FRANCINE BATTAGLIA

Professor and Chair, Mechanical & Aerospace Engineering Department
Director, Advanced Simulations for Computing ENergy Transport (ASCENT) Laboratory
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EDUCATION

Ph.D., Mechanical Engineering, Pennsylvania State University, May 1997
M.S., Aerospace Engineering, State University of New York at Buffalo, September 1992
B.S., Mechanical Engineering, State University of New York at Buffalo, June 1991

PROFESSIONAL EXPERIENCE

University at Buffalo, Buffalo, NY
Department Chair, Mechanical and Aerospace Engineering, May 2020-present
Acting Associate Dean for Faculty Affairs, SEAS, July 2019-April 2020
Professor, Mechanical and Aerospace Engineering, August 2017-present

Virginia Tech, Blacksburg, VA
Research Assignment (analogous to sabbatical), August 2015-December 2015
Professor, Mechanical Engineering, June 2012-July 2017
Associate Professor, Mechanical Engineering, August 2007-May 2012

Iowa State University, Ames, IA
Associate Professor, Mechanical Engineering, May 2005-July 2007
Assistant Professor, Mechanical Engineering, August 1999-April 2005

Center for Building Energy Research, Iowa State University, Ames, IA
Director, December 2004-July 2007
Associate Director, May 2004-November 2004

National Institute of Standards and Technology, Gaithersburg, MD
Mechanical Engineer, NRC Postdoctoral Fellow, September 1997-July 1999

University of Adelaide, Adelaide, Australia
Visiting Scholar, October 1995-November 1995

Pennsylvania State University, University Park, PA
Lecturer, January 1997-August 1997
Graduate Research Assistant, DOE-GAANN Fellow, January 1995-December 1996
Graduate Teaching Fellow, January1994-December 1994
Graduate Teaching Assistant, August 1992-December 1993

State University of New York at Buffalo, Buffalo, NY
Graduate Research Assistant, June 1991-July 1992
Undergraduate Research Assistant, September 1990-May 1991

HONORS AND AWARDS

AIAA Associate Fellow, Class of 2025
Distinguished Postdoc Mentor Award, Graduate School, UB, 2023-2024
MAC Academic Leadership Development Program Fellow, UB, 2019-2020
ASTFE Fellow, Elected April 2019
ASME Dedicated Service Award, 2016
Medal recipient awarded by the ASME Fluids Engineering Division for Seminal Contributions to the Discipline of Fluids Engineering, July 2016
College of Engineering Dean's Award for Teaching Excellence, Virginia Tech, May 2016.
College of Engineering Certificate of Teaching Excellence, Virginia Tech, April 2013.
ASME Fellow, Elected June 2009.
ASME Outstanding Student Section Advisor, Region VII, May 2004.
National Research Council Postdoctoral Fellowship, 1997-1999.
Dept. of Energy, Graduate Assistance in Areas of National Need Fellowship, Penn State, 1995-1996.
Graduate Assistant Award for Outstanding Teaching, Penn State, April 1994.
Graduate Assistant Award for Outstanding Teaching, Penn State, April 1993.
Paul H. Schweitzer Memorial Graduate Fellowship, Penn State, 1992-1993.
Minta Martin Student Conference Competition, May 1992.
AIAA Northwest Regional Conference, SUNY Buffalo
First Place, Graduate Oral Presentation Division.
Minta Martin Student Conference Competition, May 1991.
AIAA Northwest Regional Conference, Worcester Polytechnic Institute
Third Place, Undergraduate Presentation of Technical Paper.
National Science Foundation, Undergraduate Research Grant, 1990-1991.

ACKNOWLEDGEMENTS AND RECOGNITION

ASME Board of Governors for Service as IMECE Conference Chair, November 2017
ASME Board of Governors for Service as IMECE Program Chair, November 2016.
ASME Board of Governors for Service as IMECE Program Vice Chair, November 2015.
ASME Board of Governors for Service as FED Chair, July 2014.
Selected for the New Academic Leadership Series Workshop, Virginia Tech, Aug-Dec 2013.
ASME Certificate of Appreciation for Service as FEDSM Conference Chair, July 2013.
ASME Certificate of Appreciation for Service as FEDSM Technical Program Chair, July 2012.
ASME Certificate of Appreciation for Service as FMTC Chair, July 2010.

ACADEMIC AREAS OF SPECIALIZATION

Teaching

University at Buffalo

MAE 335, Fluid Mechanics (3 cr)
MAE 415/515, Advanced Fluid Mechanics (3 cr)
MAE 432/532, Advanced Thermodynamics (3 cr)
MAE 539, Computational Fluid Dynamics 1 (3 cr)
MAE 542, Advanced Heat Transfer (3 cr)

Virginia Tech

ME 3304, Heat Transfer (3 cr)
ME 3404, Fluid Mechanics (3 cr)
ME 4124, CAD of Fluid-Thermal Sciences (3 cr including lab)
ME 4324/5334, Energy Systems, Theory and Applications (3 cr)
ME 5404, Fluid Dynamics (3 cr)

Iowa State University

ME 231, Engineering Thermodynamics 1 (3 cr)
ME 331, Engineering Thermodynamics 1 (4 cr; replaced by ME 231 in 2000)
ME 332, Engineering Thermodynamics 2 (3 cr)
ME 436, Heat Transfer (4 cr)
ME 436L, Heat Transfer Laboratory (1 cr included in the 4 credits of ME 436)
ME 475, Modeling and Simulation (3 cr)
ME 536, Advanced Heat Transfer (3 cr)
ME 546, Computational Fluid Mechanics and Heat Transfer I (3 cr)

Pennsylvania State University

ME 23, Introduction to Thermal Sciences (3 cr)
ME 31, Thermodynamics 2 (3 cr)
ME 120, Engineering Thermodynamics and Heat Transfer (honors course, 4 cr)

Research

Endeavors include using computational fluid dynamics for analysis and devising computational methodologies and mathematical approaches to further contribute to emerging areas of research in the thermal and fluid sciences with relevance to energy applications. Current research interests include building energy utilization and renewable/alternative energy, and turbulent multiphase and reacting flows for applications in gasification processes such as coal or biomass.

GRANTS AND CONTRACTS

Current

1. Co-PI (PI: M. Yu), "A Compact, Modular Membrane Reactor for >10 kg/day, High-Efficiency Ammonia (NH3) Synthesis at Moderate Temperatures and Pressures", 01/01/2025-12/31/2026, DOE Office of Energy Efficiency and Renewable Energy, $300,000 (40% share). (Notie of selection received; negotiations pending with SPS and DOE)

Completed

2. Principal Investigator, "Computational Modeling of Aerosol Transmission and UV-C Aerosol Pathogen Reduction Systems", 01/01/2022-06/30/2022, UB CMI Faculty-Industry Applied Research, $40,000 (100% share).
3. Principal Investigator, "Simulations for the Containment and Control of COVID-19 in Indoor Spaces with the SteriSpace™ Air Sterilization System", 07/01/2020-06/30/2021, UB Center for Advanced Technology in Big Data & Health Sciences (UB CAT), $99,998 (100% share).
4. Co-PI (PI: F. Jazizadeh, co-PI: B. Huang), "Characterization of Adaptive Thermal Capacity for Energy Management in Smart Buildings", 07/01/2017-06/30/2018, Institute for Critical Technology and Applied Science, $80,000 (20% share).
5. Co-PI (PI: G. Flintsch , co-PIs: J. Ferris, S. Taheri, E. deLeon Izeppi, S. Katicha, A. Medina-Flintsch), "NCHRP 15-55 Guidance to Predict and Mitigate Dynamic Hydroplaning on Roadways", 04/1/2015-03/31/2018, Transportation Research Board, $177,797 (15% share).
6. Principal Investigator (co-PIs: Foster Agblevor, Michael Klein, and Reza Sheikhi), "Advancing Coal Catalytic Gasification to Promote Optimum Syngas Production", 10/1/2014-07/31/2017, U.S. Department of Energy, $625,388 (45% share).
7. Principal Investigator (co-PIs: Foster Agblevor, Michael Klein, and Reza Sheikhi), "Investigation of Coal-biomass Catalytic Gasification using Experiments, Reaction Kinetics and Computational Fluid Dynamics", 10/1/2010-09/30/2015, U.S. Department of Energy, $1,252,392 (26% share).

8. Co-Principal Investigator (PI: Brian Lattimer, co- PIs: Srinath Ekkad, Danesh Tafti, Uri Vansburger), "IC^{3}E – Advanced Fuel Gasification: A Coupled Experimental-Computational Program", 07/01/2009 -06/30/2012, Institute for Critical Technology and Applied Science, $450,000 (20% share).
9. Co-Principal Investigator (PI: S. Ted Oyama, co-PIs: Foster Agblevor, Michael Klein), "Novel Fast Pyrolysis/Catalytic Technology for the Production of Stable Upgraded Liquids", 4/1/2009 - 1/31/2012, U.S. Department of Energy, $1,500,000 (16.7% share).
10. Principal Investigator, "Modeling and Predicting Biomass Fluidization to Improve Co-Gasification", 01/01/2011-11/15/2011, U.S. Department of Energy (URS), $65,400.
11. Principal Investigator (co-PI: Ulrike Passe), "The fluid dynamics of air flow in free flow open spaces: An architectural approach to energy efficient buildings", 01/01/2007-12/31/2007, Boston Society of Architects, $20,000 (75% share).
12. Co-Principal Investigator (PI: Ulrike Passe), "Lecture series: Women in Sustainable Design: Outstanding women leaders and role models in architecture and engineering for integrative sustainable design", Office of the Provost, Iowa State University, $3,000, 01/01/2007-06/30/2007.
13. Co-Principal Investigator (PI: Robert Brown, co-PIs: Ted Heindel), "Gasification Technologies in Support of Biorefineries", 07/01/2006-05/31/2009, Grow Iowa Values Fund, $132,274 (33% share).
14. Co-Principal Investigator (PI: Robert Brown, co-PIs: Ted Heindel), "Improving the Energy Balance of Grain Ethanol Plants", Institute for Physical Research and Technology Company Assistance Program, $65,000 (57% share), 03/15/2006-07/31/2007.
15. Co-Principal Investigator (PI: Ted Heindel), "Airlift Reactor Model and Validation for Syngas Fermentation", 09/01/2005-08/31/2007, U.S. Department of Agriculture, $70,000 (50% share).
16. Principal Investigator (co-PIs: Rodney Fox and Mark Gordon), "Detailed Reaction Kinetics for CFD Modeling of Nuclear Fuel Pellet Coating for High-Temperature Gas-Cooled Reactors", 04/15/2005-08/31/2008, U.S. Department of Energy, $449,069 (50% share).
17. Principal Investigator, "An Energy and Cost Analysis of Residential Ground-Coupled Heat Pumps in Iowa", 07/01/2004-08/31/2007, Iowa Energy Center, $124,906 (no overhead).
18. Co-Principal Investigator (PI: Rodney Fox, co-PIs: Michael Olsen, James Hill), "CFD Models for Liquid-Phase Chemical Reactors: Validation of PDF and Large-Eddy Simulations Using Stereo PIV and Reactive PLIF Experiments", 2/15/2004-1/31/2009, National Science Foundation, $400,011 (25% share).
19. Co-Principal Investigator (PI: Robert Brown, co-PIs: Maohong Fan, Rodney Fox, Samy Sadaka, Brent Shanks, Jerod Smeenk), "Gasification of Switchgrass", 10/01/2004-8/31/2005, U.S. Department of Energy, $736,000 (9% share).
20. Co-Principal Investigator (PI: Rodney Fox, co-PIs: Shankar Subramanian), "Technology Crosscut–Kinetic Theory of Multiphase Flow", 10/01/2004-09/30/2007, U.S. Department of Energy, $310,000 (33% share).
21. Principal Investigator, "Numerical Simulations of Stent-Reconstruction of an Aortic Bifurcation", 03/01/2003-05/31/2003, University of Iowa, $3,975.
22. Principal Investigator (co-PI: Michael Pate), "The Benefits of Building Energy Code Upgrades in Iowa: A Cost Study Analysis", 01/01/2003-04/30/2004, Iowa Department of Natural Resources, $24,000 (50% share).

23. Co-Principal Investigator (PI: David Hoffman, co-PIs: Rodney Fox, Shankar Subramanian), "Technology Crosscut/Kinetic Theory of Multiphase Flow", 10/01/2002-09/30/2003, U.S. Department of Energy, $210,000 (22% share).
24. Co-Principal Investigator (PI: Mark Bryden, co-PIs: Tom Foust), "Multi-Component Harvesting Equipment for Inexpensive Sugars from Crop Residues", 11/01/2001-10/30/2006, U.S. Department of Energy, $740,000 (24% share).
25. Co-Principal Investigator (PI: David Hoffman, co-PIs: Rodney Fox), "Coal Utilization Sciences: Kinetic Theory of Multiphase Flow", 04/01/2001-09/30/2002, U.S. Department of Energy, $401,000 (20% share).
26. Co-Principal Investigator (PI: Michael Olsen), "A Synergistic Approach To Understanding Mixing of Non-Newtonian and Two-Phase Fluids in Microfluidic Devices", 01/01/2001-12/31/2001, Special Programs Research Initiation Grant, $28,250 (50% share).
27. Co-Principal Investigator (PI: Rodney Fox), "Computational Fluid Dynamics Modeling of Reacting Multiphase Flows", 10/01/2000-06/30/2001, Institute for Physical Research and Technology, $47,186 (50% share).

PUBLICATIONS

Google Scholar
ORCID: orcid.org/0000-0002-0380-3402
ResearcherID: E-9189-2014
Scopus Author ID: 56228778500

Theses

"Numerical Simulations of Instabilities and Asymmetric Characteristics for Suddenly Expanded Channel Flows", Doctoral thesis, The Pennsylvania State University, May 1997.

"Direct Simulations of a Mixing Layer by a Lagrangian Transport Element Method", Master of Science thesis, The State University of New York at Buffalo, September 1992.

Books

Livescu, D., Nouri, A.G., Battaglia, F., Givi, P. (Editors) 2020. "Modeling and Simulation of Turbulent Mixing and Reaction For Power, Energy and Flight," Springer. 10.1007/978-981-15-2643-5 and ISBN: 978-981-15-2642-8.

Passe, U. and Battaglia, F., 2015. "Designing Spaces for Natural Ventilation: An Architect's guide," Routledge, Taylor and Francis. ISBN: 978-0-415-81775-2

Book Chapters

Gan, I., Shan, M., Bayandor, J., and Battaglia, F., "Physiological and Environmental Impact of Temperature Change on Bumblebee Flight", in Hymenoptera - Unanswered Questions and Future Directions, IntechOpen, March 2024. 10.5772/intechopen.1004941

Bhagwat, S., Joshi, V., and Battaglia, F., "Assessing ventilation strategies to reduce the spread of pathogens in restaurants" in Integrative Approaches in Urban Sustainability - Architectural Design,

Technological Innovations and Social Dynamics in Global Contexts, IntechOpen, January 2023. 10.5772/intechopen.109634

Battaglia, F., Chen, L., Deza, M., and Estejab, B., "Educating the Next Generation of Mechanical Engineers in Fluid-Thermal Sciences" in Women in Mechanical Engineering: Energy and Environment, Springer, 2022. 10.1007/978-3-030-91546-9

Battaglia, F. and Passe, U. "Natural ventilation for buildings", *McGraw Hill Yearbook of Science & Technology*, McGraw Hill, New York, 2016. 10.1036/1097-8542.YB150704

Book Reviews

Battaglia, F., "Gasoline, Diesel, and Ethanol Biofuels from Grasses and Plants", *AIAA J.*, **49**(2), 448, February 2011. 10.2514/1.52159

Journal Articles

(Battaglia's graduate students are identified with an asterisk * and postdoctoral fellows are identified with a dagger †; collaborators' graduate students/postdocs are identified with a double dagger ‡)

Refereed

66. Kalua A., Jones J., Battaglia F., Grant E., "Framework for integrated multi-scale computational fluid dynamics simulations in natural ventilation design", *Building Services Engineering Research and Technology,* 2024. doi:10.1177/01436244241268071
65. Gallardo-Rodríguez. J., Velasco-Amate, J., Lorenzo-Horcajo, E., López-Rosales, L., Chisti, Y., Battaglia, F., Sánchez-Mirón, A., García-Camacho, F., "Current Limitations for Predicting Liquid Dispersion in Continuous Flow Bubble Columns Using CFD", *Applied Sciences*, **13**(16), 9250, 2023. 10.3390/app13169250
64. Battaglia, F., England, J., and Estejab, B., "Predicting Behavior of Gas-Solids Systems for Non-Uniform Fluidization", ASME *J. Fluids Eng.*, **145**(5), 051401, 2023. 10.1115/1.4056608
63. Shah,* M., Bayandor, J., and Battaglia, F., "The importance of morphology in resolving the bumblebee flight paradox", ASME *J. Fluids Eng.*, **145**(1), 011303, 2022. 10.1115/1.4055548
62. Nejadkhaki,‡ H.K., Sohrabi,* A., Purandare, T.P.,‡ Battaglia, F., and Hall, J., "A Variable Twist Blade for Horizontal Axis Wind Turbines: Modeling and Analysis", *Energy Convers. Manag.*, **248**(11), 2021. 10.1016/j.enconman.2021.114771
61. Jazizadeh, F, Joshi,* V, and Battaglia, F., "Adaptive and Distributed Operation of HVAC Systems: Energy and Comfort Implications of Active Diffusers as New Adaptation Capacities", *Building and Environment*, **186**(12), 2020. 10.1016/j.buildenv.2020.107089
60. Nazari,‡ A., Chen,† L. , Battaglia, F., and Taheri, S., Developing an Advance Tire Hydroplaning Model Using Co-Simulation of Fully Coupled FEM and CFD Codes to Estimate Cornering Force, *J. Fluids Eng*, 142(10), 101202, 2020. 10.1115/1.4047393
59. Jo,‡ S.J., Jones, J., and Battaglia, F., "Validation of computational fluid dynamics (CFD) platforms for the early stages of architectural design", *Prometheus*, Buildings, Cities, and Performance II, **4**, pp. 74-77, 2020. prometheus.library.iit.edu/index.php/journal/article/view/56
58. Matta,† A., Pendar, H., Battaglia, F. and Bayandor, J., Impact of caudal fin shape on thrust production of a thunniform swimmer, *Journal of Bioionic Engineering*, **17**(2), pp.254-269, 2020. 10.1007/s42235-020-0020-9
57. Wang,† J., Huo, Q., Zhang, T., Wang, S., and Battaglia, F., Numerical investigation of gaseous

pollutant cross-transmission for single-sided natural ventilation driven by buoyancy and wind, *Building and Environment*, **172**(4), 106705, pp. 1-14, 2020. 10.1016/j.buildenv.2020.106705

56. Yin, P., Pate, M., Battaglia, F., In-field Performance Evaluation and Economic Analysis of Residential Ground Source Heat Pumps in Heating Operation, *J. Building Energy*, **26**(11), 100932, pp. 1-10, 2019. 10.1016/j.jobe.2019.100932

55. Wang,† J., Battaglia, F., Wang, S., Zhang, T., and Ma, Z., Flow and heat transfer characteristics of ice slurry in typical components of cooling systems: A review, *Int. J. Heat and Mass Trans.*, **141**(11), pp. 922-939, 2019. 10.1016/j.ijheatmasstransfer.2019.07.021

54. Matta,† A., Bayandor, J., Battaglia, F., and Pendar, H., Effects of fish caudal fin sweep angle and kinematics on thrust production during low-speed thunniform swimming, *Biology Open*, **8**(7), 2019. 10.1242/bio.040626

53. López-Rosales, L.; Sánchez Mirón,A.; Contreras-Gómez, A.; García-Camacho, F.; Battaglia, F.; Zhao,* L.; and Molina-Grima, E., Characterization of bubble column photobioreactors for shear-sensitive microalgae culture, Bioresource Technology, 275(3), pp. 1-9, 2019. 10.1016/j.biortech.2018.12.009

52. Kang, Y.-S., Nazari, A., Chen,† L., Ferris, J.B., Taheri, S., Battaglia, F., Flintsch, G., "A Probabilistic Approach to Hydroplaning Potential and Risk", SAE International Journal of Passenger Cars: Mechanical Systems, *SAE Int. J. Passeng. Cars – Mech. Syst.*, 12(1), 2019. 10.4271/06-12-01-0005

51. Strasser,* W., and Battaglia, F., "Pulsating Slurry Atomization, Film Thickness, and Azimuthal Instabilities". *Atomization and Sprays*, 28(7), pp.643-672, 2018. 10.1615/AtomizSpr.2018026380

50. Wang,† J., Zhang, T., Wang, S., and Battaglia, F., "Numerical and analytical investigation of ice slurry isothermal flow through horizontal bends", *International Journal of Refrigeration,* **92**(8), pp. 37-54, 2018.10.1016/j.ijrefrig.2018.05.038

49. Wang,† J., Zhang, T., Wang, S., and Battaglia, F., "Numerical investigation of single-sided natural ventilation driven by buoyancy and wind through variable window configurations", *Energy and Buildings*, **168**(1), pp. 147-164, 2018. 10.1016/j.enbuild.2018.03.015

48. Feaster,† J., Bayandor, J., and Battaglia, F., "A computational study on the influence of insect wing geometry on bee flight mechanics", *Biology Open*, 6, pp. 1784-1795, 2017. 10.1242/bio.024612

47. Strasser,* W., and Battaglia, F., "The Effects of Prefilming Length and Feed Rate on Compressible Flow in a Self-pulsating Injector". *Atomization and Sprays*, **27**(11), pp. 929-947, 2017. 10.1615/AtomizSpr.2017020111

46. Wang,† J., Zhang, T., Wang, S., and Battaglia, F., "Gaseous pollutant transmission through windows between vertical floors in a multistory building with natural ventilation", *Energy and Buildings*, **153**(10), pp. 325-340, 2017. 10.1016/j.enbuild.2017.08.025

45. Kanholy,* S.K., Estejab,* B., and Battaglia, F., "Modeling Multiple Gas Jet Interactions during Fluidization in a Pseudo-2D Bed", *Chem. Eng. J.*, **328**(11), pp. 1009-1021, 2017. 10.1016/j.cej.2017.07.116

44. Estejab,* B., Nyendu,‡ G., Agblevor, F., and Battaglia, F., "Coal-biomass mixing characteristics in a bubbling fluidized bed of Geldart A particles". *Chem. Eng. Res. Desg*., **120**(4), pp. 1-14, 2017. 10.1016/j.cherd.2017.01.025

43. Wang,† J., Wang, S., Zhang, T., and Battaglia, F., "Assessment of single-sided natural ventilation driven by buoyancy forces through variable window configurations", *Energy and Buildings*, **139**(3), pp. 762-779, 2017. 10.1016/j.enbuild.2017.01.070

42. Wang,† J., Wang, S., Zhang, T., and Battaglia, F., "Mathematical and experimental investigation on

pressure drop of heterogeneous ice slurry flow in horizontal pipes", *Int. J. Heat Mass Trans.*, **108**(5) Part B, pp. 2381-2392, 2017. 10.1016/j.ijheatmasstransfer.2017.01.083

41. Park,* D., and Battaglia, F., "Development of a Predictive Equation for Ventilation in a Wall-Solar Chimney System". ASME *J. Sol. Energy Eng.*, **139**(3), p. 031001, 2017. 10.1115/1.4035516

40. Chen,* L., and Battaglia, F., "The Effects of Inlet Turbulence Intensity and Computational Domain on a Non-premixed Bluff-body Flame". ASME *J. Energy Resour. Technol.*, **139**(2), p. 022205, 2017. 10.1115/1.4035149

39. Strasser,* W., and Battaglia, F., "The Effects of Pulsation and Retraction on Non-Newtonian Flows in Three-Stream Injector Atomization Systems". *Chem. Eng. J.*, **309**(2), pp. 532–544, 2017. 10.1016/j.cej.2016.10.046

38. Zhao,* L., Li,‡ J., Battaglia, F., and He, Z., "Computational Investigation of the Flow Field Contribution to Improve Electricity Generation in Granular Activated Carbon-Assisted Microbial Fuel Cells". *J. Power Sources*, **333**(11), pp. 83-87, 2016. 10.1016/j.jpowsour.2016.09.113

37. Picardi,* R., Zhao,* L., and Battaglia, F., "On the Ideal Grid Resolution for Two-dimensional Eulerian Modeling of Gas-Liquid Flows", ASME *J. Fluids Eng*., **148**(11), p. 114503 (6pp), 2016. 10.1115/1.4033561

36. Strasser,* W., and Battaglia, F., "The Influence of Retraction on Three-Stream Injector Pulsatile Atomization for Air-Water Systems", ASME *J. Fluids Eng*., **138**(11), p. 111302 (12pp), 2016. 10.1115/1.4033421

35. Strasser,* W., and Battaglia, F., "Identification of Pulsation Mechanism in a Transonic Three-Stream Airblast Injector", ASME *J. Fluids Eng*., **138**(11), p. 111303 (15pp), 2016. 10.1115/1.4033422

34. Dadashi,‡ S., Feaster,* J., Bayandor, J., Battaglia, F. and Kurdila, A.J., "Identification and Adaptive Control of History Dependent Unsteady Aerodynamics for a Flapping Insect Wing", *Nonlinear Dyn*, **85**(3), pp. 1405-1421, 2016. 10.1007/s11071-016-2768-3

33. Zhao,* L., Li,‡ J., Battaglia, F., and He, Z., "Investigation of Multiphysics in Tubular Microbial Fuel Cells by Coupled Computational Fluid Dynamics with Multi-Order Butler-Volmer Reactions", *Chem. Eng. J.*, **296**(7), pp. 377–385, 2016. 10.1016/j.cej.2016.03.110

32. Chen,* L., and Battaglia, F., "The Effects of Fuel Mixtures in Non-premixed Combustion for a Bluff-body Flame". ASME *J. Energy Resour. Technol.*, **138**(3):022204, pp. 1-9, 2016. 10.1115/1.4031835

31. Estejab,* B. and Battaglia, F., "Assessment of Drag Models for Geldart A Particles in Bubbling Fluidized Beds", ASME *J. Fluids Eng.*, **138**(3):031105, pp.1-12, 2016. 10.1115/1.4031490

30. Park,* D., and Battaglia, F., "Application of a Wall-Solar Chimney for Passive Ventilation of Dwellings". ASME *J. Sol. Energy Eng.*, **137**(6):061006, pp.1-8, 2015. 10.1115/1.4031537

29. Park,* D., and Battaglia, F., "Effect of heat loads and ambient conditions on thermal comfort for single-sided ventilation". *Build. Simul.*, **8**(2), pp. 167-178, 2015. 10.1007/s12273-014-0200-9

28. Teaters,* L.C., Battaglia, F., "On the Computational Modeling of Unfluidized and Fluidized Bed Dynamics". ASME *J. Fluid. Eng.*, **136**(10):104501, pp. 1-7, 2014. 10.1115/1.4027437

27. Deza,* M., Battaglia, F., "A CFD Study of Pressure Fluctuations to Determine Fluidization Regimes in Gas-solid Beds". ASME *J. Fluid. Eng.*, **135**(10), 101301, pp.1-11, 2013. 10.1115/1.4024750

26. Law,* D., Battaglia, F., "Numerical Simulations for Hydrodynamics of Air-Water External Loop

Airlift Reactor Flows With Bubble Break-Up and Coalescence Effects". ASME *J. Fluid. Eng.*, **135**(8), 081302, pp.1-9, 2013. 10.1115/1.fellow4024396

25. Kanholy,* S. K., Chodak,‡ J., Lattimer, B. Y., and Battaglia, F., "Modeling and Predicting Gas-Solid Fluidized Bed Dynamics to Capture Nonuniform Inlet Conditions". ASME *J. Fluid. Eng.*, **134**(11), 111303, pp. 1-8, 2012. 10.1115/1.4007803

24. Deza,* M., Heindel, T.J., and Battaglia, F., "Effects of Mixing using Side Port Air Injection on a Biomass Fluidized Bed". ASME *J. Fluid. Eng.*, **133**(11), 111302, pp. 1-9, 2011. 10.1115/1.4005136.

23. Stoakes,* P., Passe, U., Battaglia, F., "Predicting Natural Ventilation Flows in Whole Buildings. Part 2: The Esherick House". *Build. Simul.,* **4**(4), 365-377, 2011. 10.1007/s12273-011-0046-3

22. Stoakes,* P., Passe, U., Battaglia, F., "Predicting Natural Ventilation Flows in Whole Buildings. Part 1: The Viipuri Library". *Build. Simul.*, **4**(3), 263-276, 2011. 10.1007/s12273-011-0045-4

21. Law,* D., Jones,‡ S.J., Heindel, T.J., Battaglia, F., "A Combined Numerical and Experimental Study of Hydrodynamics for an Air-Water External Loop Airlift Reactor". ASME *J. Fluid. Eng.*, **133**(2), 021301, pp.1-8, 2011. 10.1115/1.4003424

20. Ge,‡ Y., Gordon, M.S., Battaglia, F., and Fox, R.O., "Theoretical study of the pyrolysis of methyltrichlorosilane in the gas phase. 3. Reaction rate constant calculations". *J. Phys. Chem. A*, **114**(6), 2384-2392, 2010. 10.1021/jp911673h

19. Deza,* M., Franka,‡ N.P., Heindel, T.J., and Battaglia, F., "CFD Modeling and X-ray Imaging of Biomass in a Fluidized Bed". ASME *J. Fluid. Eng.*, **131**(11), 111303, pp**.** 1-11, 2009. 10.1115/1.4000257

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11. Bondar,* F., and Battaglia, F., "Bifurcation Analysis of Mixing Actuated by Time-Periodic Vortices", Proceedings of the ASME International Mechanical Engineering Congress and Exposition of the ASME Fluids Engineering Division, IMECE2002, pp. 1-8, 2002.

10. Mammoser,* J. H., and Battaglia, F., "Effect of Balconies on Vertical Fire Spread Through Windows in Multi-level Apartment Complexes", Fire Protection Strategies for the 21st Century Building and Fire Codes Symposium, Baltimore, MD, pp. 1-7, 2002.

9. Battaglia, F., Rehm, R. G., Baum, H. R., Hassan, M. I., and Saito, K., "A Perspective on Combustion-Driven Flows with Circulation", American Society of Mechanical Engineers, Proceedings of the Heat Transfer Division: Combustion and Energy Systems, IMECE2001-HTD-24243, Vol. 369, No. 4, pp. 117-120, 2001.

8. Battaglia, F., Brown, R. C., and Flugrad, D. R., "ABET EC 2000: Developing Assessment Tools for Continuous Improvement", ASEE Annual Conference Proceedings, 2001 ASEE Annual

Conference and Exposition: Peppers, Papers, Pueblos and Professors, pp. 1387-1398, 2001. peer.asee.org/8876

7. Battaglia, F., Rehm, R. G., Baum, H. R., Hassan, M. I., and Saito, K., "Flows with Combustion and Circulation", Second Joint Meeting of the U.S. Sections of the Combustion Institute, Oakland, CA, pp. 1-10, 2001.
6. Papadopoulos, G., Battaglia, F., and Arik, E. B., "An Experimental/Numerical Study of 3-D Flow Past Double-sided Expansions", Thirtieth AIAA Fluid Dynamics Conference, AIAA Paper 99-3696, Norfolk, VA, pp. 1-10, 1999. 10.2514/6.1999-3696
5. Battaglia, F., Rehm, R. G., and Baum, H. R., "Simulating Fire Whirls – Inviscid Swirl and Buoyancy", Eastern States Section of the Combustion Institute, North Carolina State University, Raleigh, NC, pp. 1-4, 1999.
4. Battaglia, F., McGrattan, K. B., Rehm, R. G., and Baum, H. R., "Simulations of Fire Whirls", Joint Meeting of the United States Sections of the Combustion Institute, George Washington University, Washington, DC, pp. 1-4, 1999.
3. Battaglia, F., Kulkarni, A. K., Feng, J., and Merkle, C. L., "Simulations of Planar Flapping Jets in Confined Channels", Twenty-eighth AIAA Fluid Dynamics Conference, AIAA Paper 97-1992, Snowmass, CO, pp. 1-11, 1997. 10.2514/6.1997-1992
2. Battaglia, F., Tavener, S. J., Kulkarni, A. K., and Merkle, C. L., "Bifurcation of Low Reynolds Number Flows in Symmetric Channels", First AIAA Theoretical Fluid Mechanics Meeting, AIAA Paper 96-2128, New Orleans, LA, pp. 1-10, 1996. 10.2514/6.1996-2128
1. Battaglia, F., Kulkarni, A. K., and Merkle, C. L., "Numerical simulation of asymmetric channel flows for gas burners", Australian Symposium on Combustion/Fourth Australian Flame Days, South Australia, pp. 1-6, 1995.

TECHNICAL PRESENTATIONS

Invited Talks

"Strengthening the Thermal and Fluids Engineering Workforce: Challenges and Solutions", Panel at the ASTFE Thermal and Fluids Engineering Conference, George Washington University, March 12, 2025

"Modeling Capabilities for Advancing Energy Transport Applications", Department of Mechanical Engineering, University of Minnesota, February 19, 2025.

"What is Aerospace Engineering?", Maritime Charter Middle School, Buffalo, NY, October 16, 2023

"Modeling Capabilities for Advancing Energy Transport Applications", Department of Mechanical Engineering, University of Central Florida, February 24, 2023.

"Why I Became a Mechanical Engineer… Is it the Right Career for You?", City Honors School, Buffalo, NY, March 22, 2022

"My Journey in a STEM Field, Mechanical Engineering", Student Chapter of the Society of Women Engineers, University at Buffalo, February 16, 2022

"Computational Modeling Strategies for Energy Transport Applications", Mechanical Engineering Graduate Seminar Series, University of New Mexico, February 5, 2022

"An Overview of Modeling Efforts for Energy Transport Applications", MAE Leadership Seminar, University at Buffalo, November 18, 2021

"What Mechanical and Aerospace Engineering has to Offer", EAS 199 Freshmen Seminar, University at Buffalo, October 20, 2021

"An Overview of Projects to Model Particle Dispersion", CCR Learning Lab Seminar Series, UB Center for Computational Research, October 13, 2021

"An Overview of Modeling Efforts for Energy Transport Applications", Department of Mechanical & Aerospace Engineering, Rutgers, December 9, 2020

"What Mechanical and Aerospace Engineering has to Offer", EAS 199 Freshmen Seminar, University at Buffalo, September 30, 2020

"Why I became a mechanical engineer… is it the right field for you?, UB TINKER presentation, August 8, 2018

"On the Modeling of Combustion Systems for Reliable and Efficient Predictions of Detailed Reactions", 2017 Fluids Engineering Division Summer Meeting, August 1, 2017.

"An Overview of Modeling Efforts for Advancing Energy Transport Applications", NASA Glenn, August 15, 2016.

"SWE Mentor/Mentee (Panel)", Society of Women Engineers, Virginia Tech Student Section, October 6, 2014.

"Computing at the Edge: Applications of HPC and HPV in the future of Computational Science at VT", Panelist for the First High Performance Computing & Bioinformatics Research Day, Advanced Research Computing, Virginia Tech, April 11, 2014

"A Career in Academia: What Paths Lead to Success?", Invited speaker for the College of Engineering Paul E. Torgersen Graduate Research Excellence Award, Virginia Tech (Blacksburg, VA), April 11, 2013.

"Promotion to Professor (Panel)", College of Engineering, Virginia Tech (Blacksburg, VA), March 5, 2013.

"Challenges and Strategies for Mid-Career Women Faculty (Panel)", 2013 Advancing Diversity Workshop, Virginia Tech (Blacksburg, VA), January 15, 2013.

"Computational Fluid Dynamics for Multiphase Reactive Flows in Fluidized Beds", Conoco Philips (Bartlesville, OK), May 23, 2007.

"CFD Modeling of Multiscale Phenomena", REU Chemistry Seminar Series, Department of Chemistry, Iowa State University (Ames, IA), August 2006

"Computational Modeling of Reacting Fluidized Beds", Department of Mechanical, Aerospace and Nuclear Engineering, Rensselaer Polytechnic Institute (Troy, NY), March 2006.

"M E Research at ISU – New and Developing Technology", Society of Women Engineers Regional H Conference, Iowa State University (Ames, IA), March 2006.

"On the Implementation of Effective Methods for Simulating Fluidized Beds", Oak Ridge National Laboratory (Oak Ridge, TN), February 2006.

"On the Simulation of Reactive Flows in Fluidized Beds", Mechanical Engineering Graduate Seminar, University of Pittsburgh (Pittsburgh, PA), January 2006.

"Introduction to Computational Fluid Dynamics", Engr 101, Iowa State University (Ames, IA), October 2005.

"Dealing with Awkward Situations in the Classroom", Mechanical Engineering Graduate Teaching Seminar, Iowa State University (Ames, IA), September 2005.

"Simulating Multiphase Reactive Flows in Fluidized Beds", Mechanical Engineering Seminar Series, University of Iowa (Iowa City, IA), September 2005.

"Rewards and Challenges: Career development for women in academics and industry", Panel discussion with women from non-traditional careers, Economics Department, Iowa State University (Ames, IA), April 2005.

"The Effects of Circulation on Combustion-Driven Flows", Combustion Seminar Series, Pennsylvania State University, (University Park, PA) October 2002.

"Simulating Fire Whirls", Industrial Applications and Engineering Science Seminar, Mechanical Engineering, University of Kentucky, (Lexington, KY) May 2002.

"Modeling Fire Whirls", Fire, Science and Technology, Sandia National Laboratories, (Albuquerque, NM) February 2002.

"Progress Towards Simulating Fire Whirls", Dept. of Mechanical and Aerospace Engineering, University at Buffalo, SUNY, (Buffalo, NY) March 2000.

"A Computational Study of Characteristic Instabilities that Arise in Flows With and Without Buoyancy", Fire Research Seminar, National Institute of Standards and Technology, (Gaithersburg, MD) February 1999.

"Computational Modeling of Confined Jet Flows", Dept. of Mathematics and Computer Science, Bloomsburg University, (Bloomsburg, PA) February 1997.

"Numerical Simulations of a Precessing Jet in a Symmetric Nozzle", Dept. of Mechanical Engineering, University of Adelaide, (Adelaide, South Australia) October 1995.

Abstracts and Other Conference Presentations[*] (presenter's name is underlined)

46. Joshi, V. and Battaglia, F., "Investigating the removal of pathogens from an indoor space", UB MAE Poster, January 2021 (video presentation)

45. Shah, M., Bayandor, J., and Battaglia, F., "Corrugation Effects in Insect Forward Flight", UB MAE Poster, February 17, 2020; **received first place**. Also presented at the UB SEAS Poster competition and **received third place** on February 20, 2020.

44. Joshi, V. and Battaglia, F., "Establishing the Need for Context-Aware Adaptive Control for Energy Efficient HVAC Systems", UB MAE Poster, February 17, 2020; **received second place**. Also presented at the UB SEAS Poster competition on February 20, 2020.

43. Chen,[*] L. and Battaglia, F., "Simulations of the Bluff-body Stabilized Flame using RANS and LES Methods", 3rd Thermal and Fluids Engineering Conference, Fort Lauderdale, FL, March 4-7, 2018.

42. Feaster, J., Battaglia, F. Bayandor, J., "The effect of morphologically representative corrugation on hovering insect flight", 2017 American Physical Society, Division of Fluid Dynamics, (Denver, CO) November 20, 2017

41. Agblevor, F.A., Hietsoi, O., Battaglia, F., "Red Mud Catalyst for Tar-Free Syngas Production for Higher Value Applications", 2017 Annual Meeting of the American Institute of Chemical Engineers, (Minneapolis, MN) November 1, 2017.

40. Chen, L., Battaglia, F., Flintsch, G.W., Kibler, D., "Highway Drainage at Superelevation Transitions by 3-D Computational Fluid Dynamics Modeling", Poster presentation at the 96th Annual Meeting Transportation Research Board, January 8–12, 2017, Washington, D.C.

39. Sherif, S.A., Battaglia, F., and Manglik, R.M., "The Life and Legacy of Professor Richard H. Pletcher", ASME Heat Transfer, Fluids Engineering, & Nanochannels, Microchannels, and

[*] These are conference presentations that do not appear in the Proceedings Article sections.

Minichannels Conferences, HTFEICNMM2016-1045, July 10-14, 2016, Washington, D.C.

38. Chen, L., and Battaglia, F., "Computational analysis for modeling bluff-body flames", Poster session for HPC Research Day, Virginia Tech, April 6, 2015. Received 1st for poster presentation.

37. Chen, L., and Battaglia, F., "The effects of H2 and diluents on non-premixed combustion in a burner", 31st Annual Graduate Research Symposium, Virginia Tech, March 25, 2015.

36. Estejab, B. and Battaglia, F., 2015, "Effects of biomass on mixing behavior in coal fluidized beds", 31st Annual Graduate Research Symposium, Virginia Tech, March 25, 2015

35. Chen, L., and Battaglia, F., "Comparative study of k-ε, turbulence models in the bluff-body flame", 2014 Fall Fluid Mechanics Symposium, Virginia Tech, November 11, 2014.

34. Estejab, B., and Battaglia, F., "Assessing the effects of biomass ratio on the fluidization behavior of coal-biomass mixtures", 2014 Fall Fluid Mechanics Symposium, Virginia Tech, November 11, 2014.

33. Strasser, W., and Battaglia, F., "Validation of Commercial VOF Method For A Co-Axial Injector Primary Atomization Study", Proceedings of the Fluids Engineering Division Summer Meeting, 2014 Symposium, FEDSM2014-21913, Chicago, IL, August 3-7, 2014.

32. Estejab, B., and Battaglia, F., "Modeling of Coal-biomass Fluidization using Computational Fluid Dynamics", Poster session for HPC Research Day, Virginia Tech, April 11, 2014.

31. Park, D., and Battaglia, F., "Effect of heat loads and ambient conditions on thermal comfort for single-sided ventilation", Poster session for HPC Research Day, Virginia Tech, April 11, 2014.

30. Guevara C. N., Agblevor, F., Battaglia, F "Investigation of Coal-Biomass Catalytic Co-Pyrolysis and Co-Gasification", 2013 Annual Meeting of the American Institute of Chemical Engineers, (San Francisco, CA) November 2013.

29. Estejab, B. and Battaglia, F., 2013, "Modeling of Coal-biomass Fluidization using Computational Fluid Dynamics", 2013 Fall Fluid Mechanics Symposium, Virginia Tech, November 21, 2013

28. Battaglia, F., England, J., Kanholy, S., and Deza, M., "Predicting Biomass Fluidization through Appropriate Modeling of Initial Conditions", 2010 American Physical Society, Division of Fluid Dynamics, (Long Beach, CA) November 2010.

27. Agblevor, F., Mante, O., Oyama, S.T., Battaglia, F., McClung, R., "Fractional Catalytic Pyrolysis of Biomass for Stable Pyrolysis Oils and Hydrocarbon Fuels Production" 2010 Annual Meeting of the American Institute of Chemical Engineers, (Salt Lake City, UT) November 2010.

26. Sun, J., Battaglia, F., Subramaniam, S., "Euclidean Minimum Spanning Tree Applied to Segregation in Dense Granular Media", 2009 Symposium on Turbulence and Combustion, Cornell University, (Ithaca, NY) August 2009.

25. Battaglia, F., Deza, M., and Heindel, T.J., "Numerical Simulations of a Biomass Fluidizing Bed with Side Port Air Injection", 2008 American Physical Society, Division of Fluid Dynamics, (San Antonio, TX) November 2008.

24. Battaglia, F., Deza, M., Franka, N.P., and Heindel, T.J., "Computational and Experimental Studies of Fluidized Beds for Biomass Gasification", 2007 American Physical Society, Division of Fluid Dynamics, (Salt Lake City, UT) November 2007.

23. Gao, Z., Battaglia, F., Fox, R.O., Gordon, M.S., Ge, Y., Pope, S.B., "Implementation of Detailed Chemistry of Methyltrichlorosilane Decomposition into ISAT and Parametric Study", 2007 Annual Meeting of the American Institute of Chemical Engineers, (Salt Lake City, UT) November 2007.

22. Gokarn, A., Kong, B., Battaglia, F., Olsen, M. G., Fox, R. O., and Hill, J. C., "Large Eddy

Simulations Of A Confined Rectangular Turbulent Jet", ", 2007 Annual Meeting of the American Institute of Chemical Engineers, (Salt Lake City, UT) November 2007.

21. Carmicheal, J.R., Brown, R.C., Battaglia, F., and Takehara, D.K., "Biomass Gasification Reactor Hydrodynamic Experiments and Modeling: Overcoming Scale-up and Operational Challenges", Indiana Academy of Science Fall Meeting, University of Indianapolis, (Indianapolis, IN) October 2007.

20. Takehara, D.K., Sutter, J., Battaglia, F., and Brown, R.C., "Biomass Gasification Reactor Hydrodynamics: Experimental and Computational Study of a Fluidized Bed Reactor", 2007 Biofuels Symposium: Regional Needs, National Challenges, Purdue University, (West Lafayette, IN) May 2007.

19. Sun, J., Battaglia, F. and Subramaniam, S., "Minimum spanning tree analysis of force networks in granular media", 2006 American Physical Society, Division of Fluid Dynamics, (Tampa Bay, FL) November 2006.

18. Gokarn, A., Battaglia, F., Fox, R. O., and Hill, J. C., "Subgrid scale models for large eddy simulations of a confined rectangular jet", 2005 American Physical Society, Division of Fluid Dynamics, (Chicago, IL) November 2005.

17. Sun, J., Battaglia, F. and Subramaniam, S., "Analysis of microstructures in a Brazil Nut Problem", 2005 American Physical Society, Division of Fluid Dynamics, (Chicago, IL) November 2005.

16. Xie, N., Battaglia, F. Timmer, K.J. and Brown, R.C., "Modeling of elutriation phenomenon in fluidized beds", 2005 American Physical Society, Division of Fluid Dynamics, (Chicago, IL) November 2005.

15. Xie, N., Battaglia, F., Fox, R. O., Pope, S. B., "Implementation of In Situ Adaptive Tabulation into Simulations of Multiphase Reactive Flows in Fluidized Beds", 2004 Annual Meeting of the American Institute of Chemical Engineers, (Austin, TX) November 2004.

14. Fox, R. O. and Battaglia, F., "Detailed Chemical Calculations in Fluidized Beds", SIAM Conference on Computational Science and Engineering, (San Diego, CA) February 2003.

13. Mummudi, M. B., Gokarn, A., Battaglia, F., Fox, R. O., Hill, J. C., "Numerical Simulation of a Planar Jet Reactor", 2002 Annual Meeting of the American Institute of Chemical Engineers, (Indianapolis, IN) November 2002.

12. Battaglia, F., Brown, R. C., Flugrad, D. R., "ABET EC 2000: Developing Assessment Tools for Continuous Improvement", 2001 ASEE Annual Conference & Exposition, (Albuquerque, NM) June 2001.

11. Battaglia, F., Rehm, R. G., Baum, H. R., Hassan, M. I., and Saito, K., "Flows with Combustion and Circulation", Second Joint Meeting of the U.S. Sections of the Combustion Institute, (Oakland, CA) March 2001.

10. Battaglia, F., Baum, H. R., and Rehm, R. G., "Modeling Fire Whirls", Fifty-third Annual Meeting of the American Physical Society, Division of Fluid Dynamics, (Washington, DC) November 2000.

9. Battaglia, F., Rehm, R. G., and Baum, H. R., "Fluid Dynamics and Combustion in a Fire Whirl", Twenty-eighth (International) Symposium on Combustion, Edinburgh, Scotland, July 2000.

8. Battaglia, F., Rehm, R. G., and Baum, H. R., "Simulating Fire Whirls – Inviscid Swirl and Buoyancy", Eastern States Section of the Combustion Institute, North Carolina State University, (Rayleigh, NC) October 1999.

7. Battaglia, F., McGrattan, K. B., Rehm, R. G., and Baum, H. R., "Simulations of Fire Whirls",

Joint Meeting of the United States Sections of the Combustion Institute, George Washington University, (Washington, DC) March 1999.

6. Battaglia, F., McGrattan, K. B., Rehm, R. G., and Baum, H. R., "Fire Whirl Simulations", Annual Conference on Fire Research, National Institute of Standards and Technology, (Gaithersburg, MD) November 1998.
5. Battaglia, F., McGrattan, K. B., Rehm, R. G., and Baum, H. R., "Numerical Simulations of Swirling Fire Plumes", Twenty-seventh (International) Symposium on Combustion, University of Colorado at Boulder, (Boulder, CO) August1998.
4. "Simulations of Planar Flapping Jets", Fifth Annual Sigma Xi Postdoctoral Poster Presentation, National Institute of Standards and Technology, (Gaithersburg, MD) February 1998.
3. Battaglia, F., Kulkarni, A. K., and Merkle, C. L., "Numerical Simulation of Asymmetric Channel Flows for Gas Burners", Australian Symposium on Combustion/Fourth Australian Flame Days, (Adelaide, South Australia) November 1995.
2. "Direct Simulations of a Mixing Layer by a Lagrangian Transport-Element Method", AIAA Northwest Regional Conference, Minta Martin Student Conference, (Buffalo, NY) May 1992.
1. "Vortex Simulation of a Confined Mixing Layer", AIAA Northwest Regional Conference, Minta Martin Student Conference, (Worcester, MA) May 1991.

POST-DOCTORAL RESEARCH ASSOCIATES

1. Munjal Shah (Mechanical Engineering, University at Buffalo, PhD 2023), Postdoctoral Research Associate. Responsible for investigating bio-inspired flight based on the model of a bumblebee. June 2023-September 2023.

2. Lu Chen (Mechanical Engineering, Virginia Tech, PhD 2017), Postdoctoral Research Associate. Responsible for investigating reduced kinetics models for implementation into CFD codes. August 2017-December 2018.

3. Jeffrey Feaster (Mechanical Engineering, Virginia Tech, PhD 2017), Postdoctoral Research Associate. Responsible for developing and implementing flight kinematics models into CFD codes and evaluation of flapping flight. August 2017-April 2018.

4. David Park (Mechanical Engineering, Virginia Tech, PhD 2016), Postdoctoral Research Associate. Responsible for investigating novel concept to control ventilation diffusers actively using CFD. January-May 2017.

5. Bahareh Estejab (Mechanical Engineering, Virginia Tech, PhD 2016), Postdoctoral Research Associate. Responsible for investigating fluidized beds and gasification of coal-biomass mixtures. July 2016-July 2017.

6. Jihong Wang (Civil Engineering, Dalian University of Technology, China, PhD 2013), Postdoctoral Scholar. Responsible for investigating natural ventilation to assess different window configurations. The research is funded through the China Scholarship. September 2015-September 2017.

7. Reza Sheikhi (Mechanical Engineering, U. Pittsburgh, PhD 2005), Postdoctoral Research Associate. Responsible for the development and implementation of reaction kinetics for simulation of gasification of biomass in fluidized beds. The research funded through the DOE Biomass Fast Pyrolysis Oil (Bio-oil) Stabilization program. April 2009-March 2010.

8. Zhaosheng Gao (Mechanical Engineering, U. Illinios-Chicago, PhD), Postdoctoral Research Associate. Responsible for the development and implementation of computational fluid dynamics models to predict a reactor phenomenon for coating TRISO fuels. The research funded through the DOE University Nuclear Energy Research Initiative. September 2006-May 2008.

9. Prakash Vedula (Aerospace Engineering, Georgia Tech, PhD 2001), Postdoctoral Research Associate. Responsible for the progress and development of computational fluid dynamics models to predict a spouting bed reactor for coating uranium pellets. The research funded through the DOE University Nuclear Energy Research Initiative. August 2005-August 2006.

GRADUATE STUDENTS

Dissertations/Theses Directed (major professor unless otherwise indicated)

Ph.D. degrees

1. Munjal Shah, PhD, August 2018-May 2023, "Coupling Biology and Aerodynamics as a Function of Morphology in Bumblebee Flight", now working at UB as a postdoctoral researcher.
2. Azadeh Sohrabi, PhD, August 2018-February 2023, "A Computational Analysis to Investigate the Aerodynamic Performance of Horizontal Axis Wind Turbines", now working at SimuTech.
3. Vedant Joshi, PhD, August 2018-August 2022, "Analyzing and Improving Thermal Comfort and Air Quality of Indoor Spaces using CFD", now working at ZT Systems (NJ).
4. Junhee Lee, PhD, August 2018-May 2020, "Computational Modeling of the Mixed Effects of Rainfall on Hydroplaning", now working in South Korea.
5. Ryan Soncini, PhD, August 2014-July 2017, "Computational Simulation of Coal Gasification in Fluidized Bed Reactors", now working at Alcoa (PA).
6. Jeffrey Feaster, PhD (co-advised with Prof. J. Bayandor), August 2013-July 2017, "Discovering the complex aerodynamics of flapping flight with bio-kinematics using Eulerian methods in two and three dimensions", employed at Corvid Technologies (VA).
7. Lu Chen, PhD, August 2013-July 2017, "Computational study of turbulent combustion systems and global reactor networks", employed at Lam Research (CA).
8. David Park, PhD, October 2013-October 2106, "Application of Solar Chimney for Ventilating Buildings", employed at UMC (WA).
9. Bahareh Estejab, PhD, January 2012-February 2016, "Hydrodynamic and gasification behavior of coal and biomass fluidized beds and their mixtures", faculty member at Manhattan College.
10. Wayne Strasser, PhD, January 2013-October 2015, "Seeking Understanding of Acoustics and Spray Character in a Three-Stream Pulsating Transonic Airblast Injector", faculty member at Liberty University.
11. Santhip Kanholy, PhD, August 2009-September 2014, "Eulerian-Eulerian Modeling of Fluidized Beds", working in India.
12. Mirka Deza, PhD, July 2006-March 2012, "Modeling the Hydrodynamics of a Fluidized Bed", employed as a lecturer at Iowa State University.
13. Deify Law, PhD, August 2005-May 2010, "Computational Modeling and Simulations for Hydrodynamics for Air-water External Loop Airlift Reactors", faculty member at Fresno State.
14. Jin Sun, PhD, June 2002-May 2007, "Multiscale modeling of segregation in granular flows", faculty member at University of Edinburgh.
15. Anup Gokarn, PhD, August 2002-April 2007, "Large eddy simulations of a confined jet reactor", employed at Flow Science, Inc., NM.

16. Nan Xie, PhD, August 2002-December 2006, "Computational analyses for modeling fluidized bed gasification processes", employed at Ford, Michigan.

M.S. degrees

1. Angha Sehgal, MS Project, August 2023-January 2025, Simulation of Forced Air Flow in a Shipping Container using Computational Fluid Dynamics.
2. Devdatta Kulkarni, MS Thesis, January 2022-September 2023, "Optimizing Airflow Distribution in Room with Air Sanitation Device: A Computational Study", now on OPT with University at Buffalo.
3. Isa Gan, MS Thesis, January 2022-May 2023, "Thermoregulation Effects on the Aerodynamics of Bumblebees", now a graduate student at North Carolina State University.
4. Sanika Bhagwat, MS Thesis, August 2019-May 2022, "Simulation of Respiratory Particles in a Restaurant Dining Area Using Computational Fluid Dynamics".
5. Hassan Aqtash, MS Thesis, January 2021-May 2022, "A CFD Investigation on the Performance of Two and Three Blade Wind Turbines", employed at Thermal Management.
6. Darsh Nathawani, MS Thesis, January 2018-June 2019, "Computational Analysis and Design Exploration of Solar Updraft Tower", currently a doctoral student at University at Buffalo.
7. Christopher Stockinger, MS, August 2014-May 2016, "Numerical Analysis of Airflow and Output of Solar Chimney Power Plants", employed at Carderock Division of the Naval Surface Warfare Center.
8. Robert Picardi, MS, August 2013-April 2015, "Numerical Analysis of Multiphase Flow in Bubble Columns and Applications for Microbial Fuel Cells", employed at Alarm.com.
9. Michael Detaranto, MS, May 2013-September 2014, "CFD analysis of airflow patterns and heat transfer in small, medium, and large structures", employed at TASC, Inc.
10. Elizabeth Heisler, MS, November 2013-September 2014, "Exploring Alternative Designs for Solar Chimneys using Computational Fluid Dynamics", employed at Jet Propulsion Laboratory.
11. David Park, MS, January 2012-October 2013, "Numerical Simulations of Airflow and Heat Transfer in a Room with a Large Opening", now studying for Ph.D. at Virginia Tech.
12. Michael Bromley, MS, January 2011-June 2012, Pneumatic Particulate Collection System Analysis and Design" (co-advised with K. Kochersberger).
13. Lindsey Teaters, MS, January 2011-June 2012, "A Computational Study of the Hydrodynamics of Gas-Solid Fluidized Beds", employed at the Family Justice Law Clinic at The George Washington University Law School.
14. Matthew McDaniel, MS, August 2010-June 2011, "Proposed Design for a Coupled Ground-Source Heat Pump/Energy Recovery Ventilator System to Reduce Building Energy Demand", employed at Eastman Chemical.
15. Jonas England, MS, August 2009- May 2011, "Numerical Modeling and Prediction of Bubbling Fluidized Beds", employed at MPR Associates, Inc.
16. Allison Studley, MS, May 2008-October 2010, "Numerical Modeling of Air-Water Flows in Bubble Columns and Airlift Reactors", employed at Bechtel, Naval Nuclear Laboratory.
17. Preston Stoakes, MS, August 2007-December 2009, "Numerical Simulations of Air Flow and Heat Transfer in Buildings", employed at Parker Hannifin.

18. Ronica McKinley, MS, January 2003-July 2007, "The Analysis of an Electric Drive Module: Striving to Eliminate Prototype Builds Via Analysis and Component-Level Testing", employed at John Deere Dubuque Works, Debuque, IA.
19. Ashlee Klingaman, MS, August 2005-May 2007, "Development and Calibration of a Physics-Based Fuel Pulse Scheduling Routine for Electronic Unit Pumps", employed at John Deere, Waterloo, IA.
20. Joseph Foster, MS, May 2004-December 2005, "An energy and cost analysis of residential ground-coupled heat pumps in Iowa", employed at Volvo, PA.
21. Ross Miller, MS, August 2003-August 2005 "The effects of stent geometry on the reconstruction of an arterial bifurcation", employed as assistant professor at University of Maryland.
22. Cary Lane, MS, January 2004-January 2005, "The economics of heat pump systems: air-source versus ground-source", granted May 2005.
23. Michael Groen, MS, January 2004-December 2004, "Conditioning outdoor air for industrial processes", employed at Trane.
24. Andrew Tworek, MS, January 2003-August 2004, "A numerical study on the hydrodynamics and thermal effects of microscale liquid flows past microstructures", employed at Knolls Atomic Power Laboratory.
25. Jeremy Cloutier, MS, January 2003-August 2004, "A cost analysis study of the benefits of building energy code upgrades in Iowa", employed at Power Engineering and Manufacturing.
26. Farshid Bondar, MS, June 2003-August 2003, "A computational study on mixing in two-phase flow in microchannels".
27. John Mammoser, MS, May 2001-May 2003, "A numerical study of fire spread phenomena for multi-level apartment complexes", employed at Underwriters Laboratory.
28. Nan Xie, MS, August 2000-August 2002, "Simulations of multiphase reactive flows in fluidized beds using in-situ adaptive tabulation method", employed at Ford, Michigan.
29. Anup Gokarn, MS, June 2000-August 2002, "Direct numerical simulations of channel flows with two splitter plates", employed at Flow Science, Inc.

Dissertations/Theses in Progress

30. Don Miller, PhD, August 2020-present, passed qualifying exam May 2021, passed proposal defense September 2022, degree expected December 2024
31. Tim Taylor, PhD, August 2021-present, degree expected January 2025
32. Olanrewaju Akintunde Akinnawo, PhD, August 2023-present.

Special Achievements of Graduate Students

Olanrewaju Akintunde Akinnawo, Elbridge N. and Stephana R. Townsend Scholarship, Fall 2023.
Vedant Joshi, 2021 PhD Teaching Fellowship (summer 2021)
Munjal Shah, 2021 PhD Teaching Fellowship (summer 2021)
Azadeh Sohrabi, 2021 PhD Teaching Fellowship (summer 2021)
Munjal Shah, 2020 UB SEAS Poster competition; third place
Munjal Shah, 2020 UB MAE Poster competition; first place
Vedant Joshi, 2020 UB MAE Poster competition; second place
Bahareh Estejab, 2016 recipient of the Virginia Tech Pratt fellowship
Lei Zhao, 2015 graduate student recipient of the Virginia Tech Pratt Fellowship
Lu Chen, 2015 recipient of the ASME Graduate Student Scholarship
Lu Chen, 2015 ASME/Virginia Tech Memorial Scholarship

David Park, 2015 recipient of the ASME Graduate Student Scholarship
David Park, 2013-2014 graduate student recipient of the Virginia Tech Pratt Fellowship
Bahareh Estejab, 2014 recipient of the ASME Graduate Student Scholarship
Bahareh Estejab, 2014 recipient of the ASME Willis F. Thompson Memorial Scholarship
Bahareh Estejab, 2012 graduate student recipient of the Mary V. Jones Fellowship (Virginia Tech)
Mirka Deza, 2010 graduate student recipient of the Mary V. Jones Fellowship (Virginia Tech)

Project/Independent Study/Research Supervision

University at Buffalo

MAE 501, "CFD comparing SolidWorks and Ansys Fluent", conducted by Devdatta Kulkarni, Spring 2022
MAE 501, "Fluid Structure Interaction on a Wind Turbine" conducted by Hassan Aqtash, Spring-Fall 2021
MAE 501, "Use of Robots in Waste Management", conducted by Alexandra DePlato, Spring 2020
MAE 501, "Two-way fluid structure interaction using ANSYS", conducted by Munjal Shah, Spring 2020
MAE 501, "Fluid Structure Interaction on a Wind Turbine", conducted by Azadeh Sohrabi, Spring 2020
MAE 501 "" conducted by Timothy Taylor, Spring 2020
MAE 501, "Computational Modeling of Heat Transfer with Fluid Flow", conducted by Timothy Taylor, Spring 2019
MAE 501, "Thermal Comfort and Efficiency of a HVAC System", conducted by Vedant Joshi, Spring 2019
MAE 501, "Study of one way and two way coupling in fluid structure interaction problems", conducted by Munjal Shah, Spring 2019

Iowa State

ME 599 X, "How CFD Can Be Used In Conjunction With Kuli To More Effectively Design Vehicle Cooling Systems", creative component conducted by Kevin Braun, Summer 2006.
ME 590 O, "Applying Computational Fluid Dynamics to Classical Problems", conducted by Mark Barker, Spring 2006.
ME 590 O, "Introduction to Computational Tools for Fluid Dynamics", conducted by Mark Barker, Fall 2005.
ME 590 O, "Designing a Centrifugal Pump", conducted by Joseph Foster, Fall 2005.
ME 590 O, "Computational Tools for Complex Geometry and Physics", conducted by Ronica McKinley, Fall 2004.
ME 590 O, "Computational Tools for Complex Geometry and Physics", conducted by Courtney McCauley, Fall 2004.
ME 590 C, "The Nature of Fire in Compartments", conducted by John Mammoser, Spring 2003.
ME 590 O, "Applied Numerical Analysis", conducted by Anup Gokarn, Summer 2000.

Service on Thesis Committees Other than Own Advisees

University at Buffalo

Diermyer, Zachary	Ph.D.	Aerospace Engineering	Expected Spring 2025
Morse, Ian	M.S.	Aerospace Engineering	Expected Spring 2024
Noviasky, Nicholas	Ph.D.	Mechanical Engineering	Expected Spring 2024
Fernandes, Clayton	Ph.D.	Mechanical Engineering	Expected Spring 2024
Vaghela, Pradeep	Ph.D.	Mechanical Engineering	Expected Spring 2024
Sobolewski, Michael	M.S.	Mechanical Engineering	Defended Fall 2024
Grace, Cameron	Ph.D.	Mechanical Engineering	Defended Summer 2023
Nordmann, Alexandra	M.S.	Mechanical Engineering	Defended Summer 2023
Aghachi, Mikel	M.S.	Aerospace Engineering	Defended Spring 2023
Kunkel, Thomas	M.S.	Aerospace Engineering	Defended Summer 2022

Sadeghilari, Kyan	M.S.	Mechanical Engineering	Defended Fall 2021
Carpenter, Kevin	M.S.	Mechanical Engineering	Defended Summer 2021
Rajabzadeh-Oghaz, Hamidreza	Ph.D.	Mechanical Engineering	Defended Fall 2019
Damiano, Robert	Ph.D.	Mechanical Engineering	Defended Fall 2019
DiGregorio, Nicholas	M.S.	Mechanical Engineering	Defended Spring 2018
Varble, Nicole	Ph.D.	Mechanical Engineering	Defended Spring 2018

Virginia Tech

Jo, Soo Jeong	Ph.D.	Architecture and Design	Defended Fall 2021
Kalua, Amos	Ph.D.	Architecture and Design	Defended Fall 2021
Jung, Wooyoung	Ph.D.	Civil Engineering	Defended Spring 2020
Elghannay, Husam A	Ph.D.	Mechanical Engineering	Defended Spring 2018
Horton, Brandon	Ph.D.	Mechanical Engineering	Defended Summer 2017
Matta, Alexander G	Ph.D.	Mechanical Engineering	Defended Summer 2017
Schroeder, Kevin	Ph.D.	Mechanical Engineering	Defended Summer 2017
Suh, SeungBeum	Ph.D.	Mechanical Engineering	Defended Summer 2017
Song, Yangkun	Ph.D.	Mechanical Engineering	Defended Fall 2016
Norman, Adam	M.S.	Mechanical Engineering	Defended Summer 2016
Yu, Ling	Ph.D.	Mechanical Engineering	Defended Summer 2016
Dowd, Cody	M.S.	Mechanical Engineering	Defended Spring 2016
Esmond, Micha	Ph.D.	Mechanical Engineering	Defended Spring 2016
Li, Jian	Ph.D.	Civil Engineering	Defended Spring 2016
Costain, Andrew J	M.S.	Mechanical Engineering	Defended Summer 2014
Perino, Scott V	Ph.D.	Mechanical Engineering	Defended Summer 2014
Thurber, Andrew	Ph.D.	Mechanical Engineering	Defended Summer 2014
Kasibhotla, Venkata Ravishankar	M.S.	Mechanical Engineering	Defended Spring 2014
Khare, Peeyush	M.S.	Civil Engineering	Defended Spring 2014
Mikkelson, Emily C	M.S.	Mechanical Engineering	Defended Spring 2014
Agarwal, Gaurav	Ph.D.	Mechanical Engineering	Defended Fall 2013
Deb, Surya D	Ph.D.	Mechanical Engineering	Defended Fall 2013
Sen, Debamoy	Ph.D.	Mechanical Engineering	Defended Summer 2012
Cardwell, Wesley R	M.Eng.	Mechanical Engineering	Defended Spring 2012
Gray, Sandria L	M.S.	Mechanical Engineering	Defended Spring 2012
Satterwhite, Matthew R	M.S.	Mechanical Engineering	Defended Spring 2012
Sethapati, Vivek V	M.S.	Mechanical Engineering	Defended Spring 2011
Chodak, Jillian	M.S.	Mechanical Engineering	Defended Spring 2010
McFarland, Jacob A	M.S.	Mechanical Engineering	Defended Fall 2008
Williams, Alicia M	Ph.D.	Mechanical Engineering	Defended Fall 2008

Iowa State

Heitman, Joshua	PhD	Agronomy	Defended Spring 2007
Monahan, Sarah	PhD	Chemical Engineering	Defended Spring 2007
Qin, Zhaohui	PhD	Mechanical Engineering	Defended Spring 2007
Wang, Xiaohang	PhD	Mechanical Engineering	Defended Fall 2006
Fan, Rong	PhD	Chemical Engineering	Defended Spring 2006
Feng, Hua	PhD	Mechanical Engineering	Defended Spring 2006
Na Sangkwon	PhD	Aerospace Engineering	Defended Spring 2006
Rider, Ben	MS	Aerospace Engineering	Defended Spring 2006
Li, Hao	PhD	Mechanical Engineering	Defended Fall 2005
Su, Xuefeng	PhD	Mechanical Engineering	Defended Summer 2005

Brue, Colin	MS	Mechanical Engineering	Defended Spring 2005
Feltes, Steven	MS	Mechanical Engineering	Defended Spring 2005
Hagge, Matt	MS	Mechanical Engineering	Defended Spring 2005
Hol, Philip	MS	Mechanical Engineering	Defended Spring 2005
Somashekar, Vishwanath	MS	Mechanical Engineering	Defended Fall 2004
Gupta, Sumeet	MS	AeroE and Eng. Mech	Defended Spring 2004
Pande, Saurabh	MS	Mechanical Engineering	Defended Spring 2004
Ni, Chunjian	PhD	Mechanical Engineering	Defended Summer 2003
Krakos, Joshua	MS	AeroE and Eng. Mech	Defended Spring 2003
Raman, Venkatramanan	PhD	Chemical Engineering	Defended Spring 2003
Stachour (Gourley), Elizabeth	MS	AeroE and Eng. Mech	Defended Spring 2003
Mummudi, Mothivel Balaiyya	MS	Chemical Engineering	Defended Fall 2002
Xu, Xiaofeng	MS	Mechanical Engineering	Defended Fall 2002
Duncan, Thomas	MS	Mechanical Engineering	Defended Summer 2002
Sweterlitsch, Jeff	MS	Chemical Engineering	Defended Spring 2002
Kolhapure, Nitin	MS	Chemical Engineering	Defended Summer 2001
Meng, Ning	MS	Mechanical Engineering	Defended Summer 2000

UNDERGRADUATE STUDENTS

Project/Independent Study/Research Supervision

University at Buffalo

MAE 498, Marc Rivera, Spring 2024
MAE 499, Andrew Balotin, Spring 2023
MAE 499, Matt Rioux, Spring 2021
MAE 499, Robert Oberkircher, Spring 2019
MAE 499, David Edwards, Spring 2019
MAE 499, Ji Ho Lee, Spring 2019
MAE 499, Waseem Hanini, Fall 2018
MAE 499, Kofi Odame-Adjei, Fall 2018
MAE 499, Anthony Olivett, Summer 2018
Summer Research (with stipend), Gus Hurtado, Summer 2018

Virginia Tech

Honors Thesis, "CFD of a Novel Intake Valve", by Nitya Kamdar, May 2017
ME 4994, Gus Hurtado, Spring 2017
ME 4994, Colin Chamberlain, Spring 2017
ME 4974, Daniel Salas, Fall 2016
ME 4994, Christopher Albert, Spring 2015
ME 4994, Christopher Albert, Fall 2014
ME 4994, Ricardo Cruz, Fall 2013
ME 4994, Mert Konrat, Fall 2012
ME 4974, Tamara Smith, Spring 2012
ME 4974, Jeffery Feaster, Spring 2012
ME 4994, Avi Friedman, Fall 2011
ME 4994, Brandon Morgan, Fall 2010
ME 4974, Scott Forrester, Fall 2009
ME 4974, Brandon Staudt, Spring 2009
ME 4994, Charlie Holbrook, Spring 2009

Iowa State

ME 4974, "CFD Methods, Techniques and Applications", conducted by Brandon Staudt, Spring 2009.

ME 490 H, Senior Honors Project, "Educational Outreach to Promote Alternative Energy and Careers in Engineering", conducted by Christopher Deal, Spring 2007.
ME 490 K, "Biomedical Issues Related to Aneurysms and Coronary Blood Flow Abnormalities", conducted by Justin Elwood, Fall 2006.
HON 290 H, Freshman Honors Project, conducted by Isaiah Warnke, Spring 2006.
ME 490 K, "Exploring Issues Related to CFD of Channel Flows", conducted by Gregory McGrath, Fall 2005.
ME 490 K, "Exploring Issues Related to CFD of Turbulent Channel Flows", conducted by Joseph Fuller, Fall 2005.
HON 290 H, Freshman Honors Project, conducted by Shuang Gao, Spring 2005.
ME 490 D, "Exploring Issues and Concepts Related to Heat Transfer", conducted by Matthew Roode, Spring 2005.
ME 490 J, "Ice Dispenser Model", conducted by Anna Jones, Spring 2005.
ME 490 D, "Heat Transfer and Human Hand: A Look Inside", conducted by Frank Doolittle, Spring 2005
ME 490 K, "Applied Numerical Analysis in CFD", conducted by Ian Thiele, Spring 2004.
ME 490 J, "Energy Analysis of Residential Ground-Coupled Heat Pumps", conducted by Evan Zdunek, Spring 2004.
ME 490 K, "Stent Reconstruction of an Aortic Bifurcation using Solid Works", conducted by Bethany Noyes, Spring 2003.
AerE 499, "Computational Modeling of Mixing Turbulent Flow" (Senior Design Project), conducted by Rachel Pabon, Spring 2002.
AerE 491, "Computational Study of Mixing in a Chemically Reacting Turbulent Flow" (Senior Design Project), conducted by Rachel Pabon, Fall 2001.
ME 490 C, "Numerical Methods", conducted by Dan Peterson, Fall 2001
ME 490 K, "Fundamentals of Fire and Combustion", conducted by John Mammoser, Spring 2001.
ME 490 K, "Numerical Methods for CFD", conducted by John Mammoser, Fall 2000.

HIGH SCHOOL STUDENTS

Project/Independent Study/Research Supervision

University at Buffalo

Uma Bhattacharjee (City Honors School, Buffalo, NY), Summer 2022, Fall 2022, Summer 2023
Jacob Rivera (City Honors School, Buffalo, NY), Summer 2021
Alanna Krug (Kenmore West High School, Kenmore, NY), Fall 2018

PROFESSIONAL ACTIVITIES

Leadership

Professional Organizations

Editor, ASME *J. Fluids Eng.*, November 2017-November 2025
President, American Society of Thermal and Fluids Engineers, June 2023-March 2025
Membership Coordinator, ASTFE, October 2017-December 2018
Member, ASME Engineering Sciences Segment, May 2017-June 2018
Member, ASME Conference Webtool Committee, September 2016-December 2018
Editor for the Special Issue of the ASME *J. Fluids Eng.* to commemorate the 90th anniversary of the Fluids Engineering Division, May 2015-October 2016
Vice President/Treasurer, American Society of Thermal and Fluids Engineers, August 2014-May 2023 (co-founder of this new organization established in July 2014)
ASME Congress Steering Committee
Chair, Senate, December 2019-November 2020
Chair, Steering Committee, December 2018-November 2019
Vice Chair, Steering Committee, December 2017-November 2018
Conference Chair, December 2016-November 2017

Chair, Technical Programs, December 2015-November 2016
Vice Chair, Technical Programs, January 2015-November 2015
Member, March 2014-December 2014
Member, Editorial Advisory Board of *Energy and Fuels*, January 2014-December 2018
Associate Editor, ASME *J. Fluids Eng.*, May 2012-October 2017
ASME Fluids Engineering Division (FED) Executive Committee
Treasurer, July 2014-June 2015
Chair, July 2013-June 2014
Vice Chair, July 2012-June 2013
Secretary, August 2011-June 2012
Member, January-June 2011
Chair, ASME Fluid Mechanics Technical Committee, July 2008-July 2010
Vice Chair, ASME Fluid Mechanics Technical Committee, July 2006-July 2008
ASME Multiphase Flow Committee, Member, June 2005-present
ASME Computational Fluid Dynamics Technical Committee, Member, June 2002-present
ASME Fluid Mechanics Technical Committee, Member, June 2000-present
ASME Faculty Advisor for Iowa State University Student Section, January 2000-June 2006
ASME Central Iowa Section
Webmaster, July 2002-June 2007
College Relations, July 2000-June 2002

Conferences

Workshop Co-Chair, Modeling and Simulation of Turbulent Mixing and Reaction: For Power, Energy and Flight, Buffalo Niagara Marriott, April 12-13, 2019
Conference Chair for the 2017 ASME IMECE, December 2016-November 2017
Conference Chair for the 2nd Thermal and Fluids Engineering Conference, January 2016-April 2017
Technical Program Chair for the 2016 ASME IMECE, December 2015-November 2016
Technical Program Vice Chair for the 2015 ASME IMECE, December 2014-November 2015
Organizing Committee and Session Chair for the First Thermal and Fluids Engineering Summer Conference, October 2014-August 2015
Conference Chair for the 2013 ASME FEDSM, August 2011-July 2013
FED Representative and Track Chair for the 2012 ASME IMECE, August 2011-November 2012
Symposium Co-organizer: "Symposium on Fundamental Issues and Perspectives in Fluid Mechanics", ASME Fluids Engineering Division Summer Conference, July 2008-November 2017
Symposium Co-organizer: "International Symposium on Numerical Methods for Multiphase Flows", ASME Fluids Engineering Division Summer Conference, July 2007-July 2017
Symposium Co-organizer: "Symposium on CFD Validation and Verification", ASME Fluids Engineering Division Summer Conference, July 2008-June 2009
Topic Organizer, Chair: "Forum on Fundamental Issues and Perspectives in Fluid Mechanics", ASME International Mechanical Engineering Conference and Exposition, December 2005-November 2014
Session Chair, "Session AP: Multiphase Flows I", 61st Annual Meeting of the APS Division of Fluid Dynamics, November 23, 2008
Session Chair, "Session FT: Multiphase Flows IV", 60th Annual Meeting of the APS Division of Fluid Dynamics, November 19, 2008
Topic Organizer, Session Organizer, Session Chair: "Forum on Bifurcation, Instability and Hysteresis in Fluid Flow", ASME International Mechanical Engineering Conference and Exposition, December 2001-November 2005
Session Co-Organizer, Co-Chair: "Forum on Bifurcation, Instability and Hysteresis in Fluid Flow", 2001 ASME International Mechanical Engineering Conference and Exposition, July 2000-November 2001

Session Co-Organizer, Co-Chair: "Forum on Bifurcation, Instability and Hysteresis in Fluid Flow", 2000 ASME Fluids Engineering Division Summer Meeting, January 1999-June 2000
Session Chair: "Session on Turbulent Combustion", Eastern States Section of the Combustion Institute, Fall Technical Meeting, October 1999
Session Vice-Chair: "Session on Radiation and Heat Transfer", 1999 ASME National Heat Transfer Conference, August 1998-August 1999

Other Service

Journal and Conference Reviewer
AIAA Journal
ASME Fluids Engineering Summer Conferences
ASME International Mechanical Engineering Congress & Exposition
ASME *Journal of Energy Resources Technology*
ASME *Journal of Fluids Engineering*
ASME *Journal of Heat Transfer*
ASME *Journal of Solar Energy Engineering*
Building and Environment
Chemical Engineering Journal
Chemical Engineering Research and Design
Chemical Engineering Science
Computer & Fluids
International Journal of Chemical Reactor Engineering
Powder Technology

Proposal Reviewer
DOE Basic Energy Sciences proposals (2009)
DOE Office of Science (2009)
NSF Review Panel (2005, 2006)
Virginia Tobacco Commission R&D proposals (2010, 2011)

Membership in Professional and Honor Societies

Professional Societies
American Association for the Advancement of Science
American Institute of Aeronautics and Astronautics (Lifetime Senior Member)
American Physical Society
American Society of Engineering Education
American Society of Mechanical Engineers (Fellow)
American Society of Thermal and Fluids Engineers (Fellow)

Honor Societies
Sigma Xi, The Scientific Research Society (Full Member)

Citations in Biographical Works
Marquis Who's Who in America
Marquis Who's Who of American Women
Marquis Who's Who in Science and Engineering

UNIVERSITY SERVICE
Department Committees

University at Buffalo
Group Leader for Thermal and Fluid Systems, Graduate Studies Committee, Sept 2017-April 2020

Member, Faculty Search Committee, September 2017-April 2018

Virginia Tech

Co-chair, Mechanical Engineering Mentoring Program, August 2014-July 2017
Member, Qualifying Exam Problems: Fluid Mechanics, September 2008-April 2017
Chair, Mechanical Engineering Fluids-Thermal Faculty Search Committee, August 2014-May 2015
Chair, Promotion and Tenure Committee, August 2012-July 2014
Chair, Mechanical Engineering Assessment Committee, January 2009-December 2013. Successfully reaccredited program with ABET in October 2013.
Chair, Qualifying Exam Problems: Fluid Mechanics, September 2010-August 2011
Member, Nuclear Engineering Search Committee, September 2009-July 2011
Member, Joint EngE and ME, Promotion and Tenure Committee, March-April 2010
Member, ME Personnel Committee, Member, July 2009-May 2010
Member, Promotion and Tenure Committee, August 2008-July 2010
Chair, Strategic Planning: Undergraduate Education and Curricular Programs, January-August, 2009
Member, Mechanical Engineering Assessment Committee, September 2007-December 2008

Iowa State University

Faculty Search Committee, Chair, October 2005-June 2007
Course Development Committee for ME 436, Chair, August 2005-July 2007
Academic Standards and Assessment Committee, Member, September 2004-July 2007
Course Development Committee for ME 231, ME 332, Member, August 2005-July 2006
Course Development Committee for ME 436, Member, September 2004-July 2005
Enrollment Management, Member, September 2004-July 2006
Heat Transfer Qualifier Exam Committee, August 2004-July 2005
Thermodynamics Qualifier Exam Committee, May 2003-July 2004
Course Development Committee for ME 231, ME 332, Member, September 2001-August 2004
Mechanical Engineering Curriculum Committee, Member, August 1999-July 2002

College Committees

University at Buffalo

Member, SEAS COVID-19 Task Force: Faculty Affairs, April 2020-June 2020
Chair, SEAS Ad hoc Committee on Sexual Harassment, November 2018-April 2019
MAE Representative, SEAS Tenure Committee, August 2017-July 2019

Virginia Tech

Member, College of Engineering Promotion and Tenure Committee, January 2013-January 2014
Member, ME Department Head Search Committee, February 2012-May 2012
NIA Langley Professorship Search Committee, Member, April 2010-December 2010

Iowa State University

Cluster Hire Search Committee, Member, December 2006-July 2007
Diversity Committee, Member, September 2005-May 2006
Mechanical Engineering Chair Search Committee, September 2002-May 2003

University Committees

University at Buffalo

Member, Associate Vice President for Research Administration Search Committee, May 2022-September 2022
Member, Heating, Cooling and Efficiency Committee, February 2021-present
Member, Campus Planning Committee: Faculty and Staff, April 2020-October 2020

Member, Undergraduate Dean Search Committee, October 2017-December 2017

Virginia Tech

Research Integrity Committee, Alternate Member, July 2013-June 2017