh.

Statement: I am honored to have been selected to stand for election to the Vice-Chair position of the Division of Fluid Dynamics. I believe the DFD is the premier organization in the field of fluid dynamics with a crucial mission, "the advancement and diffusion of knowledge of the physics of fluids" (**http://www.aps.org/units/dfd/**). To accomplish its goal, it is important that the DFD continues to (a) organize successful annual meetings which cover emerging topics relevant to society and attract scientists from the U.S. and other countries; (b) interact with other organizations, professional societies, and government officials/agencies, and promote the field of fluid dynamics to the public; (c) attract, support and promote members, including junior scientists, women and under-represented minorities, and researchers from abroad. While all these points require attention, I believe that the most important challenges for the future of the field will be to ensure an exciting annual meeting of relevance to societal issues with global and diverse participation, as well as the promotion of our vibrant field to government officials/agencies. We should enhance our initiatives in these areas through, e.g., increased travel grants to junior scientists, a careful selection of invited sessions and minisymposia, additional special events for students and young researchers at annual meetings, and enhanced interactions with government agencies.

Paul H. Steen
Cornell University

Background: Paul Steen has been at Cornell University since 1982, as a faculty member in Chemical and Biomolecular Engineering, with field affiliations in Applied Mathematics and Theoretical and Applied Mechanics. He holds the Maxwell M. Upson Chair in Engineering. His research is in the area of dynamics and shape-change instability of fluid systems with interfaces. In the area of shape-change, he has introduced electro-osmotic pumping to systems of droplets, inventing droplet switches which enable electronically-controlled devices. In the area of casting thin metallic films, he has linked defect formation to inertial-capillarity instabilities. He is a fellow of the American Physical Society (1996) and has been active in Division affairs as chair of the Fluid Dynamics Prize Selection Committee, chair of the Acrivos Award Selection Committee and as a member of the Nominating,

Executive, Program, Publications and Media and Frenkiel Award Selection Committees. He has co-edited "A Gallery of Fluid Motion," a DFD project published by Cambridge University Press. Steen has served as an Associate Editor of the Journal of Fluid Mechanics since 2000. He has delivered keynote talks at DFD, APS March and ACS meetings and at Gordon Conferences. He has more than 70 journal publications, has edited several books and holds a number of patents. Prior to coming to Cornell, Steen received his PhD from The Johns Hopkins University in 1981 and held a post-doctoral position in Chemical Engineering at Stanford University, after having completed undergraduate degrees in Engineering and English Literature at Brown University. At Cornell, he has served as Director of Graduate Studies for Chemical Engineering. He has been an Alexander von Humboldt fellow and has been a Senior Guest Scientist at the Forschungszentrum Karlsruhe, Germany.

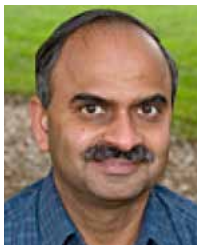
Statement: The DFD is a vibrant and diverse community. The health, welfare and further blossoming of this community stands as the primary responsibility of the Executive Committee. Running the annual meeting, recognizing its member's accomplishments through prizes, awards and fellowships and promoting the role of fluid dynamics to the world outside – the press, legislators, students and the lay public – remain its main challenges. I would be pleased to continue my service to the community as Vice-Chair of the Executive Committee. Regarding internal health, the central issue is the development of additional recognitions for distinctive contributions to the growing subfields at all levels – junior, mid-career and senior. Regarding external health, the central issue is more effective and efficient promotion to the outside world, perhaps by fostering closer cooperation with sister organizations who share our broadest goals.

Candidates for Member at Large (vote for two)

Noel Clemens
The University of Texas at Austin

Background: Noel Clemens holds the Bob R. Dorsey Professorship in Engineering at The University of Texas at Austin. He received a B.S. in Mechanical Engineering from the University of Massachusetts/Amherst in 1985, and M.S. and Ph.D. degrees from the Department of Mechanical Engineering at Stanford University in 1986 and 1991, respectively. From 1991 to 1993 he was a post-doctoral fellow at the Combustion Research Facility at Sandia National Laboratories in Livermore, CA. During the period 1993-1999, Dr. Clemens was an Assistant Professor in the Department of Aerospace Engineering and Engineering Mechanics at UT-Austin, in 1999 he was promoted to Associate Professor, and in 2005 to full professor. In September 2000 he was appointed to the Robert and Francis Stark Centennial Fellowship in Engineering, in 2005 to the Engineering Foundation Professorship and in 2009 he was named the Bob R. Dorsey Professor in Engineering. His areas of research include experimental methods, turbulent mixing, turbulent combustion, hypersonics, supersonic unsteady flows, flow control, and the development of laser measurement techniques. In 1995, he received the Presidential Faculty Fellow Award in recognition of his work in turbulent reacting flows and undergraduate education. Dr. Clemens has served the fluid dynamics community in many ways. He has served on the local organizing committees of the DFD meetings in 2002 (Dallas) and 2008 (San Antonio), and in 2006 he served as the colloquium co-Chair of the 31st International Symposium on Combustion. From 2001 to 2010 he served on the AIAA Aerodynamic Measurement Technology Committee and he currently serves on the AIAA Fluid Dynamics Technical Committee. From 2007-2009 he was an Associate Editor of the AIAA Journal and since January 2009 he has served as the Editor-in-Chief of Experiments in Fluids.

Statement: It is a great honor to be nominated for the position of Member-At-Large of the Executive Committee. I recall vividly the excitement I felt at the first meeting I attended in 1989 (Palo Alto) where I presented my research and worked as a student volunteer. I have attended nearly every meeting since that time and the DFD meeting remains my favorite conference owing to the breadth of areas covered, concise talks and collegial atmosphere. The organization of the annual meeting is the most visible and important job of the executive committee and I will work hard to ensure that future meetings meet or exceed the high standards that have been set by past meetings. I recognize that the DFD is a diverse community that includes scientists and engineers from a wide range of disciplines, and it is to the members benefit to expose them to emerging areas that can provide them with new directions for research and excite the next generation of researchers. Of utmost importance to me is that we ensure that the meetings are well organized, in attractive venues, have adequately sized facilities, and have communal spaces that are conducive to quiet reflection and informal discussions with colleagues. As a member-at-large, I will represent the interests of the membership and I will always welcome your input on ways to improve the operation and activities of the DFD.



Sanjiva Lele
Stanford University

Background: Sanjiva K. Lele is a Professor with joint appointments in the Department of Aeronautics and Astronautics, and Mechanical Engineering at Stanford University. He received a B. Tech. from IIT, Kanpur, India, in 1980 and a Ph D. from Cornell University in 1985, both in Mechanical Engineering. After working at the NASA/Stanford Center for Turbulence Research at NASA Ames as a postdoctoral fellow and later as a senior research associate he joined the faculty at Stanford University in 1990.

Lele's research interests include diverse unsteady flow phenomena, flow instabilities, turbulence, and aerodynamic noise. He is also interested in developing high-fidelity numerical methods for flow simulations. He teaches undergraduate and graduate level courses in fluid mechanics, turbulence, acoustics, aeroacoustics and engineering mathematics.

Lele received the F. N. Frenkeil award in 1986, from the American Physical Society, Division of Fluid Dynamics, and the NSF Presidential Young Investigator award in 1991. He was elected a Fellow of the American Physical Society in 2001 `for his seminal contributions to the understanding of compressible turbulent flows and for his pioneering work in computational acoustics'. He served as an Associate Editor of the Journal of Fluid Mechanics from 1994-2004. During the year 2000 he received best paper awards from both ASME and the AIAA.

Lele has played an active role in the American Physical Society's Division of Fluid Dynamics to which he got introduced as a graduate student at Cornell. He has previously served on the APS-DFD's Executive Committee during 1998-2001 and continued on the Program Committee during 2001-2003. He served on the Technical Committee for Aeroacoustics within the AIAA during 2007-2011, and as a member of the Acrivos Prize Committee of APS-DFD during 2007-2009.

Statement: APS-DFD is the professional society I most closely associate with. I got introduced to APS-DFD as a graduate student and have benefited tremendously from APS-DFD throughout my career. The APS-DFD annual meeting has been a steady source of inspiration and learning, and an anchor point for scientific collaborations and friendships. The diverse science and engineering communities which APS-DFD bridges across bring fresh new problems, application perspectives and research tools to fluid mechanics and transport sciences. In future this diversity will continue to grow as new problems of transport in living systems, in our global environment and in new energy technologies are addressed. I am excited by the opportunity to serve the APS-DFD community. As a member at large of the executive committee I will be ready to help APS-DFD. The interplay and confluence of theory, simulation, and experiments, and of fields of engineering, physics, biological sciences and mathematics seen at APS-DFD, is the key to the vibrancy of fluid mechanics. Fostering open discussion on new scientific ideas in our field, creating new collaborations and partnerships across diverse groups and communities, and fostering new ways of sharing the knowledge of our community so that everyone learns and benefits, are a few things I would like to bring to the table.

Detlef Lohse
University of Twente,
The Netherlands

Background: Detlef Lohse got his PhD on the theory of fully developed turbulence in Marburg/Germany in 1992. He then went to the University of Chicago as postdoc, where he continued to work on turbulence and started to work on sonoluminescence. In 1997 he returned to Marburg, where he got his habilitation in 1997. After a short period as Heisenberg Fellow in Munich, in 1998 he was appointed Chair of Physics of Fluids at the University of Twente/Netherlands, where he had been ever since.

Lohse works on a variety of aspects in the fundamentals and applications of fluid mechanics. The subjects include turbulence & multiphase flow, micro- & nanofluidics, granular flow, and biomedical applications of fluid mechanics. Both experimental, theoretical, and numerical methods are used in his group.

Lohse presently is Associate Editor of Journal of Fluid Mechanics, Journal of Turbulence, Nonlinearity, JSTAT, and Physica D and was Member of the Editorial Boards of Physical Review E (2003-2008), Annual Review of Fluid Mechanics (2008), and European Physical Journal B (2004-2007). He is serving and served in various national and international scientific boards, including the APS-DFD Publications & Media Committee (2005-2007, Chairman 2007), APS-DFD Fluid Dynamics Prize committee (2009-2010), APS-DFD Frenkiel Award committee (2003-2005), and as elected member of the Euromech Council (2004-2010) and the Euromech Board for the Euromech Turbulence Conference (from 2003 on, Chairman since 2009). He also is member of the Executive Board of FOM (Dutch NSF for Physics and related sciences, 2007-2015).

Lohse is Fellow of APS-DFD (2002) and of the Institute of Physics (IOP, 2004). He is elected Member of the

German Academy of Science (Leopoldina, 2002) and the Royal Dutch Academy of Science (KNAW, 2005). In 2005 he received the Spinoza Prize of the Dutch Science organization for his fundamental work on turbulent thermal convection and sonoluminescence and in 2009 the Simon-Stevin Prize from the Dutch Technology Foundation for his more applied work. In 2011 he received the Physica Prize from the Dutch Physics Organization and an European Research Council Advanced Grant.

Statement: The key organization for Fluid Dynamics on a world scale is APS-DFD. I have regularly attended the DFD meetings since 1994 and my group has been well represented with talks and contributions to the Gallery of Fluid Motion. For me, the APS-DFD meeting has been a tremendous source of inspiration and an example on how a professional organization should run a meeting. I am excited about the possible perspective to further help and improve the meeting and the outreach of DFD towards the general public. I think that I can in particular contribute in three ways: (i) APS-DFD has become an international organization, with a considerable fraction of members from Europe and Asia. The funding situation for fluid dynamics in these parts of the world is often very good and I would like to bring in my experience from the European Scientific Boards and my international perspective into APS-DFD. (ii) APS-DFD is often seen of having two fractions, namely the engineering/applied fraction and the physics/fundamental fraction. From my point of view fundamental and applied fluid mechanics are not different areas, but stimulate and need each other, which should be much more emphasized in many ways. (iii) The relevance, omnipresence, and beauty of Fluid Mechanics makes it ideal for outreach activities of science as a whole, and APS-DFD should continue to promote such outreach activities.

Ivan Maursic
University of Melbourne, Australia

Background: Ivan Marusic is a Professor at the University of Melbourne, Australia, and received his PhD from the same institution in 1992. His research is primarily in experimental and theoretical studies of turbulence at high Reynolds numbers, with an emphasis on wall-bounded flows. From 1998-2006 he was on the faculty at the University of Minnesota in the Department of Aerospace Engineering and Mechanics, where he was a recipient of a Packard Fellowship in Science and Engineering, an NSF Career Award, a McKnight Land-Grant Professorship, and a George W. Taylor Career Development Award. He returned to Melbourne in 2007 as an Australian Research Council Federation Fellow. He presently serves as an Associate Editor for the Journal of Fluid Mechanics, an Editor of Experimental Fluid and Thermal Sciences, on the Editorial board of Measurement Science and Technology, a Member of the Australian National Committee for Mechanical Sciences, and as Chair of the Engineering panel for the Australian Research Council. He is a co-founder and the inaugural President of the Australasian Fluid Mechanics Society, and was elected Fellow of the American Physical Society in 2010.

Statement: APS DFD plays a key and leading role in fostering and advocating for the field of fluid mechanics, both in the US and increasingly internationally. I have been an enthusiastic and active member since joining as a graduate student over twenty years ago, and have greatly benefited and enjoyed attending the Annual DFD meetings over the years. Previously, I have served on the DFD Program Committee (2004-2006), and led the successful bid to host the 62nd Annual Meeting in Minneapolis in 2009. It would be a privilege for me to serve on the Executive Committee, where I would be strongly committed to advancing the DFD's mission, further strengthening its ties internationally, keeping the Annual meeting a vibrant and rewarding experience, and further promoting the field to the broader community.

Modifications to the APS Division of Fluid Dynamics Bylaws

The DFD Executive Committee and the APS Council have recently approved proposed changes to the DFD Bylaws, and now, as a final step, we seek the approval of the DFD membership for these relatively minor changes. Voting on the DFD bylaw changes is to be conducted simultaneous to our election for new DFD officers, during September and October. More information on the specific changes proposed may be found at **http://www.aps.org/units/dfd/governance/modifications.cfm**.

Survey about the DFD Meeting

A survey about possible ways to deal with the continued success of the DFD meeting was conducted in the spring of 2011. The results of this survey can be viewed at: **http://www.surveymonkey.com/sr.aspx?sm=_2fNkEmU9cDkt9NuoZ7vArrMgxRfPqKSbYwvQ9sJgXiqI_3d**

If you have any questions or comments about the survey or the results, please contact Kenny Breuer: **kbreuer@brown.edu**

IN MEMORIAM: DANIEL D. JOSEPH

Daniel D. Joseph
1929 – 2011

Daniel D. Joseph, a world-renowned expert of fluid mechanics for more than four decades, passed away on 24 May 2011 at the University of Minnesota Hospital in Minneapolis. He was Professor Emeritus and Russell J. Penrose Professor Emeritus of Aerospace Engineering and Mechanics at the University of Minnesota.

Dan was born on 26 March 1929 in Chicago, Illinois. He earned an M.A. Degree in Sociology from the University of Chicago in 1950, and during the next several years he worked as a semi-skilled machinist in different factories. Regarding this early experience he once jokingly said: “In those days, I was a flaming radical motivated by some mix of idealism and stupidity. I suppose the gradual realization that there was more stupidity than idealism involved led me to conclude that sociology was not my strong suit. Besides, sociology, unlike engineering, is a subject about which ordinary people think they have expert opinions, leading to a certain lack of respect”. Therefore, he went back to school at the Illinois Institute of Technology (IIT), earning his bachelor’s degree in mechanical engineering, a master’s degree in mechanics, and his Ph.D. degree in mechanical engineering in 1963.

He began his academic career during 1962 as an Assistant Professor of mechanical engineering at the Illinois Institute of Technology (IIT). In 1963, he joined the faculty of the University of Minnesota in the Aerospace Engineering and Mechanics Department as an Assistant Professor where he remained until his retirement in 2009.

He became a Full Professor in 1968 and was the Russel J. Penrose Professor from 1991 through 2001, and Regents Professor during 1994-2005. In addition, he was a Distinguished Adjunct Professor of Aerospace and Mechanical Engineering at the University of California, Irvine, and an Honorary Professor at Xi'an Jiaotong University of China.

During his illustrious career, he held 10 US patents, was author or coauthor of more than 400 journal articles and 7 books, edited 6 more books, and consulted with various companies including Pillsbury, Gillette, M&M Mars, and many petroleum companies around the world. He was a sought-after speaker at conferences.

At the beginning of his research career, Dan studied various fluid flows in geometries with permeable bounding surfaces. Together with Gorden Beavers, he proposed and experimentally verified a “slip” boundary condition at the interface of a porous medium and a clear fluid, analogous to that in a rarefied gas flow, which is referred to as the Beavers-Joseph boundary condition.

During the late sixties and early seventies, Dan’s work was more mathematically oriented. He did research on the stability of fluid motions which led to a pair of well-known monographs, and on the theory of bifurcation which was summarized in a popular textbook on this subject written with G. Ioose. Dan is especially known for these ground-breaking works on the energy theory of stability.

In the late seventies Dan developed an interest in rheology. He advocated an approach for analyzing slow and slowly varying flows in which the flow and constitutive equations for the viscoelastic fluids are perturbed together, independent of viscoelastic models. Together with his co-workers and using his method of domain perturbations for free-surface problems, Dan developed a theory for the Weissenberg effect governing the rise of the free surface in the neighborhood of a rod rotating in a viscoelastic fluid. He also showed how to develop a rheometer based on this phenomenon. During this period of time, Dan, working with his colleagues, classified the equations of viscoelastic fluids and found that the unsteady vorticity equation is hyperbolic, giving rise to waves of vorticity. His research group subsequently solved many problems in which the governing equations involve a “change of type” from region of elliptic to that of hyperbolic, as in transonic flow. He also invented a device to measure the speed of a shear wave in the fluids, and showed that the measured speed correlated with the delayed die swell data, as well as with the tilt angle of sedimenting long particles.

IN MEMORIAM: DANIEL D. JOSEPH

In the eighties, Dan did ground-breaking experimental and theoretical work developing an understanding of the underlying physics of flow-induced particle microstructures in particulate flows. He devised simple experiments to understand the particle-scale mechanisms for these flows and came up with very-simple explanations. For example, he and co-workers noticed that in fluidized suspensions the inertial effects associated with wakes are very important. They noted that particles continuously rearrange, and that in this process "Two local mechanisms are involved: drafting and kissing and tumbling into stable cross-stream arrays. Drafting, kissing and tumbling are rearrangement mechanisms in which one sphere is captured in the wake of the other. The kissing spheres are aligned with the stream. The streamwise alignment is massively unstable and the kissing spheres tumble into more stable cross-stream pairs of doublets which can aggregate into larger relatively-stable horizontal arrays." Because of Dan, drafting-kissing- tumbling phenomenon has now become one of the standard test cases in the validation of direct numerical simulation techniques for particulate flows. Dan also identified that the particles falling in viscoelastic fluids draft and kiss, but instead of tumbling, they form chains along the streamwise direction.

Another project that Dan liked greatly was the water-lubricated transport of heavy viscous crude oil, in which the oil travels within a sheath of water along the pipeline, thus reducing the power required for pumping. He explained this technology in anthropomorphic terms "High viscosity liquids are lazy. Low viscosity liquids are the victims of the laziness of high viscosity liquids because they are easy to push around."

Dan realized that experimental tools alone were not sufficient to understand the complex physics underlying particulate flows. He devoted the 1990s to the development of new computational approaches that could provide the details of the particle-level physics of suspension flows. In this effort he led a multi-institution team to develop efficient direct numerical simulation methods that could simulate the time-dependent motion of large number of solid particles for sufficiently long-time durations from which the complex physics of these systems could be analyzed. He used these techniques to develop novel models for the lift force on a particle in dense suspensions, which was a hitherto difficult problem.

In the past decade, Dan worked on what he sometimes called one of his "legacy work". While the viscous effects in an irrotational flow have been assumed to be small, Dan realized that this may not be actually so. Consequently he set out to show that this is not the case for a range of problems, and computed the error that occurs because of this approximation. Many of these results are published in a book which he and his co-authors have recently published. In recent years Dan was intrigued by the problem of dispersion of small particles which disperse violently when they first come in contact with a liquid surface, and was working on the modeling of the coal gasification processes.

The hallmark of Dan's body of work has been to pursue fundamental enquiry (he would say "pick low lying fruit") and to extract practically relevant models that can be useful in engineering practice. This led to broad impact of his work in multiple fields. He was a rare blend of a gifted mathematician and a brilliant engineer. The spectrum of prestigious awards that Dan received is a testimony to this fact. Dan received many awards including membership in three national academies: the National Academy of Engineering, the National Academy of Sciences and the American Academy of Arts and Sciences. He was a Guggenheim Fellow, and was awarded the G.I. Taylor Medal of the Society of Engineering Science, the Timoshenko Medal of the American Society of Mechanical Engineers, the Schlumberger Foundation Award, the Bingham Medal of the Society of Rheology, the Fluid Dynamics Prize of the American Physical Society, Professional Achievement Awards from Illinois Institute of Technology and University of Illinois, and the Distinguished Service Award from the U.S. Army.

Dan was lover of classical music, opera, and the Rolling Stones. In mid life he became a marathon runner. Beside his family, he took pride in the 48 students whom he directed toward a PhD and who are now working throughout the world. The principles of his laboratory were "have some fun, tell the truth, and do good research." After retirement as a Professor, he continued to do research with his students and colleagues. The funeral and burial were held in Philadelphia, PA on 26 May 2011. Dan was preceded in death by his son, Michael Joseph. He is survived by wife Kathleen Jaglo Joseph, his sons Charles Joseph and Samuel Guillopé Weissler, his daughter Shifra Chana Hendrie, and 13 grandchildren. A memorial is planned for later this fall in

Minneapolis. Memorials are preferred to the scholarship fund at the Institute of Technology at the University of Minnesota.

Howard Hu, University of Pennsylvania,

Neelesh Patankar, Northwestern University

Pushpendra Singh, New Jersey Institute of Technology

IN MEMORIAM: HASSAN AREF

Hassan Aref
1950 – 2011

Dr. Hassan Aref (b. 1950, Alexandria, Egypt, d. 2011 De Land, Illinois, U.S.A.) was the Reynolds Metals Professor in the Department of Engineering Science and Mechanics at Virginia Tech, and also served as the Niels Bohr Visiting Professor at the Technical University of Denmark.

Prior to joining Virginia Tech as Dean of Engineering in 2003-2005 Professor Aref was Head of the Department of Theoretical and Applied Mechanics at University of Illinois at Urbana-Champaign for a decade from 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. Simultaneously, he was Chief Scientist at the San Diego Supercomputer Center for three years 1989-1992. Dr. Aref started his faculty career in the Division of Engineering at Brown University 1980-85.

He was educated at the University of Copenhagen Niels Bohr Institute, graduating in 1975 with a cand. scient degree in Physics and Mathematics. Subsequently he received the PhD degree in Physics from Cornell University in 1980.

Professor Aref was particularly well known for having developed the concept of chaotic advection in fluid mechanics. The notion that regular, laminar flows can produce chaotic particle trajectories is now understood as a cornerstone of fluid flow kinematics and the term chaotic advection is used as a classifying keyword by leading journals of the field and for major conferences. Applications of chaotic advection range from mixing by atmospheric and oceanographic flows to mixing in microfluidic devices.

Dr. Aref received the 2000 Otto Laporte Award from the American Physical Society for this work and for his work on vortex dynamics for which he is also well known. He also received the G. I. Taylor Medal from the Society of Engineering Science in 2011 for seminal applications of dynamical systems theory to fluid mechanics.

Professor Aref was the author of some 80 articles in leading journals in the field of fluid mechanics. He also authored chapters in several books, edited two collections of papers, and given presentations at conferences and universities around the world.

Throughout his career Professor Aref was involved in editorial work. He was Associate Editor of Journal of Fluid Mechanics 1984-94, founding editor with David G. Crighton of Cambridge Texts in Applied Mathematics, and on the editorial board of Theoretical and Computational Fluid Dynamics and as co-editor of Advances in Applied Mechanics. He served on the editorial boards of Physics of Fluids, Physical Review E, and Regular and Chaotic Dynamics.

Dr. Aref served as chair of the Division of Fluid Dynamics of the American Physical Society. He chaired the US National Committee on Theoretical and Applied Mechanics and served on advisory boards for several professional societies. He was a member of the Executive Committee of the Congress Committee of the International Union of Theoretical and Applied Mechanics (IUTAM), a member of the National Academies Board on International Scientific Organizations, and a member of the Board of the Society of Engineering Science. He served as Secretary for the Midwest Mechanics Seminar, 1994-2003.

Professor Aref was president of the 20th International Congress of Theoretical and Applied Mechanics held in Chicago in 2000. In the 70+ years of these significant congresses they have been held three times in USA: In 1938 in Boston, MA, with MIT and Harvard University as the host institutions, in 1968 with Stanford University as the host, and in 2000 with a consortium led by University of Illinois, Urbana-Champaign as the hosts.

Hassan Aref was born in Alexandria, Egypt. He passed away, sitting in his chair, in De Land, Illinois, U.S.A.

(Source: Virginia Tech Press Office)

IN MEMORIAM: STEVEN ALAN ORSZAG

Steven Alan Orszag
1943 – 2011

Steven Alan Orszag, a pioneer in applied and computational mathematics whose work had a deep influence in the field of fluid mechanics, died May 1. He was 68 years old.

The Percey F. Smith Professor of Mathematics at Yale, Orszag specialized in fluid dynamics, especially turbulence; computational physics and mathematics; electronic chip manufacturing; computer storage system design; and other topics in scientific computing. His work included the development of spectral methods, pseudo-spectral methods, direct numerical simulations, renormalization group methods for turbulence and very-large-eddy simulations.

In the areas of computational fluid dynamics, he achieved the first successful computer simulations of three-dimensional turbulent flows. He also developed methods that provide a fundamental theory of turbulence. Another of Orszag's primary research interests was the development of techniques for the simulation of electronic chip manufacturing processes, some of which have been applied extensively throughout the industry.

"Steve was a pioneer in applied and computational mathematics high-performance computing and more recently novel approaches to mathematics education," said John Wettlaufer, the A.M. Bateman Professor of Geophysics & Physics and professor of applied mathematics at Yale. "Vast areas of the landscape of thought have lost a brilliant thinker and a wise adviser."

Orszag's accomplishments in the area of spectral methods include the introduction of fast surface harmonic transform methods for global weather forecasting and filtering techniques for shock wave problems.

"The intrinsic difficulty of using such methods in nonlinear problems was known to fluid dynamicists and this was a major impediment to progress until Steve developed the transform methods that still form the core of many large-scale spectral computations," Wettlaufer said. "Understanding both the mathematics and the computational challenges of implementing them formed an enormous part of Steve's career and influence."

Orszag was the founder of and/or chief scientific adviser to a number of companies, including Flow Research, Ibrix (now part of HPQ), Vector Technologies and Exa Corp. He was awarded six patents and wrote over 400 archival papers.

He was the author, with Carl M. Bender, of "Advanced Mathematical Methods for Scientists and Engineers: Asymptotic Methods and Perturbation Theory," a standard text on mathematical methods for scientists. Other books he co-wrote or co-edited include "Studies in Applied Mathematics," "Numerical Analysis of Spectral Methods," "Supercomputers and Fluid Dynamics," "Japanese Supercomputing: Architecture, Algorithms, and Applications" and "Large Eddy Simulation of Complex Engineering and Geophysical Flows."

He served as chief editor or series editor of the Journal of Scientific Computing, the Springer Series in Computational Physics, and the American Institute of Physics Series on Computational and Mathematical Physics.
Orszag's research contributions have been widely recognized. He was awarded the American Institute of Aeronautics and Astronautics Fluids and Plasmadynamics Prize in 1986. He was a John Simon Guggenheim Fellow in 1989, and won the Otto Laporte Award of the American Physical Society in 1991 and the G. I. Taylor Medal of the Society of Engineering Science in 1995. He has been named an ISI Highly Cited Author by the ISI Web of Knowledge.

Before joining the Yale faculty, Orszag was the Forrest E. Hamrick Professor of Engineering at Princeton University (1984-1998) and professor of applied mathematics at MIT (1967-1984). He received his B.S. in mathematics from MIT at age 19 and his Ph.D. from Princeton in Astrophysics, which he completed in three years, and was a member of the Institute for Advanced Study.
Orszag, who was born in New York City, is survived by his wife of 47 years, Reba; his son Michael; his son Jonathan and his wife Rica; his son Peter Orszag and his wife Bianna Golodryga; his grandchildren Leila and Joshua Orszag; and his sister Myrna Baron.

(Source: Yale Daily Bulletin)

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