CURRICULUM VITAE

NAME **CITIZENSHIP**

Fazle Hussain USA (Naturalized 1977)

EDUCATION

Ph.D.	Stanford University	1969	Mech. Engineering
M.S.	Stanford University	1966	Mech. Engineering
B.S.	Bangladesh University of Engineering & Technology	1963	Mech. Engineering
Postdoctoral	American Mathematical Society Summer Institute (held at R.P.I.)	Summer 1970	Geophysical Fluid Dynamics

PROFESSIONAL EXPERIENCE

2013 – Professor, Dept. of Mechanical Engineering [also Adjunct Prof, Depts. of Physics (TTU), Chemical Engineering (TTU), Petroleum Engineering (TTU), Internal Medicine (TTUHSC), and Cell Physiology & Molecular Biophysics (TTUHSC)],

President's Distinguished Chair in Engineering & Science (2013–2018),

President's Endowed Distinguished Chair in Engineering, Science, & Medicine (2018 -)

Senior Adviser to the President, Texas Tech University (TTU)

2011 – Honorary Professor (for Life), Peking University, Beijing, China

2010 – CTR Senior Fellow, Stanford University

2010 – 13 Hugh R. & Lillie C. Cullen Distinguished University Chair, University of Houston (UH)

2010 – Adjunct Professor, Dept. of Mechanical Engineering, Rice University

2010 – Senior Member and Dean of Engineering, The Methodist Hospital Research Institute, Houston, TX

2009 – 11 Distinguished Adjunct Professor, Dept. of Nanomedicine & Biomedical Engineering, Univ. of Texas Health Sciences Center, Houston

2008 – 11 China Ministry of Education Distinguished Visiting Professor, College of Engineering, Peking University, Beijing, China

2008 – 09 Moore Distinguished Scholar, Caltech

2007 – 13 Professor, Physics Department, UH.

2007 – 13 Professor, Earth & Atmospheric Science Department, UH.

2004 –	Adjunct Prof, Bioengineering Department, Rice University.
1989 – 10	Hugh R. & Lillie C. Cullen Distinguished Professor, UH.
1985 – 89	Distinguished University Professor, UH.
1976 – 13	Professor, Mechanical Engineering Department, UH.
1973 – 76	Associate Professor, Mechanical Engineering Department, UH.
1971 – 73	Assistant Professor, Mechanical Engineering Department, UH.
1969 – 71	Post-doc Fellow, Department of Mechanics, Johns Hopkins University.
1965 – 69	Research Assistant, Stanford University.
1964 – 65	Lecturer, Department of Mechanical Engineering, Bangladesh University. [Research in: prediction, measurement and analysis of solar radiation; design and performance of an ammonia-water solar refrigerator; design, installation and testing of a rocket motor.]
1963 – 64	Mechanical Engineer, Ferrostaal A.G.(Pakistan) [Mechanical Design.]
1959 – 63	Design Engineer. Narayanganj Dock Ltd. [Design, profile drawings, and layout of various powered river crafts (up to 60 ft. length.)]

TEACHING

Undergraduate: Thermodynamics I, Thermodynamics II, Elementary Fluid Mechanics, Fluid Mechanics, ME Laboratory, Fluid Mechanics Laboratory, Thermal-Fluids Laboratory, Introduction to Mechanics (for non-MEs).

Graduate: Laminar Flow, Boundary Layer Theory, Hydrodynamic Stability, Viscous Flow Theory, Jet Flows and Jet Noise, Turbulent Shear Flow, Turbulence, Advanced Measurement Techniques in Fluid Mechanics, Vortex Dynamics, Viscous Flow Theory, and Advanced Fluid Dynamics.

CONTINUING EDUCATION

NATO Advanced Study Institute on Cardiovascular Flow Dynamics, held at Houston, October 6-17, 1975.

NASA-Stanford Center for Turbulence Research, Summer Workshops: July 13-August 8, 1987; and June 25 - July 22, 1988.

ADMINISTRATIVE

Chairman, Houston Area Fluid Mechanics Seminar, jointly sponsored by Rice University and the University of Houston (organized by F. H.) 1971-1981.

Chairman, Kovasznay Distinguished Lecture Series, UH (1980-2003).

Director, Institute for Fluid Dynamics & Turbulence, UH (1981-2013).

Director, Vortex Technology Center, UH (1996-2002).

Chairman, Presidents' Distinguished Lecture Series in Engineering, Medicine & Science, Texas Tech University, (2013-).

SPECIAL HONORS FOR RESEARCH

Honors and Awards:

Eckhart Prize (for outstanding Ph.D. Dissertation), Stanford University, (awarded in 1971).

Senior Research Excellence Award, Cullen College of Engineering, UH, 1979.

US-India Exchange Scholar, jointly sponsored by the NSF (USA) and Council of Scientific and Industrial Research (India), December, 1980.

Guest Scholar, Chinese Academy of Sciences, Beijing, China, Oct. - Nov., 1983.

Freeman Scholar, Biennial Award of ASME, l984.

Research Excellence Award (*at Full Prof level***)**, UH, (First Recipient), 1985.

Keynote Lecture on Turbulence, The IUTAM Symposium on Fluid Mechanics in the Spirit of G. I. Taylor, (organized and chaired by G. K. Batchelor) Cambridge University, UK, March 24-28, 1986.

Trinity College Fellowship, Sabbatical at Cambridge University Department of Applied Mathematics and Theoretical Physics, Fall 1992.

Horizons Lecture, Kimberly-Clark, 1992.

Tani Memorial Lecture, 6th Asian Congress on Fluid Mechanics, Singapore, May, 1995.

Inducted into The Johns Hopkins Society of Scholars, JHU, Baltimore, MD. 1996.

Midwest Mechanics Lecturer (U Michigan, Michigan St U, Northwestern U, U Wisconsin, U Minnesota, U Notre Dame, IIT, U Illinois at Urbana-Champaign, Purdue U), 1997-98.

Elected to The World Academy of Sciences (TWAS), Trieste, Italy, 1997.

Fluid Dynamics Prize, The American Physical Society, 1998.

Sabbatical at Isaac Newton Institute of Mathematical Sciences, Cambridge University, Spring 1999.

Sigma Xi Award, University of Houston, 1999.

Visiting Scholar, Kavli Institute for Theoretical Physics, UCSB, Spring. 2000.

Fluids Engineering Award, ASME, 2000.

Elected to US National Academy of Engineering, 2001.

Cullimore Lecture, NJ Inst of Tech. April 15, 2002.

Fluid Dynamics Award, AIAA, 2002.

His student, Wade Schoppa, was awarded the 2002 Andreas Acrivos PhD Dissertation Award of the American Physical Society.

His student, Robert Armstrong, was awarded Best Honors Thesis Award by the UH Honors College, 2008.

Elected to Bangladesh Academy of Science, 2003.

Top Ten Asian-Americans, seven alive, in Shell's tribute to Asian-Americans of USA in Asian Heritage Month, May, 2003.

Bangladesh Society of Mechanical Engineers Gold Medal, 2003.

Institution of Engineers Bangladesh Medal (Awarded by the Bangladesh Prime Minister) 2004.

National Academy of Engineering: Mech. Engr. Peer Committee (2003-06), Mech. Engr. Executive Committee (Secretary, Vice-Chair, Chair, Past-Chair: 2006-2014) and Mech. Engr. Search Committee (2006)

O'Donnell Prize Committee, TAMEST, (2005-06).

2007 Annual Conference Organizing Committee, TAMEST.

Moderator of the Engineering Plenary Session at 2007 TAMEST Annual Conference, Austin, Jan. 3-4.,2007. The other two moderators: S. Weinberg (**Science**) and F. Murad (**Medicine**) - both Nobel Laureates.

Esther Farfel Award, the highest Faculty recognition at the University of Houston for "Excellence in Teaching, Research and University Service" (2007)

Opening Plenary Lecture, 5th International Conference on Nonlinear Mechanics, Shanghai, China, June 11-14 (2007).

Scholar of the Year, (first recipient) presented at the First Non Resident Bangladeshi Conference (by the Chief Advisor - head of the Bangladesh Interim Government), December 27-29, (2007) Dhaka, Bangladesh

Fluid Dynamics Sectional Lecture, 2008 IUTAM Congress, Adelaide, Australia

The Keynote Lecture, 12th Asian Congress of Fluid Mechanics, Daejon, S. Korea, 2008 (also presented keynote lectures three different times before in ACFM)

Ministry of Education Distinguished Visiting Professor, Peking University, College of Engineering, (2008-2011).

Moore Distinguished Scholar, Caltech, (2008-09).

TAMEST Board Director, The Academy of Medicine, Engineering & Science of Texas, (2009-2012).

Satish Dhawan Visiting Professor, Dept of Aerospace Engineering, Indian Institute of Science, Bangalore, India, (2009-).

Distinguished Scientists Panel (includes Nobel Laureates Bob Curl and Ferid Murad), First Global Congress on NanoEngineering for Medicine and Biology, NEMB2010, ASME, Feb 7-10, (2010).

CTR Senior Fellow, Stanford University (2010-)

Draper Prize Committee, NAE (2010-13)

His student, Eric Stout, was awarded Best Honors Thesis Award by the UH Honors College, 2010.

Opening Plenary Lecture, 13th Asian Congress of Fluid Mechanics, Dhaka, Bangladesh, Dec. 17-21, 2010.

New Horizons in Engineering Distinguished Lecture, Clarkson University, March 4 (2011)

NAE President Selection Committee (2012)

Dean's Distinguished Lecture, Texas A&M University at Qatar, Doha, Qatar, April 28, 2013.

Distinguished Lecture of Mechanical and Industrial Engineering, Northeastern University, Nov. 13, 2015.

Dr. M.O. Ghani Memorial Lecture at Bangladesh Academy of Sciences, Bangladesh, Jan. 2, 2018.

Special Guest Lecture, BUET Grand (50th) Reunion, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, Jan. 5 (2018).

FOBANA 2018 Award, Federation of Bangladeshi Associations in North America (FOBANA) Annual Convention, Atlanta, GA, July 29 (2018).

"Amazing Bangladeshi" Award, Daily Star-Crown Cement, Dhaka, Bangladesh, Nov. 10 (2018).

Listings:

American Men and Women of Science, Who's Who in Engineering, Marquis Who's Who in the South and the Southwest, Men of Achievement (Cambridge, England), Who's Who in Texas, Dictionary of International Biography (London), Who's Who in Technology Today, International Who's Who in Engineering, Who's Who in Aviation and Aerospace, Who's Who in Frontier Science and Technology.

Other Honors

Fulbright Scholarship (Full Grant) 1965-66, Stanford U.

August Berner Honors Fellowship (in addition to Research Assistantship), 1966-67, Stanford U.

Senior Merit Scholarship of Pakistan Government, 1959-63.

Talent Scholarship of Pakistan Government, 1957-59.

Journal Editorships:

Editor, Technical Journal of the E. Pakistan University of Engineering, (1962).

Editor, Institute of Engineers, Pakistan; both of The Pakistan Engineer (monthly Journal) and the Proceedings of the Annual Meetings, (1963-65).

Assistant Editor, Turbulence in Liquids, (1975, 1977, 1979, 1981, 1983) Biennial Volumes, Science Press, Princeton.

Associate Editor, The Physics of Fluids, American Institute of Physics (1981-84).

Editorial Advisory Board, Experimental Thermal and Fluid Science (International Journal of Experimental Heat Transfer, Thermodynamics, and Fluid Mechanics), Elsevier Scientific Publishing, (1987-).

Editorial Advisory Board, Thermophysics and Aeromechanics, Russian Academy of Sciences, Novosibirsk, (1992-).

Associate Editor, Journal of Fluids Engineering, ASME (1995-98).

Board of Editors, Sadhana: Proceedings of Indian Acad. Sci. (Science & Engr.) (1996-1998).

Advisory Board, Journal of Turbulence, Taylor & Francis (2003-).

Some Review Panels/Scientific Committees:

Panelist, Presidential Faculty Fellows, NSF (1992).

Advisory Committee, Stanford-NASA Center for Turbulence Research, (1988-1991).

Advisory Committee, Institute of Computational Fluid Dynamics, Tokyo, (1988-2000).

Asian Fluid Mechanics Committee, (Organizes the Asian Congress of Fluid Mechanics every 2 years), Founding Member, (1979-).

Advisory Board, Third (1981), through Twelfth (1997), Symposia on Turbulent Shear Flows.

Organizing Committee, Biennial Symposia of Turbulence, U. of Missouri-Rolla, (1975-95).

Organizing Committee and International Advisory Committee, Beer-Sheva International Seminar on MHD and Turbulence, Jerusalem, Israel (1985-97).

Scientific Committee, IUTAM Symposium on Transport Phenomena, U. of Tokyo, (1987).

Scientific Committee, IUTAM Symposium on Topological Fluid Mechanics, Cambridge U, (1989).

Technical Committee on Turbulence, Am Soc Civil Engineers, (1987-91).

Organizing Committee, Research Trends in Chaotic Dynamics and Transports in Fluids and Plasmas, La Jolla International School of Physics, UC-San Diego, (1990).

Scientific Committee, IUTAM Symposium on Eddy Structure Identification in Free Turbulent Shear Flows, Poitiers, France, September 14-17, (1992).

Fluid Dynamics Prize Committee, American Physical Society, (1991-93), (2000).

Organizing Committee, W.C. Reynolds Symposium on Turbulence, Monterey, CA, March 22-23, (1993).

Physics Panel, International Science Foundation, Washington, D. C., (1993).

NASA Turbulence Peer Review Committee, (1994).

Organizing Committee, Anatol Roshko Symposium, Caltech, Nov. 18, (1995).

International Advisory Committee, International conference on Advances in Mechanical Engineering, Bangalore, India, Dec. 20-22, (1995).

Scientific Committee, IUTAM Symposium on Dynamics of Slender Vortices, Aachen, Germany, (1997).

Member, Fluid Dynamics Technical Committee, AIAA (1997-2001).

Scientific Committee, International Symposium in Mathematical Sciences in Memory of S. Chandrasekhar, Calcutta, India, Dec. (1997).

Technical Program Chair, 30th AIAA Fluid Dynamics Conference, Norfolk, VA, June (1999).

Advisory Committee, Complex Fluid Flow Program, State of Kansas (1998).

Nominating Committee, APS/DFD: Vice-chair (1997-98) ; Chair (1998-99).

Member, Committee on Naval Hydrodynamics and Hydroacoustics, National Research Council (1999-2000).

Chairman, Fluid Dynamics Award Committee, AIAA (1999, 2000).

Member (1996-98; 2008-10), Co-Chair (1998-02), Scientific Committee, U.S. National Congress of Theoretical and Applied Mechanics.

Otto Laporte Award Committee, APS, Vice-Chair (2001-02), Chair (2002-03).

Elected to 4-yr term (Vice-Chair 2000-01; Chair-Elect 2001-02; Chair 2002-03; Past-Chair 2003-04), Division of Fluid Dynamics, APS.

Advisory Committee, Keck Laboratory, New Jersey Inst of Technology (2000).

Member, AIAA Fellow Grade Selection Committee, (2001-03).

Member, NRC Associateship Award Committee, (2001-04).

TWAS Engineering Sciences Prize Committee, The World Academy of Sciences (TWAS), Trieste, Italy, Member (2003-07, 8-10), Chair (2010-13).

Member, Scientific Committee, IUTAM Symposium on Elementary Vortices and Coherent Structures, Kyoto, Japan, Oct 26-28 (2004).

Chair, Fellows Selection Committee, Aerospace Sciences, AIAA (2005).

Mechanical Engineering Peer Committee, US National Academy of Engineering (2004-2007).

1st O'Donnell Award Committee, The Academy of Medicine, Engineering, and Sciences of Texas (2005-06). Developed award criteria and procedure.

Executive Committee, Mech. Engr. Sec. of NAE (Secretary 2006-08, Vice- Chair 2008-10, Chair 2010-12, Past Chair 2012-2014).

Chair, Sustainable Energy Panel, NSF Workshop: Frontiers In Transport Research and Education: *Energy Systems, Biological Systems, Security, Information Technology and Nanotechnology*, U. Connecticut, May 17-18, (2007).

Committee on "An Independent Assessment of Nation's Wake Turbulence Research and Development Program", National Research Council (2007).

Scientific Committee, International Conference on advances in Mechanical Engr & Mechanics (ICAMEM), Tunisia (2008).

International Advisory Committee, Centennial Celebration in Aerospace Engineering at the Indian Institute of Science, Bangalore, May 18-22 (2009).

Scientific Committee, International Retreat on Vortex Aerodynamics, Peking University, August 21-23 (2009).

Honorary Chairman, 13th Asian Congress of Fluid Mechanics, Dhaka, Bangladesh, December 17-21 (2010).

Chairman, Engineering Sciences Prize Committee, The World Academy of Sciences, Trieste, Italy (2010-13).

Member, Charles Stark Draper Prize Committee, National Academy of Engineering (2011-2013).

Supervised:

Ph. D. Dissertations: 21

Carlos Thompson, Khairul Zaman, Ray Clark, Zaki Husain, Zaqir Hasan, Jin Tso, Hyder Husain, Catalina Stern, James Bridges, Joel Jenkinson, George Broze, Xiaoling Zhou, Davinder Virk, Hui Meng, Jinhee Jeong, Danghui Liu, Richard Yao (Co-advisor), Wade Schoppa, Prashant Haldipur, Dhoorjaty Pradeep, Satish Narayanan

MS. Theses: 28

Ray Clark, Dipak Bannerjee, Paramesh Banik, Paul Heinmiller, Zaqir Hasan, James Bridges, Alan Leitko, Mike Ross, Sunil Jain, Davinder Virk, C. F. Lee (co-advisor), Nick Albanis, Shashi Menon, Arindam Ghosh, Kye-Hong Park (co-advisor), Satish Narayanan, Wade Schoppa, Wu Wei, Chuang Zhou, Raja Kidambi, Seshadri Sreenivasan, Dhoorjaty Pradeep, Sayeda Sharmin Hussain, Farhan Qureshi, Madiha Ahmed, Eric Stout, Chris Bryson (co-advisor), Jie Yao

BSME Honors Theses: 12

Mike Ross, Ron Walling, Charlie Hasselbrink, Bill Berger, Rob Bradlaw, Carl Stoesz, Gustavo Posada, Andrew Glassel, Dale K. Jamison, Madiha Ahmed, Robert Armstrong, Eric Stout

Post-Doctoral Visitors: 39

V. Ramjee, Bob Antonia, Raju Vanguri, Moti Sokolov, Raja Menon, Jean-Claude Stettler, Dietrich Bechert, Joe Shlien, Peter Plaschko, M. Nallasamy, Yoshimori Kita, Ryuji Takaki, Promode Bandyopadhyay, Yoko Oshima, Michio Hayakawa, Shigeo Kida, Kuniaki Toyoda, Makoto Ichijo, Seiichi Iida, Amit Basu, Sergei Bardakhanov, Michael Goldshtik, Joseph Lai, Vladimir Shtern, Valery Zimin, Ramon Paralta-Fabi, Alexis Jirnov, M. Park, Alessandro Talamelli, Anatoly Borissov, Hyder Husain, Anne-Cecile Lesage, Souad Sennoune, Zeina Khan, Jensen Newman, Xi Chen, Julianna Santos, Duc Toan Cao, Ebrahim Hassan-Zadeh

Sigma Xi Research Excellence Award for Graduate Students:

M.A.Z. Hasan (81), H.S. Husain (83), J.E. Bridges (86), C. Stern (88), W. Schoppa (97).

CHAIRMANSHIP OF TECHNICAL MEETINGS

36th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, November 20-22, 1983, at University of Houston (co-chairmen: Hussain and Nerem).

International Symposium: Generation of Large-Scale Structures in Continuous Media, Perm-Moscow, USSR, June 11-20, 1990 (Vice-Chairman with U. Frisch).

30th Fluid Dynamics Conference, American Institute of Aeronautics & Astronautics, Norfolk, VA, June, 1999.

Co-Chairman of the Scientific Committee, US National Congress of Theoretical and Applied Mechanics, 2002.

MEMBERSHIPS

Elected Fellow of:

American Physical Society (1985).

American Society of Mechanical Engineers (1989).

American Institute of Aeronautics and Astronautics (2001).

Elected to:

The World Academy of Science, Trieste, Italy (1997)

The Academy of Medicine, Engineering & Science of Texas (2001)

PUBLICATIONS

BOOKS

Nonlinear Dynamics of Structures edited by R.Z. Sagdeev, U. Frisch, F. Hussain, S.S. Moiseev and N.S. Erokhin, World Scientific Co., 1991.

BOOK CHAPTERS

"Mechanics of Pulsatile Flows of Relevance to Cardiovascular System," in Cardiovascular Flow Dynamics and Measurements, (Eds. N.H.C. Hwang and N. Norman), University Park Press, Baltimore, pp. 541-632, (1976).

"New Aspects of Vortex Dynamics Relevant to Coherent Structures in Turbulent Flows," in Eddy Structure Identification (Ed. J.P. Bonnet) Springer, pp. 61-143, (1996).

"Genesis and Dynamics of Coherent Structures in Near-wall Turbulence: A New Look," in Self-Sustaining Mechanisms of Wall Turbulence (Ed. R. L. Panton) Computational Mechanics Publications, Southampton, p. 385, (1997).

"Injectable Multistage Nanovectors for Enhancing Imaging Contrast and Directed Therapy" in Nanostructure Science and Technology, with Biana Godin, Rita E. Serda, Xuewu Liu and Mauro Ferrari, Part 4, pp. 201-233, (2012).

ARCHIVAL PAPERS

(grouped by journals; note initials "A.K.M." dropped since 1987 to simplify)

Journal of Fluid Mechanics

1. Hussain, A.K.M.F. and Reynolds, W.C., "The Mechanics of an Organized Wave in Turbulent Shear Flow," J. Fluid Mech., **41**, pp. 241-258, (1970).
2. Hussain, A.K.M.F. and Reynolds, W.C., "The Mechanics of an Organized Wave in Turbulent Shear Flow. Part 2. Experimental Results," J. Fluid Mech., **54**, pp. 241-261, (1972).
3. Reynolds, W.C. and Hussain, A.K.M.F., "The Mechanics of an Organized Wave in Turbulent Shear Flow. Part 3. Theoretical Models and Comparison with Experiments," J. Fluid Mech., **54**, pp. 263-288, (1972).
4. Hussain, A.K.M.F. and Zaman, K.B.M.Q., "The Free Shear Layer Tone Phenomenon and Probe Interference," J. Fluid Mech., **87**, pp. 349-383, (1978).
5. Sokolov, M., Hussain, A.K.M.F., Kleis, S.J., and Husain, Z.D., "A 'Turbulent Spot' in an Axisymmetric Free Shear Layer. Part 1," J. Fluid Mech., **98**, pp. 65-95, (1980).
6. Hussain, A.K.M.F., Kleis, S.J., and Sokolov, M., "A ' Turbulent Spot' in an Axisymmetric Free Shear Layer. Part 2," J. Fluid Mech., **98**, pp. 97-135, (1980).
7. Hussain, A.K.M.F. and Thompson, C.A., "Controlled Symmetric Perturbation of the Plane Jet: an Experimental Study in the Initial Region," J. Fluid Mech., **100**, pp. 397-431, (1980).
8. Zaman, K.B.M.Q. and Hussain, A.K.M.F., "Vortex Pairing in a Circular Jet Under Controlled Excitation. Part 1.General Jet Response," J. Fluid Mech., **101**, pp. 449-491, (1980).
9. Hussain, A.K.M.F. and Zaman, K.B.M.Q., "Vortex Pairing in a Circular Jet Under Controlled Excitation. Part 2. Coherent Structure Dynamics," J. Fluid Mech., **101,** pp. 493-544, (1980).
10. Hussain, A.K.M.F. and Clark, A.R., "On the Coherent Structure of the Axisymmetric Mixing Layer: A Flow-visualization Study," J. Fluid Mech., **104**, pp. 263-294, (1981).
11. Zaman, K.B.M.Q. and Hussain, A.K.M.F., "Turbulence Suppression in Free Turbulent Shear Flows Under Controlled Excitation," J. Fluid Mech., **103**, pp. 133-160, (1981).
12. Hussain, A.K.M.F. and Zaman, K.B.M.Q., "The 'Preferred Mode' of the Axisymmetric Jet," J. Fluid Mech., **110**, pp. 39-71, (1981).
13. Kleis, S.J., Hussain, A.K.M.F. and Sokolov, M., "A Turbulent Spot in an Axisymmetric Mixing Layer. Part 3: Azimuthal Structure and Initiation Mechanism," J. Fluid Mech., **111**, pp. 87-106, (1981).
14. Zaman, K.B.M.Q. and Hussain, A.K.M.F., "Taylor Hypothesis and Large-Scale Coherent Structures," J. Fluid Mech., **112**, pp. 379-396, (1981).
15. Antonia, R.A., Satyaprakash, B.R., and Hussain, A.K.M.F., "Statistics of the Fine-Scale Velocity in Turbulent Plane and Circular Jets,," J. Fluid Mech., **119**, pp. 55-89, (1982).

16. Hasan, M.A.Z. and Hussain, A.K.M.F., "The Self-Excited Axisymmetric Jet," J. Fluid Mech., **115**, pp. 59-89, (1982).
17. Hussain, A.K.M.F. and Hasan, M.A.Z., "The 'Whistler Nozzle' Phenomenon," J. Fluid Mech., **134**, pp. 431-458, (1983).
18. Zaman, K.B.M.Q. and Hussain, A.K.M.F., "Natural Large-Scale Structures in the Axisymmetric Mixing Layer," J. Fluid Mech., **138**, pp. 325-351, (1984).
19. Hussain, A.K.M.F. and Hasan, M.A.Z., "Turbulence Suppression in Free Turbulent Shear Flows Under Controlled Excitation. Part 2. Jet Noise Reduction," J. Fluid Mech., **150**, pp. 159-167, (1985).
20. Hussain, A.K.M.F. and Zaman, K.B.M.Q., "An Experimental Study of Organized Motions in the Turbulent Plane Mixing Layer," J. Fluid Mech., **159**, pp. 85-104, (1985).
21. Stettler, J.C. and Hussain, A.K.M.F., "On Transition of Pulsatile Pipe Flow," J. Fluid Mech., **170**, pp. 169-194, (1986).
22. Hussain, A.K.M.F., "Coherent Structures and Turbulence," J. Fluid Mech., **173**, pp. 303-356, (1986).
23. Hussain, A.K.M.F. and Hayakawa, M., "Eduction of Large-Scale Organized Structures in a Turbulent Plane Wake," J. Fluid Mech., **180**, pp. 193-229, (1987).
24. Tso, J. and Hussain, F., "Organized Motions in a Fully Developed Turbulent Axisymmetric Jet," J. Fluid Mech., **203**, pp. 225-248, (1989).
25. Hayakawa, M. and Hussain, F., "Three Dimensionality of Organized Structures in a Plane Turbulent Wake," J. Fluid Mech., **206**, pp. 375-404, (1989).
26. Hussain, F. and Husain, H.S., "Elliptic Jets. Part 1. General Characteristics of Unexcited and Excited Jets," J. Fluid Mech., **208**, pp. 257-320, (1989).
27. Goldshtik, M., Hussain, F., and Shtern, V., "Symmetry Breaking in Vortex-Source and Jeffrey-Hamel Flows," J. Fluid Mech., **232**, pp. 521-565, (1991).
28. Kida, S., Takaoka, M., and Hussain, F., "Collision of Two Vortex Rings," J. Fluid Mech. **230**, pp. 583-646, (1991).
29. Husain, H.S. and Hussain, F., "Elliptic jets. Part 2. Dynamics of Coherent Structure Pairing," J. Fluid Mech., **233**, pp. 439-482, (1991).
30. Hunt, J.C.R. and Hussain, F., "A Note on Velocity, Vorticity and Helicity of Inviscid Fluid Elements," J. Fluid Mech., **229**, pp. 569-587, (1991).
31. Bridges, J.E. and Hussain, F., "Direct Application of Aerodynamic Noise Theory to Jet Flow," J. Fluid Mech., **240**, pp. 469-501, (1992).
32. Husain, H. S. and Hussain, F. "Elliptic Jets Part 3, Dynamics of Preferred Mode Coherent Structure," J. Fluid Mech. **248**, pp. 315-361, (1993).
33. Shtern, V. and Hussain, F. "Azimuthal Instability of Divergent Flows," J. Fluid Mech., **256**, pp. 535-560, (1993).
34. Virk, D. Melander, M., and Hussain, F. "Dynamics of a Polarized Vortex Ring," J. Fluid Mech., **260**, pp. 23-55, (1994).

35. Melander, M.V. and Hussain, F. "Topological Vortex Dynamics in Axisymmetric Viscous Flows," J. Fluid Mech., **260**, pp. 57-80, (1994).

36. Broze, G. and Hussain, F. "Non-Linear Dynamics of Forced Transitional Jets: Periodic and Chaotic Attractors," J. Fluid Mech., **263**, pp. 93-132, (1994).

37. Jeong, J. and Hussain, F. "On the Identification of a Vortex," J. Fluid Mech., **285**, pp. 69-94, (1995).

38. Schoppa, W., Hussain, F. and Metcalfe, R.W. "A New Mechanism of Small-Scale Transition in a Plane Mixing Layer: Core Dynamics of Spanwise Vortices," J. Fluid Mech., **298**, pp. 23-80, (1995).

39. Virk, D., Hussian, F., and Kerr, R.M. "Compressible Vortex Reconnection," J. Fluid Mech., **304**, pp. 47-86, (1995).

40. Husain, H. and Hussain, F. "Experiments on Subharmonic Resonance in a Shear Layer," J. Fluid Mech., **304**, pp. 343-372, (1995).

41. Shtern, V. and Hussain, F. "Hysteresis in Swirling Jets," J. Fluid Mech., **309**, pp. 1-44, (1996).

42. Broze, G. and Hussain, F. "Transition to Chaos in a Forced Jet: Intermittency, Tangent Bifurcations and Hysteresis," J. Fluid Mech., **311**, pp. 37-71, (1996).

43. Narayanan, S. and Hussain, F. "Measurements of Spatiotemporal Dynamics in a Forced Mixing Layer," J. Fluid Mech., **320,** pp. 71-115, (1996).

44. Jeong, J., Hussain, F., Schoppa, W., and Kim, J. "Coherent Structures Near the Wall of Turbulent Channel Flow," J. Fluid Mech., **332,** pp. 185-214, (1997).

45. Shtern, V. and Hussain, F. "Instabilities of conical flows causing steady bifurcations ," J. Fluid Mech., **366**, pp. 33-85, (1998).

46. Husain, H. S. and Hussain, F. "The Elliptic Whistler Jet," J. Fluid Mech., **397**, pp. 23-44, (1999).

47. Pradeep, D. S. and Hussain, F. "Core Dynamics of Strained Vortex: Instability and Transition," J. Fluid Mech., **447,** pp. 247-285, (2001).

48. Shtern, V. and Hussain, F. "Generation of Collimated Jets by a Point Source of Heat and Gravity," J. Fluid Mech., **449,** pp. 39-59, (2001).

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INVITED PRESENTATIONS

Invited Lectures (including keynotes)

1. "The Mechanics of a Perturbation Wave in Turbulent Shear Flow," Boeing Symposium on Turbulence, Boeing Scientific Research Laboratories, Seattle, June (1969).

2. "Mechanics of Pulsatile Flows of Relevance to the Cardiovascular System," NATO Advanced Institute on Cardiovascular System, Houston, October 6-17, (1975).
3. "Coherent Structures in Jet Flows," NASA Workshop on Flow Noise Generation, Langley Research Center, Hampton, Virginia, March 29-31, (1977).
4. "Controlled Perturbation of Circular Jets," Symposium on Turbulence, Berlin, August 1-5, (1977).
5. "Initial Condition Effect on Free Turbulent Shear Flows," Symposium on Turbulence, Berlin, August 1-5, (1977).
6. "The Free Shear Layer Edgetone and Instability Measurements," Symposium on Turbulence, Berlin, August 1-5, (1977).
7. "Investigations of Coherent Structure in Free Turbulent Shear Flows," 6th Biennial Symposium on Turbulence, University of Missouri-Rolla, October 8-10, (1979).
8. "Perturbed and Unperturbed Turbulent Jets," International Conference on the Role of Coherent Structures in Modeling Turbulence and Mixing, Madrid, June 24-27, (1980).
9. "Conditional Sampling Technique to Test the Applicability of the Taylor Hypothesis for the Large-Scale Coherent Structures," Euromech Colloquium on Hot Wire, Hot-Film and Conditional Sampling, Ecole Centrale Lyon, Lyon, July 2-5, (1980).
10. "Control of Coherent Structures," Workshop on Compliant Coating Drag Reduction, National Academy of Science, Washington, D.C., September 16-17, (1980).
11. "The Dominant Coherent Structure of the Circular Jet," ICHMT-IUTAM Joint Symposium on Heat and Mass Transfer and the Structure of Turbulence, Dubrovnik, October 6-10, (1980).
12. "Visualization Study of the Axisymmetric Mixing Layer," ICHMT-IUTAM Joint Symposium on Heat and Mass Transfer and the Structure of Turbulence, Dubrovnik, October 6-10, (1980).
13. "The Role of Coherent Structures in Free Turbulent Shear Flows," First Asian Congress on Fluid, December 8-13, (1980).
14. "The Preferred-Mode Coherent Structure of the Jet," IUTAM Symposium on Unsteady Turbulent Shear Flows, Toulouse, France, May 5-8, (1981).
15. "Acoustic Control of a Free Shear Layer: Theory vs. Experiment," Euromech Colloquium 142 on Acoustics of Turbulent Flows, Ecole Centrale de Lyon, France, September 23-25, (1981).
16. "Large-Scale Coherent Structures: What, Why and How?" 18th Annual Meeting, Society of Engineering Science, Brown University, September 2-4, (1981).
17. "The Self-Preserving Region of the Axisymmetric Jet," Workshop on Jet Flow, Stanford University, November 20-21, (1981).

18. "Coherent Structures - Reality and Myth," 34th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, Naval Post-Graduate School, Monterey, California, November 22-24, (1981).
19. "What is a Coherent Structure in Turbulence?" Invited Panel Session at the 35th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, Rutgers University, (1982).
20. "The Phenomenon of Self-Excited Jet and Its Turbulence and Noise Characteristics," 19th Annual Meeting, Society of Engineering Science, University of Missouri-Rolla, October 27-29, (1982).
21. Large-scale Organized Motions in Jets and Shear Layers," International Symposium on Recent Advances in Aerodynamics and Aeroacoustics, Stanford University, August 22-26, (1983).
22. "Coherent Structures in Turbulent Shear Flows," IUTAM Symposium on Turbulence and Chaotic Phenomena in Fluids, Kyoto University, Kyoto, Japan, September 5-10, (1983).
23. "Entanglement of Two Vortex Filaments," IUTAM Symposium on Turbulence and Chaotic Phenomena in Fluids, Kyoto University, Kyoto, Japan, September 5-10, (1983).
24. "Observations on Transition of the Unsteady Pipe Flow," Second Asian Congress of Fluid Mechanics, Beijing, China, October 25-29, (1983).
25. "Controlled Excitation of Jets and Shear Layers," Symposium on the Use of Artificial Excitation to Control Flows by Manipulating Large Scale Structures, San Antonio, June 17-21, (1984).
26. "Coherent Structures in Turbulent Shear Flows," The Freeman Lecture at the Winter Annual Meeting of ASME, New Orleans, December 11-14, (1984).
27. "Measurements of Large Scale Organized Motions in Turbulent Flows," 2nd Joint ASCE/ASME Mechanics Conference, Albuquerque, New Mexico, June 23-26, (1985).
28. "Modern Measurement Techniques of Large-scale Coherent Structures," 1986 Aerospace Sciences Meeting, Reno, Nevada, Jan. 6-9, (1986).
29. "Organized Structures in Free Shear Flows," Colloquium on Free Shear Flows/Propulsion, 1986 Aerospace Sciences Meeting, Reno, Nevada, Jan 6-9, (1986).
30. "Coherent Structures and Turbulence," IUTAM Symposium on Fluid Mechanic in the Spirit of G.I. Taylor, Cambridge, UK, 24-28 March, (1986).
31. "Physics of the Mixing Layer: Experiments and Direct Numerical Simulations," (coauthored by R.W. Metcalfe and S. Menon), IUTAM Symposium on Fluid Mechanics in the Spirit of G.I. Taylor, Cambridge University, 24-28 March, (1986).
32. "Recombination of two vortex filament," (coauthored by R. Takaki) Third Asian Congress of Fluid Mechanics, Tokyo, Japan, September 1-5, (1986).

33. "Coherent Structures: Their Measurements and Applications," Fifth Beer-Sheva International Seminar on MHD-Flows and Turbulence, Jerusalem, Israel, March 2-6, (1987).

34. "Coherent Structures in Turbulent Flows," Symposium on Prospects for Turbulence Research, National Center for Atmospheric Research, Boulder, Colorado, June 22-26, (1987).

35. "Turbulent Flow Structures Educed from Direct Numerical Simulation on Supercomputers," Second Nobeyama Workshop on Fluid Dynamics and Supercomputers, Noveyama, Japan, September 7-9, (1987).

36. "Coherent Structures and Turbulence Management in Free Turbulent Shear Flow," International Symposium on Transport Phenomena in Turbulent Flows, Univ. of Tokyo, October 25-29, (1987).

37. "What have we learned about turbulence from coherent structures?" Progress in Boundary Layers and Turbulence Research, Tokyo, April 9, (1988).

38. "Simulation of Noncircular Vortices," (with J.E. Bridges) 12th World Congress on Scientific Computation, Paris, July 18-22, (1988).

39. "Direct Numerical Simulation of Viscous Vortex Interactions," Commonwealth Specialists' Meeting on Computational Fluid Dynamics, Bangalore, INDIA, Dec. 5-10, (1988).

40. "Whither Coherent Structures?" Turbulence at Crossroads, Mathematical Science Institute Cornell University, March 22-24, (1989).

41. "Role of Vortex Reconnection in Turbulence Cascade," 1989 Newport Conference on Turbulence, Brown University, June 11-15, (1989).

42. "Vortex Reconnection," IUTAM Symposium on Topological Fluid Motion, Cambridge U., Aug. 13-19, (1989).

43. "Supercomputer Simulation of Vortex Dynamics," 3rd Nobeyama Workshop on Supercomputing and Experiments Sept 11-13, (1989).

44. "Vortex Dynamics and Reconnection," 5th European Liquid State Conference, Moscow, October 16-21, (1989).

45. "Computation of Vortex Dynamics and Turbulence," Soviet-American Conference on Computational Fluid Dynamics, Tashkent, USSR, Oct. 22-28, (1989).

46. "Role of Coherent Structures in Turbulent Shear Flows," AIChE Annual Meeting, San Francisco, November 5-10, (1989).

47. "Cut-and-Connect of Antiparallel Vortex Tubes," IUTAM Symposium on Topological Fluid Motion, Cambridge Univ., Aug. 13-18, (1989).

48. "Topology of Coherent Structures and Flame Sheets in Reacting Mixing Layers," IUTAM Symposium on Topological Fluid Motion, Cambridge Univ., Aug. 13-18, (1989).

49. "Reconnection of Two Vortex Rings," IUTAM Symposium on Topological Fluid Motion, Cambridge Univ., Aug. 13-18, (1989).

50. “Effects of Incompressible and Compressible Vortex Reconnection,” IUTAM Symposium on Topological Fluid Motion, Cambridge Univ., Aug. 13-18, (1989).

51. “Helicity Associated with Flow around Fluid Lumps and with Inhomogeneous Turbulence,” IUTAM Symposium on Topological Fluid Motion, Cambridge Univ., Aug. 13-18, (1989).

52. "Vortex Reconnection, Cascade and Mixing in Turbulent Flows," Sixth Beer-Sheva International Seminar on MHD and Turbulence, Jerusalem, Israel, Feb. 25-March 3, (1990).

53. "Coherent structures in Bounded and Free Shear Flows," 11th US National Congress of Applied Mathematics, U. of Arizona, Tuscon, May 24-28, (1990).

54. "Large-Scale Structures in Turbulent flows," International Symposium on Generation of Large-Scale Structures in Continuous Media, Perm-Moscow, June 11-2, (1990).

55. "Vortex Reconnection and Turbulence Mixing," 1990 AMS-SIAM Summer Seminar in Applied Mathematics: Vortex Dynamics and Vortex Methods, U. of Washington, Seattle, June 18-29, (1990).

56. "Organized Motions in Jets and Mixing Layers," IUTAM Symp on Separated Flows and Jets, Novosibirsk, July 9-13, (1990).

57. "Large-Scale Structures in Turbulence: A Challenge to Theorists," International Workshop on Novel Experiments and Data Processing for Basic Understanding of Turbulence, Ibaraki, Japan, October 8-10, (1990).

58. “Interplay between Experiments and CFD in Vortex and Turbulent Flows,” Japan Society of Fluid Dynamics Symposium on CFD, October 11, (1990).

59. "Understanding Turbulence via Vortex Dynamics," The Lumley Symposium: Recent Developments in Turbulence, Hampton, VA November 13-14, (1990).

60. "Understanding Cascade Mechanisms through Vortex Dynamics," Workshop on Dynamics of Structures and Intermittencies in Turbulence," Arizona State University, Phoenix, May 20-24, (1991).

61. "Helical Wave Decomposition and Self-Organization in Turbulence," 4th Nobeyama Workshop on Supercomputing and Experiments in Fluid Dynamics, Nobeyama, Japan, Sept. 3-5, (1991).

62. "New Experimental Studies in Hydrodynamics," 4th Nobeyama Workshop on Supercomputing and Experiments in Fluid Dynamics, Nobeyama, Japan, Sept. 3-5, (1991).

63. "New Aspects of Vortex Dynamics," NATO Workshop, Institute of Theoretical Physics, Santa Barbara, Nov. 1-5, (1991).

64. "New Aspects of Vortex Dynamics by Numerical Simulation: Core Dynamics, Helical Wave Dynamics, and Vortex Fine-scale Turbulence Interaction," NATO Advanced Research Workshop: Vortex Flows and Related Numerical Methods, Grenoble - St. Pierre de Chartreuse, June 15-19, (1992).

65. "Understanding Turbulence via Vortex Dynamics: Some New Perspectives," The 5th Asian Congress of Fluid Mechanics, Taejon, Korea August 10-14, (1992).

66. "New Approaches to Vortex Dynamics: Core Dynamics, Helicity, Helical Waves, and Interaction with Fine-scale Turbulence," Thirteenth Symposium on Turbulence, Univ. of Missouri-Rolla. Sept. 21-23, (1992).

67. "Study of Coherent Structures via Vortex Dynamics: Core Dynamics, Helical Waves, and Interaction with Fine-scale Turbulence.' IUTAM Symposium: Eddy Structure Identification in Free Turbulent Shear Flows, Poitiers, France, Oct 12-14, (1992).

68. "New Perspectives on Vortex Dynamics: Core Dynamics, Helical Wave Decomposition and Interaction with Turbulence," 7th Beer-Sheva International Seminar on MHD and Turbulence, Jerusalem, Israel, Feb. 14-18, (1993).

69. "Holographic Particle Velocimetry: Prospects and Limitations," Fluids Engineering Division Meeting, ASME, Washington, D. C., June 20-24, (1993).

70. "Vortex reconnection, core dynamics and related turbulence physics," Euromech Symp. Vortex Dyn, Cortona, Italy, June 27-July 2, (1993).

71. "Subharmonic Resonance in Free Shear Layers," IUTAM Symposium on Nonlinear Instability of Nonparallel Flows, Clarkson U., July 25-30, (1993).

72. "A new mechanism for transition in free shear layers: vortex core dynamics," Symposium on Developments in Fluid Dynamics and Aerospace Engineering, Bangalore, India, Dec. 9-10, (1993).

73. "Topological Fluid Mechanics and Vortex Reconnection," Turbulence as a Problem in Physics, Nehru Center for Advanced Scientific Research, Bangalore, India, Dec. 13-18, (1993).

74. "Chaos in Spatially Developing Mixing Layers," Turbulence as a Problem in Physics, Nehru Center for Advanced Scientific Research, Bangalore, India, Dec. 13-18, (1993).

75. "Anomalous diffusion in fluid-particle mixtures," Turbulence as a Problem in Physics, Nehru Center for Advanced Scientific Research, Bangalore, India, Dec. 13-18, (1993).

76. Six lectures on "Eddy Structure Identification Techniques for Free Turbulent Flows," International Center for Mechanical Sciences, Udine, Italy, May 23-27, (1994).

77. "Innovations in Holographic Particle Velocimetry," International Workshop on 3D PIV, Ford Motor Co., August 15-17, (1994).

78. "Developments in Holographic Particle Velocimetry, " NSF/DOE Workshop on Particulates and Fluids, Philadelphia, October 16-17, (1994).

79. "Core Dynamics Instability: A New Transition Mechanism in a Mixing Layer," Advances in Turbulence Research-1995, Pohang, Korea, March 27-29, (1995).

80. "Coherent Structures and Turbulence," Tani Memorial Lecture: Sixth Asian Congress of Fluid Mechanics, Singapore, May 22-26, (1995).

81. "Vortex Dynamics and Turbulence Physics," Sixth International Congress on CFD Lake Tahoe, Sept. 4-8, (1995).

82. "Core dynamics instability: a new transition mechanism in a mixing layer," Taylor Symposium, Soc. Engr. Sci. Annual Meeting, New Orleans, Oct. 30 - Nov. 2, (1995).

83. "Vortex Dynamics and Turbulence Physics," Soc. Engr. Sci. Annual Meeting, New Orleans, Oct. 30 - Nov. 2, (1995).

84. "Holographic Particle Velocimetry for Turbulent, Multiphase and Combustion Flows," 22nd National Conference on Fluid Mechanics and Fluid Power, Madras, India, Dec. 13-15, (1995).

85. "Vortex Liquid Piston Engine and some other Vortex Technologies," International Congress on Advances in Mechanical Engineering, Bangalore, India, Dec. 20-22, (1995).

86. "Dynamics of Coherent Structures in Near-Wall Turbulence," International Seminar on Fluid Mechanics Research, Dhaka, Bangladesh, Dec. 27-28, (1995).

87. "Advances in Holographic Particle Velocimetry," International Seminar on Fluid Mechanics Research, Dhaka, Bangladesh, Dec. 27-28, (1995).

88. "New Vortex Technologies," International Seminar on Fluid Mechanics Research, Dhaka, Bangladesh, Dec. 27-28, (1995).

89. "Role of Coherent Structures in Near-Wall Turbulence," Disquistiones Mechanicae, University of Illinois, Champaign-Urbana, Oct. 24-25, (1996).

90. "Vortex Dynamics & Turbulence Physics," Fluid Dynamics Lecture Series, Stanford University, Palo Alto, Feb. 4, (1997).

91. "Numerical Studies of Streamwise Vortices in a Turbulent Boundary Layer," 5th Nobeyama Workshop on High-Performance Computing in Fluid Dynamics, Nobeyama, Japan, May 13-15, (1997).

92. "Dynamics of Longitudinal Vortices in Near-Wall Turbulence," IUTAM Symposium on Simulation and Identification of Slender Vortices, Lyngby, Denmark, May 25-27, (1997).

93. "Genesis and Dynamics of Coherent Structures in Near-Wall Turbulence," Workshop on Turbulence Transport and Numerical Modeling , Los Alamos National Laboratory, June 4-7, (1997).

94. "Identification and Control of Near-Wall Vortices in Turbulent Boundary Layers," IUTAM Symposium on Slender Vortices, Aachen, Germany, Aug. 31 - Sept. 3, (1997).

95. “Dynamics and Nonlinear Modeling of Free Shear Flows,” (with G. Broze) Cornell Workshop on POD-Galerkin Methods for the Dynamics and Control of Complex Flows, Ithaca, New York, Oct. 13-14, (1997).

96. “Low-Dimensional Modeling and Chaos Control in Open Shear Flows,” (with S. Narayanan) Cornell Workshop on POD-Galerkin Methods for the Dynamics and Control of Complex Flows, Ithaca, New York, Oct. 13-14, (1997).

97. “A Robust Control Scheme for Drag Reduction in a Turbulent Boundary Layer,” Cornell Workshop on POD-Galerkin Methods for the Dynamics and Control of Complex Flows, Ithaca, New York, Oct. 13-14, (1997).

98. "Genesis of Longitudinal Vortices in Near-Wall Turbulence," Second International Seminar on Fluid Mechanics and Heat Transfer, Dhaka, Bangladesh, Dec. 17-18, (1997).

99. "A New Strategy for Drag Reduction in Turbulent Boundary Layers," 24th National Conference on Fluid Mechanics and Fluid Power, Calcutta, India, Dec. 26-28, (1997).

100. "Genesis, Dynamics and Control of Coherent Structures in the Near-Wall Region of a Turbulent Boundary Layer," International Memorial Day for Prof. Carlo Ferrari, Torino, Italy, Apr. 3-4, (1998).

101. "Genesis, Dynamics and Control of Streamwise Structures in a Turbulent Boundary Layer," Turbulence: Challenges for 21st Century, Los Alamos, New Mexico, May 18-21, (1998).

102. "Dynamics of Near-Wall Longitudinal Vortices," 13th U.S. National Congress of Theoretical and Applied Mechanics, Gainesville, Florida, Jun. 22-26, (1998).

103. "Genesis, Dynamics and Control of Coherent Structures in Fully Developed Near-Wall Turbulence" (Plenary Lecture), 29th AIAA Fluid Dynamics Conference, Albuquerque, New Mexico, Jun. 15-18, (1998).

104. "Numerical Study of Dynamics and Control of Coherent Structures near the Wall of a Turbulent Boundary Layer," 16th International Conference on Numerical methods in Fluid Dynamics, Arcachon, France, July 6-10, (1998).

105. "Dynamics and Control of Longitudinal Vortices near the wall of Fully Developed Turbulent Boundary Layers," 3rd International Workshop on Vortex Flows, Toulouse, France, Aug. 24-27, (1998).

106. "Dynamics and Control of Near-Wall Coherent Structures," IUTAM Symposium on Mechanics of Passive and Active Flow Control, Gottingen, Germany, Sept. 7-11, (1998).

107. "Genesis and Dynamics of Near-wall Coherent Structures and their Control for Drag Reduction," Hokkaido Turbulence Mini-Symposium, Sapporo, Japan, Oct. 08, (1998).

108. "Genesis and Dynamics of Near-wall Coherent Structures in Turbulent Boundary Layers and their Control for Drag Reduction," International Workshop on Control in Fluid Mechanics and Combustion, Paris, France, Oct. 14-17, (1998).

109. "Core Dynamics Instability of a Vortex in Shear :A Physical-space Cascade Mechanism," (Fluid Dynamics Prize lecture), 51st Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Philadelphia, Nov. 22-24, (1998).

110. "Role of Core Dynamics in Transition to Turbulence," Workshop on Perspectives in the Understanding of Turbulent Systems, Isaac Newton Institute, Cambridge, UK, Jan. 13-22, (1999).

111. "Vortex Dynamics related to Fluid Turbulence," Workshop on Perspectives in the Understanding of Turbulent Systems, Isaac Newton Institute, Cambridge, UK, Jan. 13-22, (1999).

112. "Core Dynamics Instability of a Vortex in Shear: A Physical-Space Cascade Mechanism," Symposium on Turbulence Structure and Vortex Dynamics, Isaac Newton Institute, Cambridge, UK, Mar. 15-19, (1999).

113. "Genesis and Dynamics of Coherent Structures in Near-Wall turbulence, and their Control for Drag Reduction," Workshop on Breakdown to Turbulence, Isaac Newton Institute, Cambridge, UK, Mar. 22-31, (1999).

114. "Vortex Dynamics and Turbulence Physics," Sigma Xi Research Award Lecture, University of Houston, Feb. 19, (2000).

115. "Near wall coherent structures in a turbulent boundary layer: genesis and control," ASME Fluids Engineering Award Lecture, Boston, Jun. 13, (2000).

116. "Vortex Dynamics & Turbulence Physics," Cullimore Lecture, Department of Mechanical Engineering, New Jersey Institute of Technology, Apr. 15, (2002).

117. "Vortex Dynamics & Turbulence Physics," AIAA Fluid Dynamics Prize Lecture, St. Louis, June 25, (2002).

118. "Mechanism of Coherent Structure Generation in Near-Wall Turbulence," IUTAM Symposium, Tokyo, Oct. 18 (2002).

119. "Vortex Breakdown Control," Roshko Symposium, Blacksburg, Jun. 28 (2003).

120. "The Interaction Between a Coherent Structure and Turbulence," Symposium on Advances in Fluid Mechanics, Bangalore, Jul. 23, (2003).

121. "Regeneration Mechanism in Near-Wall Turbulence and Drag Reduction," 2nd BSME-ASME International Conference on Thermal Engineering, Dhaka, Bangladesh, Jan. 2, (2004).

122. "Vortex Dynamics and Turbulence: Some recent findings," Bangladesh Academy of Sciences Lecture, Dhaka, Bangladesh, Jan 17, (2004).

123. "Dreams and Realities: Reflections of a Bangladeshi," Dr. Engr. Alimullah Khan Memorial Lecture, 48th National Convention, The Institution of Engineers (Bangladesh), Dhaka, Bangladesh, Jan. 20, (2004).

124. "Mechanisms of interaction between a coherent structure and turbulence," Coherent Structures in Atmosphere and Ocean, National Center for Atmospheric Research, Boulder, CO, July 11-14, (2005).

125. "Transient Growth on a Vortex Column," 5th International Conference on Nonlinear Mechanics, Shanghai U, Shanghai, China, June 11-15, (2007).

126. "Regeneration Mechanism in the Near-Wall Region of a Turbulent Boundary Layer," Workshop on Multiphase Turbulence: Dust Storms, Erosion, Hurricanes and Tornadoes, Xi'an Jiaotong University, Xi'an, China, July 16-17, (2007).

127. "The role of transient Growth in Coherent Structure-Turbulence Interaction", Turbulence Physics and Control Workshop, Center for Turbulence Research, Stanford U., Sept 14 -15, (2007).

128. "Institute of Advanced Studies – New Challenge for Bangladesh," 60 Years of Engr. Education in Bangladesh, Bangladesh U of Engr & Tech, Dhaka, Dec 29-31, (2007).

129. "Coherent Structures, vortex-turbulence interaction and the looming airport capacity crisis," FLUID DAYS International Symposium, Jwaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India Dec. 31- Jan. 1, (2008).

130. "Mechanisms of core perturbation growth in vortex-turbulence interaction," ***The Keynote Lecture***, 12th Asian Congress of Fluid Mechanics, Daejeon, S. Korea, August 18-21, (2008).

131. "Nonlinear Transient Growth in a vortex Column," ***FD Sectional Lecture***,2007

132. **ICTAM 2008,** Adelaide, Australia, Aug 24-29, (2008).

133. "Mechanisms of Transient Growth in a stable vortex column," IUTAM Symposium: 150 Years of Vortex Dynamics, Tech U Denmark, Copenhagen, Oct. 13-16, (2008).

134. "Institute of Advanced Studies – the challenge of the future", Presidential Lecture, Auburn University, speaker introduced and lecture moderated by Univ President, Jay Gouge. November 14, (2008).

135. "The looming crisis in air traffic capacity – can vortex dynamics help?" ***Enzo Levi Seminar,*** **Mexican Physical Society**, held at National University of Mexico, Mexico City, April 23-24, 2009.

136. "Nonlinear Transient Growth on a Vortex Column", ***Keynote Lecture***, International Retreat on Vortex Aerodynamics, Peking University, Beijing,, August 21-23, (2009).

137. "Coherent Structure-Turbulence Interaction", International Symposium on Turbulence, Peking University, Beijing, Sept. 21-25, (2009).

138. "The looming crisis in air traffic capacity – what can vortex dynamics do?" The Seventh International Workshop on CFD, Tokyo University, Tokyo Sept. 23-24, (2009).

139. "Coupling between coherent structures and incoherent turbulence," NORDITA and Linne Flow Centre Workshop on Turbulent Boundary Layers , KTH, Stockholm, April 29-30, (2010).

140. "Rational Design of Nanoparticles for Cancer Drug Delivery," 13th Asian Congress of Fluid Mechanics, Dhaka, Bangladesh, Dec. 17-21, (2010).

141. "Mechanics of Viscous Vortex Reconnection," 13th Asian Congress of Fluid Mechanics, Dhaka, Bangladesh, Dec. 17-21, (2010).

142. "The Looming Crisis in Air Traffic Capacity and Some Other Fluids Challenges," Symposium of Scholars, Texas Tech University, Lubbock, TX, Sept. 2-4, (2015).

143. "Order within Disorder of Fluid Turbulence," IMA Conference on Turbulence, Waves and Mixing In Honour of Lord Julian Hunt's 75th Birthday, King's College, Cambridge, UK, July 6-8 (2016).

144. "Realistic Drag Control," Symposium on the Physics and Control of Turbulent Shear Flow, City College of New York, New York City, NY, July 10-11 (2017).

145. "Realistic large-scale control for drag reduction in turbulent boundary layer." G. I. Taylor Medalist Symposium at Society of Engineering Science Technical Meeting, Northeastern University, Boston, MA, July 25-28 (2017).

146. "New Results in Wall Turbulence: Symmetry Approach to Modeling and Drag Control Mechanism." Frontiers in Turbulence: KRS70 at Denver Symposium, Denver, Co, November 17-18 (2017). "Some Topics in Fluid Mechanics." Keynote Lecture at Symposium on Fluid Mechanics, Mechanical Engineering Department, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, December 26, (2017).

147. "Order within Disorder of Fluid Turbulence and other topics of interest" Special Guest Lecture, BUET Grand (50^{th}) Reunion, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, January 5 (2018).

148. "Coherent structures and drag reduction." Opening Plenary Lecture, Control of Turbulent Friction Drag Conference, Beihang University, Beijing, China, August 1 (2018).

149. "Fundamentals of Vortex Dynamics." Tutorial for Ph.D. Students, Control of Turbulent Friction Drag Conference, Beihang University, Beijing, China, August 4 (2018)

INVITED SEMINARS (Recent; prior 200 not included)

201. Mechanical Engineering and Applied Mechanics, University of Michigan, October 6, 1997.
202. Dept. of Materials Science and Mechanics, Michigan State University, October 7, 1997.
203. Dept. of Nuclear Engineering and Engineering Physics, Univ. of Wisconsin, October 8, 1997.
204. Dept. of Mechanical Engineering, Northwestern University, October 9, 1997.
205. Dept. of Aerospace Engineering and Mechanics, University of Minnesota, October 10, 1997.
206. Joint Research Center of the E.C. ISIS Clean-Technology Sector Eng., EU, Ispra, Italy, March 31, 1998.
207. Dept. of Aerospace, Politecnico di Milano, Milan, Italy, April 1, 1998.
208. Dept. of Aerospace and Mechanical Engineering, University of Notre Dame, April21, 1998.
209. MMAE Dept., Illinois Institute of Technology, April 22, 1998.
210. Dept. of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, April 23, 1998.
211. School of Mechanical Engineering, Purdue University, April 24, 1998.

212. Aeronautical Information Technologies Division, NASA Ames Research Center, Moffet Field, California, June 12, 1998.
213. Dept. of Mechanical Engineering, Tokyo Institute of technology, Tokyo, Japan, October 06, 1998.
214. Dept. of Mechanical Engineering, Hokkaido University, Sapporo, Japan, October 07, 1998.
215. Dept. of Engineering, Cambridge University, February 4, 1999.
216. Dept. of Engineering, Cambridge University, February11, 1999.
217. Dept. of Applied Mathematics and Theoretical Physics, Cambridge University, February 19, 1999.
218. Department of Aeronautics, Imperial College, March 5, 1999.
219. European Union Joint Research Commission, Ispra, Italy, March 8, 1999.
220. Tokyo Institute of Technology, Japan, October 28, 1999.
221. Keio University, Japan, October 30, 1999.
222. Kyoto University, Japan, November 10, 1999.
223. Fluid Dynamics Seminar Series, Stanford University, February 8, 2000.
224. Institute for Theoretical Physics, University of California at Santa Barbara, February 10, 2000.
225. Dept. of Mechanical Engineering, University of California at Santa Barbara, October 30, 2000.
226. Dept. of Mechanical Engineering, Purdue University, November 2, 2001.
227. National Aerospace Laboratory, Tokyo, Japan, October 24, 2002.
228. Center for Turbulence Research, Stanford University, October 17, 2003.
229. Department of Mechanical Engineering, U Texas-Austin, December 9, 2005.
230. Department of Mechanical Engineering, MIT, March 14, 2006.
231. Division of Applied Mathematics, Brown University, March 15, 2006.
232. Department of Mech. & Aerospace Engineering, UC-Irvine, May 31, 2006.
233. Graduate Aeronautical Lab, CalTech, June 1, 2006.
234. Dept. of Mech. Engr., Johns Hopkins University, June 13, 2006.
235. Physics Dept. Colloquium, University of Houston, April 10, 2007
236. Dept. of Mechanics, Peking University, June 7, 2007.
237. Dept. of Aerospace Engr., Xinhua University, Beijing, June 8, 2007.
238. Dept. of Mechanical Engr., Virginia Tech, December7, 2007.
239. Dept. of Mechanical Engr., Islamic Univ. of Technology, Dhaka, December 25, 2007.
240. Bangladesh Academy of Science, Dhaka, Bangladesh, December 26, 2007.
241. Dept. of Aerospace Engr., Texas A&M University, September 25, 2008.

242. Dept. of Mech. Engr. & Mat. Sci., Rice University, October 1, 2008.
243. RISO National Lab, Copenhagen, Denmark, October 20, 2008
244. Center for Fluid Dynamics, Tech U Denmark, Copenhagen, October 21, 2008.
245. Department of Mechanical Engineering, Auburn University, November 13, 2008.
246. President's Lecture, moderated by Pres. J. Gogue, Auburn Univ., November 14, 2008.
247. GALCIT Seminar, Caltech, February 20, 2009.
248. Mechanical & Aerospace Sciences Department, USC, March 25, 2009.
249. Aerospace & Mechanical Engineering Dept., UCSD, April 6, 2009.
250. Mechanical Engineering Department, UCSB, April 15, 2009.
251. Mechanical & Aerospace Engineering Department, UCLA, May 1, 2009.
252. Petroleum Engineering Department, Texas A&M Univ., February 16, 2010.
253. Mechanical Engineering Department, Texas Tech University, April 1, 2010.
254. Aerospace & Mech. Engr. Dept., Ohio State Univ., April 23, 2010.
255. Aerospace Engr. & Engr. Mechanics Dept., UT-Austin, May 6, 2010.
256. Wind Energy Program, Texas Tech University, June 8, 2010.
257. MMM Division, NCAR Boulder Colorado, September 24, 2010.
258. Texas Tech University, October 2012.
259. Dept. of Mech. Engr., University of Puerto Rico at Mayagüez, March 21, 2013.
260. Dept. of Aero Engr., Iowa State University, October 17, 2013.
261. Dept. of Civil & Environmental Engr., Notre Dame University, March 31, 2015.
262. Dept. of Mech. & Industrial Engr., Northeastern University, November 13, 2015.
263. Dept. Aerospace Engineering, Tsinghua University, August 5. 2018
264. Dept. Agriculture Engineering, China Agricultural University, August 13, 2018.

FUNDED RESEARCH (FH as the only PI unless indicated otherwise)

1. UH Research Initiation Grant, April 1972 to August 1972 -- $3,581.
2. NSF Research Initiation Grant, 1972 -- $16,000.
3. ONR, February 1 to September 1, 1973 -- $20,000.
4. ONR, October 1, 1973 to June 30, 1974 -- $22,500.
5. ONR, July 1, 1974 to June 30, 1975 -- $25,000.
6. NSF, September 2, 1974 to February 29, 1976 -- $42,700.
7. NASA, Langley Research Center, October 1 to June 30, 1975 -- $20,000.
8. ONR, January 1, 1975 to June 30, 1975-- $10,000.
9. NASA, Langley Research Center, July 1, 1975 to June 30, 1976 -- $33,672.
10. ONR, July 1, 1975 to September 30, 1976 -- $43,750.

11. NSF, September 1, 1975 to August 31, 1976 -- $67,500.
12. NSF, September 1, 1976 to August 31, 1977 -- $86,500.
13. ONR, October 1, 1976 to September 30, 1977 -- $37,700.
14. NSF, January 1, 1977 to December 31, 1977 -- $69,300.
15. NSF, September 1, 1977 to August 31, 1978 -- $111,000.
16. NASA, Langley Research Center, December 1, 1977 to November 30, 1978 -- $35,000.
17. ONR, October 1, 1977 to September 30, 1978 -- $42,000.
18. NASA, Langley Research Center, December 1, 1978 to November 30, 1979 -- $35,000.
19. ONR, October 1, 1977 to September 30, 1978 -- $44.610.
20. NASA, Ames Research Center, September 1, 1978 to June 30, 1979 -- $65,623.
21. NSF, March 1, 1979 to August 31, 1981 -- $302,382.
22. ONR, October 1, 1979 to September 30, 1980 -- $46,000.
23. NASA, Ames Research Center, September 1, 1979 to June 30, 1980 -- $748,089.
24. AFOSR (with L.S.G. Kovasznay), September 1, 1979 to August 31, 1980 -- $56,038.
25. NASA Langley Research Center, December 1, 1979 to November 30, 1980 -- $40,000.
26. NASA, Ames Research Center, August 1, 1980 to July 31, 1981 -- $78,089.
27. ONR, October 1, 1980 to September 30, 1981 -- $48,000.
28. NASA, Lewis Research Center, July 1, 1981 to June 30, 1981 -- $55,983.
29. NSF, April 1, 1981 to December 31, 1981 -- $15,006.
30. NASA, Ames Research Center, July 1, 1981 to December 31, 1981 -- $40,619.
31. NSF, November 15, 1981 to November 14, 1984 -- $401,539.
32. ONR, October 1, 1981 to November 14, 1982 -- $55,008.
33. ONR, October 1, 1982 to September 30, 1985 -- $255,000.
34. NASA Lewis Research Center, March 25, 1983 to March 24, 1986 -- $95,608.
35. DOD Research Equipment Grant, Aug 1984 - July 1986 -- $690,000 (UH Matching - $330,000).
36. NASA Johnson Space Center 1984 - 87 -- $45,000.
37. NSF, U.S. - JAPAN Joint Collaboration Grant, March 1, 1985 - August 31, 1987 -- $36,350.
38. NASA Lewis Research Center 1985-89 -- $72,000.
39. NASA Ames Research Center 1985-89 -- $72,000.
40. ONR, October 1, 1985 TO September 30, 1986 -- $90,000.
41. NASA Lewis Research Center June 15, 1985 to June 14, 1986 -- $53,375.

42. NASA Ames Research Center 1986-89 -- $54,000.
43. NASA Ames Research Center 1986 -- $15,000.
44. NASA Lewis Research Center, June 15, 1986 to June 14, 1987 -- $60,000.
45. ONR, October 1, 1986 to September 30, 1987 -- $90,000.
46. EPRI, January 31, 1987 to December 30, 1989 -- $150,000.
47. NASA Ames Research Center 1987 -- $21,860.
48. ONR, June 1, 1987 to May 31, 1989 - $382,818.
49. ONR, October 1, 1987 to September 30, 1988 -- $100,000.
50. DOE, December 16, 1987 to December 15, 1990 -- $394,000.
51. NASA Lewis Research Center, Oct. 1, 1987 to Sept. 30, 1988 -- $50,000.
52. Advanced Research Program, State of Texas, June 1, 1988 to Sept. 30, 1992 -- $415,100.
53. NASA Ames Research Center, April 1, 1988 to March 31, 1990 -- $54,259.
54. ONR, October 1, 1988 to September 30, 1989 -- $100,000.
55. NCAR, March 1, 1988 to February 28, 1991 -- $34,200.
56. ONR, October 1, 1989 to September 30, 1990 -- $110,000.
57. ONR, October 1, 1990 to September 30, 1991 -- $118,000.
58. ONR, June 1, 1989 to May 31, 1993 -- $780,000.
59. NSF, US-Japan Program, May 1, 1990 to April 30, 1992 -- $27,000.
60. ONR, October 1, 1991 to September 30, 1992 -- $127, 000.
61. NSF (SGER), December 1, 1991 to November 30, 1992 -- $50,000.
62. ARL (Pennsylvania State University), (co-PI: R. Metcalfe) August 25, 1992 to December 31, 1992 -- $74,858.
63. AFOSR, March 1, 1992 to February 28, 1995 -- $590,228.
64. NASA-JSC, September 1, 1992 to August 30, 1995 -- $66,500.
65. ONR, Turbulence, October 1, 1992 to September 30, 1993 -- $100,000.
66. NSF, August 15, 1992, to July 31, 1995 -- $316,060.
67. ONR, March 15, 1993 to March 14, 1996 -- $684,600.
68. ONR, April 1, 1993 to March 31, 1996 -- $326,652.
69. NSF, Equipment, July 7, 1994 to June 30, 1996 -- $80,000.
70. ARL (Pennsylvania State University), (co-PI: R. Metcalfe) Sept. 1993 - June 1995 -- $187,000.
71. DARPA, (co-PI: M. Goldshtik, A. Jirnov) May 15, 1993 - Nov. 31, 1995 -- $758,000.
72. ONR Turbulence, Oct. 1, 1993 to Sept. 30, 1994 -- $100,000.
73. ONR, Wavelets, (co-PI: V. Zimin) February 21, 1994 to February 20, 1996 -- $378,000.

74. AFOSR, April 1, 1995 to March 31, 1998 -- $200,000.
75. NSF, Equipment, (50% UH Matching) August 1, 1994 to July 31, 1996 -- $770,222.
76. ARO, Aug. 1, 1994 to July 31, 1996 -- $147,797.
77. ARP, State of Texas, (co-PI: C. Dalton) Jan. 1, 1996 to Aug. 31, 1998 -- $157,000.
78. ATP, State of Texas, (co-PI: M. Goldshtik) Jan. 1, 1996 to Aug 31, 1998 -- $133,000.
79. NSF, August 1, 1996 to July 31, 1999 -- $250,000.
80. Shell Interdisciplinary Scholars Program, (co-PI: A. Ignatiev, V. Zimin) April 1, 1997 to Dec. 31, 1998 -- $150,000.
81. AFOSR, April 1, 1997 to Dec 31, 1997 -- $150,000.
82. AFOSR, Jan 1,1998 to Mar. 31, 2000 -- $298,489.
83. NSF, June 1, 1999 to May 31, 2002 -- $260,000.
84. NASA-URETI, August 19, 2002 to August 18, 2005 -- $223,750.
85. NSF, June 1, 2006 - May 31, 2009 -- $300,000.

SUPERCOMPUTER GRANTS

1. 3000 Cray Y-MP hours 1992 (NASA-Ames).
2. 2000 Cray Y-MP hours 1993 (NASA-Ames).
3. 250 Cray C90 hours 1994 (NASA-Ames).
4. 200 Cray C90 hours 1995 (NASA-Ames).
5. 560 Cray C90 hours 1996 (NASA-Ames).
6. 200 Cray C90 hours 1998 (NASA- Ames).
7. 150 Cray C90 hours 1999 (NASA- Ames).
8. 100 SGI O2K hours 2000 (NASA-Ames).
9. 200 Cray C90 hours 2000 (NASA-Ames).

SOME UNIV of HOUSTON SERVICE ACTIVITIES

Department

Department Advisory Committee (1972-73, 1976-78).

Lab and Shop Committee (1972-74, 1975-).

Undergraduate Affairs Committee (1971-72).

Graduate Affairs Committee (1974-76) (89-92).

Chairman Search Committee (1978-79).

Department Recruiting and Advisory Committee (1980-90).

Chairman, Kovasznay Distinguished Lecture Series (1980-04).

Design Faculty Search Committee (1992-93).

Chairman Search Committee (2000).

College

Interdisciplinary Committee on Fluid Mechanics (Chairman) 1971-88.

Graduate Standards Committee, 1972-74; (Chairman) 1974-76; 1981-84.

Graduate Faculty Board, 1974.

Ocean Systems Simulation Committee, 1972-76.

Interdisciplinary Committee on Acoustics, 1972-.

Computer Usage Committee, 1972-73.

Safety Committee, 1972-73.

Ad hoc Committee to review Industrial Engineering Department, 1977.

Planning and Development Committee, 1978-79.

Nominating Committee, 1978-79.

Dean's Advisory Committee, 1982-86.

Research Awards Committee 1983-86.

Chairman, Committee of Full Professors, 1984-85.

Space Committee, 2001.

Committee to Select College Nomination for Moores Scholar, 2005

Member, Committee of Full Profs, 2005.

Member, Tom Hsu Chair Selection Committee, 2006.

Chair, Bill Cook Scholar Selection Committee, 2006.

University

Mission Self-Study Task Force on "The University and its Facilities and Finances: Assessment of Resources and Opportunities," 1974-75.

Chairman, ad hoc Committee on University Finances, 1975-78.

Chancellor's Advisory Committee 1978-81.

Faculty Advisory Committee on Research 1980-82.

RIG/REG Program, Office of Sponsored Programs, 1981.

Member, Search Committee for Vice-Provost for Research and Graduate Studies (1995).

John & Rebecca Moores Scholars Selection Committee (1996)

Member, Academic Computing Advisory Committee (1997)

Member, University Research Council, (2000-2007)

Member, Purchasing and Plant Operations Committee (2005-)

Cullen Chair Committee (2005-)
Energy Committee (2006-)
Member, Houston Teachers Institute Faculty Advisory Council (2006-)
Search Committee for Dean of Engineering (2007)

TEXAS TECH UNIVRSITY SERVICE

Endowed Chair Review Committee (2012-13)
PhD Standards Review Committee (2012-13)
Tenure Criteria Review Committee (2012-13)
Director of Proposed ERC on Wind Energy & Clean Water (2012-)
Chief Scientist and Senior Advisor of the National Wind Resource Center (2013)
Chair of ME Dept. Chair Search Committee (2013-)
Chairman, Maddox Chairs Review Committee, Texas Tech University, (2015-)
Chairman, Dept. of Mechanical Engineering Chair Search Committee (2015-2016)

SUMMARY OF SOME PROFESSIONAL SERVICE

National Academy of Engineering:

Member, Mech. Engr. (Sec. 10) Peer Committee (2004-07)
Secretary, Mech. Engr. section (2006-08)
Member, Sec 10 Search Committee (2007)
Vice-chair, Mech. Engr. section (2008-10)
Chair, Mech. Engr. section (2010-12)
Member, NAE President Selection Committee (2012)
Member, Charles Stark Draper Prize Committee (2011-2013)
Past-Chair, Mech. Engr. section (2012-2014)

American Physical Society:

Fluid Dynamics Prize Committee, (1991-93), (2000).
Nominating Committee, APS/DFD: Vice-chair (1997-98) ; Chair (1998-99, 09-10).
Otto Laporte Award Committee, Vice-Chair (2001-02), Chair (2002-03).
Vice-chair, DFD & Chair of Fellows Selection Committee (2000-01)
Chair-elect, DFD (2001-02)
Chair, DFD (2002-03)
Past-Chair, DFD (2003-04)
Host, Annual Meeting of Division of Fluid Dynamics (APS), U Houston (1983).

Organizing Committee, Annual Meeting of APS/DFD, Austin (2002).

Organizing Committee, Annual Meeting of APS/DFD, San Antonio (2008).

American Institute of Aeronautics & Astronautics:

Member, Fluid Dynamics Technical Committee, AIAA (1997-2001).

Technical Program Chair, 30th AIAA Fluid Dynamics Conference, Norfolk, VA, June (1999).

Chair, Fluid Dynamics Award Committee, AIAA (1999, 2000).

Member, AMT Technical Committee, (2001-04).

Member, AIAA Fellow Grade Selection Committee, (2001-03).

Chair, Fellows Selection Committee, Aerospace Sciences, AIAA (2005-).

The Academy of Medicine, Engineering & Science of Texas (TAMEST):

Member, 1st O'Donnell Prize Committee, (2005-06)

Member, 2007 TAMEST Annual Meeting Organizing Committee

Moderator, Engineering Plenary Session, 2007 Annual Conference, Austin.

Member, TAMEST Board, 2009-12.

The World Academy of Sciences (TWAS):

Member, Engr. Sciences Prize Committee (2003-7, 2008-2010)

Chair, Engr. Sciences Prize Committee (2010-13)

COMMUNITY SERVICE

Yoga teacher