FARZAD MASHAYEK, PH.D.
Director, Computational Multiphase Transport Laboratory *http://cmtl.uic.edu*
Head, Department of Mechanical & Industrial Engineering *http://mie.uic.edu*
University of Illinois at Chicago
[redacted]

Farzad Mashayek currently holds the position of Professor and Head in the Department of Mechanical and Industrial Engineering (MIE) at the University of Illinois at Chicago (UIC). He received his PhD in 1994 and prior to joining UIC in 2000, served as an Assistant Professor at the University of Hawaii at Manoa for three years. He was promoted to Professor in 2004 and became part of the administration of the Department as the **Director of Graduate Studies** and the **Associate Head**. He has been **Head of MIE since 2010** after serving one year as Interim Head.

During Mashayek's tenure as DH, the MIE Department has experienced a significant growth in faculty size and student enrollment. The **BS, MS and PhD enrollments increased by 65%, 439% and 90%, respectively**. In addition, a **Professional Energy Engineering MS** program and a **Chinese 3+2 MS** program have been established, with current enrollment of 30-50 in each. Mashayek has developed the first **five-year Strategic Plan for MIE** in 2015. The plan focuses on growth in size and quality in the areas of education and research as well as improving the work climate within the Department. The plan sets an ambitious goal of tripling the annual research expenditure in five years and resulted in **more than doubling of the Department's annual research expenditure from FY15 to FY17**. During this period, **PhD student enrollment and journal publication count increased by 90% and 110%, respectively**. This remarkable increase in research output was achieved by an increase of less than 20% in the number of tenured / tenure-track faculty and is a result of the strategic hiring in emerging areas and investment in research infrastructure. To meet the high demand due to student enrollment increase, several full-time teaching track faculty members were also hired.

At the campus level, among other services, mashayek has taken a leading role in building and improving an infrastructure for High Performance Computing (HPC) and Big Data. He has been instrumental in establishing the policies for the first campus-wide computing cluster that was installed in 2014. **He is the PI on two recent successful NSF grants to acquire and install UIC's second shared computing cluster and upgrade network and data transfer on campus.**

Mashayek began his academic career by receiving an *NSF CAREER Award* and an *ONR Young Investigator Award*. Despite his administrative duties, he has continued to maintain an active research program (*http://cmtl.uic.edu)*, which currently includes **9 active and several pending grants** from federal agencies and industry. His **research group of 7 PhD, 2 MS students and 1 research faculty member** is at the forefront of the development of a state-of-the-art **software for numerical simulation of supersonic combustion** in advanced engines that are under consideration for future hypersonic flights. On another front, his group has developed a new technology for generating high quality liquid sprays using a novel method of **electrostatic atomization. This technology is currently being transitioned for commercial use** under two grants from the industry-leading Spraying Systems Co. In addition, together with a colleague co-PI, Mashayek received an NSF grant to study and model the mechanism of charge injection inside these atomizers. Most recently, he started a new **research effort on lithium ion batteries**. Mashayek's research has been supported by NSF, NASA, ONR, AFRL, Army, DOE, ANL, and several industry sponsors. Mashayek has **published over 270 articles, including 113 in archival journals, and his total number of citations (Google Scholar) presently exceeds 4300 with an *h-index* of 31.**

Mashayek has also maintained an active presence externally as a member of several professional societies. He is a **Fellow of the American Society of Mechanical Engineers (ASME)** and an **Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA)**. He has served as a member of the Mechanical Engineering Department Heads (MEDH) Executive Committee (ExCom) within the ASME. He has served on organizing committees of multiple conferences.

Education:

- PhD, Mechanical Engineering, State University of New York at Buffalo, Buffalo, NY, 1994. Dissertation: "Numerical Study of Capillary and Thermocapillary Jets and Drops"
- MS, Mechanical Engineering, Sharif University of Technology, Tehran, Iran, 1988. Thesis: "Analysis of Heat Transfer in Icing of Liquids Flowing Inside Tubes"
- BS, Mechanical Engineering, Sharif University of Technology, 1986.

Employment History:

- Head, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, Chicago, IL, August 2010 – Present.
- Director, Manufacturing Research Center, University of Illinois at Chicago, July 2011 – Present.
- Founder and President, Enabling Energy Systems, Inc., Crown Point, IN, February 2008 – 2017.
- Interim Head, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, August 2009 – July 2010.
- Acting Head, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, December 2008 – January 2009 & March 2009 – May 2009.
- Associate Head, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, July 2005 – July 2009.
- Director of Graduate Studies, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, August 2004 – July 2009.
- Professor, Department of Bioengineering, University of Illinois at Chicago, January 2008 – Present.
- Visiting Research Associate, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign, Urbana, IL, May – August 2007, 2008.
- Professor, Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, August 2004 – Present.
- Associate Professor (with tenure), Department of Mechanical and Industrial Engineering, University of Illinois at Chicago, August 2002 – August 2004.
- Director, Computational Multiphase Transport Laboratory, CMTL, University of Illinois at Chicago, August 2000 – Present.
- Associate Professor (without tenure), Department of Mechanical and Industrial Engineering, University of Illinois, August 2000 – August 2002.
- Director, Computational Fluid Dynamics Laboratory, CFDlab, University of Hawaii, August 1997 – July 2000.

- Assistant Professor, Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, August 1997 – July 2000.

- Research Assistant Professor, Department of Mechanical and Aerospace Engineering, SUNY at Buffalo, September 1996 – July 1997.

- Postdoctoral Research Associate, Department of Mechanical and Aerospace Engineering, SUNY at Buffalo, June 1994 – August 1996.

- Teaching and/or Research Assistant, Department of Mechanical and Aerospace Engineering, SUNY at Buffalo, September 1991 – June 1994.

- Director of Heat Transfer Division, Mohsen Engineering Research Center, Tehran, Iran, March 1988 – August 1991.

Research Interests:

Turbulent reacting flow, plasma flow, electrostatic atomization, solid ion batteries, computational methods

Honors and Awards:

- Best Presentation Award, The 20th International Conference on Computational Mathematics, Parallel and Distributed Computing, Prague, Czech Republic, August 13, 2018

- Keynote Speaker, The International Conference on Wireless Communications, Signal and Image Processing, Bangkok, Thailand, January 6, 2018

- Keynote Speaker, The 6th Conference on Computational Mechanics, Bangkok, Thailand, January 4, 2017

- Summer Faculty Fellow, National Center for Supercomputing Applications (NCSA), 2007, 2008

- Keynote Speaker, The 11th ISME Fluid Dynamics Conference, Tehran, Iran, May 28, 2008

- Fellow, American Society of Mechanical Engineers, 2006

- Member of Editorial Board of *Atomization and Sprays*, 2006 – 2008

- UIC College of Engineering Faculty Research Award, 2004

- Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2002

- Keynote Speaker, International Colloquium on Advances in Confined Detonations, Moscow, Russia, July 3, 2002

- Young Investigator Award, the Office of Naval Research, 1999

- CAREER Award, the National Science Foundation, 1999

- Honored by the President and the Board of Regents of the University of Hawaii, June 1999. Featured in *malamalama*, the magazine of the University of Hawaii system, January-June 2000

- Ranked first in the graduate class of Mechanical Engineering, Sharif University of Technology, Iran, 1987

- Ranked first in the overall entry-level exam for the Master of Science degree, 1985

Professional Activities:

- Member of the Operating Council, Virtual School of Computational Science and Engineering, Great Lakes Consortium for Petascale Computing, (2008 – 2012)

- Member of Editorial Board of *Atomization and Sprays*, (2006 – 2008)

- Member of the Terrestrial Energy Systems Committee of the American Institute of Aeronautics and Astronautics, AIAA (2001 – Present)

- Associate Fellow AIAA, 2002

- Member of the American Physical Society, APS (1996 – Present)

- Fellow of the American Society of Mechanical Engineers, ASME (1990 – 92, 1999 – Present)

- Member of the ASME Department Heads Executive Committee (2014 – 2016)

- Member of the Institute of Liquid Atomization and Spray Systems, ILASS (1992 – Present)

- Member of the Combustion Institute (2003 – Present)

- Member of the International Plasma Chemistry Society, IPCS (2005 – Present)

- Member of the Program Subcommittee of the International Conference on Multiphase Flow, ICMF 2007, Leipzig, Germany & ICMF 2009, Tampa, FL.

- Member of the Program Review Subcommittee of the 28th, 29th and 30th International Symposium on Combustion

- Member of the American Society of Engineering Education, ASEE

- Former Member of the American Society of Heating, Refrigerating and Air Conditioning Engineers, ASHRAE

- Former Member of the National Education Association, NEA

- Invited Participant in "Integrating Innovation into Engineering Education," Illinois Coalition for Manufacturing Innovation (ICMI) Workshop, Illinois Institute of Technology, Chicago, IL, April 10, 2009

- Invited Participant in "Gas Turbine Combustion Technology and Research Symposium," GE Aircraft Engines, Cincinnati, OH, April 23-25, 2001

Meeting/Session Organizer:

- Member of Local Organizing Committee, "20th International Finite Elements in Fluids Conference," International Association for Computational Mechanics, Chicago, IL, March 29-April 4, 2019.
- Member of Local Organizing Committee, "14th International Conference on Liquid Atomization and Spray Systems," Chicago, IL, July 22-26, 2018.
- Technical Program Chair, "9th International Energy Conversion Engineering Conference," San Diego, CA, July 31-August 3, 2011.
- Deputy Technical Program Chair, "8th International Energy Conversion Engineering Conference," Nashville, TN, August 16-19, 2010.
- Organizer/Host, "NSF Workshop on Electrostatic Atomization of Electrically Insulating Liquids: Principles and Applications," Southampton, UK, March 2-3, 2009.
- Host, "ONR Propulsion Planning Meeting," Addison, IL, May 8, 2007.
- Topical Organizer for Terrestrial Energy Systems Sessions, 45th AIAA Aerospace Sciences Meeting, Reno, NV, January 2007.
- Organizer and Host, "ONR Interim Review Meeting on Innovative Combustion for Propulsion," Chicago, IL, May 16, 2005.
- Member of Local Organizing Committee, "30th International Symposium on Combustion," Chicago, IL, July 25-30, 2004.
- Topical Organizer for AIAA Sessions, "2nd International Energy Conversion Engineering Conference," Providence, RI, August 16-19, 2004.
- Organizer for Session 28-FREPS-4, "Alternative Fuels," 1st International Energy Conversion Engineering Conference, Portsmouth, VA, August 17-21, 2003.
- Organizer for Session 20-FREPS-3, "Alternative Fuels for Power Systems," 1st International Energy Conversion Engineering Conference, Portsmouth, VA, August 17-21, 2003.
- Member of Local Organizing Committee, "3rd Joint Meeting of the U.S. Sections of the Combustion Institute," Chicago, IL, March 16-19, 2003.
- Organizer and Host, "14th ONR Propulsion Meeting," Chicago, IL, August 8-10, 2001.

Sessions Chaired:

- Session III, 20th International Conference on Computational Mathematics, Parallel and Distributed Computing, Prague, Czech Republic, August 13, 2018.
- Session "Liquid Jet in Crossflow I," 14th International Conference on Liquid Atomization and Spray Systems, Chicago, IL, July 25, 2018.

- Session I "Computer Science and Communications," The International Conference on Wireless Communications, Signal and Image Processing, Bangkok, Thailand, January 6, 2018.

- Session TES-03, "Fluids and Combustion in Power Systems," AIAA Scitech Meeting, San Diego, CA, January 5, 2016.

- Session G20, "Boundary Layers: Compressible & Thermal," 66th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Pittsburgh, PA, November 25, 2013.

- Session 245-FD-57, "Shocks," 50th AIAA Aerospace Sciences Meeting, Nashville, TN, January 12, 2012.

- Session 92-FCTE-5, "Modeling and Simulation of Thermofluids," 9th AIAA International Energy Conversion Engineering Conference, San Diego, CA, August 2, 2011.

- Session 107-TES-3, "Two-Phase Modeling," 47th AIAA Aerospace Sciences Meeting, Orlando, FL, January 6, 2009.

- Session 113-TES-4, "Advances in Turbulence and Transition," 46th AIAA Aerospace Sciences Meeting, Reno, NV, January 8, 2008.

- Session 3A "Electrostatics," 20th Annual ILASS-Americas Conference, Chicago, IL, May 16, 2007.

- Session 26-TES-1 "Combustion Modeling in Energy Systems," 45th AIAA Aerospace Sciences Meeting, Reno, NV, January 8, 2007.

- Session 1B "Droplet Dynamics," 19th Annual ILASS-Americas Conference, Toronto, CA, May 25, 2006.

- Session 25-TES-1 "Combustion Modeling in Energy Systems," 44th AIAA Aerospace Sciences Meeting, Reno, NV, January 9, 2006.

- Session "Modeling in Plasma Chemistry," 17th International Symposium on Plasma Chemistry, Toronto, Canada, August 11, 2005.

- Session "Standards for CFD in the Aerospace Industry," 42nd AIAA Aerospace Sciences Meeting, Reno, NV, January 2004.

- Session 28-FREPS-4, "Alternative Fuels for Power Systems," 1st International Energy Conversion Engineering Conference, Portsmouth, VA, August 19, 2003.

- Session 20-FREPS-3, "Alternative Fuels," 1st International Energy Conversion Engineering Conference, Portsmouth, VA, August 19, 2003.

- Session F-320-4, "Open Forum on Multiphase Flows: Gas-Particle Flows," 2003 Fluids Engineering Division of the ASME, Summer Meeting, July 8, 2003.

- Session 1, "Confined Gaseous Deflagrations and Detonations (III)," International Colloquium on Advances in Confined Detonations, Moscow, Russia, July 2, 2002.

Workshops and Short Course:

- Course Instructor, "Introduction to Computational Techniques for Multiphase Flows," *American Society of Thermal and Fluids Engineers*:
    - Champaign, IL, July 17-19, 2017
    - Chicago, IL, July 21-22, 2018

Book Reviewer for:

- "Electrostatic Atomization, Introduction to," author, Dvora Michelson, Taylor & Francis, 2006

Paper Reviewer for:

AIAA Journal, Applied Thermal Engineering, Atomization and Sprays, Chemical Engineering Science, Combustion and Flame, Combustion Science and Technology, Computer Methods in Applied, Mechanics and Engineering, International Journal for Numerical Methods in Fluids, International, Journal of Heat and Mass Transfer, International Journal of Multiphase Flow, Journal Aerosol Science, Journal of Applied Physics, Journal of Fluid Mechanics, Journal of Fluids Engineering (ASME), Journal of Heat Transfer (ASME), Journal of Propulsion and Power (AIAA), Journal of Thermophysics and Heat Transfer (AIAA), Numerical Heat Transfer, Physics of Fluids, Physics of Plasmas, Powder Technology, Proceedings of the Royal Society A, Proceedings of IUTAM Symposium on Computational Approaches to Disperse Multiphase Flow

Proposal Reviewer for:

- National Science Foundation
- Department of Energy
- Estonian Science Foundation
- Petroleum Research Fund
- Partnership for Advanced Computing in Europe
- Israel Science Foundation
- Cooperative Grants Program of the U.S. Civilian Research and Development Foundation (CRDF)
- UIC Internal Competition

Panelist for:

- "Particulate and Multiphase Processes," National Science Foundation, February 27-28, 2018.
- "Turbulence," National Science Foundation, February 9-10, 2017.
- "Fluid Dynamics FY16 Unsolicited. Microfluidics VII," National Science Foundation, February 23, 2016.
- Panel Moderator, "Electrochemical Power for Aerospace Missions," AIAA Scitech Meeting, San Diego, CA, January 5, 2016.

- "Department Heads Panel," Pi Tau Sigma Annual Convention, Champaign, IL, February 27, 2015.
- "Tips for Job Search, Promotion and Tenure Workshop," ASME International Mechanical Engineering Congress & Exposition, Montreal, Canada, November 18, 2014.
- "Computation and Data Enabled Science and Engineering Program," National Science Foundation, April 21, 2014.
- "Computation and Data Enabled Science and Engineering Program," National Science Foundation, January 30-31, 2013.
- "SBIR Phase I Panel BC: Transportation, Fuels & Engines," National Science Foundation, February 11, 2009.
- "SBIR Phase I Panel Bioenergy," National Science Foundation, July 31, 2008.
- "SciDAC-2, Turbulence Panel," Department of Energy, April 13, 2006.
- "SBIR Phase I Panel Combustion Technologies," National Science Foundation, Feb 1, 2006.
- "Nanoscale Exploratory Research," National Science Foundation, March 16, 2005.
- "SBIR/STTR Phase I, Fluids Panel," National Science Foundation, March 25, 2004.
- "CAREER: Multiphase and Particulate Systems," National Science Foundation, December 11-12, 2003.
- "SBIR/STTR Phase II Panel Chemistry/Chemical Engineering," National Science Foundation, September 16, 2003.
- "Information Technology Research/Medium Geofluids," National Science Foundation, May 29, 2003.
- "Small Business Innovation Research/Technology Transfer Programs," National Science Foundation, September 19, 2002.
- "Advantages and Specific System Applications of Pulse Detonation Engines," International Colloquium on Advances in Confined Detonations, Moscow, Russia, July 5, 2002.

University Services:

- Member, Committee on Data Sciences & Social Sciences (February 2018 – Present)
- Member, High-Performance Computing Executive Committee (May 2013 – Present)
- Member, ACTB Backfill Committee (April 2013 – April 2014)
- Member, SEL Renovation Working Group (April 2011 – April 2013)
- Member, the Large Scale Integrative Research Group (March 2005 – August 2005)

- Member, the UIC Senate Executive Committee (August 2005 – May 2006)
- UIC Senator (August 2003 – May 2006)
- Member, the UIC Graduate College (August 2000 – Present)

College of Engineering Services:

- Co-Chair, Search Committee for Associate Dean of Undergraduate Studies (March – June 2015)
- Member, COE Strategic Planning Committee (May – August 2014)
- Director, Manufacturing Research Center (MRC) (July 2011 – Present)
- Chair, Computer Science Department Head Search Committee (March 2009 – May 2009)
- Member, College Space Committee (April 2006 – November 2006)
- Elected Member, College Executive Committee (August 2006 – August 2009)

Departmental Services:

At the University of Illinois at Chicago:

- MIE Head (August 2010 – Present)
- MIE Interim Head (August 2009 – July 2010)
- MIE Acting Head (December 2008 – January 2009 & March 2009 – May 2009)
- MIE Associate Head (July 2005 – 2009)
- MIE Director of Graduate Studies (August 2004 – 2009)
- Chair, Fluid/Thermal Faculty Search Committee (August 2004 – August 2005)
- Member, Fluid/Thermal Faculty Search Committee (August 2004 – August 2005)
- Elected Member, Department Advisory Committee (August 2001 – July 2003, August 2004 – July 2005)
- Ex-Officio Member, Department Advisory Committee (August 2005 – 2009)
- Chair, Department Computer Committee (August 2001 – 2009)
- Member, J.P. Hartnett Professor of Mechanical Engineering Faculty Search Committee (August 2001 – July 2002)
- Member, Department Graduate Committee (August 2000 – August 2004)
- Member, Department National Outreach and Publicity Committee (August 2001 – Present)

- Member, Department Seminar Committee (August 2000 –August 2002)
- Secretary to the ME Faculty (Fall 2000)

At the University of Hawaii at Manoa:

- Member, Faculty Search Committee in Fluid-Thermal Sciences (Fall 1999)
- Member, Publicity Committee (August 1998 - May 2000)
- Member, Curriculum Committee (January 1999 - May 2000)
- Member, Election Committee (August 1997 - May 2000)
- Participant in Open Houses held by the College and the Department (1998 and 1999)
- Faculty Advisor, Student Chapter of the American Society of Heating, Refrigerating and Air Conditioning Engineers, ASHRAE (August 1997 - July 2000)

Courses Taught:

At the University of Illinois at Chicago:

- Intermediate Heat Transfer (ME 421)
- Heat Conduction (ME 521)
- Mathematical Methods for Engineers (ME 594)
- Numerical Heat Transfer (ME 528)
- Numerical Methods in Mechanical Engineering (ME 428)
- Computational Compressible Flow (ME 594)
- Turbulence Modeling (ME 594)
- Seminar (ME 595)

At the University of Hawaii at Manoa:

- Numerical Methods in Fluid Mechanics and Heat Transfer (ME 625)
- Conduction Heat Transfer (ME 621)
- Seminar (ME 691)
- Mechanical Engineering Experimentation (ME 301)
- Air Conditioning and Refrigeration (ME 417)

- Thermodynamics (ME 311)
- Heat Transfer (ME 422)

At SUNY/Buffalo:

- Thermodynamics I (EAS 204)

Visiting Faculty & Post-Doctoral Research Associates:

- Dr. Vitaliy Yurkiv (December 2015 – Present)
- Dr. Yingchun Cheng (October 2014 – September 2015)
- Dr. Mikhail Antimonov, (August 2012 – June 2014)
- Professor Murad Kucur, (September 2010 – August 2011), on sabbatical leave from Department of Mechanical Engineering, Istanbul University, Turkey
- Professor John Shrimpton (February – September 2006), on sabbatical from Department of Mechanical Engineering, Imperial College London, UK
- Dr. Zhaosheng Gao (August 2003 – June 2004), Current Position: Postdoctoral Fellow, University of Utah
- Dr. Ahmed Taha (July 2003 – June 2004)
- Dr. R. Vikram P. Pandya (September 1999 – May 2003), Current Position: Assistant Professor, Department of Mechanical Engineering, University of Puerto Rico
- Dr. Prasanta Deb (April 2002 – April 2003)
- Dr. Shi-Jun Liao (September 1999 - May 2000), Current Position: Professor, School of Naval Architecture and Ocean Engineering, Shanghai Jiao Tong University, PR China
- Dr. Yunlong Liu (June - November 1999), Current Position: Research Scientist, Swiss Federal Institute of Technology, Zurich, Switzerland

Graduate Students Advised: I. Current Students:

- Jonathan Komperda (August 2010 – Present), Ph.D. candidate
- Dongru Li (August 2013 – Present), Ph.D. Candidate
- Ajaykrishna Ramasubramanian (January 2015 – Present), Ph.D. candidate
- Babak Kashir Taloori (January 2016 – Present), Ph.D. candidate
- Karima Russell (January 2017 – Present), Ph.D. Candidate
- Ahmad Peyvan (January 2017 – Present), Ph.D. Candidate

- Marco Ragone (August 2018 – Present), Ph.D. Candidate
- Anthony Perri (August 2015 – Present), MS student
- Jacqueline Swift (January 2017 – Present), MS student

Graduate Students Advised: II. Former Students:

Ph.D. Students

1. Zia Ghiasi (2012 – 2018), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2014. Thesis: Large Eddy Simulation of Wall-bounded Turbulent Flows Using Discontinuous Spectral Element Method. Current Position: ACC Information Systems, Chicago, IL.

2. Hessam Abbassi (2009 – 2014), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2014. Thesis: Entropy-based Artificial Viscosity Stabilization in Discontinuous Galerkin Spectral Element Method for Supersonic Flow Simulation. Current Position: Fiat Industrial, Burr Ridge, IL.

3. Harish Kanchi (2008 – 2013), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2013. Thesis: Fluidic Control of Shear Layer in Dump Combustors Using Microjets. Current Position: ANSYS Inc. Evanston, IL.

4. Egemen Ergene (2006 – 2012), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2012. Thesis: Investigation of the Electrostatic Atomization Method for Remote Injection and High Pressure. Current Position: Caterpillar, Peoria, IL.

5. Ghazi Malkawi (2005 – 2010), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2010. Thesis: Point-to-plane and Plane-to-plane Electrostatic Charge Injection Atomization for Insulating Liquids.

6. Kaustav Sengupta (2005 – 2009), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2009. Thesis: Direct and Large-eddy Simulations of Compressible Flows with Spectral/*hp* Element Methods. Current Position: Boeing Company, India.

7. Keqin Zhang (2001 – 2009), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2009, Thesis: Parallel Simulation of Incompressible Free-surface Flows.

8. Mohammad Davoudabadi (2005 – 2008), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2008. Thesis: Plasma and Particles Dynamics Modeling in PECVD Reactors. Received UIC Fellowship in 2006. Current Position: ANSYS Inc., Evanston, IL.

9. Beniamino Rovagnati (2004 – 2008), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2008. Thesis: Study of Micron/Submicron Particle Coating in Low-Pressure Plasmas via Numerical Simulations. Received UIC Dean's Scholar Award in 2007. Current Position: Sargent & Lundy, Chicago, IL.

10. Xiaoyan Bian (2004-2008), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2007. Thesis: Towards Simulation of Charging and Breakup in Electrostatic Atomizers.

11. Babak Shotorban (2001 – 2005), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2005. Thesis: Modeling of Subgrid-Scale Effects on Particles in Large-Eddy

Simulation of Turbulent Two-Phase Flows. Received UIC Fellowship in 2003. Current Position: Associate Professor, University of Alabama in Huntsville.

12. Gustaaf B. Jacobs (1999 – 2003), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2003. Thesis: Direct Numerical Simulation of Two-phase Compressible Complex Flows with a Multidomain Spectral Method. Received UIC Fellowship in 2002. Current Position: Professor, Department of Aerospace Engineering, San Diego State University.

13. Zhaosheng Gao (2001 – 2003), Ph.D. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2003. Thesis: Stochastic Modeling and Simulation of Particle/Droplet-Laden Turbulent Flows.

M.S. Students

1. Paul Vesely (2014 – 2017), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, December 2017. Thesis: Electrostatic Atomization of Vegetable Oils with Single and Multi-Orifice Nozzles.

2. Federico Arduino (2013 – 2014), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2014. Thesis: Computer Simulation and Analysis of Investment Casting of Thin Patterns.

3. Federico Lugnani (2012 – 2013), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2013. Thesis: Simulation of Cold Flow in Cavity-Ramp Combustor.

4. Domenico Geraci (2012 – 2013), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2013. Thesis: Heat Transfer Enhancement by Micro-structured Surfaces.

5. Chien-Wei Chang (2007 – 2009), M.S. Degree in Bio Engineering, University of Illinois at Chicago, August 2009. Thesis: One-dimensional Fluid Model of Methane Plasma for Diamond-like Coating. Current Position: Printed Circuit Board Corporation, Taiwan

6. Martino Zuccali (2006 – 2008), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, May 2008. Thesis: Mixture Modelling by a Lattice Boltzmann Method Fully Recovering Maxwell Stefan Law.

7. Mohammad Davoudabadi (2003 – 2005), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2005. Thesis: Dust Particle Dynamics in Magnetized Low-Pressure Plasma Sheath.

8. Kaustav Sengupta (2003 – 2004), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, December 2004. Thesis: Numerical Simulation of Liquid-Fuel Combustor for Control of Combustion.

9. Nahid Sedighi (2002 – 2004), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, December 2004. Thesis: Simulation of Charging and Shielding of Dust Particles in Low Pressure Cold Plasma.

10. Palak Gandhi (2002 - 2003), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, December 2004. Thesis: Numerical Investigation of Compressible Flow in Two-Sided Lid-Driven Cavity.

11. Beniamino Rovagnati (2000 - 2002), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2002. Thesis: A Computational Investigation of NOx Reduction by Reburn Process in Wood-Fired Stoker Boiler.

12. Marco Fumagalli (2000 - 2002), Co-advisor (Advisor: Suresh Aggarwal), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, August 2002. Thesis: A Numerical Investigation of Fluid and Particle Dynamics in an Unsteady Flow past an Oscillating Cylinder.

13. Dazhi Guo (1999 - 2001), M.S. Degree in Mechanical Engineering, University of Illinois at Chicago, December 2001. Thesis: Numerical Simulations of Particle-Laden Turbulent Flows.

14. Brian S.C. Lau (1997 - 1999), M.S. Degree in Mechanical Engineering, University of Hawaii at Manoa, May 1999. Thesis: Simulation of Oscillating Drops with Thermocapillary Effects.

15. Jason D. Zeda (1998 - 1999), M.S. Degree in Mechanical Engineering, University of Hawaii at Manoa, August 1999. Major Report: Numerical Simulation of Evaporating Capillary Jets.

16. Celine Barre, (1996 - 1997), Co-advisor, M.S. Degree in Aerospace Engineering, SUNY at Buffalo, February 1998. Thesis: Direct Numerical Simulation of Particle-Laden Plane Strain Turbulent Flows.

Undergraduate Students Advised:

- Michelle McClary, "Creating A Matlab GUI For Calculation of Thrust-Time History for Solid Grain Propellant," Spring 2018.

- Chloe Engels, "The Creation of a Computer Program to Aid in Fluid Mechanics Research," Fall 2015, Spring 2016, Spring 2017.

- Nirav Patel, College of Engineering Summer Internship, 2015.

- Matheus Scotti Alves Tonin Simoni, College of Engineering Summer Internship, 2015.

- Azeam Anjum, "ME 392 project: Implementation of a Novel Averaging Method in DSEM-FMDF," Spring 2013.

- Paul Vesely, "ME 392 project: SimpleMAC CFD Solver with Particle Simulations," Spring 2013.

- Azeam Anjum, "ME 392 project: SimpleMAC CFD Solver for Complex Geometry," Fall 2012.

- Nathan Chilton, "ME 392 project: Design of an Articulating Table and Mist Suppression System," Spring 2011.

- Arash Nazem, "ME 392 project: Understanding Electrostatic Atomization with Diesel Fuel," Fall 2010 – Spring 2011.

- Viktor Mozharov, "ME 392 project: Electrostatic Atomizers," Fall 2010.

- Donald Frederick, "ME 392 project: Simulation of Liquid-fuel Combustors," Fall 2007.

- Christopher Naylon, "ME 392 project: Electrostatic Atomization," Spring 2007.

- Mark Moreno, "NSF/REU: Electrostatic Spraying," Summer – Fall 2006.
- Michael Liss, ME 392 project: "Heat Transfer in Electronic Packages," Spring 2006.
- Jason Wennerberg, ME 392 project: "Numerical Simulation of Plasma Systems using a Particle-in-Cell (PIC) Code," Fall 2003 and Spring 2004.
- Karima Russell, "Two-Phase Flow in Confined Enclosures," Fall 2003 and Spring 2004.
- Hyo Jin Hahn, ME 392 project: "Graphical Representation of Simulation Results for Two-Phase Flow in a Combustor," Summer 2001.
- Jorge Mauricio, Sharif Zaben, Judee Tam, Ruben Roman, and George Tape, ME 396 project: "Thin Si Integrated Circuit (IC) and IC Package Evaluation," Spring 2001.

Grant Support: I. Research Fund:

Active Grants:

1. Principal Investigator, "Fundamental Understanding of SEI Effects on Li Dendrite Formation and Growth," Co-PI: Reza Shahbazian-Yassar (UIC), National Science Foundation, $353,358, August 2018 – July 2021.
2. Senior Personnel, "MRI: Acquisition of a Composable Platform as a Service Instrument for Deep Learning & Visualization (COMPaaS DLV)," National Science Foundation, $997,363, October 2018 – September 2021.
3. Principal Investigator, "GOALI: Liquid Charging in Electrostatic Atomizers for Coating and Painting Applications," Co-PI: Alexander Yarin (UIC), National Science Foundation, $350,000, July 2015 – July 2019.
4. Co-Principal Investigator (35% share), "Industrial Assessment Center for Energy Efficiency, Smart Manufacturing and Cyber Security of Illinois and Northwestern Indiana Small and Medium Sized Manufacturing Companies and Water Facilities," PI: Lin Li (UIC), Department of Energy, $1,575,000, September 2016 – September 2021.
5. Principal Investigator, "MRI/Acquisition: SABER: Shared Analytics and Big Data Enterprise Resource," multiple Co-PIs (UIC), National Science Foundation, $600,000, August 2016 – July 2019.
6. Principal Investigator, "CC* Networking Infrastructure: Building HPRNet (High-Performance Research Network) for Advancement of Data Intensive Research and Collaboration," multiple Co-PIs (UIC), National Science Foundation, $500,000, March 2017 – February 2019.
7. Principle Investigator, "Adaption of Electrostatic Atomization for Coating Applications," Spraying Systems Co., $60,000, August 2017 – August 2019.
8. Principle Investigator, "Design, Testing, and Characterization of Spraying Systems," Spraying Systems Co., $160,000, August 2017 – August 2019.
9. Principal Investigator, "Simulation of Turbulent Combustion in High Speed Flow," Enabling Energy Systems, Inc., $92,480, August 2016 – August 2019.

Pending Proposals:

10. Co-Principal Investigator, "RET Site: Computational Modeling and Simulation for Science, Technology, Engineering, and Math Education," National Science Foundation, $600,000, September 2019 – September 2022.

11. Principal Investigator, "GOALI: Controlled Coating via Charged Droplet Impact and Deposition on Dielectric and Conducting Surfaces," Co-PI: Alexander Yarin (UIC), National Science Foundation, $430,000, July 2019 – July 2022.

Completed Grants:

1. Principle Investigator, "Electrostatic Atomization," Spraying Systems Co., $140,000, August 2013 – August 2015.

2. Principal Investigator, "Simulation of Turbulent Combustion Interaction in High Speed Flow on Unstructured Grids," Enabling Energy Systems, Inc., $115,000, March 2011 – August 2015.

3. Principal Investigator (through Enabling Energy Systems, Inc.), "Spectral LES/FMDF for Simulation of Turbulent Combustion Interaction in High Speed Flow on Unstructured Grids," Phase II STTR, Office of Secretary of Defense, $750,000, April 2012 – December 2014.

4. Principle Investigator, "Analysis, Design, Fabrication and Testing of X-ray Instruments," Argonne National Laboratory, $81,000, June 2013 – June 2014.

5. Co-Investigator, "Experimental and Computational Studies to Advance Operability and Performance of Combustion Systems Adopting Fluidic Control," PI: P. Strykowski (University of Minnesota), the Office of Naval Research, $150,000, October 2011 – September 2013.

6. Principle Investigator, "Design, Testing, and Characterization of Spraying Systems," Spraying Systems Co., $166,000, January 2010 – August 2013.

7. Principle Investigator, "X-Ray Optics," Argonne National Laboratory, $110,000, February 2012 – February 2013.

8. Principle Investigator, "Plasma Deposition of Thin Films on Nanowires and Nanoparticles," Co-PI: Themis Matsoukas (Penn State University), the National Science Foundation, $358,000, May 2007 – April 2012.

9. Co-Investigator, "MRI-R2: Acquisition of an Aberration-Corrected Scanning Transmission Electron Microscope for Multidisciplinary Research and Education at UIC," PI: R. Klie (many co-PIs), UIC, the National Science Foundation, $2,000,000, March 2010 – February 2012.

10. Principal Investigator (through Enabling Energy Systems, Inc.), "Spectral LES/FMDF for Simulation of Turbulent Combustion Interaction in High Speed Flow on Unstructured Grids," Phase I STTR, Office of Secretary of Defense, $100,000, March 2011 – September 2011.

11. Co-Investigator, "Experimental and Computational Studies to Advance Operability and Performance of Combustion Systems Adopting Fluidic Control," PI: P. Strykowski (University of Minnesota), the Office of Naval Research, $444,000, February 2008 –February 2011.

12. Principal Investigator, "Flame Anchoring in Dump Combustors with Counter-current Shear Flow," NASA, $84,000, September 2006 – March 2011.

13. Co-Investigator, “Performance Testing of Electrostatic Atomizers,” PI: J. Shrimpton (UIC), Enabling Energy Systems, Inc., $81,000, July 2008 – June 2010.

14. Principal Investigator (through Enabling Energy Systems, Inc.), “Electrostatic Atomizing Fuel Injector for Small Scale Engines,” Phase I STTR, Army Research Office, $100,000, July 2008 – January 2009.

15. Principle Investigator, “Ultra-rich Superadiabatic Combustion of Hydrogen Sulfide in a Reverse Flow Reactor,” Innovative Energy Solutions, $116,000, February 2007 – December 2009.

16. Principal Investigator, “US–UK Workshop on Electrostatic Atomization of Electrically-insulating Liquids,” the National Science Foundation, $25,000, May 2007 – April 2009.

17. Co-Investigator, “Efficient Turbulent Flame Stabilization for Advanced Propulsion,” PI: P. Strykowski (University of Minnesota), the Office of Naval Research, $450,000, January 2005 – December 2008.

18. Principal Investigator, “Design and Analysis of Electrohydraulic Systems for Autonomous Vehicle Applications,” Co-PI: Sabri Cetinkunt (UIC), Servo Tech Inc., $50,414, March 2006 – March 2007.

19. Principle Investigator, “REU: A Low-Pressure Plasma Process for Nano-coating of Micron- and Nano-sized Particles,” the National Science Foundation, $6,000, March 2006 – February 2007.

20. Principle Investigator, “A Low-Pressure Plasma Process for Nano-coating of Micron- and Nano-sized Particles,” Co-PI: Themis Matsoukas (Penn State University), the National Science Foundation, $120,000, March 2005 – February 2007.

21. Principal Investigator, “Development and Implementation of Volume-of-Fluid Techniques for Direct Numerical Simulation of Turbulent Flows,” Sverdrup Technology Inc, $39,000, January 2003 – September 2003.

22. Principal Investigator, “Development of Kinetic-Approach-Based Two-Fluid Models for Two-Phase Turbulent Flows,” the National Science Foundation, $109,913, March 2003 – February 2006.

23. Principal Investigator, “Analytical Investigation of Fuel Droplets Dispersed in Turbulent Flows for Control and Design of Practical Combustion-Propulsion Systems,” the Office of Naval Research, Arlington, VA, $100,238, February 2003 – September 2004.

24. Principal Investigator, “Analytical Investigation of Fuel Droplets Dispersed in Turbulent Flows for Control and Design of Practical Combustion-Propulsion Systems,” the Office of Naval Research, Arlington, VA, $67,588, November 2002 – May 2003.

25. Principal Investigator, “CAREER: Two-Phase Turbulent Reactive Flows, Matching Fund,” the National Science Foundation, Washington, D.C., Grant Number: CTS-0096349, $50,000, April 2002 - February 2005.

26. Co-Investigator, “CFD Calculations of METHANE deNOX Reburn Process,” the Gas Technology Institute, Des Plaines, IL, $1,020,000 (Mashayek’s share $340,000), April 2002 – May 2005.

27. Principal Investigator, "CAREER: Two-Phase Turbulent Reactive Flows, Matching Fund," the National Science Foundation, Washington, D.C., Grant Number: CTS-0096349, $35,000, June 2001 - February 2005.

28. Principal Investigator, "CFD Calculations of METHANE deNOX Reburn Process on a Parallel Computer," the Gas Technology Institute, Des Plaines, IL, $25,000, January 2001 - December 2001.

29. Principal Investigator, "Analytical Investigation of Fuel Droplets Dispersed in Turbulent Flows for Control and Design of Practical Combustion-Propulsion Systems," the Office of Naval Research, Arlington, VA, Grant Number: N00014-99-1-0808 (at UH) and N00014-01-1-0122 (at UIC), $222,412, June 1999 - May 2002.

30. Principal Investigator, "CAREER: Two-Phase Turbulent Reactive Flows," the National Science Foundation, Washington, D.C., Grant Number: CTS-9874655 (at UH) and CTS-0096349 (at UIC), $200,000, March 1999 - February 2005.

31. Principal Investigator, "14th ONR Propulsion Program Meeting," the Office of Naval Research, Arlington, VA, $2,500, April-August 2001.

32. Principal Investigator, "Modeling and Numerical Simulation of Two-Phase Turbulent Reacting Flows," the Petroleum Research Fund, the American Chemical Society, Washington, D.C., Grant Number: ACS-PRF# 33044-G, $20,000, June 1998 - August 2000.

33. Principal Investigator, "Development of a Local Base for Utilizing Nationwide Supercomputing Facilities," the Seed Money Grant, the University of Hawaii, Honolulu, HI, Grant Number: 382688, $14,500, February 1998 - January 1999.

34. Travel Award, Research and Training Revolving Fund, the University of Hawaii, Honolulu, HI, $3,350, 1997 - 1999.

35. Sub-contractor, "Hydrodynamic Coefficient Analysis," $25,000, August 1997 - July 1998. Sub-contracted from "Development of a Semi-Autonomous Underwater Vehicle for Intervention Missions (SAUVIM)," the Office of Naval Research.

Grant Support: II. Supercomputer Time:

1. Principal Investigator, "DNS Investigation of Compressibility Effects on Separating and Reattaching Shear Layers," Co-PI's: Jonathan Komperda, Dongru Li, Ahmad Pevan, Zia Ghiasi and Karima Russell, National Center for Supercomputing Applications (NCSA), Blue Waters, 2,000,000 SUs, May 2018 – March 2019.

2. Principal Investigator, "Simulation of Supersonic Combustion," Argonne National Laboratory, Advanced Leadership Computing Facility, Mira, 2,000,000 SUs, December 2017 – July 2018.

3. Principal Investigator, "Near-Wall Resolution Requirement for Direct Numerical Simulation of Turbulent Flow Using Multidomain Chebyshev Grid," NSF Extereme Science and Engineering Discovery Enviornment (XSEDE), IU/TACC (Jetstream), 50,000 SUs and SDSC (Comet), 50,000 SUs, January 2018 – June 2019.

4. Principal Investigator, "Simulation of Supersonic Combustion," Argonne National Laboratory, Advanced Leadership Computing Facility, Mira, 2,000,000 SUs, October 2016 – March 2017.

5. Principal Investigator, “Simulation of Turbulent Flow in Liquid-fuel Combustor with Microjets,” NSF Extereme Science and Engineering Discovery Enviornment (XSEDE), TACC Lonestar, 1,580,000 SUs, January 2013 – June 2014.

6. Principal Investigator, “Simulation of Turbulent Flow in Liquid-fuel Combustor with Microjets,” NSF Extereme Science and Engineering Discovery Enviornment (XSEDE), SDSC Trestles, TACC Lonestar, 3,500,000 SUs, January 2012 – December 2012.

7. Principal Investigator, “Simulation of Turbulent Flow in Liquid-fuel Combustor with Microjets,” NSF TeraGrid, SDSC Trestles, NCSA Abe, TACC Lonestar, 2,000,000 SUs, January 2011 – December 2011.

8. Principal Investigator, “Large-Eddy Simulation of Turbulent Flow in Liquid-Fuel Combustor,” NSF TeraGrid, MRAC Allocation, 350,000 SUs, January 2010 – December 2010.

9. Principal Investigator, “Simulation of Liquid-Fuel Combustors,” TeraGrid AUS Startup Allocation, 30,000 SUs, January 2009 – December 2009.

10. Principal Investigator, “Large-Eddy Simulation of Turbulent Flow in Liquid-Fuel Combustor,” NSF TeraGrid, MRAC Allocation, 350,000 SUs, December 2008 – December 2009.

11. Principal Investigator, “Simulation of Liquid-Fuel Combustors,” 1,000,000 Service Units on the Abe, National Center for Supercomputing Applications, November 2007 – April 2009.

12. Principal Investigator, “Simulation of Novel Liquid-Fuel Combustors,” 100,000 Service Units on the Abe, National Center for Supercomputing Applications, June 2007 – May 2008.

13. Principal Investigator, “Simulation of Novel Liquid-Fuel Combustors,” 10,000 Service Units on the Tungsten, National Center for Supercomputing Applications, June 2007 – May 2008.

14. Principal Investigator, “Simulation of Novel Liquid-Fuel Combustors,” 20,000 Service Units on the Copper, National Center for Supercomputing Applications, September 2006 – August 2007.

15. Principal Investigator, “Direct Numerical Simulation of Turbulent Flow over a Backward-Facing Step with Countercurrent Shear,” 20,000 Service Units on the IBM/SP at the University of Michigan, July 2002 – June 2003.

16. Principal Investigator, “Direct Numerical Simulation of Two-Phase Turbulent Reacting Flow,” 500 Service Units on the CRAY/T90 supercomputer at the San Diego Supercomputing Center, July 2001 - June 2002.

17. Principal Investigator, “Numerical Simulation of Two-Phase Turbulent Reacting Flow,” 5000 Service Units on the IBM/SP at the San Diego Supercomputing Center, January 2001 - December 2001.

18. Principal Investigator, “Direct Numerical Simulation of Two-Phase Turbulent Reacting Flow,” 650 Service Units on the CRAY/T90 supercomputer at the San Diego Supercomputing Center, January 2000 - June 2001.

19. Principal Investigator, “Numerical Simulation of Two-Phase Turbulent Reacting Flow,” 2000 Service Units on the IBM/SP at the San Diego Supercomputing Center, October 1999 - December 2000.

20. Principal Investigator, "Direct Numerical Simulation of Two-Phase Turbulent Reacting Flow," 290 Service Units on the CRAY/T90 supercomputer at the San Diego Supercomputing Center, October 1998 - December 1999.

21. Principal Investigator, "Development of Parallel CFD Codes for Simulation of Multiphase Turbulent Flow," 3990 CPU Hours/year on the IBM Parallel Computing System at the Maui High Performance Computing Center, March 1998 - February 2000.

22. Principal Investigator, "Direct Numerical Simulation of Two-Phase Turbulent Reacting Flow," 40 Service Units on the CRAY/T90 supercomputer at the San Diego Supercomputing Center, April 1998 - September 1998.

23. Principal Investigator, "Direct Numerical Simulation of Two-Phase Turbulent Reacting Flow," 60 Service Units on CRAY/C90 supercomputer at Pittsburgh Supercomputing Center, August 1997 - June 1998.

Patent Applications:

1. Mashayek, F. and Shrimpton, J.S., "Charge-injection Multi-Orifice Atomizer for Electrically Insulating Liquids," Provisional Patent Application 61/160,016 filed on 3/13/2009.

2. Mashayek, F. and Yarin, A.L., "Bioreactor for Microalgae Cultivation and Harvesting," Provisional Patent Application 61/161,809 filed on 3/21/2009.

Publications: I. Book Edited:

1. Roy, G.D. and Mashayek, F., editors, *Proceedings of the Fourteenth ONR Propulsion Meeting*, Chicago, IL, August 8-10, 2001.

Publications: II. Book Chapters: (*Invited articles are identified by •)*

1. Monfort, M., Luciani, T., Komperda, J., Ziebart, B., Mashayek, F. and Marai, G.E., "A Deep Learning Approach to Identifying Shock Locations in Turbulent Combustion Tensor Fields," in Schultz, T., editors, *Modeling, Analysis, and Visualization of Anisotropy,* 2017.

2. • Mashayek, F. and Minkowycz, W.J., "Eulerian-Lagrangian Simulations of Particle/droplet-Laden Turbulent Flows," in Minkowycz, W.J., Sparrow, E.M., and Murthy, J.Y., editors, *Handbook of Numerical Heat Transfer, 2nd ed.,* Chapter 22, John Wiley & Sons, Inc., 2006.

3. • Jacobs, G.B., Gao, Z., Pandya, R.V.R., Shotorban, B., and Mashayek, F., "Numerical Simulation of Two-Phase Flows for Prediction/Control of Combustion in Liquid-Fueled Combustors," in Roy, G.D., editor, *Advances in Combustion and Noise Control,* Cranfield University Press, 2005.

4. • Jacobs, G.B., Pandya, R.V.R., Shotorban, B., Gao, Z., and Mashayek, F., "Deterministic and Probabilistic Approaches for Prediction of Two-Phase Turbulent Flow in Liquid-Fuel Combustors," in Roy, G.D., editor, *Combustion Processes in Propulsion: Control, Noise, and Pulse Detonation,* Chapter 3, Elsevier, 2005.

5. • Jaberi, F.A., Mashayek, F., Madnia, C.K., Taulbee, D.B., and Givi, P., "Advances in Analytical Description of Turbulent Reacting Flows," in Roy, G.D., editor, *Advances in Chemical Propulsion: Science to Technology*, Chapter 9, CRC Press, Boca Raton, FL, 2001.

6. • Mashayek, F., Taulbee, D.B., and Givi, P., "Modeling and Simulation of Two-Phase Turbulent Flow," in Roy, G.D., editor, *Propulsion Combustion: Fuels to Emissions*, Chapter 8, Taylor & Francis, Washington, D.C., 241-280, 1998.

Publications: III. Review Articles:

1. • Mashayek, F. and Jaberi, F.A., "Combustion with Particles and Drops," in Michaelides, E., editor, *Multiphase Flow Handbook,* Chapter 7, CRC Press, Boca Raton, FL, 2017.

2. • Mashayek, F., "Terrestrial Energy Systems," *Aerospace America,* **47**(11), 45-45, 2009.

3. • Mashayek, F., "Combustion," in Crowe, C.T., editor, *Multiphase Flow Handbook,* Chapter 12: Multiphase Interactions, Section 7, CRC Press, Boca Raton, FL, 2006.

4. • Mashayek, F. and Pandya, R.V.R., "Analytical Description of Particle/Droplet-Laden Turbulent Flows," *Progress in Energy and Combustion Science*, **29**(4), 329-378, 2003.

Publications: IV. Journal Articles:

1. Ramsubramanian A., Yurkiv, V., Najafi, A., Nie, A., Khounsary, A., Shahbazian-Yassar, R. and Mashayek, F., "A Numerical Study on Striped Lithiation of Tin Oxide Anodes," *International Journal of Solids and Structures*, accepted, 2018.

2. Kashir, B., Perri, A.E., Yarin, A.L. and Mashayek, F., "Numerical Investigation of Leaky Dielectric Liquid Charging at Low to High Voltages," *Physics of Fluids*, accepted, 2018. **Editor's Pick**

3. Yurkiv, V., Yarin, A.L. and Mashayek, F., "Modeling of Droplet Impact onto Polarized and Non-polarized Dielectric Surfaces," *Langmuir*, **34**(34), 10169-10180, 2018.

4. Yurkiv, V., Foroozan, T., Ramsubramanian A., Shahbazian-Yassar, R. and Mashayek, F., "The Influence of Stress Field on Li Electrodeposition in Li-metal Battery," *MRS Communications*, **8**(3), 1285-1291, 2018.

5. Ghiasi, Z., Li, D., Komperda, J. and Mashayek, F., "Near-Wall Resolution Requirement for Direct Numerical Simulation of Turbulent Flow Using Multidomain Chebyshev Grid," *International Journal of Heat and Mass Transfer*, **126**, 746-760, 2018.

6. Vesely, P.W., Schick, R.J., Shrimpton, J.S. and Mashayek, F., "Energy Efficient Primary Atomization of Viscous Food Oils Using an Electrostatic Method," *Journal of Food Engineering*, **237**, 27-32, 2018.

7. Ji, H. Trevino, J., Tu, R., Knapp, E., McQuade, J., Yurkiv, V., Mashayek, F. and Vuong, L., "Long-range Self-assembly via the Mutual Lorentz Force of Plasmon Radiation," *Nano Letters*, **18**(4), 2564-2570, 2018.

8. Sankaran, A., Staszel, C., Mashayek, F. and Yarin, A.L., "Faradaic Reactions' Mechanisms and Parameters in Charging of Oils," *Electrochimica Acta*, **268**, 173-186, 2018.

9. Yurkiv, V., Foroozan, T., Ramsubramanian A., Shahbazian-Yassar, R. and Mashayek, F., "Phase-Field Modeling of Solid Electrolyte Interface (SEI) Influence on Li Dendrite Behavior," *Electrochimica Acta*, **265**, 609-619, 2018.

10. Foroozan, T., Soto, F.A., Yurkiv, V., Sharifi-Asl, S., Deivanayagam, R., Huang, Z., Rojaee, R., Mashayek, F., Balbuena, P.B. and Shahbazian-Yassar, R., "Synergistic Effect of Graphene Oxide for Impeding the Dendritic Plating of Li," *Advanced Functional Materials,* **28**(15), Article No. 1705917, 2018.

11. Yurkiv, V., Sharifi-Asl, S., Ramasubramanian, A., Shahbazian-Yassar, R. and Mashayek, F., "Oxygen Evolution and Phase Transformation in LCO Cathode: A Phase-Field Modeling Study," *Computational Material Science*, **140**, 299-306, 2017.

12. Sharifi-Asl, S., Soto, F., Nie, A., Yuan, Y., Asayesh-Ardakani, H., Foroozan, T., Song, B., Mashayek, F., Klie, R., Amine, K., Lu, J., Balbuena, P. and Shahbazian-Yassar, R., "Face-Dependent Thermal Instability in $LiCoO_2$," *Nano Letters*, **17**(4), 2165-2171, 2017.

13. Chaudhuri, A., Jacobs, G.B., Don, W.S., Abbassi, H. and Mashayek, F., "Explicit Discontinuous Spectral Element Method with Entropy Generation Based Artificial Viscosity for Shocked Viscous Flows," *Journal of Computational Physics*, **332**, 99-117, 2017.

14. Sankaran, A., Staszel, C., Sahu, R., Yarin, A. and Mashayek, F., "Evidence of Faradaic Reactions in Electrostatic Atomizers," *Langmuir*, **33**(6), 1375-1384, 2017.

15. Cheng. Y., Zhu, Y., Han, Y., Liu, Z., Yang, B., Nie, A., Huang, W., Shahbazian-Yassar, R. and Mashayek, F., "Sodium-Induced Reordering of Atomic Stacks in Black Phosphorous," *Chemistry of Materials*, **29**(3), 1350-1356, 2017.

16. Ramsubramanian A., Yurkiv, V., Najafi, A., Nie, A., Khounsary, A., Shahbazian-Yassar, R. and Mashayek, F., "A Comparative Study on Continuum-Scale Modelling of Elasto-Plastic Deformation in Rechargeable Ion Batteries," *Journal of The Electrochemical Society*, **164**(13), A3418-A3425, 2017.

17. Yurkiv, V., Gutiérrez-Kolar, J., Unocic R. R., Ramsubramanian A., Shahbazian-Yassar, R. and Mashayek, F., "Competitive Ion Diffusion within Grain Boundary and Grain Interiors in Polycrystalline Electrodes with the Inclusion of Stress Field," *Journal of The Electrochemical Society*, **164**(12), A2830-A2839, 2017.

18. Nie, A., Cheng, Y., Ning, S., Foroozan, T., Yasaei, P., Li, W., Song, B., Yuan, Y., Chen, L., Salehi-Khojin, A., Mashayek, F., Shahbazian-Yassar, R., "Selective Ionic Transport Pathways in Phosphorene," *Nano Letters*, **16**(4), 2240-2247, 2016.

19. Nie, A., Gan, L., Cheng, Y., Tao, X., He, K., Yuan, Y., Sharifi-Asl, S., He, K., Asayesh-Ardakani, Vasiraju, V., Lu, J., H., Mashayek, F., Klie, R., Vaddiraju, S., Schwingenschlogl, U. and Shahbazian-Yassar, R. "Ultra-fast and Highly Reversible Sodium Storage in Zn-Sb Intermetallic Nanomaterials," *Advanced Functional Materials*, **26**(4), 543-552, 2016.

20. Asayesh-Ardakani, H., Nie, A., Marley, P., Zhu, Y., Phillips, P., Singh, S., Mashayek, F., Sambandamurthy, G., Low, K.-B., Klie, R., Banerjee, S., Odegard, G. and Shahbazian-Yassar, R. "Atomic Origins of Monoclinic-Tetragonal (Rutile) Phase Transition in Doped VO2 Nanowires," *Nano Letters*, **15**(11), 7179-7188, 2015.

21. Nie, A., Gan, L., Cheng, Y., Li, Q., Yuan, Y., Mashayek, F., Wang, H., Schwingenschlogl, U., Klie, R. and Shahbazian-Yassar, R., "Twin Boundary-Assisted Lithium Ion Transport," *Nano Letters*, **15**(1), 610-615, 2015.

22. Nie, A., Cheng, Y., Zhu, Y., Asayesh-Ardakani, H., Tao, R., Mashayek, F., Han, Y., Schwingenschlög, U., Klie, R., Vaddiraju, S. and Shahbazian-Yassar, R., "Lithiation-induced Shuffling of Atomic Stacks," *Nano Letters*, **14**(9), 5301-5307, 2014.

23. Abbassi, H., Mashayek, F. and Jacobs, G.B., "Shock Capturing with Entropy-based Artificial Viscosity for Staggered Grid Discontinuous Spectral Element Method," *Computers & Fluids*, **98**, 152-163, 2014.

24. Gao, Q., Meng, G., Nie, A., Mashayek, F., Wang, C., Odegard, G. and Shahbazian-Yassar, R., "Direct Evidence of Lithium-induced Atomic Ordering in Amorphous TiO_2 Nanotubes," *Chemistry of Materials,* **26**(4), 1660-1669, 2014.

25. B. Rovagnati, A.L. Yarin, F. Mashayek, and T. Matsoukas, "A Reduced Model for Nanoparticle Coating in Non-equilibrium Plasma," *Physics Letters A,* **377**(28-30), 1745-1748, 2013.

26. Nie, A., Gan, L.-Y., Cheng, Y., Asayesh-Ardakani, H., Li, Q., Dong, C., Tao, R., Mashayek, F., Wang, H.-T., Schwingenschlögl, U., Klie, R. and Yassar, R., "Atomic-Scale Observation of Lithiation Reaction Front in Nanoscale SnO2 Materials," *ACS Nano,* **7**(7), 6203-6211, 2013.

27. H. Kanchi, K. Sengupta and F. Mashayek, "Effect of Turbulent Inflow Boundary Condition in LES of Flow over a Backward-facing Step using Spectral Element Method," *International Journal of Heat and Mass Transfer*, **62**, 782-793, 2013.

28. Johnson, A.K., Yarin, A.L. and Mashayek, F., "Packing Density and the Kozeny-Carman Equation," *Neurosurgery,* **71**(5):E1064-5. Doi: 10.1227/NEU.0b013e31826c57d6, 2012.

29. A. Kourmatzis, E. Ergene, J.S. Shrimpton, D.C. Kyritsis, F. Mashayek, and M. Huo, "Combined Aerodynamic and Electrostatic Atomization of Dielectric Liquid Jets," *Experiments in Fluids,* DOI 10.1007/s00348-012-1284-6, **53**(1), 221-235, 2012.

30. H. Kanchi, K. Russell, M.J. Anderson, S.P. Beard, P.J. Strykowski, and F. Mashayek, "Fluidic Control with Microjets in Dump Combustors," *International Journal of Heat and Mass Transfer*, **54**, 5395-5405, 2011.

31. Ergene, E.L., Malkawi, G., Shrimpton, J.S., and Mashayek, F., "Charge Injection Characteristics for Multiple Blade-Plane Configurations Immersed in a Quiescent Dielectric Liquid," *IEEE Transactions on Dielectrics and Electrical Insulation,* **17**(6), 1846-1852, 2010.

32. Malkawi, G., Yarin, A.L., and Mashayek, F., "Breakup Mechanisms of Electrostatic Atomization of Corn Oil and Diesel Fuel," *Journal of Applied Physics,* **108**(6), 064910, 2010.

33. Chang, C.-W., Davoudabadi, M., and Mashayek, F., "One-dimensional Fluid Model of Methane Plasma for Diamond-like Coating," *IEEE Transactions on Plasma Science,* **38**(7), 1603-1614, 2010.

34. Zhang, K.K.Q., Shotorban, B., Minkowycz, W.J., and Mashayek, F., "A Comprehensive Approach for Simulation of Capillary Jet Breakup," *International Journal of Heat and Mass Transfer,* **53**(15-16), 3057-3066, 2010.

35. • Sengupta, K., Shotorban, B., Jacobs, G.B., and Mashayek, F. "Spectral-based Simulations of Particle-laden Turbulent Flows," *International Journal of Multiphase Flow*, **39**(9), 811-826, 2009.

36. Rovagnati, B. and Mashayek, F., "A Kinetic Model to Study Film Deposition during Dusty Plasma Chemical Vapor Deposition Process," *Journal of Applied Physics,* **105**(6), 063303, 2009.

37. Zhang, K.K.Q., Sengupta, K., Xia, K., Minkowycz, W.J., and Mashayek, F., "A Superposition-based Parallel Discrete Operator Splitting Finite Element Method for Incompressible Flows," *International Journal of Heat and Mass Transfer,* **52**(13-14), 2979-2991, 2009.

38. Davoudabadi, M., Shrimpton, J.S., and Mashayek, F. "On Accuracy and Performance of High-Order Finite Volume Methods in Local Mean Energy Model of Non-thermal Plasmas," *Journal of Computational Physics,* **228**(7), 2468-2479, 2009.

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53. Miller, R.S., Mashayek, F., Adumitroaie, V., and Givi, P., "Structure of Isotropic and Homogeneous Shear Magnetohydrodynamic Turbulence," *Bulletin of the American Physical Society*, **40**(12), p. 1917, 48th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Irvine, CA, November 19-21, 1995.

54. Taulbee, D.B., Mashayek, F., and Givi, P., "Explicit Algebraic Stress and Flux Models for Turbulent Particle-Laden Flows," *Bulletin of the American Physical Society*, **40**(12), p. 1993, 48th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Irvine, CA, November 19-21, 1995.

Public Lectures: (*Invited lectures are identified by* •)

1. • "High-fidelity Simulation of Turbulent Flows," Department of Mechanical Engineering, City University of Hong Kong, Hong Kong, China, January 3, 2018.

2. "Modeling and simulation of Li dendrite formation considering the solid electrolyte interface (SEI) influence," *Americas International Meeting on Electrochemistry and Solid-State Science (AiMES),* Cancun, Mexico, October 2, 2018.

3. "Large-Scale Simulations of Turbulence Using Discontinuous Spectral Element Method," *20th International Conference on Computational Mathematics, Parallel and Distributed Computing,* Prague, Czech Republic, August 13, 2018.

4. "Application of a Modal Filter for Large-Eddy Simulation of Turbulence using Discontinuous Spectral Element Method," *5th Joint US-European Fluids Engineering Summer Conference,* Montreal, Canada, July 18, 2018.

5. • "Simulation of Turbulent Flows," Department of Mechanical Engineering, University of Science and Technology Beijing, Beijing, China, May 18, 2018.

6. • "Electrostatic Atomization: Coating Application," American Coatings Conference, Indianapolis, IN, April 9, 2018.

7. • "Processing Signals Generated by Computer Simulations of Turbulent Flows," *The International Conference on Wireless Communications, Signal and Image Processing*, Bangkok, Thailand, January 6, 2018.

8. • "Electrostatic Atomization: Coating Application," Department of Mechanical Engineering, Tongji University, Shanghai, China, October 9, 2017.

9. • "High-fidelity Simulation of Turbulent Flows," Department of Automotive Engineering, Tongji University, Shanghai, China, May 25, 2017.

10. • "High-fidelity Simulation of Turbulent Flows," Department of Mechanical Engineering, Chongqing Jiao Tong University, Chongqing, China, May 23, 2017.

11. • "High-Fidelity Simulation of Turbulent Reacting Flows," *The 6th Conference on Computational Mechanics*, Bangkok, Thailand, January 4, 2017.

12. "Supersonic Combustion Simulation," *Hawaii International Conference on STEM/STEAM Education*, Honolulu, HI, June 10, 2016.

13. • "Spectral Element Simulation of Turbulent Flows," Department of Ocean Engineering, Shanghai Jiao Tong University, Shanghai, China, May 19, 2016.

14. • "Spectral Element Simulation of Turbulent Flows," Department of Mechanical Engineering, Chang'an University, Xian, China, May 16, 2016.

15. • "Spectral Element Simulation of Turbulent Flows," Department of Mechanical Engineering, Xian Jiao Tong University, Xian, China, May 16, 2016.

16. • "High-fidelity Simulation of Supersonic Combustor," Department of Mechanical Engineering, University of Science and Technology Beijing, Beijing, China, October 26, 2015.

17. • "Spectral Element Simulation of Turbulent Flows," Department of Mechanical Engineering, Sharif University of Technology, Tehran, Iran, June 15, 2015.

18. • "High-fidelity Simulation of Supersonic Combustor," Department of Mechanical Engineering, Tongji University, Shanghai, China, May 14, 2015.

19. "Subsonic Slanted Cavity Combustor Simulation with a Discontinuous Spectral Element Method," *6th European Conference on Computational Fluid Dynamics (ECFD VI),* Barcelona, Spain, July 22, 2014.

20. • "Spectral Element Simulation of Turbulent Flows," Department of Mechanical, Materials and Aerospace Engineering, Illinois Institute of Technology, Chicago, IL, September 4, 2013.

21. "Electrostatic Atomization and CFD," Navistar, Lisle, IL, February 14, 2013.

22. • "Simulation of Turbulent Flows with Spectral Element Methods," Department of Mechanical Engineering, University of Twente, Enschede, Netherlands, September 17, 2012.

23. • "Simulation of Turbulent Flows with Spectral Element Methods," Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, September 4, 2012.

24. "Experimental and Computational Studies to Advance Operability and Performance of Combustion Systems Adopting Fluidic Control," *ONR Annual Review Meeting*, Washington, DC, August 7, 2012.

25. "Effects of Microjets in Flow over a Backward-facing Step," *the ASME 11th Biennial Conference on Engineering Systems Design and Analysis (ESDA2012)*, Nantes, France, July 2, 2012.

26. "Application of Entropy Viscosity Method for Supersonic Flow Simulation using Discontinuous Spectral Element Method," *AIAA Aerospace Sciences Meeting*, Nashville, TN, January 12, 2012.

27. "Experimental and Computational Studies to Advance Operability and Performance of Combustion Systems Adopting Fluidic Control," *23rd ONR Propulsion Meeting*, National Harbor, MD, September 13, 2011.

28. "Large-eddy Simulation of a Horizontal Microjet in Backward-facing Step Flow," *9th International Energy Conversion Engineering Conference,* San Diego, CA, August 2, 2011.

29. "Comparison of LES Studies in Backward-facing Step Using Chebyshev Multidomain and Legendre Spectral Element Methods," *20th AIAA Computational Fluid Dynamics Conference,* Honolulu, HI, June 28, 2011.

30. "Fluidic Control Using Microjets in Dump Combustors to Increase Heat Release Rate," *The 22nd ONR Propulsion Meeting*, Crystal City, VA, June 22, 2010.

31. • "Simulation of Nanoparticle Dynamics and Coating in Low-pressure Plasma Reactor," Department of Physics and Astronomy, University of Iowa, Iowa City, IA, April 19, 2010.

32. • "Innovation and Sustainability," *Second Illinois Coalition for Manufacturing Innovation (ICMI) Workshop,* Illinois Institute of Technology, Chicago, IL, March 19, 2010.

33. "Large Eddy Simulation of Particle- laden Flow over a Backward-facing Step using a Spectral Multidomain Method," *AIAA Aerospace Sciences Meeting*, Orlando, FL, January 6, 2010.

34. "Backward-facing Dump Combustor with Horizontal Microjets," *ONR Propulsion Midterm Review Meeting*, Washington, DC, December 16, 2009.

35. "Large Eddy Simulation of Compressible Flow over a Backward-facing Step using a Spectral Multidomain Method," 62nd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Minneapolis, MN, November 23, 2009.

36. "Dump Combustors with Fluidic Control," *The 21th ONR Propulsion Meeting*, Monterey, CA, June 9, 2009.

37. • "Integrating Innovation into Engineering Education," *First Illinois Coalition for Manufacturing Innovation (ICMI) Workshop,* Illinois Institute of Technology, Chicago, IL, April 10, 2009.

38. • "A Historical Perspective of Jet Propulsion Laboratory Studies on Electrostatic Spray Dispersion for Soot Control in Combustion Systems," *Workshop on Electrostatic Atomization of Electrically Insulating Liquids: Principles and Applications,* Southampton University, UK, March 3, 2009.

39. • "Electrostatic Atomization of Combustion of Electrically Insulating Liquids," *AIAA Aerospace Sciences Meeting*, Orlando, FL, January 6, 2009.

40. "Fluidic Control of Reacting Flow Using Microjets in an Axisymmetric Dump Combustor," *AIAA Aerospace Sciences Meeting*, Orlando, FL, January 5, 2009.

41. "Simulations of Dump Combustors with Fluidic Control," *The International Symposium on Recent Advances in Combustion and Noise Control for Propulsion,* Kauai, HI, December 10, 2008.

42. • "Modeling and Simulation of Particle/Droplet-Laden Turbulent Flows," The 11th ISME Fluid Dynamics Conference, Tehran, Iran, May 28, 2008.

43. • "Particle-laden Flows," Department of Mechanical and Aerospace Engineering, State University of New York at Buffalo, Buffalo, NY, January 23, 2008.

44. • "DNS and LES of Turbulent Flows Using Spectral Methods," *AIAA Aerospace Sciences Meeting*, Reno, NV, January 8, 2008.

45. "Shear Flow Control in Dump Combustors Using Microjets," *The 20th ONR Propulsion Meeting*, Washington, DC, December 13, 2007.

46. • "Particle-laden Flows," Department of Mechanical Engineering, San Diego State University, San Diego, CA, November 20, 2007.

47. • "Simulation of Nanoparticle Dynamics and Coating in Low-pressure Plasma Reactor," Department of Chemical Engineering, Pennsylvania State University, State College, PA, September 27, 2007.

48. • "Simulation of Nanoparticle Dynamics and Coating in Low-pressure Plasma Reactor," Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, September 10, 2007.

49. • "Nanoparticle Coating in Low-pressure Plasma Reactor for Energy-related Applications," Nanotechnology Workshop, The Center for Nanoscale Science and Technology, University of Illinois at Urbana-Champaign, IL, May 3, 2007.

50. "Numerical Studies of Counter-current Dump Combustor for Flame Stabilization," 19th ONR Propulsion Meeting, Costa Mesa, CA, December 19, 2006.

51. • "Can Renewable Liquid Fuels Quench Our Energy Thirst?" Department of Aerospace and Mechanical Engineering, University of Notre Dame, Notre Dame, IN, December 5, 2006.

52. • "Counter-current Dump Combustor," NASA Glenn Research Center, Cleveland, OH, June 23, 2006.

53. "Particle Mobilization in PECVD Reactor Using Thermophoretic Force," *33rd IEEE International Conference on Plasma Science,* Traverse City, MI, June 6, 2006.

54. "Compound Capillary Jet Breakup," *19th Annual Conference on Liquid Atomization and Spray Systems,* Toronto, Canada, May 25, 2006.

55. • "Simulation of Nanoparticle Coating in Low-pressure Plasma Reactor," Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN, April 19, 2006.

56. "Numerical Simulation of Counter-current Dump Combustor for Efficient Flame Stabilization," *AIAA Aerospace Sciences Meeting*, Reno, NV, January 9, 2006.

57. "Simulation of Nanoparticle Dynamics in Low-Pressure Cold Plasma Reactor," *AIAA Aerospace Sciences Meeting*, Reno, NV, January 11, 2006.

58. • "Simulation of Dispersed Particles in Complex Flows," Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, Blacksburg, VA, September 14, 2005.

59. "Numerical Studies of Counter-current Dump Combustor for Flame Stabilization," 18th ONR Propulsion Meeting, Monterey, CA, August 25, 2005.

60. "Modeling of Chemical Reactions for Plasma Coating of Nanoparticles," *the 17th International Symposium on Plasma Chemistry,* Toronto, Canada, August 8, 2005.

61. • "Low-Pressure Plasma Process for Nanoparticle Coating," *the 32nd IEEE International Conference on Plasma Science,* Monterey, CA, June 23, 2005.

62. "Efficient Turbulent Flame Stabilization for Advanced Propulsion," ONR Interim Review Meeting on Innovative Combustion for Propulsion, Chicago, IL, May 16 2005.

63. • "Simulation of Dispersed Particles in Complex Flows," Division of Applied Mathematics, Brown University, Providence, RI, April 8, 2005.

64. • "Simulation of Dispersed Particles in Complex Flows," Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, December 14, 2004.

65. "On Stochastic Modeling of Heavy Particle Dispersion in LES of Two-Phase Turbulent Flows," *IUTAM Symposium on Computational Approaches to Disperse Multiphase Flow,* Argonne, IL, October 4, 2004.

66. "An Efficient Computational Model for Testing Control Strategies in Liquid-Fuel Combustors," 17th ONR Propulsion Meeting, Boston, MA, June 16, 2004.

67. • "Simulation of Dispersed Particles in Complex Flows," Department of Theoretical & Applied Mathematics and Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, April 8, 2004.

68. • "Deterministic, Probabilistic and Stochastic Description of Gas-Solid Turbulent Flows," Department of Mechanical Engineering, Sharif University of Technology, Tehran, Iran, October 11, 2003.

69. "Deterministic and Stochastic Simulations of Two-Phase Flows for Prediction/Control of Combustion in Liquid-Fueled Combustors," the International Colloquium on Combustion and Noise Control, Cranfield, UK, August 14, 2003.

70. • "Evaporating Drops: Oscillation Effect and Turbulence Application," Department of Mechanical Engineering, Imperial College London, London, UK, August 11, 2003.

71. "Current Issues in Analytical Description of Particle/Droplet-Laden Turbulent Flows," 4th ASME/JSME Joint Fluids Engineering Conference, Honolulu, HI, July 8, 2003.

72. "Numerical Simulation of Controlled Liquid-Fuel Combustors," 16th ONR Propulsion Meeting, Los Angeles, CA, June 11, 2003.

73. "Model Development for and Numerical Simulation of Two-Phase Turbulent Flow in Liquid-Fuel Combustors," Mid-Year ONR Combustion Control Review Meeting, Los Angeles, CA, January 16, 2003.

74. "Two-Fluid Large-Eddy Simulation Approach for Two-Phase Turbulent Flows," 55th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Dallas, TX, November 26, 2002.

75. "Deterministic and Probabilistic Approaches for Prediction of Two-Phase Turbulent Flow in Liquid-Fuel Combustors," 15th ONR Propulsion Meeting, Washington, DC, August 5, 2002.

76. • "A Review of Current Advances in Computations of Two-phase Turbulent Flows," Faculty of Aerospace Engineering, Delft University, Delft, the Netherlands, July 9, 2002.

77. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," Mid-Year ONR Combustion Control Review Meeting, Orlando, FL, February 21, 2002.

78. "Kinetic Equation for Particle Transport and Heat Transfer in Non-Isothermal Turbulent Flows," 40th Aerospace Sciences Meeting and Exhibit, AIAA, Reno, NV, January 14, 2002.

79. • "Evaporating Drops: Oscillation Effect and Turbulence Application," Department of Mechanical Engineering, University of Iowa, Iowa City, IA, October 18, 2001.

80. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," 14th ONR Propulsion Meeting, Chicago, IL, August 8, 2001.

81. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," Mid-Year ONR Combustion Control Review Meeting, San Diego, CA, February 15, 2001.

82. "Probability Density Function Modeling of Evaporating Droplets Dispersed in Isotropic Turbulence," 39th Aerospace Sciences Meeting and Exhibit, AIAA, Reno, NV, January 8, 2001.

83. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," 13th ONR Propulsion Meeting, Minneapolis, MN, August 10, 2000.

84. • "Analytical Investigation of Turbulent Gas-Liquid Flows," Department of Mechanical Engineering, University of Illinois at Chicago, Chicago, IL, March 27, 2000.

85. • "Analytical Investigation of Turbulent Gas-Liquid Flows," Department of Aerospace Engineering and Mechanics, University of Minnesota, Minneapolis, MN, March 16, 2000.

86. • "Analytical Investigation of Turbulent Gas-Liquid Flows," Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN, March 15, 2000.

87. • "Analytical Investigation of Turbulent Gas-Liquid Flows," Department of Mechanical Engineering, Texas A&M University, College Station, TX, March 13, 2000.

88. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," Mid-Year ONR Combustion Control Review Meeting, Tallahassee, FL, February 17, 2000.

89. "Velocity and Temperature Statistics in Reacting Droplet-Laden Homogeneous Shear Turbulence," 38th Aerospace Sciences Meeting and Exhibit, AIAA, Reno, NV, January 10, 2000.

90. • "Two-Phase Turbulent Flows: A Systematic Analytical Approach," Department of Mechanical Engineering, Northwestern University, Evanston, IL, December 8, 1999.

91. • "Two-Phase Turbulent Flows: A Systematic Analytical Approach," Department of Mechanical, Materials, and Aerospace Engineering, Illinois Institute of Technology, Chicago, IL, December 6, 1999.

92. • "Two-Phase Turbulent Flows: A Systematic Analytical Approach," Department of Mechanical, Industrial, and Manufacturing Engineering, Northeastern University, Boston, MA, November 8, 1999.

93. • "Two-Phase Turbulent Flows: A Systematic Analytical Approach," Department of Mechanical Engineering, Florida State University, Tallahassee, FL, November 4, 1999.

94. • "Two-Phase Turbulent Flows: A Systematic Analytical Approach," Mechanical Engineering Department, University of Connecticut, Storrs, CT, September 24, 1999.

95. • "Recent Approaches to Turbulent Two-Phase Flows," Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, September 16, 1999.

96. "Direct Numerical Simulation of Particle-Laden Homogeneous Plane Strain Turbulent Flow," First International Symposium on Turbulence and Shear Flow Phenomena, Santa Barbara, CA, September 13, 1999.

97. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," 12th ONR Propulsion Meeting, Salt Lake City, UT, August 4, 1999.

98. • "Simulation and Modeling of Turbulent Two-Phase Reactive Flows," the Monthly Meeting of the Board of Regents of the University of Hawaii, Honolulu, HI, July 16, 1999.

99. "Simulation and Modeling of Two-Phase Turbulent Flows for Prediction and Control of Combustion Systems," ONR Combustion Control Workshop, Baton Rouge, LA, April 22, 1999.

100. "Numerical Simulation of Heterogeneous Flow with Homogeneous Reaction," 37th Aerospace Sciences Meeting and Exhibit, AIAA, Reno, NV, January 11, 1999.

101. • "Analytical Treatment of Two-Phase Turbulent Flows," Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, December 3, 1998.

102. "Drop Oscillations with Thermocapillary Effects," 51st Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Philadelphia, PA, November 23, 1998.

103. "Statistics in Two-Phase Reacting Homogeneous Shear Turbulence," 51st Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Philadelphia, PA, November 23, 1998.

104. "Direct Numerical Simulation of Two-Phase Turbulent Reacting Flows" 50th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, San Francisco, CA, November 25, 1997.

105. "A Solution to the Modeled Reynolds Stress Transport Equation and Algebraic Stress Models" 50th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, San Francisco, CA, November 24, 1997.

106. • "Finite Element Analysis of Free Surface Flows," Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, December 4, 1997.

107. • "Two-Phase Turbulent Reacting Flows: Mathematical Modeling and Numerical Simulation" Department of Mechanical Engineering, University of Hawaii at Manoa, Honolulu, HI, April 14, 1997.

108. • "Two-Phase Turbulent Reacting Flows: Mathematical Modeling and Numerical Simulation" Department of Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, March 10, 1997.

109. • "Two-Phase Turbulent Flows: Modeling and Simulations," Mechanical Engineering Department, Louisiana State University, Baton Rouge, LA, December 5, 1996.

110. • "Applications and Numerical Treatments of Two-Phase Flows," Department of Mechanical Engineering, University of Michigan at Dearborn, Detroit, MI, November 26, 1996.

111. "Direct Numerical Simulation of Evaporating Droplet Dispersion in Low Mach Number Shear Turbulence," 49th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Syracuse, NY, November 25, 1996.

112. "Thermocapillary Instability of Liquid Jets," 7th Annual Conference on Liquid Atomization and Spray Systems, Bellevue, WA, June 1, 1994.

113. “A Hybrid Finite Element - Volume of Fluid Method for Simulating Liquid Atomization,” 6th Annual Conference on Liquid Atomization and Spray Systems, Worcester, MA, May 19, 1993.

114. “A Brief Review of Upwind Techniques in Finite Elements Methods,” Department of Civil Engineering, State University of New York at Buffalo, Buffalo, NY, December 7, 1992.

115. “Solid Propellant Grain Design Using an Interface Reconstruction Scheme,” Central State Section Meeting of the Combustion Institute, Columbus, OH, April 27, 1992.

116. “Simultaneous Conduction and Radiation in an Absorbing-Emitting-Conducting Medium with Moving Boundaries,” First Conference on Computational Fluid Dynamics in Iran, Tehran, January 1990.