Wei Shyy

Professor Wei Shyy is the President of The Hong Kong University of Science and Technology (HKUST). He first joined HKUST in August 2010 as Provost and Chair Professor of Mechanical and Aerospace Engineering. Prior to this, he was Clarence L. "Kelly" Johnson Collegiate Professor and Chairman of the Department of Aerospace Engineering of the University of Michigan. He was previously employed by the University of Florida and GE Research and Development Center in Schenectady, New York.

He is the author or a co-author of five books and numerous journal and conference articles dealing with computational and modeling techniques involving fluid flow, biological and low Reynolds number aerodynamics, combustion and propulsion, and a broad range of topics related to aerial and space flight vehicles. He was the Principal Investigator of several multi-institutional research projects, funded by the US Government and industries, on future space transport, bio-inspired flight, and computational aeronautical science. He is General Editor of the Cambridge Aerospace Book Series published by the Cambridge University Press, Co-Editor-in-Chief of Encyclopedia of Aerospace Engineering, a major reference work published by Wiley-Blackwell. He also serves as editor and member of editorial board of numerous peer reviewed journals.

Professor Shyy is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) and the American Society of Mechanical Engineers (ASME). He has received awards for his research and professional contributions, including the AIAA 2003 Pendray Aerospace Literature Award, the ASME 2005 Heat Transfer Memorial Award, and The Engineers' Council (Sherman Oaks, CA) 2009 Distinguished Educator Award. In 2021, the French Government made him an Officer of the Legion of Honor. His professional views have been quoted in various news media, including the New York Times, the Washington Post, the Associated Press, the USA Today, the Christian Science Monitor, the New Scientist, and the US News & World Report. Professor Shyy has supervised and hosted many PhD students as well as postdoctoral fellows and visiting scholars.

As an academic leader, Professor Shyy has consistently advocated broadening the educational scope and approach, advancing research and knowledge transfer to help address global challenges. He is committed to promoting university's societal engagement and independent, entrepreneurial spirit. He has also led efforts in fostering diverse and inclusive campus cultures to better reflect and support the university's overall mission.

Motivated by his appreciation of the intrinsic beauty of natural flyers, Professor Shyy is an avid bird photographer. Some of his photos are compiled in eBooks, entitled "Flight InSight" and "Flapping".

CITIZENSHIP

U.S.A.

EDUCATION

B.S. (1977), Power Mechanical Engineering, National Tsing-Hua University, Taiwan.

M.S.E. (1981) / Ph.D. (1982), Aerospace Engineering, University of Michigan.

EMPLOYMENT

Employment History

July 1977	-	June 1979:	Military Service (Taiwan)
Aug 1979	-	May 1982:	Graduate Research Assistant, University of Michigan
May 1982	-	Apr 1983:	Post-doctoral Research Scholar, University of Michigan, and Consultant to Ford Motor Company and General Electric Company
May 1983	-	Aug 1988:	Research Scientist, General Electric Research and Development Center, Schenectady, NY
Jan 1987	-	Jun 1987:	Visiting Professor of Aeronautics and Astronautics, National Cheng-Kung University, Taiwan
Aug 1988	-	Jul 1992:	Associate Professor of Aerospace Engineering, Mechanics and Engineering Science, University of Florida
Jul 1992	-	Jun 2002:	Professor of Aerospace Engineering, Mechanics and Engineering Science, University of Florida
Jan 1996	-	Jun 2002:	Professor and Chairman of Aerospace Engineering, Mechanics and Engineering Science Department, University of Florida
Jul 2002	-	Jun 2004:	Professor and Chairman of Mechanical and Aerospace Engineering Department (merged between Mechanical Engineering Department, and Aerospace Engineering, Mechanics and Engineering Science Department), University of Florida
Jul 2004	-	Dec 2004:	Distinguished Professor and Chairman of Mechanical and Aerospace Engineering Department, University of Florida
Jan 2005	-	Aug 2010:	Clarence L. “Kelly” Johnson Collegiate Professor and Chairman of Aerospace Engineering Department, University of Michigan
Fall 2010	-	Aug 2013:	Provost, Hong Kong University of Science and Technology
Sep 2013	-	Aug 2018:	Executive Vice-President & Provost, Hong Kong University of Science and Technology
Feb 2018	-	Aug 2018:	Acting President, Hong Kong University of Science and Technology
Sep 2018	-	Present:	President, Hong Kong University of Science and Technology

Consulting Experiences

- BDM Federal
- Chung Shan Institute of Science and Technology (Taiwan)
- Dominion Engineering Works
- Ford Scientific Research Laboratory
- Ford Powertrain Division
- GE Research and Development Center
- GE Lighting
- GE Aircraft Engines
- Gould, Lewis & Proctor
- Industrial Technology Research Institute (Taiwan)
- Lockheed Martin / GE Aerospace
- NASA
- OSRAM Sylvania
- Pratt & Whitney
- National Science Foundation (Committee of Visitors)
- Prairie View A&M University
- ZONA Technology

Teaching Experiences

- Undergraduate: Engineering Analysis: Differential Equations II; Fluid Mechanics; Aerospace Propulsion
- Graduate: Numerical Methods; Fluid Mechanics; Turbulent Fluid Flow; Thermo-fluid Dynamics for Space Applications; Computational Fluid Dynamics; Viscous Flows

Ph.D. Students Advised as Chair or Co-chair (the year the student graduated)

1. S.-J. Liang (1993) A Study of Free and Moving Boundary Problems Involving Thin Crystal Growth
2. S. Thakur (1993) Treatment of Convection in Sequential Solvers for Navier-Stokes Equations
3. J.A. Wright (1993) A Pressure-Based Composite Grid Method for Complex Fluid Flows
4. E.L. Blosch (1994) Pressure-Based Methods on Single-Instruction Stream / Multiple-Data Stream Computers
5. H.S. Udaykumar (1994) A Mixed Eulerian-Lagrangian Approach for the Simulation of Interfacial Phenomena in Solidification Processing
6. R. Smith (1994) A Viscous Flow Based Membrane Wing Model
7. J. Liu (1996) Multiblock Computations and Turbulence Modeling for Turbomachinery Flows
8. H. Ouyang (1996) Multilevel Simulation and Modeling of Vertical Bridgman Growth of Single Crystals and Solidification of Binary Alloys
9. M. Rao (1996) Computational Modeling of Phase Change, Convective Heat Transfer and Free Surface Flow in Solidification Processing
10. V. Krishnamurty (1996) Effect of Compressibility on the Turbulence Structure and Its Modeling
11. J.K. Clutter (1997) Computation of High Speed Reacting Flows
12. H-C Kan (1997) Computational Study of Leukocyte Rheology Based on a Multilayer Model (co-chair)
13. A. Martin (1997) Multiscale Modeling of Heat Transfer Enhancement with Fiber Array Inserts (co-chair)
14. N. C. Prewitt (1999) Parallel Computing of Overset Grids for Aerodynamic Problems with Moving Objects
15. G. L. Abate (1999) Experimental Investigations of Shock Waves Undergoing Sudden Expansion in a Confined Chamber

16. N. Papila (2001) Neural Network and Polynomial-Based Response Surface Techniques for Supersonic Turbine Design Optimization
17. G. Chochua (2002) Computations of Gas Annular Damper Seal Flows
18. M. Francois (2002) Computations of Drop Dynamics with Heat Transfer
19. D. Yu (2002) Viscous Flow Computations with the Lattice-Boltzmann Equation Method (co-chair)
20. I. Senocak (2002) Computational Methodology for the Simulation of Turbulent Cavitating Flows.
21. N. N'dri (2002) Multi-Scale Computation in Hemodynamics (co-chair)
22. Y. Lian (2003) Membrane and Adaptively-Shaped Wings for Micro Air Vehicle
23. R. Vaidyanathan (2004) Investigation of Navier-Stokes Code Verification and Design Optimization
24. R. Kamakoti (2004) Computational Aeroelasticity Using a Pressure-Based Method
25. J. Wu (2005) Filter-Based Modeling for Turbulent Cavitating Flow Computations
26. Y. Utturkar (2005) Computational Modeling of Thermodynamic effects of Cryogenic Cavitation
27. M. Popescu (2005) A Finite-Volume, Cartesian Grid Method for Computational Aeroacoustics
28. B. Jayaraman (2006) Computational Modeling of Glow Discharge-Induced Fluid Dynamics
29. R.K. Singh (2006) Three-Dimensional Marker-Based Multiphase Flow Computation Using Adaptive Cartesian Grid Techniques
30. D. Viieru (2006) Flapping and Fixed Wing Aerodynamics of Low Reynolds Number Flight Vehicles
31. J. Chao (2006) Multi-Scale Computational Fluid Dynamics with Interfaces
32. E. Uzgoren (2006) Adaptive, Multi-Domain Techniques for Two-Phase Flow Computations
33. T. Goel (2007) Multiple Surrogates and Error Modeling in Optimization of Liquid Rocket Propulsion Components (co-chair)
34. Y. Mack (2007) CFD-Based Surrogate Modeling of Liquid Rocket Engine Components via Design Space Refinement and Sensitivity Assessment
35. X. Zhang (2009) Multiscale Modeling of Li-Ion Cells: Mechanics, Heat Generation and Electrochemical Kinetics (co-chair)
36. S. Chimakurthi (2009) A Computational Aeroelasticity Framework for Analyzing Flapping Wings (co-chair)
37. E. Sozer (2010) Modeling of Gaseous Reacting Flow and Thermal Environment of Liquid Rocket Injectors
38. C.-C. Tseng (2010) Modeling of Turbulent Cavitating Flows
39. J. Sim (2010) 3-D Adaptive Eluerian-Lagrangian Method for Multiphase Flows with Spacecraft Applications
40. Y.-C. Cho (2010) Low-Reynolds Number Adaptive Flow Control Using Dielectric Barrier Discharge Actuator
41. C.-K. Kang (2011) Aerodynamics, Scaling, and Performance of a Flexible Flapping Wing
42. P.C. Trizila (2011) Aerodynamics of Low Reynolds Number Rigid Flapping Wing Under Hover and Freestream Conditions
43. E. A. Hassan (2012) Multi-fluid Dynamics for Supersonic Jet-and-Crossflows and Liquid Plug Rupture
44. D. Yeo (2013) Aerodynamic Sensing for Autonomous Unmanned Aircraft Systems (co-chair)
45. W. Du (2013) Multi-Scale Modeling, Surrogate-Based Analysis, and Optimization of Lithium-Ion Batteries for Vehicle Applications
46. C-K Kuan (2013) Parallel processing of Eulerian-Lagrangian, Cell-Based Adaptive Method for Moving Boundary Problems
47. P. Tan (2016) Investigation of Non-Aqueous Lithium-Oxygen Batteries for Performance Improvement (co-chair)
48. J.-J. Fu (2017) Effects of Wing Morphology on Flapping-Wing Aerodynamics (co-chair)
49. C. Hefler (2019) Inherent Aspects of Root Flapping Tandem Wing Arrangements in Nature: Forewing – Hindwing Interactions in Dragonfly Flight (co-chair)

RESEARCH

Professor Shyy's research is centered on computational modeling techniques, which include continuum and lattice Boltzmann formulations. He has made substantial contributions to the formulations of the techniques needed for treating complex geometry, coupled multi-physics, moving and deformable boundaries, and fluid-fluid/fluid-structure interactions. A key feature is that his interest encompasses fundamental and application, including (i) development of original and novel numerical and modeling techniques for multidisciplinary problems related to thermo-fluid dynamics; (ii) computational and modeling techniques typically developed to a point that they have a comprehensive capability to tackle original physical issues; (iii) consistent emphasis on close collaboration between theory/computation and experiment; (iv) extension of scientific research to address engineering issues arising from optimization, assessment and design tool development.

Overall, he has made substantial contributions to air and space flight vehicle research and development, fluid machinery design optimization, and computational methods for complex unsteady flows. To name but a few, he

- demonstrated, by combined computational modeling and experiment, and in collaboration with students and colleagues, the importance of membrane wings and flexible structures for low-Reynolds-number flight; also offered new insight into issues such as tip vortices, downwash, and kinematics associated with flapping wing vehicles.
- developed, with the collaborators, and working jointly with NASA Marshall and Boeing-Rocketdyne, a multidisciplinary approach (combining numerical simulations, surrogate models, and optimization techniques) to improve the efficiency and design of turbines for reusable launch vehicles (RLVs), including supersonic turbines for NASA's second generation RLVs and Moon/Mars endeavors. The tools developed have been applied by researchers in many other fields.
- developed the CONCERT computer code, the first 3D numerical model used by GE Aircraft Engines in the 1990s for gas turbine combustor flow analysis.
- made original contributions to computational moving boundary problems arising from engineering and science, including multiphase flows and drop collision/impact dynamics, cavitation for rocket and underwater propulsion, fluid-structures interactions for aerial vehicles and sail dynamics, spacecraft thermal management, cellular and bio-mechanical processes, and advanced materials processing.
- developed, in collaboration with colleagues of the Hong Kong University of Science and Technology, University of Michigan and General Motors, advanced predictive capability of and physical insight into materials sciences, mechanics, thermo-transport and multi-scale modeling of modern battery technologies for vehicle development.
- pioneered development of three-dimensional Navier-Stokes-based computer tools for hydraulic turbine flow analyses, including distributors, runners and draft tubes. Supervised Ph.D. studies and developed original cavitation models needed for, e.g., liquid rocket engines, hydraulic turbines and underwater propulsion.
- analyzed hydrocarbon emissions in spark-ignition engines which impacted IC engine design and changed the standard picture of when, where, and how the emissions occur. While previous wisdom contended that these occurred in the quench layer, he proved that these occur in crevices and oil layers, which was a completely new idea, and was confirmed experimentally.
- contributed, in collaboration with colleagues of Pratt & Whitney and Dresser-Rand, to turbomachinery heat transfer, including those related to leading edge film cooling, cavity heat transfer, supersonic nozzle heat transfer, and modern seal operation.

- investigated high temperature (about 6,000 K) heat transfer for high pressure discharge lamp, based on a model accounting for combined radiation, convection and conduction in equilibrium plasma and neutral fluids. The research has contributed to product design of GE and other industrial entities.
- conducted extensive research in solidification processing, materials manufacturing, and crystal growth, at both macroscopic and microscopic (morphological) levels in the areas of materials sciences. Spanning the scales from surface tension, conduction to convection and overall crystal sizes, his research has elucidated the rich and complex thermal physics associated with various processing techniques (including continuous casting, Bridgman, float zone, electron beam melting, plasma coating).
- contributed to issues in biomechanics including deformation and recovery of cellular (leukocyte) dynamics through capillary scale geometries, cell-receptor dynamics associated with cell adhesion and movement, liquid plug propagation in airways, and fluid flow through stenosed artery and bypass graft in an anastomosis.
- analyzed, with collaborators of GE Aerospace (later became part of Lockheed-Martin) capillary-pumped loop thermal management for spacecraft, and conducted original research on fluid physics, materials processing, and multiphase fluid dynamics for micro-gravity space environments.

As part of his professional activities, in 2002, he led a group to establish the Institute for Future Space Transport, a seven-university consortium funded by NASA, under the University Research, Engineering and Technology Institutes program (now called the Constellation University Institutes Program, CUIP). In 2006, he served as the principal investigator to lead the establishment of the Michigan/AFRL/Boeing Collaborative Center in Aeronautical Sciences (MAB-CCAS), a five-year endeavor sponsored by the Air Force Research Laboratory. In 2007, he was the principal investigator of a Multidisciplinary University Research Initiative (MURI) project, sponsored by DoD, on Biologically-Inspired, Anisotropic Flexible Wing for Optimal Flapping Flight. The foundations of Alcoa, Ford, and TRW selected him as a recipient for their unrestricted research grants, with no string attached and no deliverables required.

AWARDS & HONORS

- Fellow of American Institute of Aeronautics and Astronautics (AIAA) & American Society of Mechanical Engineers (ASME)
- General Electric Research and Development Center: Publications Award (1986)
- Chinese Society of Mechanical Engineers (Taiwan): Research Paper Award (1987)
- AIAA: Service Citation (1993)
- NASA Kennedy Space Center: Certificate of Appreciation (1999) & Productivity Award (1999)
- AIAA Pendray Aerospace Literature Award (2003) with the citation “For significant contributions to research and publications in computation and modeling techniques for a broad range of aerospace applications.”
- ASME Heat Transfer Memorial Award (2005), with the citation “For outstanding and archival contributions to the thermal sciences in a number of areas including modeling of phase-change and moving boundary heat transfer problems, convective flows in complicated domain, air-breathing and rocket combustion, materials thermal processing, and turbo-machinery flows."
- Listed in Who's Who in America (since 1993), Who's Who in Science and Technology (since 1993), Who's Who in the World (since 1994), International Directory of Distinguished Leadership (since 1988), etc.
- Distinguished Alumnus Award, Department of Power Mechanical Engineering, National Tsing-Hua University (2009).

- The Engineers' Council (Sherman Oaks, CA): 2009 Distinguished Educator Award, with the citation "In Recognition of Outstanding Contributions to the Engineering Profession as a Teacher, Researcher, Mentor to Students and Staff, and Leader in Working Together with Industry." http://www.engineerscouncil.org/
- The article entitled Effects of Nucleus on Leukocyte Recovery, published in *Annals of Biomedical Engineering*, Vol. 27, (1999), pp. 648-655, was featured as the Cover Article of the issue.
- The article entitled Evaluation of geometric conservation law using pressure-based fluid solver and moving grid technique published in *International Journal of Numerical Methods for Heat & Fluid Flow* (2004) was chosen as the Outstanding Paper Award Winner at the Literati Club Awards for Excellence 2005.
- The article entitled Multi-scale Thermo-fluid Transport in Porous Media**,** published in *International Journal of Numerical Methods for Heat & Fluid Flow* was chosen as a Highly Commended Award Winner at the Literati Network Awards for Excellence 2009.
- The article entitled Flow Structures of Gaseous Jets Injected into Water for Underwater Propulsion, published in *Acta Mechanica Sinica*, Vol. 27, (2011), pp.461-472, was featured as the Focused Paper of the issue.
- The article entitled Effects of Flexibility on the Aerodynamic Performance of Flapping Wings, published in *Journal of Fluid Mechanics*, Vol. 689, (2011), pp. 32-74, was featured as the Cover Article of the issue.
- Distinguished Alumnus Award, National Tsing-Hua University (2013).
- University of Michigan 2013 Alumni Merit Award for the Department of Aerospace Engineering.
- Officer of the Legion of Honor by the French government (2021).

OTHER PROFESSIONAL ACTIVITIES

Editorship

- *Cambridge University Press: Cambridge Aerospace Book Series*: General Editor (2000-present); Cambridge Elements (Aerospace Engineering) (2020-present)
- *ASME Applied Mechanics Reviews*: Associate Editor (2002-2010)
- *Computer Modeling in Engineering & Sciences*: Associate Editor (2002-2004)
- *Acta Mechanica Sinica:* Associate Editor (2004-2007); Co-Editor-in-Chief (2008-2018)
- *Encyclopedia of Aerospace Engineering:* Co-Editor-in-Chief (2007-present)
- *Communications in Computational Physics:* Associate Editor (2009-present)

Member of Editorial Boards

- *AIAA Journal*
- *Progress in Aerospace Sciences*
- *Numerical Heat Transfer*: An International Journal of Computation and Methodology (Part A: Applications, Part B: Fundamentals)
- *Progress in Computational Fluid Dynamics*: An International Journal
- *International Journal for Numerical Methods in Heat and Fluid Flow*
- *International Journal for Numerical Methods in Fluids*
- *Chinese Journal of Aeronautics*
- *Transactions of the Aeronautical and Astronautical Society of the Republic of China* (Taiwan)
- *Frontiers of Energy and Power Engineering in China*
- *International Journal of Fluid Machinery and Systems*
- *Journal of Computational Surgery*

Selected Summary of Professional and Public Services

- NASA Consortium of Computational Fluid Dynamics for Propulsion Design (1990-1994)
- ASME Heat Transfer Division, Aerospace Heat Transfer (K-12) Committee (1994-2000)
- National Science Foundation (Committee of Visitors, 1997)
- Director of NASA Florida Space Grant Consortium (1998-2000)
- University of Florida Presidential Search Advisory Committee (1999)
- APS Fluid Dynamics Prize Selection Committee (Vice Chair, 1999-2000; Chair, 2000-2001)
- AIAA Pendray Literature Award Selection Committee (2003-2008)
- Universities Space Research Association (USRA) International Working Group (2003-2004)
- Air Force Research Laboratory- Air Vehicles Directory Awards Selection Committee (2005)
- University of Michigan College of Engineering Dean's Search Advisory Committee (2005)
- Referee of the State Natural Science Award of the People's Republic of China (2006)
- Panelist of National Research Council's Space Studies Board: Committee on Meeting the Workforce Needs for the National Vision for Space Exploration (2006)
- University of Michigan Department of Mechanical Engineering Chair Search Advisory Committee (2007)
- External Advisory Committee of Department of Aeronautics and Astronautics, University of Washington (2007-present)
- Naval Research Laboratory External Review Panelist of Materials and Chemistry Technology S&T Program (2008)
- School of Aerospace Engineering, Technical University of Delft: International Peer Review Committee (2008)
- Department of Mechanical Engineering Academic Advisory Committee, Hong Kong University of Science and Technology (2009 - 2010)
- Department of Aerospace Engineering, Korea Advanced Institute of Science and Technology: Global Advisory Board (2011, 2016)
- Member of Higher Education Evaluation and Accreditation Council of Taiwan, for National Taiwan University (December 2011)
- Member of Board of Directors, Hong Kong Science and Technology Parks Corporation (July 2012 - 2018)
- Member of University Advisory Board, Coursera (2013-2016)
- Member of University Grants Committee (Hong Kong) (January 2014 – January 2018)
- Member of Board of Governors of Technion, Israel Institute of Technology (June 2015 - present)

Patent

Shyy, W., Francois, M., and Chung, J. N., 2003, U.S. Patent No. 6,598,409: Thermal Management Device.

PUBLICATIONS

Books Authored

1. Shyy, W. (author), *Computational Modeling for Fluid Flow and Interfacial Transport*, Elsevier, Amsterdam, The Netherlands, (1994, revised printing 1997); Dover, New York, (2006) xviii + 504 pages. {Reviews of this book: W.B.J. Zimmerman, *The Chemical Engineering Journal*, Vol. 55, (1994); P.L. Roe, *AIAA Journal*, Vol. 32, (1994); B. Huang, *Drying Technology*, Vol. 12, (1994); L.A. Bertram, *Applied Mechanics Reviews*, Vol. 48, (1995); A. Iserles, *Journal of Fluid Mechanics*, Vol 305, (1995); H. Muthsam, *Monatshefte fur Mathematik* (1996)}
2. Shyy, W., Udaykumar, H.S., Rao, M.M., and Smith, R.W. (authors), *Computational Fluid Dynamics with Moving Boundaries*, Taylor & Francis, Washington, DC, (1996, revised printing 1997, 1998 & 2001); Dover, New York, (2007), xviii + 285 pages {Reviews of this book: S. Bhaduri, *Applied Mechanics Reviews*, Vol. 50, (1997); D. Kothe, *AIAA Journal*, Vol. 36 (1998)}.
3. Shyy, W., Thakur, S.S., Ouyang, H., Liu, J., and Blosch, E. (authors), *Computational Techniques for Complex Transport Phenomena*, Cambridge University Press, New York, hardcover (1997), paperback (2005), xviii + 321 pages. {Review of this book : W.M. Worek, Applied Mechanics Reviews, Vol. 52, (1999); Mathematics Abstract, April (1999); AIChE J.}
4. Shyy, W., Lian, Y., Tang, J., Viieru, D., and Liu, H. (authors), *Aerodynamics of Low Reynolds Number Flyers*, Cambridge University Press, New York, (2008, 2009, 2011; paperback 2011). {Review of this book: M. Platzer, AIAA Journal, Vol. 47, (2009)}.
5. Shyy, W., Aono, H., Kang, C.-K., and Liu, H. (authors), *An Introduction to Flapping Wing Aerodynamics*, Cambridge University Press, New York (2013).
6. Hefler, C., Kang, C.-K., Qiu, H., and Shyy, W. (authors), *Distinct Aerodynamics of Insect-Scale Flight*, Cambridge University Press, New York (2021).

Edited Books/Proceedings/Special Issues

1. Chao, C. C., Orszag, S. A., and Shyy, W. (editors): *Recent Advances in Computational Fluid Dynamics*, Lecture Notes in Engineering, Vol. 43, Springer-Verlag, New York, (1989) vi + 529 pages.
2. Atreya, A., Gritzo, L., Saltiel, C., and Shyy, W. (editors): *Fire and Combustion System*, Volume 2 of the Proceedings of the Heat Transfer Division, 1995 ASME International Mechanical Engineering and Exposition, HTD-Vol. 317-2, New York, (1995), pp. 1-212.
3. Shyy, W., and Narayanan, R. (editors): *Fluid Dynamics at Interface*, Cambridge University Press, (1999), paperback (2010), xvi + 461 pages.
4. Shyy, W. (editor): *Applied Mechanics Reviews* - Special Issue on *Animal Locomotion in Fluids, and Its Mimicry*, July (2005).
5. Abate, G., Ol, M., and Shyy, W. (editors): Special Section on *Biologically Inspired Aerodynamics*, *AIAA Journal*, Vol. 46, (2008), pp. 2113-2190.
6. Blockley, R., and Shyy., W. (editors-in-chief): *Encyclopedia of Aerospace Engineering*, printed version published by Wiley-Blackwell in November 2010, 9 volumes, 5648 pages; online version updated annually.

Refereed Articles in Journals/Books

1. Shyy, W., and Adamson, T.C., Jr., "Analysis of Hydrocarbon Emissions from Conventional Spark-Ignition Engines," *Combustion Science and Technology*, Vol. 33, (1983), pp. 245-260.
2. Shyy, W., "Determination of Relaxation Factors for High Cell Peclet Number Flow Simulation," *Computer Methods in Applied Mechanics and Engineering*, Vol. 43, (1984), pp. 221-230.
3. Shyy, W., "A Study of Finite Difference Approximations to Steady-State, Convection-Dominated Flow Problems," *Journal of Computational Physics*, Vol. 57, (1985), pp. 415-438.

4. Shyy, W., Tong, S.S., and Correa, S.M., "Numerical Recirculating Flow Calculation Using a Body-fitted Coordinate System," *Numerical Heat Transfer*, Vol. 8, (1985), pp. 99-113.
5. Shyy, W., "A Numerical Study of Annular Dump Diffuser Flows," *Computer Methods in Applied Mechanics and Engineering*, Vol. 53, (1985), pp. 47-65.
6. Shyy, W., "Numerical Outflow Boundary Condition for Navier-Stokes Flow Calculations by a Line Iterative Method," *AIAA Journal*, Vol. 23, (1985), pp. 1847-1848.
7. Correa, S.M., Drake, M. C., Pitz , R. W., and Shyy, W., "Prediction and Measurement of Non-Equilibrium Turbulent Diffusion Flame," *Twentieth Symposium (International) on Combustion*, The Combustion Institute, Pittsburgh, PA, (1985), pp. 337-343.
8. Braaten, M. E., and Shyy, W., "A Study of Recirculating Flow Computation Using Body-fitted Coordinates: Consistency Aspects and Mesh Skewness," *Numerical Heat Transfer*, Vol. 9, (1986), pp. 559-574.
9. Braaten, M. E., and Shyy, W., "Comparison of Iterative and Direct Solution Methods for Viscous Flow Calculations in Body-fitted Coordinates," *International Journal for Numerical Methods in Fluids*, Vol. 6, (1986), pp. 325-349.
10. Drake, M. C., Pitz, R. W., and Shyy, W., "Conserved Scalar Probability Density Functions in a Turbulent Jet Diffusion Flame," *Journal of Fluid Mechanics*, Vol. 171, (1986), pp. 24-51.
11. Shyy, W., and Vu, T.C., "A Numerical Study of Incompressible Navier-Stokes Flow through Rectilinear and Radial Cascade of Turbine Blades," *Computational Mechanics*, Vol. 1, (1986), pp. 269-279.
12. Shyy, W., and Braaten, M. E., "Three-Dimensional Analysis of the Flow in a Hydraulic Turbine Draft Tube," *International Journal for Numerical Methods in Fluids*, Vol. 6, (1986), pp. 861-882.
13. Shyy, W., "A General Coordinate System Method for Computing Transport Phenomena," *Heat Transfer 1986*, (C. L. Tien, V. P. Carey and J. K. Ferrell (eds.)), Hemisphere, Washington, D.C.,Vol.2, (1986), pp. 397-402.
14. Shyy, W., "An Adaptive Grid Method for Navier-Stokes Flow Computation," *Applied Mathematics and Computation*, Vol. 21, (1987), pp. 201-219.
15. Shyy, W., "An Adaptive Grid Method for Navier-Stokes Flow Computation II: Grid Addition," *Applied Numerical Mathematics*, Vol. 2, (1986), pp. 9-19.
16. Shyy, W., "Effects of Open Boundary on Incompressible Navier-Stokes Flow Computation: Numerical Experiments," *Numerical Heat Transfer*, Vol. 12, (1987), pp. 157-178.
17. Correa, S. M., and Shyy, W., "Computational Models and Methods for Continuous Gaseous Turbulent Combustion," *Progress in Energy and Combustion Science*, Vol. 13, (1987), pp. 249-292.
18. Drake, M. C., Correa, S. M., Pitz, R. W., Shyy, W., and Fenimore, C. P., "Superequilibrium and Thermal Nitric Oxide Formulation in Turbulent Diffusion Flames," *Combustion and Flame*, Vol. 69, (1987), pp. 347-365.
19. Shyy, W., Braaten, M. E., and Sober, J. S., "A Three-Dimensional Grid Generation, Procedure for Gas Turbine Combustor Flow Computations," *Journal of the CSME*, Vol. 8, (1987), pp. 1-9; also AIAA Paper No. 87-2024, *AIAA 25th Aerospace Sciences Meeting*, January 12-15, Reno, NV.
20. Braaten, M. E., and Shyy, W., "A Study of Pressure Correction Methods with Multigrid for Viscous Flow Calculations in Non-Orthogonal Curvilinear Coordinates," *Numerical Heat Transfer*, Vol. 11, (1987), pp. 417-442.
21. Shyy, W., "Adaptive Computation, Grid Smoothness and Numerical Boundary Treatment for Recirculating Navier-Stokes Flows," *Journal of the CSME*, Vol. 8, (1987), pp. 139-154.
22. Shyy, W., Tswei, Y-M., and Lee, D., "A Study of Lagrangian Models for Calculating Dilute Particle Flow, Part 1: Basics," *Transactions of AARC*, Vol. 20, (1987), pp. 83-98.
23. Vu, T. C., and Shyy, W., "Navier-Stokes Computation of Radial Inflow Turbine Distributor," *ASME Journal of Fluids Engineering*, Vol. 110, (1988), pp. 29-32.

24. Shyy, W., and Dakin, J.T., "Three-Dimensional Natural Convection in a High-Pressure Mercury Discharge Lamp," *International Communications in Heat and Mass Transfer*, Vol. 15, (1988), pp. 51-58.
25. Shyy, W., "Computation of Complex Fluid Flows Using Adaptive Grid Method," *International Journal for Numerical Methods in Fluids*, Vol. 8, (1988), pp. 475-489.
26. Shyy, W., Correa, S. M., and Braaten, M. E., "Computation of Flow in a Gas Turbine Combustor," *Combustion Science and Technology*, Vol. 58, (1988), pp. 97-117; earlier version entitled, "Computational Models for Gas-Turbine Combustors," published in R.M.C. So, J. H. Whitelaw and H. C. Mongia (eds.), *Calculations of Turbulent Reactive Flows*, ASME, New York (1986), pp. 141-184.
27. Shyy, W., "A Numerical Study of Two-Dimensional Compressible Navier-Stokes Flows," *Numerical Heat Transfer*, Vol. 14, (1988), pp. 323-341.
28. Shyy, W., Braaten, M. E., and Burrus, D. L., "Study of Three-Dimensional Gas-Turbine Combustor Flows," *International Journal of Heat and Mass Transfer*, Vol. 32, (1989), pp. 1155-1164.
29. Dakin, J. T., and Shyy, W., "The Prediction of Convection and Additive Demixing in Vertical Metal Halide Discharge Lamps," *Journal of the Electrochemical Society*, Vol. 136, (1989), pp. 1210-1215.
30. Shyy, W., and Chang, P. Y., "Transport Process in Horizontal Discharge Lamp under Microgravity," *International Communications in Heat and Mass Transfer*, Vol. 16, (1989), pp. 713-722.
31. Chang, P. Y., Shyy, W., and Dakin, J. T., "A Study of Three-Dimensional Natural Convection in High Pressure Mercury Lamps, Part I: Parametric Variations with Horizontal Mounting," *International Journal of Heat and Mass Transfer*, Vol. 33, (1990), pp. 483-493.
32. Shyy, W., and Chang, P. Y., "A Study of Three-Dimensional Natural Convection in High Pressure Mercury Lamps, Part II: Wall Temperature Profiles and Inclination Angles," *International Journal of Heat and Mass Transfer*, Vol. 33, (1990), pp. 495-506.
33. Vu, T. C., and Shyy, W., "Viscous Flow Analysis as a Design Tool for Hydraulic Turbine Components," ASME *Journal of Fluids Engineering*, Vol. 112, (1990), pp. 5-11.
34. Vu, T. C., and Shyy, W., "Navier-Stokes Flow Analysis for Hydraulic Turbine Draft Tubes," *ASME Journal of Fluids Engineering*, Vol. 112, (1990), pp. 199-204.
35. Shyy, W., and Chang, P. Y., "Effects of Convection and Electric Field on Thermofluid Transport in Horizontal High Pressure Mercury Arcs," *Journal of Applied Physics*, Vol. 67, (1990), pp. 1712-1719.
36. Shyy, W., and Chen, M.-H., "Steady-State Natural Convection with Phase Change," *International Journal of Heat and Mass Transfer*, Vol. 33, (1990), pp. 2545-2563.
37. Shyy, W., and Chen, M.-H., "Effect of Prandtl Number on Buoyancy-Induced Transport Process with and without Solidification," *International Journal of Heat and Mass Transfer*, Vol. 33, (1990), pp. 2565-2578.
38. Shyy, W., and Vu, T. C., "On the Adoption of Velocity Variable and Grid System for Fluid Flow Computation in Curvilinear Coordinates," *Journal of Computational Physics*, Vol. 92, (1991), pp. 82-105.
39. Chang, P. Y., and Shyy, W., "Adaptive Grid Computation of Three-Dimensional Natural Convection in Horizontal High Pressure Mercury Lamps," *International Journal for Numerical Methods in Fluids*, Vol. 12, (1991), pp. 143-160.
40. Chen, M-H., Hsu, C.-C., and Shyy, W., "Assessment of TVD Schemes for Inviscid and Turbulent Flow Computation," *International Journal for Numerical Methods in Fluids*, Vol. 12, (1991), pp. 161-177.
41. Shyy, W., and Chen, M.-H, "Interaction of Thermocapillary and Natural Convection Flows during Solidification: Normal and Reduced Gravity Conditions," *Journal of Crystal Growth*, Vol. 108, (1991), pp. 247-261.

42. Shyy, W., "Structure of an Adaptive Grid Computational Method from the Viewpoint of Dynamic Chaos," *Applied Numerical Mathematics*, Vol. 7, (1991), pp. 263-285.
43. Shyy, W., "Structure of an Adaptive Grid Computational Method from the Viewpoint of Dynamic Chaos, Part II: Grid Addition and Probability Distribution," *Applied Numerical Mathematics*, Vol. 7, (1991), pp. 523-545.
44. Chang, P.Y., and Shyy, W., "Three-Dimensional Heat Transfer and Fluid Flow in the Modern Discharge Lamp," *International Journal of Heat and Mass Transfer*, Vol. 34, (1991), pp. 1811-1822.
45. Shyy, W., and Chen, M-H., "Double-Diffusive Flow in Enclosures," *Physics of Fluids A*, Vol. 3, (1991), pp. 2592-2607.
46. Shyy, W., Thakur, S., and Wright, J., "Second-Order Upwind and Central Difference Schemes for Recirculating Flow Computation," *AIAA Journal*, Vol. 30, (1992), pp. 923-932.
47. Shyy, W., and Liang, S.-J., "Interaction of Time Stepping and Convection Terms for Unsteady Flow Simulation," *Computational Mechanics*, Vol. 9, (1992), pp. 285-304.
48. Gingrich, W.K., Cho, Y.I., and Shyy, W., "Effect of Aspect Ratio on Laminar Heat Transfer Behavior of a Non-Newtonian Fluid in an Electronics Coldplate," *International Communications in Heat and Mass Transfer*, Vol. 19, (1992), pp. 311-325.
49. Shyy, W., Pang, Y., Hunter, G.B., Wei, D.Y., and Chen, M.-H., "Modeling of Turbulent Transport and Solidification during Continuous Ingot Casting," *International Journal of Heat and Mass Transfer*, Vol. 35, (1992), pp. 1229-1245.
50. Shyy, W., Mittal, R., and Udaykumar, H.S., "Control of Longitudinal Oscillations in a Constant Area Combustor: Numerical Simulation," *Combustion and Flame*, Vol. 89, (1992), pp. 363-366.
51. Shyy, W., Gingrich, W.K., and Gebhart, B., "Adaptive Grid Solution for Buoyancy Induced Flow in Vertical Slots," *Numerical Heat Transfer*, Part A, Vol. 22, (1992), pp. 51-70.
52. Chang, P.Y., and Shyy, W., "A Study of Three-Dimensional Natural Convection in High Pressure Mercury Lamps, Part III: Arc Centering by Magnetic Field," *International Journal of Heat and Mass Transfer*, Vol. 35, (1992), pp. 1857-1864.
53. Shyy, W., Chen, M-H., Mittal, R., and Udaykumar, H.S., "On the Suppression of Numerical Oscillation Using a Non-Linear Filter," *Journal of Computational Physics*, Vol. 102, (1992), pp. 49-62.
54. Shyy, W., and Rao, M., "Convection Treatment for High Rayleigh Number Laminar Natural Convection Calculation," *Numerical Heat Transfer, Part B*, Vol. 22, (1992), pp. 367-374.
55. Shyy, W., Chen, M.-H., and Sun, C.-S., "Pressure-Based Multigrid Algorithm for Flow at All Speeds," *AIAA Journal*, Vol. 30, (1992), pp. 2660-2669; also *AIAA 30th Aerospace Sciences Meeting*, Paper No. AIAA-92-0548.
56. Gingrich, W.K., Cho, Y.I., and Shyy, W., "Effect of Shear Thinning on Laminar Heat Transfer Behavior in a Rectangular Duct," *International Journal of Heat and Mass Transfer*, Vol. 35, (1992), pp. 2823-2836.
57. Shyy, W., Pang, Y., Chen, M-H., and Wei, D.Y., "Heat Transfer and Convection Characteristics of Superheated Turbulent Jet Interacting with Solid Objects," *International Journal of Heat and Mass Transfer*, Vol. 35, (1992), pp. 2837-2848.
58. Shyy, W., "Applications of Body-Fitted Coordinates in Transport Processes: Numerical Computation and Physical Interpretation," *Advances in Transport Processes*, Vol. IX, (1993), pp. 1-56, A. S. Mujumdar and R. A. Mashelkar (eds.), Elsevier, Amsterdam, The Netherlands.
59. Shyy, W., and Sun, C-S., "Development of a Pressure-Correction/Staggered-Grid Based Multigrid Solver for Incompressible Recirculating Flows," *Computers and Fluids*, Vol. 22, (1993), pp. 51-76.
60. Shyy, W., Pang, Y., Hunter, G.B., Wei, D.Y., and Chen, M.-H., "Effect of Turbulent Heat Transfer on Continuous Ingot Solidification," *ASME Journal of Engineering Materials and Technology*, Vol. 115, (1993), pp. 8-16; also *Heat and Mass Transfer in Solidification Processing*, S.G. Advani and C. Beckermann (eds.), pp. 79-92, ASME, (1991).

61. Shyy, W., Sun, C-S., Chen, M-H., and Chang, K.C., "Multigrid Computation for Turbulent Recirculating Flows in Complex Geometries," *Numerical Heat Transfer, Part A*, Vol. 23, (1993), pp. 79-98.
62. Thakur, S., and Shyy W., "Development of High Accuracy Convection Schemes for Sequential Solvers," *Numerical Heat Transfer, Part B*, Vol. 23, (1993), pp. 175-199.
63. Shyy, W., and Vu, T.C., "Modeling and Computation of Flow in a Passage with 360-Degree Turning and Multiple Airfoils," *ASME Journal of Fluids Engineering*, Vol. 115, (1993), pp. 103-108; also ASME Paper 91-GT-162, at *International Gas Turbine and Aeroengine Congress and Exposition*, Orlando, FL, June 3-6 (1991).
64. Shyy, W., Udaykumar, H.S., and Liang, S.-J., "An Interface Tracking Method Applied to Morphological Evolution during Phase Change," *International Journal of Heat and Mass Transfer*, Vol. 36, (1993), pp. 1833-1844; also *AIAA 27th Thermophysics Conference*, Paper No. 92-2902, (1992).
65. Shyy, W., and Chen, M.-H., "A Study of Buoyancy-Induced and Thermocapillary Flow of Molten Alloy," *Computer Methods in Applied Mechanics and Engineering*, Vol. 105, (1993), pp. 333-358; also *AIAA 28th Aerospace Sciences Meeting*, Paper No. AIAA-90-0255, (1990).
66. Wright, J., and Shyy, W., "A Pressure-Based Composite Grid Method for the Incompressible Navier-Stokes Equations," *Journal of Computational Physics*, Vol. 107, (1993), pp. 225-238; also *28th AIAA/SAE/ASME/ASEE Joint Propulsion Conference*, Paper No. 92-3641, (1992).
67. Liang, S.-J., and Shyy, W., "Dynamic Simulation of Thin Fibre Growth," *Journal of Materials Processing & Manufacturing Science*, Vol. 2, (1993), pp. 189-215; also *Heat Transfer in Melting, Solidification, and Crystal Growth-1993*, I.S. Habib and S. Thynell (eds.), HTD-Vol. 234, pp. 21-33, ASME, New York, (1993).
68. Vu, T.C., and Shyy, W., "3-D Viscous Flow Analysis for the GAMM Workshop Draft Tube and Francis Runner," *3D-Computation of Incompressible Internal Flows*, G. Sottas and I.L. Ryhming (eds.), pp. 155-162, Vieweg, Braunschweig, Germany (1993).
69. Thakur, S., and Shyy, W., "Some Implementational Issues of Convection Schemes for Finite Volume Formulations," *Numerical Heat Transfer, Part B*, Vol. 24, (1993), pp. 31-55.
70. Shyy, W., Udaykumar, H.S., and Liang, S.-J., "Quasiequilibrium Meniscus Formation with Hysteresis Effects," *Physics of Fluids A*, Vol. 5, (1993), pp. 2610-2623; also *AIAA 27th Thermophysics Conference*, Paper No. 92-2903, (1992).
71. Shyy, W., and Rao, M., "Simulation of Transient Natural Convection Around an Enclosed Vertical Channel," *ASME Journal of Heat Transfer*, Vol. 115, (1993), pp. 946-954.
72. Shin, S., Cho, Y.I., Gingrich, W.K., and Shyy, W., "Numerical Study of Laminar Heat Transfer with Temperature Dependent Fluid Viscosity in a 2:1 Rectangular Duct," *International Journal of Heat and Mass Transfer*, Vol. 36, (1993), pp. 4365-4373.
73. Blosch, E.L., Shyy, W., and Smith, R., "The Role of Mass Conservation in Pressure-Based Algorithms," *Numerical Heat Transfer*, Part B, Vol.24, (1993), pp. 415-429.
74. Shyy, W., Thakur, S., and Udaykumar, H.S., "A High Accuracy Sequential Solver for Simulation and Active Control of Longitudinal Combustion Instability," *Computing Systems in Engineering*, Vol. 4, (1993), pp. 27-41; also Invited Presentation in *Second U.S. National Congress on Computational Mechanics*, August 16-18, (1993), Washington, D.C.
75. Shyy, W., Liu, J., and Wright, J.A., "Pressure-Based Viscous Flow Computation Using Multi-Block Overlapped Curvilinear Grids," *Numerical Heat Transfer, Part B*, Vol. 25, (1994), pp. 39-59.
76. Shyy, W., and Rao, M.M., "Enthalpy Based Formulations for Phase-Change Problems with Application to G-Jitter," *Microgravity Science and Technology*, Vol. VII, (1994), pp. 41-49; also *AIAA 28th Thermophysics Conference*, Paper No. 93-2831, (1993).
77. Vu, T.C., and Shyy, W., "Performance Prediction by Viscous Flow Analysis for Francis Turbine Runner," *ASME Journal of Fluids Engineering*, Vol. 116, (1994), pp. 116-120.

78. Shyy, W., Liang, S.-J., and Wei, D.Y., "Effect of Dynamic Perturbation and Contact Condition on Edge-Defined Fibre Growth Characteristics," *International Journal of Heat and Mass Transfer*, Vol. 37, (1994), pp. 977-987.
79. Shyy, W., and Thakur, S., "Development of a Controlled Variation Scheme in a Sequential Solver for Recirculating Flows, Part I: Theory and Formulation," *Numerical Heat Transfer, Part B*, Vol. 25, (1994), pp. 245-272.
80. Shyy, W., and Thakur, S., "Development of a Controlled Variation Scheme in a Sequential Solver for Recirculating Flows, Part II: Applications," *Numerical Heat Transfer, Part B*, Vol. 25, (1994), pp. 273-286.
81. Shyy, W., and Burke, J., "A Study of Iterative Characteristics of Convective-Diffusive and Conjugate Heat Transfer Problems," *Numerical Heat Transfer, Part B*, Vol. 26, (1994), pp. 21-37.
82. Shyy, W., "Modeling of Transient Two-Phase Heat Transfer for Spacecraft Thermal Management," *Microgravity Science and Technology*, Vol. VII, (1994), pp. 219-227.
83. Blosch, E.L., and Shyy, W., "Sequential Pressure-Based Navier-Stokes Algorithms on SIMD Computers: Computational Issues," *Numerical Heat Transfer, Part B*, Vol. 26, (1994), pp. 115-132; earlier version entitled, "Parallel Efficiency of Sequential Pressure-Based Navier-Stokes Algorithms on the CM-2 and MP-1 SIMD Computers," *AIAA 32nd Aerospace Sciences Meeting*, Paper No. 94-0409, (1994).
84. Stuttaford, P.J., Anghaie, S., and Shyy, W., "Computation of High Temperature Near Wall Heat Transfer Using an Enthalpy Balancing Scheme," *International Journal of Heat and Mass Transfer*, Vol. 38, (1995), pp. 55-64.
85. Hung, C.I., Shyy, W., and Ouyang, H., "Transient Natural Convection and Conjugate Heat Transfer in a Crystal Growth Device," *International Journal of Heat and Mass Transfer*, Vol. 38, (1995), pp. 701-712.
86. Udaykumar, H.S., and Shyy, W., "Development of a Grid-Supported Marker Particle Scheme for Interface Tracking," *Numerical Heat Transfer, Part B*, Vol. 27, (1995), pp. 127-153; also *AIAA 11th Computational Fluid Dynamics Conference*, Paper No. 93-3384, (1993).
87. Udaykumar, H.S., and Shyy, W., "Simulation of Morphological Instabilities During Solidification; Part I: Conduction and Capillarity Effects," *International Journal of Heat and Mass Transfer*; Vol. 38, (1995), pp. 2057-2073; shorter version in C. Beckermann, H.P. Wang, L.A. Bertram, M.S. Sohal and S.I. Guceri (eds) *Transport Phenomena in Solidification*, ASME HTD-Vol. 284, (1994), pp. 177-189.
88. Shyy, W., "Elements of Pressure-Based Computational Algorithms for Complex Fluid Flow and Heat Transfer," *Advances in Heat Transfer*, Vol. 24, (1994), pp. 192-275, J.P. Hartnett, T.F. Irvine, Jr., and Y.I. Cho (eds.), Academic Press, New York.
89. Shyy, W., and Smith, R., "Computation of Laminar Flow and Flexible Structure Interaction," *Computational Fluid Dynamics Review*, (1995), pp. 777-796, M. Hafez and K. Oshima (eds.), Wiley, Chichester, U.K.
90. Shyy, W., and Rao, M.M., "Calculation of Meniscus shapes and Transport Processes in Float Zone," *International Journal of Heat and Mass Transfer*, Vol. 38, (1995) pp. 2281-2295.
91. Shyy, W., Rao, M., and Udaykumar, H.S., "Scaling Procedure and Finite Volume Computations of Phase-Change Problems with Convection," *Engineering Analysis with Boundary Elements*, Vol. 16, (1995), pp. 123-147.
92. Smith, R.W., and Shyy, W., "A Computational Model of Flexible Membrane Wings in Steady Laminar Flow," *AIAA Journal*, Vol. 33, (1995), pp. 1769-1777.
93. Smith, R.W., and Shyy, W., "Computation of Unsteady Laminar Flow Over a Flexible Two-Dimensional Membrane Wing," *Physics of Fluids*, Vol. 7, (1995) pp. 2175-2184; similar content entitled, "Coupled Computations of a Flexible Membrane Wing and Unsteady Viscous Flow," presented at the *26th AIAA Fluid Dynamics Conference*, Paper No. 95-2261, June 19-22, (1995).

94. Wright, J., and Shyy, W., "Numerical Simulation of Unsteady Convective Intrusions in a Thermohaline Stratification," *International Journal of Heat and Mass Transfer*; Vol. 39, (1996), pp. 1183-1201.
95. Udaykumar, H.S., Shyy, W., and Rao, M.M., "ELAFINT: A Mixed Eulerian-Lagrangian Method for Fluid Flow with Complex and Moving Boundaries," *International Journal for Numerical Methods in Fluids*, Vol. 22, (1996), pp. 691-712; also *AIAA 6th AIAA/ASME Joint Thermophysics and Heat Transfer Conference*, Paper No. 94-1996, June 20-23, (1994), also a shorter version published in the *Proceedings of the 14th International Conference on Numerical Methods in Fluid Dynamics*, Bangalore, India, July (1994).
96. Thakur, S., Shyy, W., and Liou, M.-S., "Convection Treatment and Pressure Splitting for Sequential Solution Procedures. Part I: Theory and One-Dimensional Test Cases," *Numerical Heat Transfer, Part B*, Vol. 29, (1996) pp. 1-27.
97. Thakur, S., Shyy, W., and Liou, M.-S., "Convection Treatment and Pressure Splitting for Sequential Solution Procedures. Part II: Pressure-Based Algorithm," *Numerical Heat Transfer; Part B*, Vol. 29, (1996), pp. 29-42; earlier version entitled, "Investigation of Convection and Pressure Treatment with Splitting Techniques," has been published as NASA TM 106868 & ICOMP-95-3, Cleveland, OH, (1995).
98. Ouyang, H., and Shyy, W., "Multi-Zone Simulation of Bridgman Growth Process of -NiAl Crystal," *International Journal of Heat and Mass Transfer*, Vol. 39, (1996), pp. 2039-2051.
99. Blosch, E.L., and Shyy, W., "Scalability and Performance of Data-Parallel Pressure-Based Multigrid Methods for Viscous Flows," *Journal of Computational Physics*, Vol. 125, (1996), pp. 338-353.
100. Segal, C., and Shyy, W., "Energetic Fuels for Combustion Applications," *ASME Journal of Energy Resources Technology* (Invited Paper to Commemorate the 75th Anniversary of the Fuels and Combustion Technology (FACT) Division of ASME), Vol. 118, (1996), pp. 180-186.
101. Liu, J., and Shyy, W., "Assessment of Grid Interface Treatments for Multi-Block Incompressible Viscous Flow Computation," *Computers and Fluids*, Vol. 25, (1996), pp. 719-740.
102. Smith, R.W., and Shyy, W., "Computation of Aerodynamic Coefficients for a Flexible Membrane Airfoil in Turbulent Flow," *Physics of Fluids*, Vol. 8, (1996), pp. 3346-3353.
103. Thakur, S., Wright, J.A., Shyy, W., Liu, J., Ouyang, H., and Vu, T., "Development of Pressure-Based Composite Multigrid Methods for Complex Fluid Flows," *Progress in Aerospace Sciences*, Vol. 32, (1996), pp. 313-375.
104. Shyy, W., "The Computer-Aided Analysis of Directional Solidification Processes," JOM (*Publication of The Minerals, Metals & Materials Society*), (1996) March Issue, pp. 24-29.
105. Comini, G., Minkowycz, W.J., and Shyy, W., "General Algorithms for the Finite Element Solution of Incompressible Flow Problems Using Primitive Variables," in *Advances in Numerical Heat Transfer*., W.J. Minkowycz and E.M. Sparrow (editors), Vol. 1, (1997), pp. 201-239, Taylor & Francis, Washington, DC.
106. Shyy, W., Liu, J., and Ouyang, H. "Multi-Resolution Computations for Fluid Flow and Heat/Mass Transfer," in *Advances in Numerical Heat Transfer*, W.J. Minkowycz and E.M. Sparrow (editors), Vol. 1, (1997), pp. 137-169, Taylor & Francis, Washington, DC.
107. Segal, C., Friedauer, M.J., Udaykumar, H.S., Shyy, W., and Marchand, A.P. "Ignition Characteristics of a New High-Energy Density Fuel in High Speed Flows," *AIAA Journal of Propulsion and Power*, Vol. 13, (1997), pp. 246-249.
108. Rao, M.M., and Shyy, W. "Moving Boundary Computation of the Float Zone Process," *International Journal for Numerical Methods in Engineering*, Vol. 40, (1997), pp. 1231-1261; also in *Transport Phenomena in Materials Processing and Manufacturing*, ASME HTD-Vol. 336/FED-Vol. 240, pp. 295-303 (1996).

109. Ouyang, H., Shyy, W., Levit, V., and Kaufman, M.J. "Simulation and Measurement of a Vertical Bridgman Growth System for -NiAl Crystal," *International Journal of Heat and Mass Transfer*, Vol. 40, (1997), pp. 2293-2305, also in *Transport Phenomena in Materials Processing and Manufacturing*, ASME HTD-Vol. 336/FED-Vol. 240, pp. 73-83 (1996).
110. Smith, R.W., and Shyy, W., "Incremental Potential Flow Based Membrane Wing Element," *AIAA Journal*, Vol. 35, (1997), pp. 782-788.
111. Clutter, J.K., and Shyy, W. "Computation of High Speed Reacting Flow for Gun Propulsion Applications," *Numerical Heat Transfer, Part A*, Vol. 31, (1997), pp. 355-374.
112. Ouyang, H., and Shyy, W., "Numerical Simulation of CdTe Vertical Bridgman Growth," *Journal of Crystal Growth*, Vol. 173, (1997), pp. 352-366.
113. Li, S., and Shyy, W., "On Invariant Integrals in the Marguerre-von Karman Shallow Shell," *International Journal of Solids and Structures*, Vol. 34, (1997), pp. 2927-2944.
114. Krishnamurty, V.S., and Shyy, W., "Study of Compressibility Modifications to the k-ε Turbulence Model," *Physics of Fluids*, Vol. 9, (1997), pp. 2769-2788.
115. Udaykumar, H.S., Shyy, W., Segal, C., and Pal, S. "Phase Change Characteristics of Energetic Fuels in Turbulent Reacting Flows," *Numerical Heat Transfer, Part A*, Vol. 32, (1997), pp. 97-109.
116. Shyy, W., Jenkins, D.A., and Smith, R.W., "Study of Adaptive Shape Airfoils at Low Reynolds Number in Oscillatory Flows," *AIAA Journal*, Vol. 35, (1997), pp. 1545-1548.
117. Jayaraman, V., Udaykumar, H.S., and Shyy, W. "Adaptive Unstructured Grid for Three-Dimensional Interface Representation," *Numerical Heat Transfer, Part B*, Vol. 32, (1997), pp. 247-265.
118. Udaykumar, H.S., Kan, H.-C., Shyy, W., and Tran-Son-Tay, R., "Multiphase Dynamics in Arbitrary Geometries on Fixed Cartesian Grids," *Journal of Computational Physics*, Vol. 137, (1997), pp. 366-405.
119. Krishnamurty, V.S., and Shyy, W., "Effect of Wall Roughness on the Flow Through Converging-Diverging Nozzles," *Journal of Propulsion and Power*, Vol. 13, (1997), pp. 753-762.
120. Shyy, W., and Krishnamurty, V., "Compressibility Effect in Modeling Complex Turbulent Flows," *Progress in Aerospace Sciences*, Vol. 33, (1997), pp. 587-645.
121. Krishnamurty, V.S., and Shyy, W., "Computational Analysis of Hypersonic Turbulent Flows Over a Projectile with Aerospike," *AIAA Journal*, Vol. 36, (1998), pp. 163-172.
122. Krishnamurty, V.S., and Shyy, W., "Treatment of Inviscid Fluxes in Compressible Turbulent Flow Computations," *Numerical Heat Transfer, Part B*, Vol. 33, (1998), pp. 139-152.
123. Kan, H.-C., Udaykumar, H.S., Shyy, W., and Tran-Son-Tay, R., "Hydrodynamics of a Compound Drop with Application to Leukocyte Modeling," *Physics of Fluids*, Vol. 10, (1998), pp. 760-774.
124. Martin, A., Saltiel, C., and Shyy, W., "Frictional Losses and Convection Heat Transfer in Sparse, Periodic Cylinder Arrays in Cross Flow," *International Journal of Heat and Mass Transfer*, Vol. 41, (1998), pp. 2383-2397.
125. Tran-Son-Tay, R., Kan, H.-C., Udaykumar, H.S., Damay, E., and Shyy, W. "Rheological Modeling of Leukocytes," *Medical & Biological Engineering & Computing*, Vol. 36, (1998), pp. 246-250.
126. Martin, A., Saltiel, C., and Shyy, W., "Heat Transfer Enhancement with Porous Inserts in Recirculating Flows," *ASME Journal of Heat Transfer*, Vol. 120, (1998), pp. 458-467.
127. Martin, A., Saltiel, C., Chai, J., and Shyy, W., "Convective and Radiative Internal Heat Transfer Augmentation with Fiber Arrays," *International Journal of Heat and Mass Transfer*, Vol. 41, (1998), pp. 3431-3440.
128. Thakur, S., Shyy, W., Udaykumar, H.S., and Hill, L., "Multiblock Interface Treatments in a Pressure-Based Flow Solver," *Numerical Heat Transfer, Part B*, Vol. 33, (1998), pp. 367-396.

129. Clutter, J.K., and Shyy, W. "Numerical Methods for Treating Disparate Scales in High-Speed Reacting Flows," *Numerical Heat Transfer; Part B*, Vol. 34, (1998), pp. 165-189.
130. Mei, R., and Shyy, W., "On the Finite Difference-Based Lattice Boltzmann Method in Curvilinear Coordinates," *Journal of Computational Physics*, Vol. 143, (1998), pp. 426-448.
131. Shyy, W., Pal, S., Udaykumar, H.S., and Choi, D. "Structured Moving Grid and Geometric Conservation Laws for Fluid Flow Computation," *Numerical Heat Transfer, Part A*, Vol. 34, (1998), pp. 369-397.
132. Thakur, S.S., Wright, J.A., and Shyy, W., "Convective Film Cooling Over a Representative Turbine Blade Leading-Edge," *International Journal of Heat and Mass Transfer*, Vol. 42, (1999), pp. 2269-2285.
133. Kan, H.-C., Udaykumar, H.S., Shyy, W., and Tran-Son-Tay, R., "Numerical Analysis of the Deformation of an Adherent Drop Under Shear Flow," *ASME Journal of Biomechanical Engineering*, Vol. 121, (1999), pp. 160-169.
134. Shyy, W., Klevebring, F., Nilsson, M., Sloan, J., Carroll, B., and Fuentes, C. "A Study of Rigid and Flexible Low Reynolds Number Airfoils," *Journal of Aircraft*, Vol. 36, (1999), pp. 523-529.
135. Shyy, W., He, X., and Thakur, S.S. "Jets and Free Stream Interaction Around a Low-Reynolds Number Airfoil Leading Edge," *Numerical Heat Transfer, Part A*, Vol. 35, (1999), pp. 891-902.
136. Udaykumar, H.S., Mittal, R., and Shyy, W., "Computation of Solid-Liquid Phase Fronts in the Sharp Interface Limit on Fixed Grids," *Journal of Computational Physics*, Vol. 153, (1999), pp. 535-574.
137. Mei, R., Luo, L., and Shyy, W., "An accurate Boundary Treatment in the Lattice Boltzmann Method," *Journal of Computational Physics*, Vol. 155, (1999), pp. 307-330, also *AIAA 14th Computational Fluid Dynamics Conference*, Paper No. 99-3353 (1999).
138. Kan, H.-C., Shyy, W., Udaykumar, H.S., Vigneron, P., and Tran-Son-Tay, R., "Effects of Nucleus on Leukocyte Recovery," *Annals of Biomedical Engineering*, Vol. 27, (1999), pp. 648-655, (featured as the cover article of the issue).
139. Ye, T., Mittal, R., Udaykumar, H.S., and Shyy, W., "An Accurate Cartesian Grid Method for Viscous Incompressible Flows with Complex Immersed Boundaries," *Journal of Computational Physics*, Vol. 156, (1999), pp. 209-240.
140. Shyy, W., Berg, M., and Ljungqvist, D., "Flapping and Flexible Wings for Biological and Micro Air Vehicles," *Progress in Aerospace Sciences*, Vol. 35, (1999), pp. 155-205.
141. Prewitt, N., Belk, D., and Shyy, W., "Parallel Computing of Overset Grids for Aerodynamic Problems with Moving Objects," *Progress in Aerospace Sciences*, Vol. 36, (2000), pp. 117-172.
142. Shyy, W., and Udaykumar, H.S., "Multiscale Modeling for Solidification Processing," in B. Sunden and G. Comini (editors): *Computational Analysis of Convection Heat Transfer*, WIT Press, Southampton, U.K. (2000), pp. 141-198.
143. He, X., Senocak, I., Shyy, W., Thakur, S.S., and Gangadharan, S. "Evaluation of Laminar-Turbulent Transition and Equilibrium Near Wall Turbulence Models," *Numerical Heat Transfer*, Part A, Vol. 37, (2000), pp. 101-112.
144. Madsen, J.I., Shyy, W., and Haftka, R.T., "Response Surface Techniques for Diffuser Shape Optimization," *AIAA Journal*, Vol. 38, (2000), pp. 1512-1518.
145. Croce, G., Comini, G., and Shyy, W., "Incompressible Flow and Heat Transfer Computations Using a Continuous Pressure Equation and Non-Staggered Grids," *Numerical Heat Transfer*, Part B, Vol. 38, (2000), pp. 291-307.
146. Mei, R., Shyy, W., Yu, D., and Luo, L. "Lattice Boltzmann Method for 3-D Flows with Curved Boundary" *Journal of Computational Physics*, Vol. 161, (2000), pp. 680-699, also *AIAA 38th Aerospace Sciences Meeting & Exhibit*, Paper No. 2000-0822 (2000).

147. Clutter, J.K., Mikolaitis, D.W., and Shyy, W., "Reaction Mechanism Requirements in Shock-Induced Combustion Simulations," *Proceedings of the Combustion Institute,* Vol. 28, (2000), pp. 663-669, *Twenty-Eighth International Symposium on Combustion*, Edinburgh, Scotland, July 30 – August 4th.
148. Chochua, G., Shyy, W., Thakur, S., Brankovic, A., Lieneau, J., Porter, L., and Lischinsky, D., "A Computational and Experimental Investigation of Turbulent Jet and Crossflow Interaction," *Numerical Heat Transfer*, Vol. 38, (2000), pp. 557-572.
149. Kamakoti, R., Berg, M., Ljungqvist, D., and Shyy, W., "A Computational Study for Biological Flapping Wing Flight," *Transactions of the Aeronautical and Astronautical Society of the Republic of China (Taiwan)*, Vol. 32, (2000), pp. 265-279.
150. Shyy, W., Tucker, P.K., and Vaidyanathan, R., "Response Surface and Neural Network Techniques for Rocket Engine Injector Optimization," *Journal of Propulsion and Power,* Vol. 17, (2001), pp. 391-401; also *AIAA/SAE/ASME/ASEE 35th Joint Propulsion Conference*, Paper No. 99-2455, June 20-24 (1999).
151. Shi, W., Shyy, W., and Mei, R., "Finite Difference-Based Lattice Boltzmann Method for Inviscid Compressible Flows," *Numerical Heat Transfer,* Part B, Vol. 40, (2001), pp. 1-21.
152. Levin, O., and Shyy, W., "Optimization of a Flexible Low Reynolds Number Airfoil," *Computer Modeling in Engineering & Sciences*, Vol. 2, (2001), pp. 523-536; also presented in the *AIAA 39th Aerospace Sciences Meeting & Exhibit*, Paper No. 2001-0125 (2001).
153. Hudson, M.K., Luchini, C., Clutter, J.K., and Shyy, W., "The Evaluation of Computational Fluid Dynamics Methods for Design of Muzzle Blast Suppressors for Firearms Propellants," *Propellants, Explosives, Pyrotechnics*, Vol. 26, No. 4, (2001), pp. 201-208.
154. Ye, T., Shyy, W., and Chung, J.C., "A Fixed-Grid, Sharp-Interface Method for Bubble Dynamics and Phase Change," *Journal of Computational Physics*, Vol. 174, (2001), pp. 781-815.
155. Shyy, W., Papila, N., Vaidyanathan, R., and Tucker, P.K., "Global Design Optimization for Aerodynamics and Rocket Propulsion Components," *Progress in Aerospace Sciences,* Vol. 37, (2001), pp. 59-118.
156. Shyy, W., and Ebert, M.P., "Heat Transfer and Fluid Flow in Rotating Sealed Cavities," *Advances in Heat Transfer*, Vol. 35, (2001), pp. 173-248, J.P. Hartnett, T.F. Irvine, Jr., Y.I. Cho and G.A. Greene (eds.), Academic Press, New York.
157. Shyy, W., Francois, M., Udaykumar, H.S., N'dri N., and Tran-Son-Tay, R., "Moving Boundaries in Micro-Scale Biofluid Dynamics," *Applied Mechanics Reviews*, Vol. 54, (2001), pp. 419-453.
158. Wang, G., Senocak, I., Shyy, W., Ikohagi, T., and Cao, S., "Dynamics of Attached Turbulent Cavitating Flows," *Progress in Aerospace Sciences*, Vol. 37, (2001), pp. 551-581.
159. Abate, G., and Shyy, W., "Dynamic Structure of Confined Shocks Undergoing Sudden Expansion," *Progress in Aerospace Sciences*, Vol. 38, (2002), pp. 23-42.
160. Pan, K.-L., Shyy, W., and Law, C.K., "An Immersed-Boundary Method for The Dynamics of Premixed Flame," *International Journal of Heat and Mass Transfer*, Vol. 45, (2002), pp. 3503-3516.
161. Prewitt, N.C., Belk, D.M., and Shyy, W., "Improvements in Parallel Chimera Grid Assembly," *AIAA Journal*, Vol. 40, (2002), pp. 497-500.
162. Shyy, W., Garbey, M., Appukuttan, A., and Wu, J., "Evaluation of Richardson Extrapolation in Computational Fluid Dynamics," *Numerical Heat Transfer,* Vol. 41, (2002), pp. 139-164.
163. Chochua, G., Shyy, W., and Moore, J., "Computational Modeling for Honeycomb-Stator Gas Annular Seal," *International Journal of Heat and Mass Transfer*, Vol. 45, (2002), pp. 1849-1963.
164. Lian, Y., Steen, J., Trygg-Wilander, M., and Shyy, W., "Low Reynolds Number Turbulent Flows Around a Dynamically-Shaped Airfoil," AIAA 31st Fluid Dynamics Conference, Paper No. 2001-2723 (2001), also *Computers and Fluids*, Vol. 32, (2002), pp. 287-303.

165. Chochua, G., Shyy, W., and Moore, J. "Modeling of Compressible Periodic Flows with Application to Turbomachinery Seals," *Progress in Computational Fluid Dynamics*, Vol. 2, (2002), pp. 9-19.
166. Mei, R., Yu, D., Shyy, W., and Luo, L.-S., "Force Evaluation in the Lattice Boltzmann Method Involving Curved Geometry," *Physical Review E*, Vol. 65, (2002) # 041203, pp. 1-14.
167. Yu, D., Mei, R., and Shyy, W., "A Multi-Block Lattice Boltzmann Method for Fluid Flows," *International for Numerical Methods in Fluids*, Vol. 39, (2002), pp. 99-120; also presented in *AIAA Fluids 2000 and Exhibit, Paper No. AIAA-2000-2614*, June 19-22, (2000), Denver, Colorado.
168. Papila, N., Shyy, W., Griffin, L., and Dorney, D.J., "Shape Optimization of Supersonic Turbines Using Global Approximation Methods," *Journal of Propulsion and Power*, Vol. 18, (2002), pp. 509-518; an earlier version of the paper was presented in the *AIAA 39th Aerospace Sciences Meeting & Exhibit*, Paper No. 2001-1065 (2001).
169. Senocak, I., and Shyy, W., "A Pressure-Based Method for Turbulent Cavitating Flow Computations," *Journal of Computational Physics*, Vol. 176, (2002), pp. 363-383; also presented in AIAA 31st Fluid Dynamics Conference, Paper No. 2001-2907 (2001).
170. Francois, M., Shyy, W., and Chung, J., "Analysis of a Micro-Scale, Multiphase Device for Enhanced Thermal Management," *Progress in Computational Fluid Dynamics*, Vol. 2, (2002), pp. 59-71.
171. Shyy, W., "Multi-Scale Computational Heat Transfer with Moving Solidification Boundaries," invited paper, *International Journal for Heat and Fluid Flow*, Vol. 23, (2002), pp. 278-287.
172. Branham, M. L., Tran-Son-Tay, R., Schoonover, C., Davis, P.S., Allen, S. D., and Shyy, W., "Rapid Prototyping of Micropatterned Substrates Using Conventional Laser Printers," *Journal of Materials Research*, Vol. 17, (2002), pp. 1559-1562.
173. Francois, M., and Shyy, W., "Micro-Scale Drop Dynamics for Heat Transfer Enhancement," *Progress in Aerospace Sciences*, Vol. 38, (2002), pp. 275-304.
174. Popescu, M., and Shyy, W., "Assessment of Dispersion-Relation-Preserving and Space-Time Schemes for Wave Equations," *Numerical Heat Transfer*, Part B, Vol. 42, (2002), pp. 99-118, also *AIAA 40th Aerospace Sciences Meeting & Exhibit*, Paper No. 2002-0225 (2002).
175. Schuchkin, V., Osipov, M., Shyy, W., and Thakur, S., "Mixing and Film Cooling in Supersonic Duct Flows," *International of Heat and Mass Transfer*, Vol. 45, (2002), pp. 4451-4461.
176. Pan, K. L., Qian, J., Law, C.K., and Shyy, W., "The Role of Hydrodynamic Instability in Flame-Vortex Interaction," *Proceedings of the Combustion Institute*, Vol. 29, part 2, (2003) 1695-1704.
177. Ahlman, D., Söderlund, F., Jelliffe, J., Kurdila, A.J., and Shyy, W., "Proper Orthogonal Decomposition for Time Dependent Lid-Driven Cavity Flows," *Numerical Heat Transfer*, Vol. 42, (2002), pp. 285-306.
178. Kamakoti, R., Lian, Y., Regisford, S., Kurdila, A.J., and Shyy, W., "Computational Aeroelasticity Using a Pressure-Based Solver," *Computer Modeling in Engineering & Sciences*, Vol. 3, (2002), pp. 773-790; earlier version also presented in the *AIAA 40th Aerospace Sciences Meeting & Exhibit*, Paper No. 2002-0869.
179. Shyy, W., Jayaraman, B., and Andersson, A., "Modeling of Glow Discharge-Induced Fluid Dynamics," *Journal of Applied Physics*, Vol. 92, (2002), pp. 6434-6443.
180. Vaidyanathan, R., Senocak, I., Wu, J., and Shyy, W., "Sensitivity Evaluation of a Transport-Based Turbulent Cavitation Model," *Journal of Fluids Engineering*, Vol. 125, (2003), pp. 447-458; also *AIAA 32nd Fluid Dynamics Conference*, Paper No. 2002-3184 (2002).
181. Garbey, M., and Shyy, W. "A Least Square Extrapolation Method for Improving Solution Accuracy of PDE Computations," *Journal of Computational Physics*, Vol. 186, (2003), pp. 1-23.

182. Appukuttan, A., Shyy, W., Sheplak, M., and Cattafesta, L., "Mixed Convection Induced by MEMS-Based Thermal Shear Stress Sensors," *Numerical Heat Transfer*, Part A, Vol. 43, (2003), pp. 283-305.
183. Wu, J., Senocak, I., Wang, G., Utturkar., Y., and Shyy, W., "Three-Dimensional Simulation of Turbulent Cavitating Flows in a Hollow-Jet Valve," *Computer Modeling in Engineering & Sciences*, Vol. 4, (2003), pp. 679-689.
184. N'Dri, N., Shyy, W., Liu, H., and Tran-Son-Tay, R., "Multi-Scale Modeling Spanning from Cell Surface Receptors to Blood Flow in Arteries," in C. Pozrikidis (ed.): *Modeling and Simulation of Capsules and Biological Cells*, pp. 103-162, Chapman & Hall/CRC, 2003.
185. Shyy, W., Tran-Son-Tay, R., and N'Dri, N., "Micro-Nano Coupling in Biological Systems," in V. M. Harik and M. Salas (eds.): *Trends in Nano-Scale Mechanics*, pp. 167-204, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003.
186. Yu, D., Mei, R., Luo, L., and Shyy, W., "Viscous Flow Computations with the Method of Lattice Boltzmann Equation" *Progress in Aerospace Sciences*, Vol. 39, (2003), pp. 329-367.
187. Francois, M., and Shyy, W., "Computations of Drop Dynamics with the Immersed Boundary Method; Part 1- Numerical Algorithm and Buoyancy Induced Effect," *Numerical Heat Transfer*, Part B, Vol. 44, (2003), pp. 101-118
188. Francois, M., and Shyy, W., "Computations of Drop Dynamics with the Immersed Boundary Method; Part 2 - Drop Impact and Heat Transfer," *Numerical Heat Transfer*, Part B, Vol. 44, (2003), pp. 119-143.
189. N'Dri, N., Shyy, W., and Tran-Son-Tay, R., "Computational Modeling of Cell Adhesion and Movement Using a Continuum-Kinetics Approach," *Biophysical Journal*, Vol. 85, (2003), pp. 2273-2286.
190. Lian, Y., Shyy, W., Viieru, D., and Zhang, B., "Membrane Wing Aerodynamics for Micro Air Vehicles," *Progress in Aerospace Sciences*, Vol. 39, (2003), pp. 425-465.
191. Lian, Y., Shyy, W., Ifju, P., and Verron, E., "A Membrane Wing Model for Micro Air Vehicles," *AIAA Journal*, Vol. 41, (2003), pp. 2492-2494; also a longer, earlier version is presented in the AIAA 32nd Fluid Dynamics Conference, Paper No. 2002-2972 (2002).
192. Lian, Y., Shyy, W., and Haftka, R.T., "Shape Optimization of a Membrane Wing for Micro Air Vehicles," *AIAA Journal*, Vol. 42, (2004), pp. 424-426, also a longer, earlier version is presented in the AIAA 41st Aerospace Sciences Meeting & Exhibit, Paper No. 2003-0106, (2003).
193. Francois, M., Uzgoren, E., Jackson, J., and Shyy, W., "Multigrid Computations with the Immersed Boundary Technique for Multiphase Flows," *International Journal of Numerical Methods for Heat and Fluid Flow*, Vol. 14, (2004), pp. 98-115.
194. Ye, T., Shyy, W., Tai, C.-F., and Chung, J.N., "Assessment of Sharp- and Continuous-Interface Methods for Drop in Static Equilibrium," *Computers & Fluids*, Vol. 33, (2004), pp. 917-926.
195. Johansen, S. T., Wu, J., and Shyy, W., "Filter-Based Unsteady RANS Computations," *International Journal of Heat and Fluid Flow*. Vol. 25, (2004), pp. 10–21.
196. Senocak, I., and Shyy, W., "Interfacial Dynamics-Based Modeling of Turbulent Cavitating Flows, Part-1: Model Development and Steady-State Computations," *International Journal for Numerical Methods in Fluids*, Vol. 44, (2004), pp. 975-995.
197. Senocak, I., and Shyy, W., "Interfacial Dynamics-Based Modeling of Turbulent Cavitating Flows, Part-2: Time-Dependent Computations," *International Journal for Numerical Methods in Fluids*, Vol. 44, (2004) pp997-1016.
198. Shyy, W., "Multiphase Computations Using Sharp and Continuous Interface Techniques for Micro-Gravity Applications," *Comptes Rendus Mecanique*, Vol. 332, (2004), pp. 375-386.
199. Kamakoti, R., and Shyy, W., "Evaluation of Geometric Conservation Law Using Pressure-Based Fluid Solver and Moving Grid technique," *International Journal of Numerical Methods for Heat and Fluid Flow*, Vol. 14, (2004), pp. 851-865.

200. Vaidyanathan, R., Tucker, P.K., Papila, N., Shyy, W., "CFD-Based Optimization for a Single Element Rocket Injector," *Journal of Propulsion and Power*, Vol. 20, (2004), pp. 705-717; an earlier version was presented in the *41st Aerospace Sciences Meeting & Exhibit*, Paper No. 2003-0296, (2003).
201. Lörstad, D., Francois, M., Shyy, W., and Fuchs, L., "Volume of Fluid and Immersed Boundary Investigations of a Single Rising Droplet," *International Journal for Numerical Methods in Fluids*, Vol. 46, (2004), pp. 109-125; an earlier version was presented in the *41st Aerospace Sciences Meeting & Exhibit*, Paper No. 2003-1282, (2003).
202. Kamakoti, R., and Shyy, W., "Fluid-Structure Interaction for Aeroelastic Applications," *Progress in Aerospace Sciences*, Vol. 40, (2004), pp. 535-558.
203. Lian, Y., and Shyy, W., "Three-Dimensional Fluid-Structure Interactions of a Membrane Wing for Micro Air Vehicle Applications," *AIAA 44th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference*, Paper No. 2003-1726, (2003), also *Journal of Aircraft*, Vol. 42, (2005), pp. 865-873.
204. Yu, D., Mei, R., and Shyy, W., "Improved Treatment of the Open Boundary in the Method of Lattice Boltzmann Equation," *Progress in Computational Fluid Dynamics*, Vol. 5, (2005), pp. 3-12.
205. Garbey, M., and Shyy, W., "A Least Square Extrapolation Method for the a posteriori Error Estimate of the Incompressible Navier-Stokes Problem," *International Journal for Numerical Methods in Fluids*, Vol. 48, (2005), pp. 43-59.
206. Shyy, W., Ifju, P.G., and Viieru, D., "Membrane Wing-Based Micro Air Vehicles," *Applied Mechanics Reviews*, Vol. 58, (2005), pp. 283-301.
207. Senocak, I., Johansen, S.T., and Shyy, W. "Statistical Characteristics of Unsteady Reynolds-Averaged Navier-Stokes Simulations," *Numerical Heat Transfer*, Part B, Vol. 46, (2005), pp. 1-18.
208. Utturkar, Y., Zhang, B., and Shyy, W. "Reduced Order Modeling of Fluid Flow with Moving Boundaries by Proper Orthogonal Decomposition," *International Journal of Heat and Fluid Flow*, Vol. 26, (2005), pp. 276-288.
209. Viieru, D., Albertani, R., Shyy, W., and Ifju, P.G. "Effect of Tip Vortex on Wing Aerodynamics of Micro Air Vehicles," *Journal of Aircraft*, Vol. 42, (2005), pp. 1530-1536; an earlier version was presented in the *22nd AIAA Applied Aerodynamics Conference and Exhibit*, 19 August 2004, Providence, RI., Paper No. 2004-4971.
210. Queipo, N., Haftka, R.T., Shyy, W., Goel, T. Vaidyanathan, R., and Tucker, P.K., "Surrogate-Based Analysis and Optimization," *Progress in Aerospace Sciences*, Vol. 41, (2005), pp. 1-25.
211. Chao, J., Shyy, W., Thakur, S.S., Sheplak, M., and Mei, R., "Effect of Conjugate Heat Transfer on MEMS-Based Thermal Shear Stress Sensor," *Numerical Heat Transfer*, Part A, Vol. 48, (2005), pp. 197-217.
212. Su, C.-M., Lee, D., Tran-Son-Tay, R., and Shyy, W., "Fluid Flow Structure in Arterial Bypass Anastomosis," *Journal of Biomedical Engineering*, Vol. 127, (2005), pp. 611-618.
213. Tai C.-F and Shyy, "Multigrid Computations and Conservation Law Treatment of a Sharp Interface Method," *Numerical Heat Transfer*, Part B, Vol. 48, (2005), pp. 405-424.
214. Popescu, M., Shyy, W., and Garbey, M., "Finite Volume Treatment of Dispersion-Relation-Preserving and Optimized Prefactored Compact Schemes for Wave Equations," *Journal of Computational Physics*, Vol. 210, (2005), pp. 705-729.
215. Wu, J. Wang, G., and Shyy, W., "Time-Dependent Turbulent Cavitating Flow Computations with Interfacial Transport and Filter-Based Models," *International Journal for Numerical Methods in Fluids*, Vol. 49, (2005), pp. 739-761.
216. Utturkar, Y., Wu, J., Wang, G., and Shyy, W., "Recent Progress in Modeling of Cryogenic Cavitation for Liquid Rocket Propulsion," *Progress in Aerospace Sciences*, Vol. 41, (2005), pp. 558-608.

217. Shyy, W., "Moving Boundary Problems," in W.J. Minkowycz, E.M. Sparrow and J.Y. Murthy (eds.), *Handbook of Numerical Heat Transfer*, Second Edition, (2006), pp. 559-592, Wiley, New York.
218. Goel, T., Haftka, R.T., Papila, M., and Shyy, W., "Generalized Pointwise Bias Error Bounds for Response Surface Approximations," *International Journal for Numerical Methods in Engineering*, Vol. 65, (2006), pp. 2035-2059.
219. Tran-Son-Tay, R., and Shyy, W., "Blood Rheology," *Encyclopedia of Medical Devices and Instrumentation*, 2nd edition, J.G. Webster (editor), (2006) pp. 500-511, Wiley, New York.
220. Singh, R.K., Chao, J., Popescu, M., Tai, C.-F., Mei, R., and Shyy, W., "Multiphase/Multidomain Computations Using Continuum and Lattice Boltzmann Methods," *ASCE Journal of Aerospace Engineering*, Vol. 19, (2006), pp. 288-295.
221. Goel, T., Haftka, R.T., Shyy, W., and Queipo, N., "Ensemble of Surrogates," *Journal of Structural and Multidisciplinary Optimization*, Vol. 33, (2007), pp. 199-216.
222. Goel, T., Vaidyanathan, R., Haftka, R.T., Shyy, W., V. Queipo, N.V., and Tucker, P.K., "Response Surface Approximation of Pareto Optimal Front in Multi-Objective Optimization," *Computer Methods in Applied Mechanics and Engineering*, Vol. 196, (2007), pp. 879-893; also presented in the *10th AIAA/ISSMO Multi-Disciplinary Analysis and Optimization Conference*, Aug. 30 – Sept. 1, 2004 / Albany, NY, Paper No. AIAA-2004-4501.
223. Chao, J., Mei. R., and Shyy, W., "Error Assessment of Lattice Boltzmann Equation Method for Variable Viscosity Flows," *International Journal for Numerical Methods in Fluids*, Vol. 53, (2007), pp. 1457-1471.
224. Mack, Y., Goel, T., Shyy, W., and Haftka, R.T., "Surrogate Model-Based Optimization Framework: A Case Study in Aerospace Design," in *Evolutionary Computation in Dynamic and Uncertain Environments*, edited by Shengxiang Yang, Yew-Soon Ong, and Yaochu Jin, Springer-Verlag, (2007), Chap. 14, pp. 323-342.
225. Singh, R.K., and Shyy, W., "Three-Dimensional Adaptive Cartesian Grid Method with Conservative Interface Restructuring and Reconstruction" *Journal of Computational Physics*, Vol. 224, (2007), pp. 150-167.
226. Jayaraman, B., Thakur, S., and Shyy, W., "Modeling of Fluid Dynamics and Heat Transfer Induced by Dielectric Barrier Plasma Actuator," *Journal of Heat Transfer*, Vol. 129, (2007), pp. 517-525.
227. Lian, Y., and Shyy, W., "Laminar-Turbulent Transition of a Low Reynolds Number Rigid or Flexible Airfoil," *AIAA Journal*, Vol. 45, (2007), pp. 1501-1513; also, AIAA 36th Fluid Dynamics Conference and Exhibit, June 5-8, 2006, Paper No. 2006-3051.
228. Marjavaara, B. D., Lundström, T.S., Goel, T., Mack, Y., and Shyy, W., "Turbine Diffuser Shape Optimization by Multiple Surrogate Model Approximations of Pareto Fronts," *ASME Journal of Fluids Engineering*, Vol. 129, (2007), pp. 1228-1240.
229. Zhang, X., Shyy, W., and Sastry, A.M., "Numerical Simulation of Intercalation-Induced Stress in Li-Ion Battery Electrode Particles," *Journal of the Electrochemical Society*, Vol. 154, (2007), pp. A910-916.
230. Uzgoren, E., Singh, R., Sim, J., and Shyy, W., "Computational Modeling for Multiphase Flows with Spacecraft Application," *Progress in Aerospace Sciences*, Vol. 43, (2007), pp. 138-192.
231. Shyy, W., and Liu, H., "Flapping Wings and Aerodynamic Lift: The Role of Leading-Edge Vortices," *AIAA Journal*, Vol. 45, (2007), pp. 2817-2819.
232. Stanford, B., Sytsma, M., Albertani, R., Viieru, D., Shyy, W., and Ifju, P., "Static Aeroelastic Model Validation of Membrane Micro Air Vehicle Wings," *AIAA Journal*, Vol. 45, (2007), pp. 2828-2837.
233. Garbey, M., and Shyy, W., "On Optimized Extrapolation Method for Elliptic Problems with Large Coefficient Variation," *Journal of Algorithm and Computational Technologies*, Vol. 1, (2007), pp. 495-523.

234. Popescu, M., Vedder, R., and Shyy, W., "A Finite Volume-Based High Order, Cartesian Cut-Cell Method for Wave Propagation," *International Journal for Numerical Methods in Fluids*, Vol. 56, (2008), pp. 1787-1818.
235. Yuan, K., Ji, Y., Chung, J.N., and Shyy, W., "Cryogenic Boiling and Two-Phase Flow during Pipe Chilldown in Earth and Reduced Gravity," *Journal of Low Temperature Physics*, Vol. 150, (2008), pp. 101-122.
236. Samad, A., Kim, K.-Y., Goel, T., Haftka, R.T., and Shyy, W., "Multiple Surrogate Modeling for Axial Compressor Blade Shape Optimization," *Journal of Propulsion and Power*, Vol. 24, (2008), pp. 302-310.
237. Jayaraman, B., and Shyy, W., "Modeling of Dielectric Barrier Discharge-Induced Fluid Dynamics and Heat Transfer," *Progress in Aerospace Sciences*, Vol. 44, (2008), pp. 139-191.
238. Goel, T., Dorney, D.J., Haftka, R.T., and Shyy, W., "Improving the Hydrodynamic Performance of Diffuser Vanes *via* Shape Optimization," *Computers and Fluids*, Vol. 37, (2008), pp. 705-723; also AIAA Paper No. 2007-5551, 43nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 2007.
239. Goel, T., Haftka, R.T., Shyy, W., and Watson, L.N., "Pitfalls of Using a Single Criterion for Selecting Experimental Designs," *International Journal for Numerical Methods in Engineering*, Vol. 75, (2008), pp. 127-155.
240. Tang, J., Viieru, D., and Shyy, W., "Effects of Reynolds Number and Flapping Kinematics on Hovering Aerodynamics," *AIAA Journal*, Vol. 46, (2008), pp. 967-976; also 45th AIAA Aerospace Sciences Meeting and Exhibit, 8-11 January 2007, Reno, Nevada, Paper No. AIAA 2007-129.
241. Li, X., Wang, G., Zhang, M., and Shyy, W., "Structures of Supercavitating Multiphase Flows," *International Journal of Thermal Sciences*, Vol. 47, (2008), pp. 1263-1275.
242. Sozer, E., and Shyy, W., "Modeling of Fluid Dynamics and Heat Transfer through Porous Media for Liquid Rocket Propulsion," *International Journal of Numerical Methods for Heat and Fluid Flow*, Vol. 18, (2008), pp. 883-899; also AIAA Paper No. 2007-5549, 2007.
243. Jayaraman, B., Cho. Y., and Shyy, W., "Modeling of Dielectric Barrier Discharge Plasma Actuator," *Journal of Applied Physics*, Vol. 103, (2008), pp. 053304:1-15; also AIAA Paper No. 2007-4531, 38th AIAA Plasmadynamics and Lasers Conference, 2007.
244. Goel, T., Thakur, S., Haftka, R.T., Shyy, W., and Zhao, J., "Surrogate Model-Based Strategy for Cryogenic Cavitation Model Validation and Sensitivity Evaluation," *International Journal for Numerical Methods in Fluids*, Vol. 58, (2008), pp. 969-1007; also AIAA Paper No. 2006-5047, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 09-12 July 2006, Sacramento, California.
245. Stanford, B, Ifju, P., Albertani, R., and Shyy, W., "Fixed Membrane Wings for Micro Air Vehicles: Experimental Characterization, Numerical Modeling, and Tailoring," *Progress in Aerospace Sciences*, Vol. 44, (2008), pp. 258-294.
246. Shyy, W., Lian, Y., Tang, J., Liu, H., Trizila, P., Stanford, B., Bernal, L.P., Cesnik, C.E.S., Friedmann, P., and Ifju, P., "Computational Aerodynamics of Low Reynolds Number Plunging, Pitching and Flexible Wings for MAV Applications," *Acta Mechanica Sinica*, Vol. 24, (2008), pp. 351-373; also, 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-523.
247. Zhang, X., Sastry, A.M., and Shyy, W. "Intercalation-induced Stress and Heat Generation inside Lithium-Ion Battery Cathode Particles," *Journal of the Electrochemical Society*, Vol. 155, (2008), pp. A542-A552.
248. Aono, H., Shyy, W., and Liu, H. "Vortex Dynamics in Near Wake of a Hovering Hawkmoth," *Acta Mechanica Sninca*, Vol. 25, (2009), pp. 23-36; also 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-583.

249. Uzgoren, E., Sim, J., and Shyy, W., "Marker-Based 3-D Adaptive Cartesian Grid Method for Multiphase Flow around Irregular Geometries," *Communications in Computational Physics*, Vol. 5, (2009), pp. 1-41.
250. Shyy, W., Trizila, P., Kang, C., and Aono, H. "Can Tip Vortices Enhance Lift of a Flapping Wing?" *AIAA J*ournal, Vol. 47, (2009), pp. 289-293.
251. Goel, T., Haftka, R.T., and Shyy, W., "Comparing Error Estimation Measures for Polynomial and Kriging Approximation of Noise-Free Functions," *Journal of Structural and Multidisciplinary Optimization*, Vol. 38**,** (2009), pp. 429-442.
252. Li, X., Wang, G., Yu, Z., and Shyy, W., "Multiphase Fluid Dynamics and Transport Processes of Low Capillary Number Cavitating Flows," *Acta Mechanica Sinica*, Vol. 25, (2009), pp. 161-172.
253. Ol, M., Bernal, L., Kang, C.-K., and Shyy, W., "Shallow and Deep Dynamic Stall for Flapping Low Reynolds Number Airfoils," *Experiments in Fluids*, Vol. 46, (2009), pp. 883-901.
254. Chimakurthi, S., Tang, J., Palacios, R., Cesnik, C., and Shyy, W., "Computational Aeroelastic Framework for Analyzing Flapping Wing Micro Air Vehicles," *AIAA Journal*, Vol. 47, (2009), pp. 1865-1878; an earlier version was presented in the 49th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 7-10, April 2008, Paper No. AIAA-2008-1814.
255. Shyy, W., Lian, Y., Chimakurthi, S.K., Tang, J., Cesnik, C.E.S., Stanford, B., and Ifju, P.G., "Flexible Wings and Fluid–Structure Interactions for Micro-Air Vehicles," Chapter 11, Flying Insects and Robots, Dario Floreano, Jean-Christophe Zufferey, Mandyam V. Srinivasan, and Charlie Ellington (Editors), pp. 143-157, Springer-Verlag, Berlin, Germany, (2009).
256. Tseng, C.-C., and Shyy, W., "Modeling for Isothermal and Cryogenic Cavitation," *International Journal of Heat and Mass Transfer*," Vol. 53, (2010), pp. 513-525.
257. Dahm, W.J.A., Allen, E.H., Razouk, R.R., and Shyy, W., "Challenges and Opportunities in the Next Two Decades of Aerospace Engineering," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 1, Chapter 2, (2010), pp. 27-37.
258. Shyy, W., Aono, H., and Liu, H., "Flapping Wing Aerodynamics," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 1, Chapter 17, (2010), pp. 231-243.
259. Shyy, W., and Sim, J., "Computational Modeling for Multiphase flows, Including Microgravity and Space Applications," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 1, Chapter 51, (2010), pp. 597-608.
260. Luo, L.-S., and Shyy, W., "Lattice Boltzmann Equation Methods," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 1, Chapter 56, (2010), 651-660.
261. Hu, H., Shih, T.I-P., and Shyy, W., "Lift, Thrust, and Flight," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 2, Chapter 72, (2010), 837-844.
262. Liu, H., and Shyy, W., "Micro Air Vehicle-Motivated Aerodynamics," *Encyclopedia of Aerospace Engineering*, R. Blockley and W. Shyy (Editors), Wiley, Vol. 7, Chapter 346, (2010), pp. 4265-4277.
263. Tseng, C.-C., Wei, Y.-J., Wang, G., and Shyy, W., "Review: Modeling of Turbulent, Isothermal and Cryogenic Cavitation under Attached Conditions," *Acta Mechanica Sinica*, Vol. 26, (2010), pp. 325-353.
264. Shyy, W., Aono, H., Chimakurthi, S.K., Trizila, P., Kang, C.-K., Cesnik, C.E.S., and Liu, H., "Recent Progress in Flapping Wing Aerodynamics and Aeroelasticity," *Progress in Aerospace Sciences*, Vol. 46, (2010), pp. 284-327
265. Du, W., Gupta, A., Zhang, X., Sastry, A.M., and Shyy, W., "Effect of Cycling Rate, Particle Size, and Transport Properties on Lithium-Ion Cathode Performance," *International journal of Heat and Mass Transfer*, Vol. 53, (2010), pp. 3552-3561.

266. Popescu, M., Johansen, S.T., and Shyy, W., "Flow-Induced Acoustics in Corrugated Pipes," *Communications in Computational Physics*, Vol. 10, (2011), pp. 120-139; an earlier version was presented in the 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-1417.
267. Qi, D., Liu, Y., Shyy, W., and Aono, H., "Simulations of Dynamics of Plunge and Pitch of a Three-Dimensional Flexible Wing in a Low Reynolds Number Flow," *Physics of Fluids*, Vol. 22, (2010), pp. 091901:1-20.
268. Cho, Y.-C., Jayaraman, B., Viana, F.A.C., Haftka, R.T., and Shyy, W., "Surrogate Modeling for Characterizing the Performance of a Dielectric Barrier Discharge Plasma Actuator**,"** *International Journal of Computational Fluid Dynamics*, Vol. 24, (2010), pp. 281-301; an earlier version of the paper was also presented in the 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-1381.
269. Liu, H., Nakata, T., Gao, N., Maeda, M., Aono, H., and Shyy, W., "Micro Air Vehicle-Motivated Computational Biomechanics in Bio-Flights: Aerodynamics, Flight Dynamics and Maneuvering Stability," *Acta Mechanica Sinica*, Vol. 26, (2010), pp.863–879.
270. Chao, J., Mei, R., Singh, R., and Shyy, W., "A Filter-based, Mass Conserving Lattice Boltzmann Method for Immiscible Multiphase Flows," *International Journal for Numerical Methods in Fluids*, Vol. 66, (2011), pp. 622-647.
271. Trizila, P., Kang, C.-K., Aono, H., Visbal, M., and Shyy, W., "Low Reynolds Number Aerodynamics of a Flapping Rigid Flat plate"," *AIAA Journal*, Vol. 49, (2011), pp. 806-823.
272. Gupta, A., Seo, J.H., Zhang, X., Du, W., Sastry, A.M., and Shyy, W. "Effective Transport Properties of LiMn2O4 Electrode via Particle-Scale Modeling," *Journal of the Electrochemical Society*, Vol. 158, (2011), pp. A487-497.
273. Cho, Y.-C., and Shyy, W., "Adaptive Flow Control of Low-Reynolds Number Aerodynamics Using Dielectric Barrier Discharge Actuator," *Progress in Aerospace Sciences*, Vol. 47, (2011), pp. 495-521.
274. Tang, J.-N., Wang, N.-F., Shyy, W., "Flow Structures of Gaseous Jets Injected into Water for Underwater Propulsion," *Acta Mechanica Sinica*, Vol. 27, (2011), pp.461-472, (featured as the Focused Paper of the issue).
275. Hassan, E.A., Uzgoren, E., Fujioka, H., Grotberg, J.B., and Shyy, W., "Adaptive Lagrangian-Eulerian Computation of Propagation and Rupture of a Liquid Plug in a Tube" *International Journal for Numerical Methods in Fluids*, Vol. 67, (2011), pp. 1373–1392.
276. Shyy, W., Cho, Y.-C., Du, W., Gupta, A., Tseng, C.-C., and Sastry, A.M., "Surrogate-based modeling and dimension reduction techniques for multi-scale mechanics problems," *Acta Mechanica Sinica*, Vol. 27, (2011), pp. 845–865
277. Kang, C.-K., Aono, H., Cesnik, C.E.S., and Shyy, W., "Effects of Flexibility on the Aerodynamic Performance of Flapping Wings," *Journal of Fluid Mechanics*, Vol. 689, (2011), pp. 32-74 (featured as the cover article of the issue); an earlier version was also presented in the 6th AIAA Theoretical Fluid Mechanics Conference, 27 - 30 June 2011, Honolulu, Hawaii, Orlando, Florida, Paper No. 2011-3121.
278. Sim, J., and Shyy, W., "Interfacial Flow Computations Using Adaptive Eulerian-Lagrangian Method for Spacecraft Applications," *International Journal for Numerical Methods in Fluids*, Volume 68, (2012), pp. 1438–1456.
279. Abate, G., and Shyy, W., "Bio-inspiration of Morphing for Micro Air Vehicles," in *Morphing Aerospace Vehicles and Structures*, J. Valasek (Ed.), pp. 41-53, Wiley, New York.
280. Kuan, C.-K., Sim, J., and Shyy, W., "Adaptive Thermo-Fluid Moving Boundary Computations for Interfacial Dynamics," *Acta Mechanica Sinica*, Vol. 28, (2012), pp. 999-1021.
281. Hassan, E., Boles, J., Aono, H., Davis, D., and Shyy, W., "Supersonic Jet and Crossflow Interaction: Computational Modeling," *Progress in Aerospace Sciences*, Vol. 57, (2013), pp. 1-24.

282. Kang, C.-K., Aono, H., Baik, Y.S., Bernal, L.P., Ol, M., and Shyy, W., "Fluid Dynamics of Pitching and Plunging Flat Plate at Intermediate Reynolds Numbers," *AIAA Journal*, Vol. 51, (2013), pp. 315-329.
283. Kang, C.K., and Shyy, W., "Scaling Law and Enhancement of Lift Generation of an Insect-Size Hovering Flexible Wing," *Journal of the Royal Society Interface*, Vol. 10, (2013), Article Number: 20130361.
284. Tan, P., Wei, Z., Shyy, W., and Zhao, T.S., "Prediction of the Theoretical Capacity of Non-Aqueous Lithium-Air Batteries," *Journal of Applied Energy*, Vol. 109, (2013), pp. 275-282.
285. Gogulapati, A., Friedmann, P., Kheng, E., and Shyy, W., "Approximate Aeroelastic Modeling of Flapping Wings in Hover: Comparison with CFD and Experimental Data," *AIAA Journal*, Vol. 51, (2013), pp. 567-583.
286. Yeo, D., Atkins, E.M., Bernal, L.P., and Shyy, W., "Experimental Characterization of Lift on a Rigid Flapping Wing," *Journal of Aircraft*, Vol. 50, (2013), pp. 1806-1811.
287. Huang, B., Young, Y.L., Wang, G., and Shyy, W., "Combined Experimental and Computational Investigation of Unsteady Structure of Sheet/Cloud Cavitation," *ASME Journal of Fluids Engineering*, Vol. 135, (2013), 071301.
288. Cho, Y.-C., and Shyy, W., "Adaptive Control of Low-Reynolds Number Aerodynamics in Uncertain Environments: Part 1. Disturbance Regimes and Flow Characteristics," *Computers and Fluids*, Vol. 86, (2013), pp. 582-596.
289. Cho, Y.-C., and Shyy, W., "Adaptive Control of Low-Reynolds Number Aerodynamics in Uncertain Environments: Part 2. Vortex Dynamics and System Modeling Under Stall," *Computers and Fluids*, Vol. 86, (2013), pp. 597-610.
290. Xue, N., Du, W., Gupta, A., Shyy, W., Sastry, A.M., and Martins, J.R.R.A., "Optimization of a Single Lithium-Ion Battery Cell with a Gradient-Based Algorithm," *Journal of the Electrochemical Society*, Vol. 160, (2013), pp. A1071-A1078.
291. Du, W., Xue, N., Sastry, A.M., Martins, J.R.R.A., and Shyy, W., "Energy Density Comparison of Li-ion Cathode Materials Using Dimensional Analysis," *Journal of the Electrochemical Society*, Vol. 160, (2013), pp. A1187-A1193.
292. Vandenheede, Ruben B.R., Bernal, L.P., Morrison, C.L., Gogulapati, A., Friedmann, P.P., Kang, C.-K. and Shyy, W., "Experimental and Computational Study on Flapping Wings with Bio-Inspired Hover Kinematics," *AIAA Journal*, Vol. 52, (2014), pp. 1047-1058; an earlier version was also presented in the 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 07-10 January 2013, Gaylord Texan Hotel & Convention Center.
293. Xue, N., Du, W., Greszler, T.A., Shyy, W., and Martins, J.R.R.A., "Design of a Lithium-ion Battery Pack for PHEV Using a Hybrid Optimization Method," *Journal of Applied Energy*; Vol. 115, (2014), pp. 591-602.
294. Du, W., Xue, N., Shyy, W., and Martins, J.R.R.A., "A Surrogate-Based Multi-Scale Model for Mass Transport and Electrochemical Kinetics in Lithium-Ion Battery Electrodes," *Journal of the Electrochemical Society*; Vol. 161, (2014), pp. E3086-E3096.
295. Tan, P., Shyy, W., An., L., Wei, Z.H., and Zhao, T.S., "A Gradient Porous Cathode for Non-Aqueous Lithium-Air Batteries Leading to a High Capacity," *Electrochemistry Communications*, Vol. 46, (2014), pp. 111-114.
296. Arora, N., Gupta, A., Sanghi, S., Aono, H., and Shyy, W., "Lift-Drag and Flow Structures Associated with the 'Clap and Fling' Motion" *Physics of Fluids*, Vol. 26, (2014), 071906.
297. Xue, N., Du, W., Martins, J.R.R.A., and Shyy, W., "Lithium-Ion Batteries: Thermomechanics, Performance, and Design Optimization," *Handbook of Clean Energy Systems*, Vol. 5, Chapter 26, (2015), pp. 2849-2864, Wiley, New York; also, *Green Aviation*, R. Agarwal, F. Collier, A. Schafer and A. Seabridge (eds.), Chap. 19, (2016), Wiley, UK.

298. Tan, P., Shyy, W., Wei, Z.H., An., L., and Zhao, T.S., "A Carbon Powder-Nanotube Composite Cathode for Non-Aqueous Lithium-Air Batteries," *Electrochimica Acta*, Vol. 147, (2014), pp. 1-8.
299. Kang, C.K., and Shyy, W., "Analytical Model for Instantaneous Lift and Shape Deformation of an Insect-Scale Flapping Wing in Hover," *Journal of the Royal Society Interface*, Vol. 11, (2014), Article Number 20140933.
300. Kuan, C.-K., Pan, K.-L., and Shyy, W., "Study on High Weber Number Droplet Collision by a Parallel, Adaptive Interface-Tracking Method," *Journal of Fluid Mechanics*, Vol. 759, (2014), pp. 104-133.
301. Fu, J.-J., Hefler, C., Qiu, H.-H., and Shyy, W., "Effects of Aspect Ratio on Flapping Wing Aerodynamics in Animal Flight," *Acta Mechanica Sinica*, Vol. 30, Issue 6, (2014), pp. 776-786.
302. Tan, P., Shyy, W., Zhao, T.S., Wei, Z.H., and An., L., "Discharge Product Morphology Versus Operating Temperature in Non-Aqueous Lithium-Air Batteries," *Journal of Power Sources*, Vol. 278, (2015), pp. 133-140.
303. Yeo, D., Atkins, E.M., Bernal, L.P., and Shyy, W., "Fixed Wing Unmanned Aircraft In-Flight Pitch and Yaw Control Moment Sensing," *Journal of Aircraft*, Vol. 52, No. 2(2015), pp. 403-420.
304. Ren, X.D., Xu, K., Shyy, W., and Gu, C., "A Multi-Dimensional High-Order Discontinuous Galerkin method Based on Gas Kinetic Theory for Viscous Flow Computations," *Journal of Computational Physics*, Vol. 292, (2015), pp. 176-193.
305. Tan, P., Shyy, W., and Zhao, T.S., "What Is the Ideal Distribution of Electrolyte Inside Cathode Pores of Non-Aqueous Lithium-Air Batteries?" *Science Bulletin*, Vol. 60, Issue 10, (2015), pp. 975-976.
306. Tan, P., Shyy, W., Zhao, T.S., Zhu X.B., and Wei Z.H., "A RuO_2 Nanoparticle-Decorated Buckypaper Cathode for Non-Aqueous Lithium-Oxygen Batteries," *Journal of Materials Chemistry A*, Vol. 3, (2015), pp. 19042-19049; DOI: 10.1039/C5TA06133D.
307. Tan, P., Shi, L., Shyy, W., and Zhao, T.S., "Morphology of the Discharge Product in Non-Aqueous Lithium-Oxygen Batteries: Furrowed Toroid Particles Correspond to a Lower Charge Voltage," *Energy Technology*, Vol. 4, Issue 3, (2016), pp. 393-400.
308. Shyy, W., Kang, C.-K., Chirarattananon, P., Ravi, S., and Liu, H., "Aerodynamics, Sensing and Control of Insect-Scale Flapping-Wing Flight," *Proceedings of the Royal Society A*, Vol. 472, (2016), Article Number: 20150712, DOI: 10.1098/rspa.2015.0712.
309. Arora, N., Gupta, A., and Shyy, W., "A Shifting Discontinuous-Grid-Block Lattice Boltzmann Method for Moving Boundary Simulations," *Computers & Fluids*, Vol. 125, (2016), pp. 59-70.
310. Tan, P., Wei, Z.H., Shyy, W., Zhao, T.S., and Zhu X.B., "A Nano-structured RuO_2/NiO Cathode Enables the Operation of Non-Aqueous Lithium-Air Batteries in Ambient Air," *Energy & Environmental Science* (*Royal Society of Chemistry)*, Vol. 9, (2016), pp. 1783-1793, DOI: 10.1039/c6ee00550k.
311. Shyy, W., and Mittal, R., "Solution Methods for the Incompressible Navier-Stokes Equations," *Handbook of Fluid Dynamics*, first edition (1998) Chapter 31 (pp. 31-1 to 31-33); second edition (2016) Chapter 41 (pp. 41-1 to 41-22), R. Johnson (editor), CRC Press, Boca Raton, FL.
312. Chimakurthi, S.K., Reuss, S., and Shyy, W., "Fluid-Structure Interactions," *Handbook of Fluid Dynamics*, second edition (2016) Chapter 31 (pp. 31-1 to 31-24), R. Johnson (editor), CRC Press, Boca Raton, FL.
313. Ren, X.D., Xu, K., and Shyy, W., "A Multi-Dimensional High-order DG-ALE Method Based on Gas-Kinetic Theory with Application to Oscillating Bodies," *Journal of Computational Physics*, Vol. 316, (2016), pp. 700-720.
314. Arora, N., Gupta, A., Sanghi, S., Aono, H., and Shyy, W., "Flow Patterns and Efficiency-Power Characteristics of a Self-Propelled, Heaving Rigid Flat Plate," *Journal of Fluids and Structures*, Vol. 66, (2016), pp. 517-542.

315. Tan, P., Shyy, W., Zhao, T.S., Zhang, R.H., and Zhu, X.B., "Effects of Moist Air on the Cycling Performance of Non-Aqueous Lithium-Air Batteries," *Applied Energy*, Vol. 182, (2016), pp. 569-575.
316. Tan, P., Shyy, W., Wu, M.C., Huang, Y.Y., and Zhao, T.S., "Carbon Electrode with NiO and RuO2 Nanoparticles Improves the Cycling Life of Non-Aqueous Lithium-Oxygen Batteries," *Journal of Power Sources,* Vol. 326, (2016), pp. 303-312.
317. Jiang, H.R., Shyy, W., Liu, M., Wei, L., Wu, M.C., and Zhao, T.S., "Boron Phosphide Monolayer as a Potential Anode Material for Alkali Metal-Based Batteries," *Journal of Materials Chemistry A,* Vol. 5, (2017), pp. 672-679.
318. Xu, A., Shyy, W., and Zhao, T.S., "Lattice Boltzmann Modeling of Transport Phenomena in Fuel Cells and Flow Batteries," *Acta Mechanica Sinica*, DOI 10.1007/s10409-017-0667-6, Vol. 33, (2017), pp. 555-574.
319. Ren, X.D., Xu, K., and Shyy, W., "A Gas-Kinetic Theory Based Multidimensional High-Order Method for the Compressible Navier–Stokes Solutions," *Acta Mechanica Sinica*, DOI 10.1007/s10409-017-0695-2 (2017).
320. Fu, J.-J., Shyy, W., and Qiu, H.-H., "Effects of Aspect Ratio on Vortex Dynamics of a Rotating Wing," *AIAA Journal*, Vol. 55, (2017), pp. 4074-4082.
321. Tan, P., Jiang, H.R., Zhu, X.B., An, L., Jung, C.Y., Wu, M.C., Shi, L., Shyy, W., and Zhao, T.S., "Advances and Challenges in Lithium-Air Batteries," *Applied Energy*, Vol. 204, (2017), pp. 780-806.
322. Jiang, H.R., Shyy, W., Wu, M.C., Wei, L., and Zhao, T.S., "Highly Active, Bi-Functional and Metal-Free B4C-Nanoparticle-Modified Graphite Felt Electrodes for Vanadium Redox Flow Batteries," *Journal of Power Sources*, Vol. 365, (2017), pp. 34-42.
323. Ji, X., Zhao, F., Shyy, W., and Xu, K., "A Family of High-Order Gas-Kinetic Schemes and Its Comparison with Riemann Solver Based High-Order Methods," *Journal of Computational Physics*, Vol. 356, (2018), pp. 150-173.
324. Fu, J.-J., Liu, X., Shyy, W., and Qiu, H.-H., "Effects of Flexibility and Aspect Ratio on the Aerodynamic Performance of Flapping Wings" *Bioinspiration & Biomimetics*, Vol. 13, (2018), Article Number: 036001.
325. Jiang, H.R., Wu, M.C., Ren, Y.X., Shyy, W., and Zhao, T.S., "Towards a Uniform Distribution of Zinc in the Negative Electrode for Zinc Bromine Flow Batteries," *Applied Energy*, Vol. 213, (2018), pp. 366-374.
326. Jiang, H.R., Shyy, W., Liu, M., Ren, Y.X., and Zhao, T.S., "Borophene and Defective Borophene as Potential Anchoring Materials for Lithium-Sulfur Batteries: a First-Principles Study," *Journal of Materials Chemistry A*, Vol. 6, (2018), pp. 2107-2114.
327. Jiang, H.R., Shyy, W., Zeng, L., Zhang, R.L., and Zhao, T.S., "Highly efficient and ultra-stable boron-doped graphite felt electrodes for vanadium redox flow batteries," *Journal of Materials Chemistry A*, Vol. 6, (2018), pp. 13244-13253.
328. Hefler, C., Qiu, H-H, and Shyy, W., "Aerodynamic Characteristics Along the Wing Span of a Dragonfly Pantala Flavescens," *Journal of Experimental Biology*, Vol. 221, (2018), **DOI:** 10.1242/jeb.171199.
329. Ji, X., Pan, L., Shyy, W., and Xu, K., "A Compact Fourth-Order Gas-Kinetic Scheme for the Euler and Navier-Stokes Equations," *Journal of Computational Physics*, Vol. 372, (2018), pp. 446-472. Arora, N., Kang, C-K., Shyy, W., and Gupta, A., "Analysis of Passive Flexion in Propelling a Plunging Plate Using a Torsion Spring Model," *Journal of Fluid Mechanics*, Vol. 857, (2018), pp. 562-604.
330. Jiang, H.R., Shyy, W., Wu, M.C., Zhang, R.H., and Zhao, T.S., "A Bi-Porous Graphite Felt Electrode with Enhanced Surface Area and Catalytic Activity for Vanadium Redox Flow Batteries," *Applied Energy,* Vol. 213, (2019), pp. 105-113.

331. Jiang, H.R., Shyy, W., Ren, Y.X., Zhang, R.H., and Zhao, T.S., "A Room-Temperature Activated Graphite Felt as the Cost-Effective, Highly Active and Stable Electrode for Vanadium Redox Flow Batteries," *Applied Energy*, Vol. 233, (2019), pp. 544-553.
332. Jiang, H.R., Zeng, Y.K., Wu, M.C., Shyy, W., and Zhao, T.S., "A Uniformly Distributed Bismuth Nanoparticle-Modified Carbon Cloth Electrode for Vanadium Redox Flow Batteries," *Applied Energy*, Vol. 213, (2019), pp. 226-235.
333. Jiang, H.R., Wei, L., Fan, X.Z., Xu, J.B., Shyy, W., and Zhao, T.S., "A Novel Energy Storage System Incorporating Electrically Rechargeable Liquid Fuels as the Storage Medium," *Science Bulletin*, Vol. 64, (2019), pp. 270-280.
334. Hu, Y., Liu, X., Shyy, W., and Qiu, H., "Flow Over the Tip Region of a Flexible Cantilever Wing with the Effect of Angle of Attack," *ASME Journal of Fluids Engineering*, Vol. 141, (2019), Article # 094501.
335. Jiang, H.R., Zhang, B.W., Sun, J., Fan, X.J., Shyy, W., and Zhao, T.S., "A Gradient Porous Electrode with Balanced Transport Properties and Active Surface Areas for Vanadium Redox Flow Batteries," *Journal of Power Sources*, Vol. 440, (2019), DOI: 10.1016/j.jpowsour.2019.227159.
336. Liu, C., Zhou, G., Shyy, W., and Xu, K., "Limitation Principle for Computational Fluid Dynamics," *Shock Wave*s, Vol. 29, (2019), pp. 1083-1102.
337. Jiang, H.R., Sun, L., Wei, L., Wu, M.C., Shyy, W., and Zhao, T.S., "A High Power Density and Long Cycle Life Vanadium Redox Flow Battery," *Energy Storage Materials*," Vol. 24, (2020), pp. 529-540.
338. Hefler, C., Noda, R., Qiu, H-H, and Shyy, W., "Aerodynamic performance of a free-flying dragonfly-A span-resolved investigation," *Physics of Fluids*, Vol. 32, (2020), DOI: 10.1063/1.5145199.
339. Ji, X., Zhao, F.X., Shyy, W., and Xu, K., "A HWENO Reconstruction Based High -Order Compact Gas -Kinetic Scheme on Unstructured Mesh," *Journal of Computational Physics*, (2020), 109367.
340. Zhao, F.X., Ji, X., Shyy, W., and Xu, K., "An Acoustic and Shock Wave Capturing Compact High-Order Gas-Kinetic Scheme with Spectral-Like Resolution," *International Journal of Computational Fluid Dynamics*, Vol. 34, (2020), pp. 731-756.
341. Liu, X., Hefler, C., Fu, J.J., Shyy, W., and Qiu, H., "Implications of wing pitching and wing shape on the aerodynamics of a dragonfly," *Journal of Fluids and Structures*, Vol.101, (2021), Article #103208.
342. Liu, X., Hefler, C., Shyy, W., and Qiu, H., "The Importance of Flapping Kinematic Parameters in the Facilitation of the Different Flight Modes of Dragonflies," *Journal of Bionic Engineering*, Vol. 18, (2021), pp. 419-427.
343. Ji, X., Zhao, F., Shyy, W., and Xu, K., "Compact High-Order Gas-Kinetic Scheme for Three-Dimensional Flow Simulations," *AIAA Journal*, (2021), DOI: 10.2514/1.J060208.

Comments/Reviews in Refereed Journals

1. Shyy, W., and Sindir, M., "Comments on Policy Statement on the Control of Numerical Accuracy," *ASME Journal of Fluids Engineering*, Vol. 116, (1994), pp. 196-197.
2. Shyy, W. "Book Review: Computation of Unsteady Internal Flows. – Paul G. Tucker, Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001," *AIAA Journal*, Volume 39, p. 2428, (2001).
3. Shyy, W. "Review of Flow Control by Feedback: Stabilization and Mixing. – O.M. Aamo and M. Krstic, Springer-Verlag London Ltd, Surrey, UK. 2003. 198 pp. ISBN 1-85233-669-2," *Applied Mechanics Reviews*, Volume 56, Number 5, 9R23 (2003).
4. Abate, G., Ol, M., and Shyy, W. "Introduction: Biologically Inspired Aerodynamics," *AIAA Journal*, Vol. 46, (2008), pp. 2113-2114.

Full-Length Conference Publications *(Conference papers later published in journals are excluded from the following list to avoid repetitions)*

1. Shyy, W., "A Note on Assessing Finite Difference Procedures for Large Peclet/Reynolds Number Flow Calculation," *Boundary and Interior Layers: Computational and Asymptotic Methods*, Boole Press, J.J.H. Miller (ed.), Dublin, Ireland, Vol. 3, (1984), pp. 303-308.
2. Shyy, W., Correa, S. M., and Tong, S.S., "Demonstration of a New Body-Fitted Coordinate Code for Modeling Gas-Turbine Combustor Flows," AIAA Paper No. 84-1381 *20th AIAA/ASME/SAE Joint Propulsion Conference*, Cincinnati, OH, June 11-13, (1984).
3. Shyy, W., "A Further Assessment of Numerical Annular Dump Diffuser Flow Calculations," AIAA Paper No. 85-1440, *21st AIAA/ASME/SAE Joint Propulsion Conference*, Monterey, CA, July 8-10(1985).
4. Shyy, W., and Correa, S. M., "A Systematic Comparison of Several Numerical Schemes for Complex Flow Calculations," AIAA Paper No. 85-0440, *23rd AIAA Aerospace Sciences Meeting*, Reno, NV, January 14-17 (1985).
5. Shyy, W., and Correa, S. M., "A Heuristic Evaluation of Numerical Methods for Complex Flows," *Proceedings of ASME International Computers in Engineering Conference*, Vol. 3, Boston, MA, August 4-8 (1985), pp. 285-292.
6. Shyy, W., "Adaptive Grid for Internal Flow Computation," *Computational Mechanics '86*, G. Yagawa and S. N. Atluri (Editors), Springer-Verlag, New York, (1986), pp. VII59-VII64.
7. Shyy, W. Braaten, M. E., and Correa, S. M., "A Numerical Study of Flow in a Combustor with Dilution Holes," AIAA Paper No. 86-0057, *24th AIAA Aerospace Sciences Meeting*, Reno, NV, January 6-8 (1986).
8. Vu, T. C., Shyy, W., Braaten, M. E., and Reggio, M., "Recent Developments in Viscous Flow Analysis for Hydraulic Turbine Components," *Proceedings of International Association for Hydraulic Research 1986 Symposium*, Vol. 2, Paper No. 51, Montreal, Canada, September 2-5 (1986).
9. Shyy, W., and Braaten, M. E., "Effect on Inlet Swirl on the Convergence Behavior of a Combustor Flow Computation Algorithm," *Modeling and Simulation*, Vol. 18, M. Willumsen, R. D. Cruz, W. G. Vogt and M. H. Mickle (eds.), Instrument Society of America, Research Triangle Park, North Carolina, (1987), pp. 1839-1844.
10. Lee, D., and Shyy, W., "A Study of Adaptive Solutions for One-Dimensional Problem with Strong Convection and Source Terms," *Modeling and Simulation*, Vol. 18, M. Willumsen, R. D. Cruz, W. G. Vogt and M. H. Mickle (eds), Instrument Society of America, Research Triangle Park, North Carolina, (1987), pp. 1845-1851.
11. Shyy, W., and Braaten, M. E., "Combustor Flow Computations in General Coordinates with a Multigrid Method," *AIAA 8th Computational Fluid Dynamics Conference*, Paper No. 87-1156-CP, Honolulu, Hawaii, June 9-11 (1987), pp. 587-597.
12. Shyy, W., and Braaten, M. E., "A Numerical Study of Flow in Gas-Turbine Combustor," *AIAA/SAE/ASME/ASEE 23rd Joint Propulsion Conference*, Paper No. 87-2132, San Diego, CA, June 29-July 2 (1987).
13. Lee, D., Shyy, W., and Tswei, Y.-M., "Local and Global Methods in Adaptive Grid Computation for Highly Convective Flow," *Computational Techniques and Application: CTAC'87*, B. J. Noyce and C. A. J. Fletcher (eds.), North-Holland, New York (1988), pp. 401-410.
14. Shyy, W., and Braaten, M. E., "Application of a Generalized Pressure Correction Algorithm for Flows in Complicated Geometries," *Advances and Applications in Computational Fluid Dynamics*, O. Baysal (ed.), ASME, New York, (1988), pp. 109-119.
15. Shyy, W., and Braaten, M. E., "Adaptive Grid Computation for Inviscid compressible Flows Using a Pressure Correction Method," *Proceedings of AIAA/ASME/SIAM/APS First National Fluid Dynamics Congress*, (AIAA-CP 888), Cincinnati, OH (1988), pp. 112-120.

16. Burrus, D. L., Shyy, W., and Braaten, M. E., "Numerical Models for Analytical Predictions of Combustor Aerothermal Performance Characteristics," *AGARD Conference Proceedings No. 422: Combustion and Fuels in Gas Turbine Engine*, Paper No. 25, (1988).
17. Shyy, W., "A Unified Pressure Correction Algorithm for Computing Complex Fluid Flows," in *Recent Advances in Computational Fluid Dynamics* (C. C. Chao, S. A. Orszag, and W. Shyy (Editors)), Lecture Notes in Engineering, Springer-Verlag, New York, Vol. 43 (1989), pp. 135-147.
18. Gingrich, W. K., Gebhart, B., and Shyy, W., "Numerical Solutions for a Buoyancy Induced Flow in a Vertical Slot," *Numerical Methods in Thermal Problems*, R. W. Lewis and K. Morgan (Editors), Pineridge Press, Swansea, U.K. Vol. VI, (1989), pp. 523-533.
19. Shyy, W., and Chang, P. Y., "Probing Complex Flow Structure Using Computational Tool," *Flow Visualization - 1989*, B. Khalighi, M.J. Braun and C.J. Freitas (Editors), ASME, New York, (1989), pp. 143-149.
20. Shyy, W., "Computation of Droplet Characteristics in Swirling Recirculating Flow," *AIAA 27th Aerospace Sciences Meeting*, Paper No. 89-0055, January 9-12 (1989).
21. Shyy, W., and Chen, M.-H., "Computation of Double-Diffusive Convection with Solidification in an Enclosure," *AIAA/ASME 5th Joint Thermophysics & Heat Transfer Conference*, Paper No. AIAA-90-1721, (1990).
22. Shyy, W., and Udaykumar, H.S., "Numerical Simulation of Thermo-acoustic Effect on Longitudinal Combustion Instabilities," *AIAA/SAE/ASME/ASEE Joint Propulsion Conference*, Paper No. AIAA-90-2065, (1990).
23. Vu, T.C., Shyy, W., and Ozell, B., "Hydraulic Turbine Performance Prediction by Supercomputing," in D. Pelletier (ed.), *Proceedings of 4th Canadian Supercomputing Symposium*, June 4-6 (1990), Montreal, Canada, pp. 83-91.
24. Vu, T.C., and Shyy, W., "A Comparative Study of Three-Dimensional Viscous Flows in Semi and Full Spiral Casings," *Proceedings of IAHR 15th Symposium* (1990), Belgrade, Yugoslavia, paper No. 12.
25. Shyy, W., and Chang, G.-C., "Choice of Velocity Variables for Complex Flow Computation," NASA CP-3078: *Computational Fluid Dynamics Symposium on Aeropropulsion*, pp. 241-257, (1991).
26. Shyy, W., Pang, Y., Wei, D.Y., and Chen, M.-H., "Effect of Surface Tension and Buoyancy on Continuous Ingot Solidification," *AIAA 29th Aerospace Sciences Meeting*, Paper No. AIAA-91-0506, (1991).
27. Chen, M.-H., Shyy, W., Sun, C.-S., and Liang, S.-J., "Assessment of Several Linear Multigrid Solvers for Transport Problems," *Numerical Methods in Laminar and Turbulent Flow*, Vol. VII, C. Taylor, J.H. Chin and G.M. Homsy (Editors), Part 2, pp. 1283-1294, Pineridge Press, Swansea, U.K., (1991).
28. Shyy, W., Gingrich, W.K., Krotiuk, W.J., Fredley, J.E., and Chalmers, D.R., "Modeling of Two-Phase Thermocapillary Flow in a Spacecraft Thermal Control Loop," *Microgravity Flows-1991*, A. Hashemi, B.N. Antar, I. Tanasawa (Editors), pp. 15-20, ASME, (1991).
29. Thakur, S., and Shyy, W., "Unsteady, One-Dimensional Gas Dynamics Computations Using a TVD Type Sequential Solver," *28th AIAA/SAE/ASME/ASEE Joint Propulsion Conference*, Paper No. 92-3640 (1992).
30. Gingrich, W.K., and Shyy, W., "Transient Simulation of the Two-Phase Thermocapillary Flow under Microgravity," *Topics in Heat Transfer*, Vol. 3, R.S. Downing, L. Haas, S. Chelliah, E.E., anderson, K. Vafai, W.S. Chang and G.R. Cunnington (Editors), ASME HTD - Vol. 206-3, pp. 29-34, ASME, (1992).
31. Shyy, W., Thakur, S., and Tucker, P.K., "Treating Convection in Sequential Solvers," NASA CP-3174, *Advanced Earth-to-Orbit Propulsion Technology - 1992*, Vol. II, pp. 144-153 (1992).
32. Shyy, W., Wright, J.A., and Liu, J., "A Multilevel Composite Grid Method for Fluid Flow Computations," *AIAA 31st Aerospace Sciences Meeting*, Paper No. 93-0768, (1993).

33. Shyy, W., Gingrich, W.K., Krotiuk, W.J., and Fredley, J.E., "Transient Two-Phase Heat Transfer in a Capillary-Pumped-Loop Reservoir for Spacecraft Thermal Management," *10th Symposium on Space Nuclear Power and Propulsion*, AIP Conference Proceedings No. 271, M.S. El-Genk and M.D. Hoover (Editors), pp. 993-998, (1993), New York.
34. Shyy, W., Rao, M. Krotiuk, W.J. and Fredley, J.E., "Modeling and Simulation of Phase Change and Thermofluid Transport for Spacecraft Applications," *10th Symposium on Space Nuclear Power and Propulsion*, AIP Conference Proceedings No. 271, M.S. El-Genk and M.D. Hoover (Editors), pp. 1691-1696, (1993), New York.
35. Udaykumar, H.S., and Shyy, W., "Modeling Solidification Processes at Morphological Scales," *Advanced Computations in Materials Processing*, V. Prasad and R.V. Arimilli (Editors), HTD-Vol. 241, pp. 33-43, ASME, New York (1993).
36. Tucker, P.K., and Shyy, W., "A Numerical Analysis of Supersonic Flow over an Axisymmetric Afterbody," *AIAA/SAE/ASME/ASEE 29th Joint Propulsion Conference*, Paper No. 93-2347, (1993).
37. Smith, R., and Shyy, W., "A Viscous Flow Based Membrane Wing Model," *AIAA 24th Fluid Dynamics Conference*, Paper No. 93-2955, (1993).
38. Vu, T.C., Heon, K., and Shyy, W., "An Integrated CFD Tool for Hydraulic Turbine Efficiency Prediction," *Proceedings of the 5th International Symposium of Refined Flow Modeling and Turbulence Measurements*, pp. 811-818, Presses Ponts et Chaussees, Paris, France, September 7-10, (1993).
39. Clutter, J.K., Li, H., Shyy, W., and Thakur, S., "Computation of Compressible Internal Flow for Interior Ballistic Applications," *30th AIAA/ASME/SAE/ASEE Joint Propulsion Conference*, Paper No. AIAA-94-3049, (1994).
40. Vu, T.C., Heon, K., and Shyy, W., "A CFD-Based Computer Engineering System for Hydraulic Turbines," *Proceedings of the XVII IAHR Symposium*, Vol. 1, pp. 329-340, Beijing, China, (1994).
41. Shyy, W., Ouyang, H., Hung, C.I., and Rao, M.M., "Modeling of Transport and Solidification Processes in Vertical Bridgman Crystal Growth Systems," in T.H. Hwang and R.N. Smith (Editors) *Challenges of High Temperature Heat Transfer Equipment*, ASME HTD-Vol. 282, pp. 1-13 (1994).
42. Thakur, S., Shyy, W., and Tucker, P.K., "A Controlled Variation Scheme (CVS) for Flows at All Speeds," NASA CP-3282, *Advanced Earth-to-Orbit Propulsion Technology - 1994*, Vol. II, pp. 29-40 (1994).
43. Liu, J., and Shyy, W., "On the Conservative Interface Treatment for Multi-Block Viscous Flow Computations," *NASA CR 195442 & ICOMP-95-4*, Cleveland, OH, (1995).
44. Udaykumar, H.S., Shyy, W., Kan, H.-C., Jubin, P., and Tran-Son-Tay, R., "An Eulerian-Lagrangian Method for Fluid Flow with Moving Boundaries," *ASME 1995 IMECE*, Proceedings of the ASME Fluids Engineering Division, FED-Vol. 234, D.C. Wiggert, F.J. Moody, M. Padmanabhan, F. Dodge, Horii, P.E. Raad, T.T. Huang, and G. Tryggvason (Editors), pp. 183-199 (1995), ASME New York.
45. Smith, R.W., and Shyy, W., "Computation of Aerodynamic Coefficients for a Flexible Two-Dimensional Membrane Wing in Turbulent Flow," *ASME 1995 IMECE*, Proceedings of the ASME Fluids Engineering Division, FED-Vol. 234, D.C. Wiggert, F.J. Moody, M. Padmanabhan, F. Dodge, Horii, P.E. Raad, T.T. Huang, and G. Tryggvason (Editors), pp. 3-9 (1995), ASME New York.
46. Ouyang, H., and Shyy, W., "*Applications of Multi-Level Simulation of Bridgman Growth Process for β-NiAl and CdTe Crystals*," 1996 TMS Annual Meeting, 1996 EPD Congress (Proceedings of Sessions and Symposia sponsored by the Extraction and Processing Division), G.W. Warren (ed.), pp. 707-723, The Minerals, Metals & Materials Society, Warrendale, PA, (1996).

47. Thakur, S., Wright, J., Shyy, W., and Vu, T., "A Pressure-Based Composite Multigrid Method with Conservative Interface Treatment," *AIAA 34th Aerospace Sciences Meeting & Exhibit*, Paper No. 96-0298, (1996).
48. Krishnamurty, V.S., Clutter, J.K., and Shyy, W., "Study of Two-Equation Based Modelling for Compressible, Turbulent Flows," *AIAA 34th Aerospace Sciences Meeting & Exhibit*, Paper No. 96-0518, (1996).
49. Clutter, J.K., Abate, G., Shyy, W., and Segal, C. "Study of Fast Transient Flow Phenomenon for Munition Application," *AIAA 34th Aerospace Sciences Meeting & Exhibit*, Paper No. 96-0829, (1996).
50. Hudson, M.K., Luchini, C., Clutter, J.K., and Shyy, W. "CFD Approach to Firearms Sound Suppresor Design," *32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, Paper No. AIAA 96-3020, (1996).
51. Liu, J., Shyy, W., Vu, T., and Perng, C.-Y. "Two-Equation Turbulence Modeling for Internal Flows with Non-Equilibrium and Rotating Effects," C.-J. Chen, C. Shih, J. Lienau and R.J. Kung (Editors), *Flow Modeling and Turbulence Measurements VI (Proceedings of the 6th International Symposium on Flow Modeling and Turbulence Measurements*, September 8-10 (1996) Tallahassee, FL), pp. 347-354, A.A. Balkema, Rotterdam, The Netherlands.
52. Clutter, J.K., Abate, G., and Shyy, W. "The Modeling of Blast Overpressure and Comparison with Experimental Results," *Proceedings of 16th International Ballistics Symposium and Exhibition*, Vol. 1, pp. 425-434, San Francisco, CA, September 23-27, (1996).
53. Martin, A.R., Saltiel, C., and Shyy, W. "Radiation-Assisted Internal Heat Transfer Enhancement with Fiber Arrays," *1996 ASME International Joint Power Generation Conference*, ASME Power Division Publication PWR Vol. 30, pp. 17-23, Houston, (1996).
54. Vu, T.C., Boyer, B., and Shyy, W. "Draft Tube Loss Prediction by Viscous Flow Analysis - The Quest for Accuracy," *Hydro Power 1996 Conference*, Beijing, P.R. China, (1996).
55. Kan, H.-C., Udaykumar, H.S., Shyy, W., and Tran-Son-Tay, R., "Simulation of Multiphase Dynamics by a Mixed Eulerian-Lagrangian Approach," *ASME 1996 IMECE*, Paper No. 96-WA/HT-32.
56. Krishnamurty, V.S., Shyy, W., and Thakur, S.S., "Effect of Wall Roughness on the Flow Through Converging-Diverging Nozzles," *AIAA 35th Aerospace Sciences Meeting & Exhibit*, Paper No. 97-0208, (1997).
57. Clutter, J.K. Krishnamurty, V.S., and Shyy, W., "Combustion and Turbulence Effects in Hypersonic Projectile Flows," *AIAA 35th Aerospace Sciences Meeting & Exhibit*, Paper No. 97-0897, (1997).
58. Thakur, S.S., Wright, J.A., and Shyy, W., "Computation of a Leading-Edge Film Cooling Flow Over an Experimental Geometry," *ASME International Turbo Exposition & Conference*, Paper No. 97-GT-381, (1997).
59. Vasic, S., Vu, T. C., and Shyy, W., "Numerical Computation of Turbulent Flows with Strong Streamline Curvature Effects," *The Fifth Annual Conference of the Computational Fluid Dynamics Society of Canada*, May 25-27 (1997), Victoria, British Columbia, Canada.
60. Madsen, J.I., Shyy, W., Haftka, R.T., and Liu, J., "Response Surface Techniques for Diffuser Shape Optimization," *AIAA 28th Fluid Dynamics Conference*, Paper No. 97-1801, (1997).
61. Shyy, W., and Smith, R.W., "A Study of Flexible Airfoil Aerodynamics with Application to Micro Aerial Vehicles," *AIAA 28th Fluid Dynamics Conference*, Paper No. 97-1933, (1997).
62. Abate, G., Shyy, W., Segal, C., and Anderson, C., "Development of the Air Force Research Laboratory Shock Induced Combustion Device," *48th Aeroballistic Range Association Meeting*, Nov. 3-6, (1997), Austin, TX.
63. Clutter, J.K., and Shyy, W., "Evaluation of Source Treatments for High-Speed Reacting Flows," *AIAA 36th Aerospace Sciences Meeting & Exhibit*, Paper No. 98-0250, (1998).

64. Clutter, J.K., Mikolaitis, D.W., and Shyy, W., "Effect of Reaction Mechanism in Shock-Induced Combustion Simulations," *AIAA 36th Aerospace Sciences Meeting & Exhibit*, Paper No. 98-0274, (1998).
65. Vasic, S., Vu, T. C., Shyy, W., and Baliga, R.B., "Numerical Computation of Turbulent U-Duct Flow with a Second-Moment Closure," *Hydro Power 1998 Conference*, Singapore, (1998).
66. Jenkins, D.A., Shyy, W., Sloan, J., Klevebring, F., and Nilsson, M, Airfoil Performance at Low Reynolds Numbers for Micro Air Vehicle Applications," *Thirteenth Bristol International RPV/UAV Conference*, Paper No. 29, ISBN 0-86292-461-8, University of Bristol, Bristol, U.K., March 30 - April 1, (1998).
67. Boudreaux, E.J., Krishnamurty, V.S., Mitchell, A.M., and Shyy, W., "Experiments and Analyses of an Aerospike Flow Environment for Protecting Infrared Missile Dome," *NATO RTO Meeting Proceedings 5: Missile Aerodynamics*, Paper 13, Sorrento, Italy, 11-14 May (1998).
68. Shyy, W., Kan, H.-C., Udaykumar, H.S., and Tran-Son-Tay, R., "Deformation, Recovery, and Adhesion of a Viscous Drop," *Third International Conference on Multiphase Flow (ICMF'98)*, Lyon, France, June 8-12 (1998).
69. Prewitt, N.C., Belk, D.M., and Shyy, W., "Implementation of Parallel Grid Assembly for Moving Body Problems," *AIAA Atmospheric Flight Mechanics Conference & Exhibit*, Paper No. 98-4344, (1998).
70. Abate, G., Shyy, W., Segal, C., and Anderson, C., "Gas Dynamic Structure of a Shock Wave Undergoing Sudden Expansion," *20th AIAA Advanced Measurement and Ground Testing Technology Conference*, Paper No. 98-2508, June 15-18, (1998).
71. Tucker, P.K., Shyy, W., and Sloan, J.G., "An Integrated Design/Optimization Methodology for Rocket Engine Injectors," *AIAA/SAE/ASME/ASEE 34th Joint Propulsion Conference*, Paper No. 98-3513, July 13-15 (1998).
72. Udaykumar, H.S., Mittal, R., and Shyy, W., "An Eulerian-Lagrangian Front Tracking Method for Immersed Boundaries," *ASME 1998 IMECE*.
73. Ebert, M., Shyy, W., Thakur, S., and Liou, M.-S., "Heat Transfer and Fluid Flow in Rotating Cavities," *AIAA 37th Aerospace Sciences Meeting & Exhibit*, Paper No. 99-0737, (1999).
74. Abate, G., Shyy, W., Segal, C., Mikolaitis, D.W., and Anderson, C., "Gas Dynamic Structure of Expanding Shock," *AIAA 37th Aerospace Sciences Meeting & Exhibit*, Paper No. 99-0820 (1999).
75. Prewitt, N.C., Belk, D.M., and Shyy, W., "Distribution of Data Structure for Parallel Grid Assembly," *AIAA 37th Aerospace Sciences Meeting & Exhibit*, Paper No. 99-0913 (1999).
76. Prewitt, N.C., Belk, D.M., and Shyy, W., "Parallel Implementation of Time-Accurate CFD Applications with Moving Chimera Grids," *The Ninth SIAM Conference on Parallel Processing for Scientific Computing* (1999).
77. Papila, N., Shyy, W., Fitz-Coy, N., and Haftka, R.T., "Assessment of Neural Net and Polynomial-Based Techniques for Aerodynamic Applications," *AIAA 17th Applied Aerodynamics Conference*, Paper No. 99-3167 (1999).
78. Ye, T., Mittal, R., Udaykumar, H.S., and Shyy, W., "A Cartesian Grid Method for Viscous Incompressible Flows with Complex Immersed Boundaries," *AIAA 14th Computational Fluid Dynamics Conference*, Paper No. 99-3312 (1999).
79. Thakur, S., and Shyy, W., "Reynolds Stress Models for Flows in Complex Geometries: Review and Application," *AIAA 30th Fluid Dynamics Conference*, Paper No. 99-3782 (1999).
80. Tucker, P. K., Shyy, W., and Vaidyanathan, R., "Optimization of a GO_2/GH_2 Impinging Injector Element," NASA 10^{th} Thermal and Fluids Analysis Workshop, September 13-17, 1999, Huntsville, AL.
81. Udaykumar, H.S., Mittal, R., and Shyy, W., "Simulation of Flow and eat Transfer with Phase Boundaries and Complex Geometries on Cartesian Grids," *ASME 1999 IMECE*, ASME Proceedings HT-Vol. 364-3, pp. 357-370, (1999).

82. Tucker, P. K., Shyy, W., and Vaidyanathan, R., "Optimization of a GO_2/GH_2 Swirl Coaxial Injector Element," Penn State University Propulsion Engineering Research Center 11th Annual Symposium on Propulsion, November (1999).
83. Sloan, J.G., Shyy, W., and Haftka, R.T., "Airfoil and Wing Planform Optimization for Micro Air Vehicles," *NATO RTO Proceedings 35: Aerodynamic Design and Optimization of Flight Vehicle in a Concurrent Multi-Disciplinary Environment*, Paper No. 28, Ottawa, Canada, 18-21 October (1999).
84. Lillberg, E., Kamakoti, R., and Shyy, W., "Computation of Unsteady Interaction between Viscous Flows and Flexible Structure with Finite Inertia," *AIAA 38th Aerospace Sciences Meeting & Exhibit*, Paper No. 2000-0142 (2000).
85. Abate, G., Edwards, J., Roper, J., Shyy, W., Mikolaitis, D., Segal, C., and Anderson, C., "An Experimental and Numerical Investigation of Fast ransient Gas Dynamics," *AIAA 38th Aerospace Sciences Meeting & Exhibit*, Paper No. 2000-0556 (2000).
86. Thakur, S.S., Lin. W., Wright, J.A., Shyy, W., and Lievens, R., "Computational Modeling of Low-Pressure Fan Flows," *ASME International Turbo Exposition & Conference*, Munich, Germany, May 8-11 (2000).
87. He, X., Fuentes, C., Shyy, W., Lian, Y., and Carroll, B., "Computation of Transitional Flows around an Airfoil with a Movable Flap," *AIAA Fluids 2000 and Exhibit, Paper No. AIAA-2000-2240*, June 19-22, (2000), Denver, Colorado.
88. Fuentes, C., He, X., Carroll, B.F., Lian, Y., and Shyy, W., "Low Reynolds Number Flows Around an Airfoil with a Movable Flap – Part 1: Experiments," *AIAA Fluids 2000 and Exhibit, Paper No. AIAA-2000-2240*, June 19-22, (2000), Denver, Colorado.
89. Udaykumar, H.S., Tran, L., Shyy, W., Vanden, K., and Belk, D.M., "A Combined Immersed Interface and ENO Shock Capturing Method for Multimaterial Impact Dynamics," *AIAA Fluids 2000 and Exhibit, Paper No. AIAA-2000-2664*, June 19-22, (2000), Denver, Colorado.
90. Tucker, P.K., Shyy, W., and Vaidyanathan, R., "An Optimization-Based Approach to Injector Element Design," *AIAA/SAE/ASME/ASEE 35th Joint Propulsion Conference*, Paper No. 2000-3220, July 16-19 (2000).
91. Papila, N., Shyy, W., Griffin, L., Huber, F., and Tran, K., "Preliminary Design Optimization for a Supersonic Turbine for Rocket Propulsion," *AIAA/SAE/ASME/ASEE 35th Joint Propulsion Conference*, Paper No. 2000-3242, July 16-19 (2000).
92. Vaidyanathan, R., Papila, N., Shyy, W., Tucker, P.K., Griffin, L. W., Fitz-Coy, N., and Haftka, R.T, "Neural Network-Based and Response Surface-Based Optimization Strategies for Rocket Engine Component Design," *8th AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, Paper No. 2000-4480, Long Beach, CA, (2000).
93. Francois, M.M., Shyy, W., and Chung, J.N., "A Micro-Scale Membrane Actuated Condenser/Evaporator for Enhanced Thermal Management," *ASME IMECE Conference*, November (2000).
94. N'dri, N., Shyy, W., Tran-Son-Tay, R., and Udaykumar, H.S., "A Multi-Scale Model for Cell Adhesion and Deformation," *ASME IMECE Conference*, November (2000).
95. Shyy, W., Francois, M.M., and Udaykumar, H.S., "Computational Moving Boundary Problems in Engineering and Biomechanics," Keynote Paper, *The 7th National Computational Fluid Dynamics Conference*, Keynote Paper, Kenting, Taiwan, August (2000).
96. Shyy, W., Papila, N., Tucker, P.K., Vaidynanthan, R., and Griffin, L. "Global Optimization for Fluid Machinery Applications," Keynote Paper, *Proceedings of The Second International Symposium on Fluid Machinery and Fluid Engineering (ISFMFE)*, pp. 1-10, Beijing, China, October (2000).
97. Chochua, G., Shyy, W., and Moore, J., "Thermophysical Modeling for Honeycomb-Stator Gas Annular Seal," AIAA Paper No. 2001-2757 (2001).
98. Senocak, I., and Shyy, W., "Numerical Simulation of Turbulent Flows with Sheet Cavitation," *CAV2001*, June 2001, Pasadena, CA. (2001).

99. Prewitt, N., Duffy, D., and Shyy, W., "Mixed Parallel Programming Models Applied to Chimera Grid Assembly," AIAA 15th Computational Fluid Dynamics Conference, Paper No. 2001-2586 (2001).
100. Mei, R., Yu, D., and Shyy, W., "Assessment of the Multi-Relaxation-Time and Single-Relaxation-Time Models in the Lattice Boltzmann Equation Method," *AIAA 15th Computational Fluid Dynamics Conference*, Paper No. 2001-2666 (2001).
101. Griffin, L., Dorney, D., Huber, F., Shyy, W., Papila, N., and Tran, K. "Detailed Aerodynamic Design Optimization of an RLV Turbine," *37th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, Paper No. AIAA 2001-3397 (2001).
102. Chochua, G., Shyy, W., and Moore, J., "Aerodynamics of Scallop Seal Flows in Turbomachinery," *2001 ASME International Mechanical Engineering Congress & Exposition (IMECE)*, (2001), New York, NY.
103. Papila, M., Papila, N., Shyy, W., Haftka, R.T., and Fitz-Coy, N., "Design Space Windowing Using Mean Squared Error Criterion," *AIAA 40th Aerospace Sciences Meeting & Exhibit*, Paper No. 2002-0539 (2002).
104. Ifju, P., Jenkins, D., Ettinger, S., Lian, Y., Shyy, W., and Waszak, M., "Flexible Wing-Based Micro Air Vehicles," *AIAA 40th Aerospace Sciences Meeting & Exhibit*, Paper No. 2002-0705 (2002).
105. Shyy, W., Francois, M., and Udaykumar, H.S., "Cartesian and Curvilinear Grid Methods for Multi-domain, Moving Boundary Problems," Keynote Paper, *Thirteenth International Conference on Domain Decomposition Methods*, N. Debit, M. Garbey, R. Hoppe, J. P´eriaux, D. Keyes, Y. Kuznetsov (Editors), pp. 109-125.
106. Francois, M. M., and Shyy, W., "Direct Simulations of Impact Dynamics and Heat Transfer of a Liquid Drop," Invited Paper, *Proceedings of Fifth World Congress on Computational Mechanics*, July 7-12, 2002, Vienna, Austria, Editors: H.A. Mang, F.G. Rammerstorfer, and J. Eberhardsteiner.
107. Senocak, I., and Shyy, W., "Evaluation for Cavitation Models for Navier-Stokes Computation," *Proceedings of FEDSM'02, ASME Fluids Engineering Division Summer Meeting*, Montreal, Quebec, Canada, July 14–18, 2002.
108. Chochua, G., and Shyy, W., "Modeling of Fluid Dynamics of Gas Seals," Invited Paper in the *4th International Conference on Pumps and Fans (4th ICPF)*, August 26-29, 2002, Tsinghua University, Beijing, China.
109. Burman, J., Papila, N., Shyy, W., and Gebart, B.R., "Assessment of Response Surface-Based Optimization Techniques for Unsteady Flow Around Bluff Bodies," AIAA Paper 2002-5996, *9th AIAA/ISSMO Symposium on Multidisciplinary Analysis and Optimization*, Atlanta, Georgia, 4-6 September 2002.
110. Yu, D., Mei, R., and Shyy, W., "A Unified Boundary Treatment in Lattice Boltzmann Method," *AIAA 41st Aerospace Sciences Meeting & Exhibit*, Paper No. 2003-0953, (2003).
111. Wu, J., Utturkar, Y., Senocak, I., Shyy, W., and Arakere, N., "Impact of Turbulence and Compressibility Modeling on Three-Dimensional Cavitating Flow Computations," *AIAA 33rd Fluid Dynamics Conference*, Paper No. 2003-4264 (2003).
112. Jayaraman, B., and Shyy, W., "Flow Control And Thermal Management Using Dielectric Glow Discharge Concepts," *AIAA 33rd Fluid Dynamics Conference*, Paper No. 2003-3712 (2003).
113. Zhang, B., Lian, Y., and Shyy, W., "Proper Orthogonal Decomposition for Three-Dimensional Membrane Wing Aerodynamics," *AIAA 33rd Fluid Dynamics Conference*, Paper No. 2003-3917 (2003).
114. Viieru, D., Lian, Y., and Shyy, W. "Investigation of Tip Vortex on Aerodynamic Performance of a Micro Air Vehicle," *AIAA 33rd Fluid Dynamics Conference*, Paper No. 2003-3597 (2003).
115. Ifju, P., Jenkins, D., Ettinger, S., Lian, Y., Shyy, W., and Waszak, M., "Flexible Wing-Based Micro Air Vehicles," Invited paper, Confederation of European Aerospace Societies Aerodynamics Conference, June 10-12, (2003) London, UK.

116. Senocak, I., and Shyy, W., "Computations of Unsteady Cavitation with a Pressure-Based Method," *Proceedings of FEDSM'0*, Paper No. 2003-45009, *4th ASME_JSME Joint Fluids Engineering Conference*, Honolulu, Hawaii, USA, July 6–11 (2003).
117. Shyy, W., "Multiphase Computations Using Sharp and Continuous Interface Techniques," Keynote Paper, *3rd International Conference on Computational Heat and Mass Transfer*, May 26–30, 2003, Banff, CANADA.
118. Chochua, G., and Shyy, W., "Computational Modeling of Turbulent Flows Over Rough Surfaces," Proceedings of IMECE'03 2003 ASME International Mechanical Engineering Congress & Exposition, Paper Number IMECE 2003-41063, Washington, DC, November 16-21 (2003).
119. Chung, J.N., Shyy, W., Yuan, K., Chen, T., and Carvalho, C., "Microgravity Cryogenic Boiling Heat Transfer with Application to ZBO and Pipe Chilldown," in Advances in Cryogenic Engineering, Vol. 49, edited by J. Waynert et al., , pp. 1179-1186, American Institute of Physics.
120. Vaidyanathan, R., Shyy, W., Garbey, M., and Haftka, R.T. "CFD Code Verification Using Least Square Extrapolation Method," *42nd Aerospace Sciences Meeting & Exhibit*, Paper No. 2004-0739, (2004).
121. Popescu, M., Shyy, W., and Garbey, M. "A Study of Dispersion-Relation-Preserving and Optimized Prefactored Compact Schemes for Wave Equations," *42nd Aerospace Sciences Meeting & Exhibit*, Paper No. 2004-0519, (2004).
122. Kamakoti, R., Shyy, W. Thakur, S.S., and Sankar, B. "Time Dependent RANS Computation for an Aeroelastic Wing," *42nd Aerospace Sciences Meeting & Exhibit*, Paper No. 2004-0886, (2004).
123. Vaidyanathan, R., Goel, T., Shyy, W., Haftka, R.T., V. Queipo, N.V., and Tucker, P.K., "Global Sensitivity and Trade-Off Analyses for Multi-Objective Liquid Rocket Injector Design," *40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, 11-14 July 2004 / Fort Lauderdale, FL, Paper No. AIAA-2004-4007.
124. Shyy, W. Wu, J., Utturkar, Y., and Tai, C.-F., "Interfacial-Dynamics-Based Cavitation Model and Multiphase Flow Computation," invited presentation, *European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS) 2004 Congress*, Jyväskylä Paviljonki International Congress Centre and University of Jyväskylä, Mattilanniemi, 24 – 28 July 2004.
125. Uzgoren, E., Shyy, W., and Garbey, M., "Parallelized Domain Decomposition Techniques for Multiphase Flows," *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference*, July 11-15, 2004, Charlotte, North Carolina, Paper No. ASME HT-FED-2004-56079.
126. Wu, J., Shyy, W., and Johansen, S.T., "Filter-Based Unsteady RANS Computations for Single-Phase and Cavitating Flows," *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference*, July 11-15, 2004, Charlotte, North Carolina, Paper No. ASME HT-FED-2004-56181.
127. Utturkar, Y., Thakur, S., and Shyy, W., "Accurate Time-Dependent Computations and Reduced-Order Modeling for Multiphase Flows," *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference*, July 11-15, 2004, Charlotte, North Carolina, Paper No. ASME HT-FED-2004-56236.
128. Garbey, M., Shyy, W., Hadri, B., and Rouqetet, E., "Numerically Efficient Solution Techniques for Computational Fluid Dynamics and Heat Transfer Problems," *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference*, July 11-15, 2004, Charlotte, North Carolina, Paper No. ASME HT-FED-2004-56475.

129. Joly, F., Shyy, W., and Labrosse, G., "The Effect of Thermo-Solutal Capillary Transport on the Dynamics of Liquid Bridge," *Proceedings of 2004 ASME Heat Transfer/Fluids Engineering Summer Conference, July 11-15, 2004*, Charlotte, North Carolina, Paper No. ASME HT-FED-2004-56583.
130. Shyy, W., Wu, J., and Utturkar, Y., "Computational Modeling for Cavitation for Liquid Rocket Applications," *40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, Paper No. AIAA-2004-3985, 11-14 July 2004, Fort Lauderdale, FL.
131. Shyy, W., Haftka, R.T., Vaidyanathan, R., and Goel, T., "Large Scale Computation-Facilitated Design Optimization for Propulsion Components," *40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*, Paper No. AIAA-2004-3986, 11-14 July 2004, Fort Lauderdale, FL.
132. Utturkar, Y., Thakur, S.S., and Shyy, W. "Computational Modeling of Thermodynamic Effects in Cryogenic Cavitation," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-1286, (2005).
133. Singh, R.K., N'Dri, N.N., Uzgoren, E., Shy, W., and Garbey, M. "Three-Dimensional Adaptive, Cartesian Grid Method for Multiphase Flow Computations," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-1389, (2005).
134. Garbey, M., Hadri, B., and Shyy, W. "Fast Elliptic Solver for Incompressible Navier Stokes Flow and Heat Transfer Problems on the Grid," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-1386, (2005).
135. Mack, Y., Goel, T., Shyy, W., Haftka, R.T., and Queipo, N., "Multiple Surrogates for Shape Optimization of Bluff Body-Facilitated Mixing," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-0333, (2005).
136. Goel, T., Mack, Y., Shyy, W., Haftka, R.T., and Queipo, N., "Interaction between Grid and Design Space Refinement for Bluff Body-Facilitated Mixing," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-0125, (2005).
137. Tang, L., Chen, P.-C., Liu, D.D., Gao, X.-W., Shyy, W., Utturkar, Y., and Zhang, B. "Proper Orthogonal Decomposition and Response Surface Method for TPS/RLV Structural Design Optimization: X-34 Case Study," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-0839, (2005).
138. Thakur, S.S., Wright, J.A., and Shyy, W., "An Algorithm for Chemically Reacting Flows on Generalized Grids Using a Rule-Based Framework," *43rd Aerospace Sciences Meeting & Exhibit*, Paper No. 2005-0875, (2005).
139. Popescu, M., Tai, C.F., and Shyy, W. "A Finite Volume-Based High Order Cartesian Cut-Cell Method for Computational Aeroacoustics," 11th AIAA/CEAS Aeroacoustics Conference, Monterey, California, May, 23 - 25. 2005, AIAA Paper No. 2005-2825.
140. Singh, R.K., Uzgoren, E., Tai, C.-F and Shyy, W., "A Marker-Based, Adaptive/Multi-Grid Technique for Interfacial Fluid Dynamics," Keynote paper, *CFD 2005 – 4th International Conference on Computational Fluid Dynamics in the Oil and Gas, Metallurgical & Process Industries*, 6 - 8 June, 2005, Trondheim, Norway.
141. Chen, P.C., Liu, D.D., Chang, K.T., Tang, L., Gao, X.W., Bhungalia, A., Beran, P., and Shyy, W "Aerothermodynamic Optimization of Hypersonic Vehicle TPS Design by a POD/RSM-Based Approach," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-0777, (2006).
142. Singh, R.K., and Shyy, W., "Three-Dimensional Adaptive Grid Computation with Conservative, Marker-Based Tracking for Interfacial Fluid Dynamics," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-1523, (2006).
143. Viieru, D., Tang, J., Lian, Y., Liu, H., and Shyy, W., "Flapping and Flexible Wing Aerodynamics of Low Reynolds Number Flight Vehicles," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-0503, (2006).

144. Jayaraman, B., Thakur, S.S., and Shyy, W., "Modeling of dielectric barrier discharge and resulting fluid dynamics," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-0686, (2006).
145. Goel, T., Haftka, R.T., Shyy, W., and Watson, L.T., "Pointwise RMS bias error estimates for design of experiments," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-0724, (2006).
146. Chen, P.C., Liu, D.D. Chang, K.T., Tang, L., Gao., X.-W., Bhungalia, A., Beran, P., and Shyy, W., "Aerothermodynamic Optimization of Hypersonic Vehicle TPS Design by a POD/RSM-Based Approach," *44th Aerospace Sciences Meeting & Exhibit*, Paper No. 2006-0777, (2006).
147. Popescu, M., Tai, C.F., and Shyy, W. "Cartesian Cut-Cell Method with Local Grid Refinement for Wave Computations," 12th AIAA/CEAS Aeroacoustics Conference, Monterey, California, May 8-10, (2006), AIAA Paper No. 2006-2522.
148. Kamakoti, R., Thakur, S., Wright, J.A., and Shyy, W., "Validation of a New Parallel All-Speed CFD Code in a Rule-Based Framework for Multidisciplinary Applications,"AIAA 36th Fluid Dynamicvs Conference and Exhibit, June 5-8, 2006, Paper No. 2006-3063.
149. Samad, A., Kim, K.-Y., Goel, T., Haftka, R.T., and Shyy, W., "Shape Optimization of Turbomachinery Blade Using Multiple Surrogate Models," 2006 ASME Joint-U.S.-European Fluids Engineering Summer Meeting, July 19-23, (2006), Miami, FL, USA, Ppaer No. FEDSM2006-98368.
150. Mack, Y., Haftka, R.F., Griffin, L., Snellgrove, L., Dorney, D., Huber, F., and Shyy, W., "Radial Turbine Preliminary Aerodynamic Design Optimization for Expander Cycle Liquid Rocket Engine," AIAA Paper No. 2006-5047, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 09–12 July 2006, Sacramento, California.
151. Luke, E., Thakur, S., Thompson, D., Wright, J., and Shyy, W., "Recent Progress Towards a Rule-Based Computational Tool for Liquid Rocket Combustion," AIAA Paper No. 2006-5043, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 09-12 July 2006, Sacramento, California.
152. Sozer, E., Shyy, W., and Thakur, S., "Multi-Scale Porous Media Modeling for Liquid Rocket Injector Applications," AIAA Paper No. 2006-5046, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 09-12 July 2006, Sacramento, California.
153. Goel, T., Zhao, J., Thakur, S., Haftka, R.T., and Shyy, W., "Surrogate Model-Based Strategy for Cryogenic Cavitation Model Validation and Sensitivity Evaluation," AIAA Paper No. 2006-5047, 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 09-12 July 2006, Sacramento, California.
154. Goel, T., Haftka, R.T., Queipo, N., and Shyy, W., "Performance Estimate and Simultaneous Application of Multiple Surrogates," 11th AIAA/ISSMO Multi-Disciplinary Analysis and Optimization Conference, 06–08 Sept 2006, Portsmouth, Virginia, Paper No. 2006-7047.
155. Wang, G., Li, X., Zhang, M., and Shyy, W., "Multiphase Dynamics of Supercavitating Flows around a Hydrofoil," Sixth International Symposium on Cavitation, CAV2006, Wageningen, The Netherlands, September 2006.
156. Uzgoren, E., Sim, J., and Shyy, W., "Computations of Multiphase Fluid Flows Using Marker-Based Adaptive, Multilevel Cartesian Grid Method," 45th AIAA Aerospace Sciences Meeting and Exhibit, 8-11 January 2007, Reno, Nevada, Paper No. AIAA 2007-336.
157. Lian, Y., and Shyy, W., "Aerodynamics of Low Reynolds Number Plunging Airfoil under Gusty Environment," 45th AIAA Aerospace Sciences Meeting and Exhibit, 8-11 January 2007, Reno, Nevada, Paper No. AIAA 2007-79.
158. Jayaraman, B., Lian, Y., and Shyy, W., "Low- Reynolds Number Flow Control Using Dielectric Barrier Discharge- Based Actuators," AIAA Paper No. 2007-3974, 37th AIAA Fluid Dynamics Conference and Exhibit, 2007.

159. Tang, J., Viieru, D., and Shyy, W., "A Study of Aerodynamics of Low Reynolds Number Flexible Airfoils," AIAA Paper No. 2007-4212, 37th AIAA Fluid Dynamics Conference and Exhibit, 2007.
160. Uzgoren, E., Sim, J., Singh, R.K., and Shyy, W., "A Unified Adaptive Cartesian Grid Method for Solid- Multiphase Fluid Dynamics with Moving Boundaries," AIAA Paper No. 2007-4576, 18th AIAA Computational Fluid Dynamics Conference, 2007.
161. Mack, Y., Haftka, R.T., Segal, C., Queipo, N., and Shyy, W., "Computational Modeling and Sensitivity Evaluation of Liquid Rocket Injector Flow," AIAA Paper No. 2007-5592, 43nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, 2007.
162. Uzgoren, E., Sim, J., and Shyy, W., "Marker-Based, 3-D Adaptive Cartesian Grid Method for Multiphase Flow around Irregular Geometries," 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-1239.
163. Tang, J., Chimakurthi, S., Palacios, R., Cesnik, C.E.S., and Shyy, W., "Computational Fluid-Structure Interaction of a Deformable Flapping Wing for Micro Air Vehicle Applications," 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-615.
164. Lian, Y., Ol, M., and Shyy, W., "Comparative Study of Pitch-Plunge Airfoil Aerodynamics at Transitional Reynolds Number," 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-652.
165. Goel, T., Haftka, R.T., and Shyy, W., "Error Measures for Noise-free Surrogate Approximations," 46th AIAA Aerospace Sciences Meeting and Exhibit, 7-10 January 2008, Reno, Nevada, Paper No. AIAA 2008-901.
166. Gogulapati, A., Friedmann, P., and Shyy, W., "Nonlinear Aeroelastic Effects in Flapping Wing Micro Air Vehicles," 49th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 7-10, April 2008, Paper No. AIAA-2008-1817.
167. Popescu, M., and Shyy, W. "Modeling of Fluid Dynamics Interacting with Ductile Fraction Propagation in High Pressure Pipeline," Proceedings of the 8th Symposium on Application in Computational Fluid Dynamics, August 10-14, 2008, Jacksonville, Florida, Paper No. FEDSM-2008-55014.
168. Trizila, P., Kang, C.-K., Visbal, M.R., and Shyy, W., "Unsteady Fluid Physics and Surrogate Modeling of Low Reynolds Number, Flapping Airfoils," AIAA Paper No. 2008-3821, 38th AIAA Fluid Dynamics Conference and Exhibit, 2008.
169. Trizila, P., Kang, C.-K., Visbal, M.R., and Shyy, W., "A Surrogate Model Approach in 2D versus 3D Flapping Wing Aerodynamic Analysis," AIAA Paper No. 2008-5914, 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, 10 - 12 September 2008, Victoria, British Columbia Canada.
170. Cho, Y.C., Fledderjohn, M., Holzel, M., Jayaraman, B., Santillo, M., Bernstein, D.S., and Shyy, W., "Adaptive Flow Control of Low Reynolds Number Aerodynamics Using a Dielectric Barrier Discharge Actuator," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-0378.
171. Sozer, E., Vaidyanathan, A., Segal, C., and Shyy, W., "Computational Assessment of Gaseous Reacting Flows in Single Element Injector," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-0449.
172. Kang, C.-K., Baik, Y.S., Bernal, L.P., Ol, M., and Shyy, W., "Fluid Dynamics of Pitching and Plunging Airfoils of Reynolds Number between 1×10^4 and 6×10^4, " 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-0536.

173. Sim, J., and Shyy, W., "3-D Adaptive Eulerian-Lagrangian Method for Gravity- and Capillarity-Induced Flows," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-1150.
174. Tseng, C.-C., and Shyy, W., "Turbulence Modeling for Isothermal and Cryogenic Cavitation," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-1215.
175. Aono, H., Chimakurthi, S., Cesnik, C., Liu, H., and Shyy, W., "Computational Modeling of Spanwise Flexibility Effects on Flapping Wing Aerodynamics," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-1270.
176. Qin, S., Zhuang, M., Visbal, M.R., Galbraith, M.C., Lian, Y., and Shyy, W., "Local and Global Stability Analysis on Flows around a SD7003 Airfoil," 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, 5 - 8 January 2009, Orlando, Florida, Paper No. 2009-1470.
177. Gogulapati, A., Friedmann, P., and Shyy, W., "Approximate Aeroelastic Model of Flapping Wings in Hover," International forum on Aeroelasticity and Structural Dynamics, Paper No. IFASD-2009-143, Seattle, WA, June 21-25, 2009.
178. Tseng, C.-C., and Shyy, W., "Surrogate-Based Modeling of Cryogenic Turbulent Cavitating Flows," Proceedings of the 7th International Symposium on Cavitation (CAV2009), Paper No. 77, August 17-22, 2009, Ann Arbor, Michigan, USA.
179. Fledderjohn, M., Cho, Y.C., Hoagg, J.B., Santillo, M., Shyy, W., and Bernstein, D.S., "Retrospective Cost Adaptive Flow Control Using a Dielectric Barrier Discharge Actuator," AIAA Guidance, Navigation, and Control Conference, August 10-13, 2009, Chicago, IL, Paper No. 2009-5857.
180. Orlowski, C., Girard, A., and Shyy, W., "Derivation and simulation of the nonlinear dynamics of a flapping wing micro-air vehicle," The European Micro Aerial Vehicle Conference and Flight Competition 2009 (EMAV2009), Delft, the Netherlands, from 14 - 17 September.
181. Wu, P., Sällström, E., Ukeiley, L., Ifju, P., Chimakurthi, S., Aono, H., Cesnik, C.E.S., and Shyy, W., "An Integrated Experimental and Computational Approach to Analyze Flexible Flapping Wings in Hover," Society of Experimental Mechanics MAC XXVIII: A Conference and Exposition on Structural Dynamics, Jacksonville, Florida, February 1 – February 4, 2010.
182. Baik, Y.S., Rausch, J.M., Bernal, L.P., Shyy, W., and Ol, M.V., "Experimental Study of Governing Parameters in Pitching and Plunging Airfoil at Low Reynolds Number," 48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition 4 - 7 January 2010, Orlando, Florida, Paper No. 2010-388.
183. Aono, H., Chimakurthi, S.K., Wu, P., Sällström, E., Stanford, B.K., Cesnik, C.E.S., Ifju, P., Ukeiley, L., and Shyy, W., "A Computational and Experimental Study of Flexible Flapping Wing Aerodynamics," 48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition 4 - 7 January 2010, Orlando, Florida, Paper No. 2010-554.
184. Sim, J., Kuan, C.-K., and Shyy, W., "3-D Multiscale Adaptive Eulerian-Lagrangian Method for Multiphase Flows with Phase Change," 48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition 4 - 7 January 2010, Orlando, Florida, Paper No. 2010-1295.
185. Sozer, E., Hassan, E.A., Yun., S., Thakur, S., Wright, J., Ihme, M., and Shyy, W., "Turbulence-Chemistry Interaction and Heat Transfer Modeling of H2/O2 Gaseous Injector Flows," 48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition 4 - 7 January 2010, Orlando, Florida, Paper No. 2010-1525.
186. Aono, H., Gupta, A., Qi, D., and Shyy, W., "The Lattice Boltzmann Method for Flapping Wing Aerodynamics," 40th AIAA Fluid Dynamics Conference and Exhibit, 28 June - 1 July 2010, Chicago, Illinois, Paper No. 2010-4867.

187. Kang, C., Aono, H., Cesnik, C.S., and Shyy, W., "A Numerical Framework for the Fluid-Structure Interaction of a Flexible Flapping Wing," 28th AIAA Applied Aerodynamics Conference, 28 June - 1 July 2010, Chicago, Illinois, Paper No. 2010-5082.
188. Baik, Y.S., Aono, H., Rausch, J.M., Bernal, L.P., Shyy, W., and Ol, M.V., "Experimental study of impulsively rotated flat plate at low Reynolds number" AIAA 40th Fluid Dynamics Conference and Exhibit, 20 Jun -1 July 2010, Chicago, Illinois. AIAA Paper 2010-4462.
189. Rausch, J.M., Baik, Y.S., Bernal, L.P., Shyy, W., and Ol, M.V. "Fluid dynamics of spanwise-flexible elliptical flat plates at low Reynolds numbers" AIAA 40th Fluid Dynamics Conference and Exhibit, 20 Jun -1 July 2010, Chicago, Illinois. AIAA Paper 2010-4739.
190. Trizila, P., Kang, C.-K., Aono, H., Visbal, M., and Shyy, W., "Fluid Physics and Surrogate Modeling of a Low Reynolds Number Flapping Rigid Flat Plate," 28th AIAA Applied Aerodynamics Conference, 28 June - 1 July 2010, Chicago, Illinois, Paper No. 2010-5081.
191. Cho, Y., Hoagg, J., Bernstein, D., and Shyy, W., "Retrospective Cost Adaptive Control of Low-Reynolds Number Aerodynamics Using a Dielectric Barrier Discharge Actuator," 5th AIAA Flow Control Conference, 28 June - 1 July 2010, Chicago, Illinois, Paper No. 2010-4841.
192. Yeo, D., Atkins, E.M., and Shyy, W., "Aerodynamic Sensing as Feedback for Ornithopter Flight Control'49th AIAA Aerospace Sciences Meeting, 4 - 7 January 2011, Orlando, Florida, Paper No. 2011-0552.
193. Hassan, E., Aono, H., Boles, J., Davis, D., and Shyy, W., "Multi-Scale Turbulence Model in Simulation of Supersonic Crossflow," 49th AIAA Aerospace Sciences Meeting, 4-7 January 2011, Orlando, Florida, Paper No. 2011-478.
194. Cho, Y., Hoagg, J., Bernstein, D., and Shyy, W., "Retrospective Cost Adaptive Flow Control Using a Dielectric Barrier Discharge Actuator with Parameter-Dependent Modeling," 49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 4 - 7 January, 2011, Orlando, Florida, Paper No. 2011-1302.
195. Sim, J., Kuan, C.-K., and Shyy, W., "Simulation of Spacecraft Fuel Tank Self-Pressurization Using Eulerian-Lagrangian Method," 49th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 4 - 7 January 2011, Orlando, Florida, Paper No. 2011-1318.
196. Kang, C.-K., Aono, H., Cesnik, C.E.S., and Shyy, W., "A Scaling Parameter for Thrust Generation of Flapping Flexible Wings," 49th AIAA Aerospace Sciences Meeting, 4 - 7 January 2011, Orlando, Florida, Paper No. 2011-1313.
197. Tang, J.-N., Tseng, C.-C., Wang, N.-F., Shyy, W., "Flow Structures of Gaseous Jets Injected into Water for Underwater Propulsion," 49th AIAA Aerospace Sciences Meeting, 4 - 7 January 2011, Orlando, Florida, Paper No. 2011-185.
198. Baik, Y., Bernal, L. P., Shyy, W., and Ol, M. V., "Unsteady Force Generation and Vortex Dynamics of Pitching and Plunging Flat Plates at Low Reynolds Number," 49th AIAA Aerospace Sciences Meeting, 4-7 January 2011, Orlando, Florida, Paper No. 2011-220.
199. Cho, Y.-C., Du, W., Gupta, A., Tseng, C.-C., Sastry, A.M., and Shyy, W., "Surrogate-Based Modeling and Dimension-Reduction Techniques for Thermo-Fluid Energy Systems," Keynote Paper, Proceedings of the ASME/JSME 2011 8th Thermal Engineering Joint Conference AJTEC2011, March 13-17, 2011, Honolulu, Hawaii, USA, Paper No. AJTEC2011-44034.
200. Hassan, E., Aono, H., Boles, J., Davis, D., and Shyy, W., "Adaptive Turbulent Schmidt Number Approach for Multi-Scale Simulation of Supersonic Crossflow," 20th AIAA Computational Fluid Dynamics Conference, 27 - 30 June 2011, Honolulu, Hawaii, Paper No. 2011-3702.
201. Smedresman, A., Yeo, D., and Shyy, W., "Design, Fabrication, Analysis, and Testing of a Micro Air Vehicle Propeller," 29th AIAA Applied Aerodynamics Conference and Exhibit, 27 - 30 June 2011, Honolulu, Hawaii, Paper No. 2011-3817.
202. Rausch, J.M., Bernal, L.P., Cesnik, C.S., Shyy, W., and Ukeiley, L., "Fluid Dynamic Forces on Plunging Spanwise-Flexible Elliptical Flat Plates at Low Reynolds Numbers" 41st AIAA Fluid Dynamics Conference and Exhibit 27 - 30 June 2011, Honolulu, Hawaii, Paper No. 2011-3435.

203. Yeo, D., Atkins, E.M., and Shyy, W., "Experimental and Analytical Pressure Characterization of a Rigid Flapping Wing for Ornithopter Development," AIAA Atmospheric Flight Mechanics Conference 08 - 11 August 2011, Portland, Oregon, Paper No. 2011-6518.
204. Lee, D.J., Thakur, S., Ihme, M., and Shyy, W., "Characterization of Flow Field Structure and Species Composition in a Shear Coaxial Rocket GH2/GO2 Injector: Modeling of Wall Heat Losses," 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, San Diego, California, July 31-3, 2011, Paper No. AIAA-2011-6125.
205. Cho, Y. -C., and Shyy, W., "Nonlinearity Identification and Flow Control for Low- Reynolds Number Aerodynamics with Unsteady Free- Stream," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition 09 - 12 January 2012, Nashville, Tennessee, Paper No. 2012-0076.
206. Hassan, E., Aono, H., Boles, J., Davis, D., and Shyy, W., "Multi-Scale Turbulence Model in Simulation of Supersonic Crossflow Part 2: Inclined Injection," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition 09 - 12 January 2012, Nashville, Tennessee, Paper No. 2012-0566.
207. Kuan, C.-K., Sim, J., and Shyy, W., "Parallel, Adaptive Grid Computing of Multiphase Flows in Spacecraft Fuel Tanks," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition 09 - 12 January 2012, Nashville, Tennessee, Paper No. 2012-0761.
208. Yeo, D., Atkins, E.M., Bernal, L.P., and Shyy, W., "Experimental Investigation of the Pressure, Force, and Torque Characteristics of a Rigid Flapping Wing," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition 09 - 12 January 2012, Nashville, Tennessee, Paper No. 2012-0849.
209. Kang, C.-K., and Shyy, W., "Effects of Flexibility on Aerodynamics of a Hovering Flexible Airfoil at Reynolds Number of 100 to 1000," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition 09 - 12 January 2012, Nashville, Tennessee, Paper No. 2012-1206.
210. Vandenheede, Ruben B.R., Bernal, L.P., Morrison, C.L., Gogulapati, A., Friedmann, P.P., Kang, C.-K. and Shyy, W., "Comparison of Experiments on Bio-inspired Hover Kinematics with the Unsteady Vortex Model and CFD," 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 07-10 January 2013, Gaylord Texan Hotel & Convention Center.
211. Kuan, C.-K., Sim, J., Hassan, E., and Shyy, W., "Parallel Eulerian-Lagrangian Method with Adaptive Mesh Refinement for Moving Boundary Computation," 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 07-10 January 2013, Gaylord Texan Hotel & Convention Center.
212. Cho, Y.-C., and Shyy, W., "Unsteady Low-Reynolds Number Flow Control in Different Regimes," 51st AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, 07-10 January 2013, Gaylord Texan Hotel & Convention Center.
213. Kang, C.-K., and Shyy, W., "Modeling of Instantaneous Passive Pitch of Flexible Flapping Wings," 43rd Fluid Dynamics Conference, 24-27 June 2013, San Diego, CA, Paper No. 2013-2469.
214. Arora, N., Gupta, A., Sanghi, S., Aono, H., and Shyy, W., "A lattice Boltzmann framework for analysis of 'clap and fling' motion of finite thickness membranes," 31st AIAA Applied Aerodynamics Conference, 24-27 June 2013, San Diego, CA, Paper No. 2013-2529.
215. Kang, C.-K., and Shyy, W., "A Quasi-Steady Model for the Lift on a Hovering Flexible Wing," 52nd Aerospace Sciences Meeting, 13-17 January 2014, National Harbor, Maryland, Paper No. 2014-1114.

216. Arora, N., Jain, A., Singh, A., Gupta, A., Sanghi, S., Aono, H., and Shyy, W., "Forward propulsion of a rigid plunging airfoil," 32nd AIAA Applied Aerodynamics Conference, 16-20 June 2014, Atlanta, Georgia, Paper No. 2014-2150.
217. Arora, N., Gupta, A., and Shyy, W., "A shifting discontinuous-grid-block lattice Boltzmann method for moving boundary simulations," 22nd AIAA Computational Fluid Dynamics Conference, 22-26 June 2015, Dallas, Texas, Paper No. 2015-2614.
218. Arora, N., Gupta, A., Aono, H., and Shyy, W., "Propulsion of a plunging flexible airfoil using a torsion spring model," 33rd AIAA Applied Aerodynamics Conference, 22-26 June 2015, Dallas, Texas, Paper No. 2015-3295.
219. Hefler, C., Noda, R., Shyy, W., and Qiu, H., "Unsteady Vortex Interactions for Performance Enhancement of a Free Flying Dragonfly," Proceedings of the ASME 2017 Fluids Engineering Division Summer Meeting, FEDSM2017, July 31-August 3, 2017, Waikoloa, Hawaii, USA.