Yongsheng LIAN

Associate Professor
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Education

1999-2003	Ph.D, Aerospace Engineering, University of Florida, Gainesville, FL
1998-1999	M.Phil., Mathematics, Hong Kong University of Science and Technology, Hong Kong, China
1995-1998	M.S., Applied Mathematics, Chinese Academy of Sciences, Beijing, China
1991-1995	B.S., Mathematics, ShanDong University, JiNan, China

Professional Appointments/Experience

2014-present	Associate Professor, Department of Mechanical Engineering, University of Louisville, Louisville, KY.
2008-2014	Assistant Professor, Department of Mechanical Engineering, University of Louisville, Louisville, KY.
2005-2008	Research Specialist, University of Michigan, Ann Arbor, MI.
2003-2005	Senior Researcher, Ohio Aerospace Institute, Cleveland, OH.

Publications in Books

1. Shyy, W., Lian, Y., Tang, J., Viieru, D., and Liu, H., *Aerodynamics of Low Reynolds Number Flyers*, Cambridge University Press, 2008.

Book Chapters

1. Sethu, P., Putty, K., Lian, Y. and Kalia, A., "Microfluidic cell-arrays for high-throughput interrogation of host-pathogen interactions", Handbook of Research on Computational and Systems Biology: Interdisciplinary Applications, ICCSB2009, 2011 publication.
2. Shyy, W., Lian, Y., Chimakurthi, S. K., Tang, J., Cesnik, C.E.S., Stanford, B., and Ifju, P., "Flexible Wings and Fluid-Structure Interactions for Micro-Air Vehicles," In *Flying Insects & Robots*, Floreano, Zufferey, Srinivasan, Ellington (Eds.), Springer Verlag, pp. 143-157, December 2009.

Publications in Refereed Journals

1. Guo, Y., Lian, Y., and Sussman, M., "Investigation of drop impact on dry and wet surfaces with consideration of surrounding air," Physics of Fluids, Vol. 28, 073303 (2016), http://dx.doi.org/10.1063/1.4958694
2. Hord, K., and Lian, Y., "Leading edge vortex development on a pitch-up airfoil," *International Journal of Aerodynamics, Vol. 5, No. 1, pp. 69-81, 2015.*
   DOI: http://dx.doi.org/10.1504/IJAD.2015.074629

3. Hord, K, and Lian, Y.,"Leading Edge Vortex Circulation Development on Finite Aspect Ratio Pitch-Up Wings," *AIAA Journal*, 2016, http://dx.doi.org/10.2514/1.J053911
4. Chen, Y., & Lian, Y. (2015). Numerical investigation of vortex dynamics in an H-rotor vertical axis wind turbine. *Engineering Applications of Computational Fluid Mechanics*, (ahead-of-print), 1-12.
5. Li, G., Lian, Y., Guo, Y., Jemison, M., Sussman, M., Helms, T., & Arienti, M. (2015). Incompressible multiphase flow and encapsulation simulations using the moment-of-fluid method. *International Journal for Numerical Methods in Fluids*, *79*(9), 456-490.
6. Broering, T. M., & Lian, Y. (2015). Numerical study of tandem flapping wing aerodynamics in both two and three dimensions. *Computers & Fluids*, *115*, 124-139.
7. Zhang, C. and Lian, Y., "Conjugate heat transfer analysis using a simplified household refrigerator model," *International Journal of Refrigeration*, Vol. 45 (2014): 210-222.
8. Zhang, M. and Lian, Y., "Numerical investigation of the Coulter principle in a hydrodynamically focused microfluidics," *International Journal of Information and Electronics Engineering*, Vol. 4, No. 6, November 2014, pp. 462-468.
9. Lian, Y., Broering, T., Hord, K., and Prater, R., "The characterization of tandem corrugated wings," *Progress in Aerospace Sciences*, Vol. 65, 2014, pp. 41-69.
10. Zwangzig, S., Lian, Y., and Brehob, E., "Numerical simulation of phase change material composite wallboard in a multi-layered building envelope," *Energy Conversion and Management*, Vol. 69, 2013, pp.27-40
11. Broering, T., and Lian, Y., "The effect of phase angle and wing spacing on tandem flapping wings," *Acta Mechanica Sinica* (2012) 28(6):1557–1571
12. Broering, T., and Lian, Y., "Numerical Investigation of Energy Extraction in a Tandem Flapping Wing Configuration," *AIAA Journal*, Vol. 50, No. 11, 2012, pp. 2295-2308.
13. Hord, K., Lian, Y., "Numerical Investigation of the Aerodynamic and Structural Characteristics of a Corrugated Airfoil," *Journal of Aircraft*, Vol. 49, No. 3, 2012, pp. 749-757.
14. Zhang, M., Lian, Y., Brehob, E., and Harnett, C.," Investigation of Hydrodynamic Focusing in a Microfluidic Coulter Counter Device", *Journal of Biomechanical Engineering*, Vol. 134, No. 8, 2012, 081001 (9 pages)
15. Song, G. J., Yang, D. H., Tong, P., and Lian, Y., "Parallel WNAO Algorithm for Solving 3D Elastic Equation and its Wavefield Simulations in TI Media," *Chinese J. Geophys*, 2012, Vol. 55, No. 2, pp. 547-559.
16. Lian, Y., "Parametric Study of a Pitching Flat Plate at Low Reynolds Numbers," *Computer Modeling in Engineering & Sciences*, Vol. 72, No. 1, pp. 1-16, 2011.
17. Lian, Y., "Blockage Effects on the Aerodynamics of a Pitching Wing," *AIAA Journal*, Vol. 48, No. 12, pp. 2731-2738, 2010.
18. Lian, Y., Oyama, A., and Liou, M-S., "Progress in Design Optimization Using Evolutionary Algorithms for Aerodynamic Problems," *Progress in Aerospace Sciences*, Vol. 46, pp. 199-223, 2010.
19. Shyy, W., Lian, Y., Tang, J., Liu, H., Trizila, P., Stanford, B., Bernal, L., Cesnik, C., Friedman, P., and Ifju, P., "Computational Aerodynamics of Low Reynolds Number Plunging, Pitching and

Flexible Wings for MAV Applications," Review Paper, *Acta Mech Sin*, Vol. 24, pp. 351-373, 2008.

20. Lian, Y., and Shyy, W., "Laminar-Turbulent Transition of a Low Reynolds Number Rigid or Flexible Airfoil," *AIAA Journal*, Vol. 47, No. 7, 2007.
21. Lian, Y., and Liou, M-S., "Aero-Structural Optimization of a Transonic Compressor Rotor," *Journal of Propulsion and Power*, Vol. 22, No. 4, 2006, pp. 880-888.
22. Lian, Y., and Kim, N-H., "Reliability-based Design Optimization of a Transonic Compressor," *AIAA Journal*, Vol. 44, No. 2, 2006, pp. 368-375.
23. Lian, Y., and Liou, M-S., "Multi-objective Optimization of a Transonic Compressor Rotor using Evolutionary Algorithm," *Journal of Propulsion and Power*, Vol. 21, No. 6, 2005, pp. 979-987.
24. Lian, Y., and Shyy, W., "Three-Dimensional Fluid-Structure Interactions of a Membrane Wing for Micro Air Vehicle Applications," *Journal of Aircraft*, Vol. 42, No. 5, 2005, pp. 865-873.
25. Lian, Y., and Liou, M-S., "Multi-objective Optimization Using Coupled Response Surface Model and Evolutionary Algorithm," *AIAA Journal*, Vol.43, No.6, 2005, pp. 1316-1325.
26. Lian, Y., and Liou, M-S., "Mining of Data from Evolutionary Algorithms for Improving Design Optimization," *Computer Modeling in Engineering & Sciences*, Vol. 8, No.1, 2005, pp. 61-72.
27. Lian, Y., Shyy, W., Viieru, D., and Zhang, B. N., "Membrane Wing Aerodynamics for Micro Air Vehicles," *Progress in Aerospace Sciences*, Vol. 39, 2003, pp. 425-465.
28. Lian, Y., Steen, J., Trygg-Wilander, M. and Shyy, W., "Low Reynolds Number Turbulent Flows around a Dynamically Shaped Airfoil," *Computers and Fluids*, Vol. 32, 2003, pp. 287-303.
29. Lian, Y., Shyy, W., and Haftka,R., "Shape Optimization of a Membrane Wing for Micro Air Vehicles," *AIAA Journal*, Vol. 42, 2004, pp. 424-426.
30. Lian, Y., Shyy, W., Ifju, P., and Verron, E., "A Membrane Wing Model for Micro Air Vehicles," *AIAA Journal*, Vol. 41, 2003, pp. 2492-2494.
31. Kamakoti, R., Lian, Y., Regisford, S., Kurdila A. and Shyy, W., "Computational Aeroelasticity Using a Pressure-based Solver," *Computer Modeling in Engineering & Sciences*, Vol. 3, 2002, pp. 773-790.
32. Lian, Y. and Xu, K., "A Gas-Kinetic Scheme for Multi-material Flows and Its Application in Chemical Reactions," *Journal of Computational Physics*, Vol. 163, 2000, pp. 349-375.
33. Lian, Y. and Xu, K., "A Gas-Kinetic Scheme for Reactive Flows," *Computers and Fluids*, Vol. 29, 2000, pp. 725-748.
34. Lian, Y. and Wang, R., "A Simplified BGK-type Scheme," *Chinese Journal of Computational Mechanics*, Vol. 16, 1999, pp. 275-282 (in Chinese).
35. Lian, Y. and Wang, R., "Multiresolution Scheme Based on WENO Schemes," *Chinese Journal of Numerical Mathematics and Applications*, Vol. 21, 1999, pp. 58-68.
36. Lian, Y. and Wang, R., "Multiresolution Scheme Based on WENO," *Mathematic Numerica Sinica*, Vol. 21, 1999, pp. 215-224.
37. Lian, Y. and Wang, R., "A Comparison of Upwind Schemes Based on the Boltzmann Equation and the Euler Equations," *Communications in Nonlinear Science and Simulation*, Vol. 2, 1997, pp. 117-120.

38. Lian, Y. and Wang, R., "An Implicit Kinetic Flux Vector Splitting Scheme," *Communications in Nonlinear Science and Simulation,* Vol. 2, 1997, pp. 185-190.

Publications in Conference Proceedings

1. Vahab, M., Hussaini, M. Y., Sussman, M., and Lian, Y., (2016) "An adaptive coupled level set and moment-of-fluid method for simulating droplet impact and solification on solid surfaces with application to aircraft icing," AIAA Paper,
2. Lian, Y., Motil, B., and Rame, E., (2016) "Investigation of multiphase flow in a packed bed reactor under microgravity conditions," AIAA Paper
3. Guo, Y., and Lian, Y., (2016) "Numerical investigation of high-speed droplet impact on solid and wet surfaces," AIAA Paper
4. Lian, Y., and Guo, Y., (2015) "Numerical Investigation of the Effects of Rain Drops on an Airfoil Using the Moment of Fluid Method," Proceedings of the ASME-JSME-KSME Joint Fluids Engineering Conference, July 26-31, Seoul, Korea, AJK2015-21729.
5. Guo, Y., and Lian, Y., (2015) "Investigation of the Splashing Phenomenon of Large Droplets for Aviation Safety," SAE 2015 International Conference on Icing of Aircraft, Engines, and Structures, Prague, Czech Republic, June 22-25, 2015, 15ICE-0078
6. Zhang, C., Lian, Y., Hitzelberger, E., Kempiak, M., and Crane, S., "Experimental and Numerical Investigation of a Domestic Refrigerator," ASME paper, FEDSM2014-21156.
7. Li, G., Lian, Y., Mersch, M., Omalley, C., and Hoffman, A., "Liquid-gas Two Phase Flow Simulation for Flat Fan Nozzles," ASME paper FEDSM2014-21170.
8. Lian, Y., Guo, Y.S., Li, G.B., and Sussman, M., "Multiphase Flow Simulation Using the Moment of Fluid Method," ICCFD8-2014-0162, July, 2014.
9. Hord, K., and Lian, Y., "Feature Based Grid Adaption for the Study of Dynamic Stall," AIAA paper, AIAA-2014-2997.
10. Lian, Y., Yisen Guo, and Andrew Work "Numerical Simulation of Supercooled Large Droplets Using the Moment of Fluid Method," AIAA Paper 2014-0740, AIAA Science and Technology Forum and Exposition 2014: 52nd Aerospace Sciences Meeting.
11. Li, G., Lian, Y., and Sussman, M., "Simulations of Gas-liquid Two-phase Jet Flows Using the Moment of Fluid Method", Proceedings of the ASME 2013 Fluid Engineering Division Summer Meeting, FEDSM2013-16366
12. Hord, K., Lian, Y.," Leading Edge Vortex Dynamics on a Pitch-up Airfoil", Proceedings of the ASME 2013 Fluid Engineering Division Summer Meeting, FEDSM2013-16019
13. Zhang, M., Lian, Y., "Numerical Investigation of the Coulter Principle in a Microfluidic Coulter Counter", Proceedings of the ASME 2013 Fluid Engineering Division Summer Meeting, FEDSM2013-16011
14. Zhang, C., Lian, Y., "Numerical Investigation of Heat Transfer and Flow Field in Domestic Refrigerators", Proceedings of the ASME 2013 Fluid Engineering Division Summer Meeting, FEDSM2013-16039

15. Zwanzig, S. D., Lian, Y., and Brehob, E., "Study of Energy Saving Using Phase Change Material in a Multi-Layered Building Envelope," Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition, IMECE2012-85926
16. Chen, Y., Hord, K., Prater, R., Bai, L., and Lian, Y., "Design Optimization of a Vertical Axis Wind Turbine Using a Genetic Algorithm and Surrogate Models," AIAA Paper 2012-5434
17. Hord, K., and Lian, Y.,"Numerical Study of Finite Aspect Ratio Perching Wings," AIAA paper 2012-1081
18. Lian, Y., and Henshaw, W., "A Framework for Interactions of Fluids and Rigid Bodies with Arbitrary Motions," AIAA Paper 2012-710
19. Broering, T., and Lian, Y., "Investigation of Three-Dimensional Low Reynolds Number Tandem Flapping Wings," AIAA paper 2012-709
20. Prater, R., and Lian, Y., "Aerodynamic Response of Stationary and Flapping wings in Oscillatory Low Reynolds Number Flows," AIAA Paper 2012-418.
21. Hord, K., and Lian, Y., "Numerical Investigation of the Aerodynamic and Structural Characteristics of a Corrugated Airfoil," AIAA paper 2010-4624.
22. Prater, R., and Lian, Y., "Numerical Analysis of Aerodynamic Characteristics of a Flat Plate in Gusting Low Reynolds Number Flow," AIAA Paper 2010-4564, Chicago, IL, June 2010.
23. Broering, T., and Lian, Y., "The Effect of Wing Spacing on Tandem Wing Aerodynamics," AIAA Paper 2010-4385, Chicago, IL, June 2010.
24. Broering, T., Lian, Y., and Henshaw, W., "Numerical Study of Two Flapping Airfoils in Tandem Configuration," AIAA Paper 2010-865, Orlando, FL, January 2010.
25. Lian, Y., and Ol, M., "Experiments and Computation on a Low Aspect Ratio Pitching Flat Plate," AIAA Paper 2010-385, Orlando, FL, January 2010.
26. Ol., M., Altman, A., Eldredge, J., Garman, D., and Lian, Y., "Summary of Progress on Pitching Plates: Canonical Problems in Low-Re Unsteady Aerodynamics," AIAA Paper 2010-1085, Orlando, FL, January 2010.
27. Lian, Y., "Parametric Study of a Pitching Flat Plate at Low Reynolds Numbers," AIAA Paper 2009-3688, San Antonio, TX, June 2009.
28. Lian, Y., "Numerical Investigation of Boundary Effects on Flapping Wing Study," AIAA Paper 2009-539, Orlando, FL, January 2009.
29. Lian, Y., Ol., M., and Shyy, W., "Numerical and Experimental Investigation of Reynolds Number Effect on Flapping Airfoil Aerodynamics," AIAA Paper 2008-0652.
30. Lian, Y., Ol., M., and Shyy, W., "Numerical and Experimental Investigation of Reynolds Number Effect on Flapping Airfoil Aerodynamics," AIAA Paper 2008-0652, Reno, NV, January 2008.
31. Jayaraman, B., Lian, Y., and Shyy, W., "Low-Reynolds Number Flow Control Using Dielectric Barrier Discharge-Based Actuators," AIAA Paper 2007-3974, Miami, FL, June 2007.
32. Lian, Y., and Shyy, W., "Aerodynamics of Low Reynolds Number Plunging Airfoil under Gusty Environment," AIAA Paper 2007-71, Reno, NV, 2007.
33. Lian, Y., and Shyy, W., "Laminar-Turbulent Transition of a Low Reynolds Number Rigid or Flexible Airfoil," AIAA Paper 2006-3051, San Francisco, CA, June 2006.

34. Viieru, D., Tang, J., Lian, Y., Liu, H., and Shyy, W., "Flapping and Flexible Wing Aerodynamics of Low Reynolds Number Flight Vehicles," AIAA Paper 2006-503, Reno, NV, January 2006.
35. Lian, Y., and Liou, M., "Aero-Structure Optimization of a Transonic Compressor Blade," AIAA Paper 2005-3634, 41st AIAA/ASME/ASE/ASEE Joint Propulsion Conference & Exhibit, Tucson, Arizona, July 10-13, 2005.
36. Lian, Y., and Kim, N., "Reliability-based Design Optimization of a Transonic Compressor," AIAA Paper 2005-4021, 41st AIAA/ASME/ASE/ASEE Joint Propulsion Conference & Exhibit, Tucson, Arizona, July 10-13, 2005.
37. Lian, Y., and Liou, M., "Multiobjective Optimization of a Transonic Compressor Blade using Evolutionary Algorithm," AIAA Paper 2005-1816, Austin, TX, June 2005.
38. Lian, Y., and Liou, M., "Multiobjective Optimization Using Coupled Response Surface Model and Evolutionary Algorithm," AIAA Paper 2004-4323, Albany, NY, August 30-September 1, 2004.
39. Lian, Y., and Liou, M., "Data Mining for Evolutionary Design Optimization," AIAA Paper 2004-2143, Portland, OR, June 28-July 1,2004.
40. Lian, Y., Liou, M., and Oyama, A., "An Enhanced Evolutionary Algorithm with a Surrogate Model," Proceeding of Genetic and Evolutionary Computation Conference, Seattle, WA, June 2004.
41. Zhang, B.N., Lian, Y., and Shyy, W., "Proper Orthogonal Decomposition for Three-Dimensional Membrane Wing Aerodynamics," AIAA Paper 2003-3917, Orlando, FL, June 2003.
42. Viieru, D., Lian, Y., and Shyy, W., "Investigation of Tip Vortex on Aerodynamic Performance of a Micro Air Vehicle," AIAA Paper 2003-3597, Orlando, FL, June 2003.
43. Lian, Y. and Shyy, W., "Three-Dimensional Fluid-Structure Interactions of a Membrane Wing for Micro Air Vehicle Applications," AIAA Paper 2003-1726, Norfolk, VA, April 2003.
44. Lian, Y., Shyy, W. and Haftka, R., "Shape Optimization of a Membrane Wing for Micro Air Vehicles," AIAA Paper 2003-0106, Reno, NV, January 2003.
45. Lian, Y., Shyy, W., Ifju, P. and Verron, E.,"A Computational Model for Coupled Membrane-Fluid Dynamics," AIAA Paper 2002-2972, St. Louis, MO, June 2002.
46. Kamakoti, R., Lian, Y., Regisford, S., Kurdila, A. and Shyy, W., "Computational Aeroelasticity using a Pressure-based Solver," AIAA Paper 2002-0869, Reno, NV, January 2002.
47. Ifju, P., Jenkins, D., Ettinger, S., Lian, Y. and Shyy, W., "Flexible-Wing-Based Micro Air Vehicles," AIAA Paper 2002-0705, Reno, NV, January 2002.
48. Lian, Y., Steen, J., Trygg-Wilander, M., and Shyy, W., "Low Reynolds Number Turbulent Flows around a Dynamically Shaped Airfoil," AIAA Paper 2001-2723, Anaheim, CA, June 2001.
49. Fuentes, C., He, X., Carroll, B., Lian, Y. and Shyy, W., "Low Reynolds Number Flows Around an Airfoil with a Movable Flap, Part 1: Experiments," AIAA Paper 2000-2239, Denver, CO, June 2000.
50. He, X., Fuentes, C., Shyy, W., Lian, Y. and Carroll, B., "Computation of Transitional Flows around an Airfoil with a Movable Flap," AIAA Paper 2000-2240, Denver, CO, June 2000.

Technical Reports

1. Lian, Y., and Xu, K., "A Gas-kinetic Scheme for Reactive Flows," NASA/CR-1998-208963, ICASE Report No. 98-55.
2. Lian, Y., and Xu, K., "A Gas-Kinetic Scheme for Multimaterial Flows and Its Application in Chemical Reaction," NASA/CR-1999-209364, ICASE Report 99-28.

Presentations and Seminars (since 2008)

1. Work, A., Lian, Y., and Sussman, M., "The Effect of Disturbances and Surrounding Air on the Droplet Impact Phenomena," 66th Annual Meeting of the APS Division of Fluid Dynamics, Nov 25th, 2013, Pittsburg, PA.
2. Guo, Y., Lian, Y., and Sussman, M., "Numerical Simulation of Droplet Impact on Dry Solid Surfaces Using the Moment of Fluid Method," 66th Annual Meeting of the APS Division of Fluid Dynamics, Nov 26th, 2013, Pittsburg, PA.
3. Lian, Y., "Transitional Flow Simulation of Dynamic Stall," ARMY Research Center, Moffett, CA, July 11th, 2013.
4. Li, G., Lian, Y., and Sussman, M., "Simulations of Gas-liquid Two-phase Jet Flows Using the Moment of Fluid Method," ASME 2013 Fluid Engineering Division Summer Meeting, July 11th, 2013, Inclined Village, NV.
5. Hord, K., Lian, Y.," Leading Edge Vortex Dynamics on a Pitch-up Airfoil," Proceedings of the ASME 2013 Fluid Engineering Division Summer Meeting, July 10th, 2013, Inclined Village, NV.
6. Zhang, M., Lian, Y., "Numerical Investigation of the Coulter Principle in a Microfluidic Coulter Counter," ASME 2013 Fluid Engineering Division Summer Meeting, July 10th, 2013, Inclined Village, NV.
7. Zhang, C., Lian, Y., "Numerical Investigation of Heat Transfer and Flow Field in Domestic Refrigerators," ASME 2013 Fluid Engineering Division Summer Meeting, July 9th, 2013, Inclined Village, NV.
8. Lian, Y., "Aerodynamics of Dynamic Stall," Computational Aerosciences Branch, NASA Langley Research Center, Feb 4th 2012, Hampton, VA.
9. Lian, Y., "Numerical Simulation of Supercooled Large Droplets," Icing Branch, NASA Glenn Research Center, Dec 14th 2012, Hampton, VA.
10. Zwanzig, S., Lian,Y., and Brehob, E., "Study of Energy Saving Using Phase Change Material in a Multi-Layered Building Envelop," ASME 2012 International Mechanical Engineering Congress & Exposition, Oct 14th, 2012, Houston, TX.
11. Chen, Y., Hord, K., Prater, R., Bai, L., and Lian, Y., "Design Optimization of a Vertical Axis Wind Turbine Using a Genetic Algorithm and Surrogate Models," 12th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference and 14th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, Sep 2012, Indianapolis, IN.
12. Lian, Y., "Aerodynamics of a Perching Wing," Aeroelasticity Branch, NASA Langley Research Center, July 26th 2012, Hampton, VA.
13. Lian, Y., "CFD and its application in industry," Hitachi Electrical Application Co, June 12, 2012, Shanghai, China.

14. Lian, Y., "Aerodynamics of Tandem Wings," Xi'an Jiaotong University, June 26, 2012, Xian, Chian.
15. Lian, Y., "Computational aerodynamics: recent progress," Institute of Mechanics, Chinese Academy of Sciences, July 1st 2012, Beijing, China.
16. Zhang, M. and Lian, Y., "Numerical simulation for the current signal in micro-fluidic Coulter counter," March 6th 2012, 37th Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, OH.
17. Chen, Y. and Lian, Y., "Numerical study of the aerodynamic performance of a vertical axis wind turbine," March 6th 2012, 37th Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, OH.
18. Prater, R. and Lian, Y., "Lift production of flapping wings in oscillatory flow," March 6th 2012, 37th Dayton-Cincinnati Aersopace Sciences Symposium, Dayton, OH.
19. Hord, K. and Lian, Y., "Simulation of the flight dynamics of a flapping airfoil," March 6th 2012, 37th Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, OH.
20. Broering, T. and Lian, Y. "Interaction between a fl aping wing and a fixed wing," March 6th 2012, 37th Dayton-Cincinnati Aerospace Sciences Symposium, Dayton, OH.
21. Lian, Y. and Henshaw, W. "A Framework for Interactions of Fluids and Rigid Bodies with Arbitrary Motions," Jan 9th 2012 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Nashville, TN.
22. Broering, T. and Lian, Y., "Investigation of Three-Dimensional Low Reynolds Number Tandem Flapping Wings," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, January 2012 Nashville, TN.
23. Prater, R. and Lian, Y., "Aerodynamic Response of Stationary and Flapping wings in Oscillatory Low Reynolds Number Flows," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, January 2012 Nashville, TN.
24. Hord, K. and Lian, Y.," Numerical Study of Finite Aspect Ratio Perching Wings," 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, January 2012 Nashville, TN.
25. Lian, Y., "Aerodynamics of tandem wings," at Laurence Livermore National Laboratory, March 2011.
26. Hord, K. and Lian, Y., "Numerical Investigation of the Aerodynamic and Structural Characteristics of a Corrugated Airfoil," 28th AIAA Applied Aerodynamics Conference, June 2010 Chicago, IL.
27. Prater, R. and Lian, Y., "Numerical Analysis of Aerodynamic Characteristics of a Flat Plate in Gusting Low Reynolds Number Flow," 28th AIAA Applied Aerodynamics Conference, June 2010 Chicago, IL.
28. Broering, T. and Lian, Y., "The Effect of Wing Spacing on Tandem Wing Aerodynamics," 28th AIAA Applied Aerodynamics Conference, June 2010 Chicago, IL.
29. Broering, T., Lian, Y. and Henshaw, W., "Numerical Study of Two Flapping Airfoils in Tandem Configuration," Jan 6th 2010, 48th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL.
30. Lian, Y., "Parametric Study of a Pitching Flat Plate at Low Reynolds Numbers," June 27th, 2009, AIAA Conference, San Antonio, TX.

31. Lian, Y., "Numerical Investigation of Boundary Effects on Flapping Wing Study," 47th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Orlando, FL, Jan 9th ,2009.

Current Graduate Students

1. Mr. Russell Prater (M. Eng. 2012, Ph.D. expected December 2017, University of Louisville)
2. Ms. Yan Chen (M. S, August 2012, Ph.D. expected July 2017, University of Louisville)
3. Mr. Andrew Work (Ph.D. expected July 2017, University of Louisville)
4. Mr. Yisen Guo (Ph.D. expected July 2017, University of Louisville)

Former Graduate Students

1. Dr. Kyle Hord (M.Eng., 2010, Ph.D., August 2014, University of Louisville)
2. Dr. Muheng Zhang (Ph.D., August 2014, University of Louisville)
3. Dr. Timothy Broering (Ph.D., August 2013, University of Louisville)
4. Mr. Matthew Fuller (M.Eng., May 2010, University of Louisville)
5. Mr. Kyle Schmidt (M.Eng., May 2010, University of Louisville)
6. Mr. Stephen Zwanzig (M.Eng., August 2012, University of Louisville)

Postdoctoral Researchers

1. Dr. Guibo Li, University of Louisville, Louisville, KY (2012 August-2014 July)
2. Dr. Chaolei Zhang, University of Louisville, Louisville, KY (2012 August-2014 August)

Former Visiting Scholars

1. Dongsheng Yang, Hitachi Electrical Application Co., Shanghai, China
2. Haishui Jin, Hitachi Electrical Application Co., Shanghai, China
3. Guojie Song, Tsinghua University, China
4. Ronan Serre, Université Pierre et Marie CURIE, Paris, France

Research Grants and Contracts

1. PI, "Computer-Aided Optimal Design of a Microfluidic Coulter Counter," Intramural Research Incentive Grant, University of Louisville, $10,000, 04/2009-03/2010 (co-PI: Dr. Cindy Harnett)

2. PI, "Numerical Simulation of a Biologically Inspired Corrugated Wing for Micro Air Vehicles", Intramural Research Incentive Grant, University of Louisville, $4140, 04/2009-03/2010 (no co-PIs)

3. PI, "Numerical Study of 3D Flapping Wing in Rectilinear and Non-rectilinear Motions", Air Force Office of Scientific Research, $30,000, 07/2009 – 06/2010 (no co-PIs)

4. PI, “Biologically Inspired Wing Design for Micro Air Vehicles”, Kentucky Science and Engineering Foundation, $80,000, 09/2009 – 08/2011 (co-PI: Dr. Suzanne Smith, University of Kentucky)

5. Co-PI, “Microfluidic Cell Arrays for High-Throughput Cell Culture”, Kentucky Science and Engineering Foundation, $100,000, 07/2009 –06/2011 (PI: Dr. Palaniappan Sethu)

6. Co-PI, “Optimal Design of a MicroFludic Coulter Counter: Multiphysics Simulation and Experiments”, $100,000, Kentucky Science and Engineering Foundation, 09/2009 – 12/2013 (PI: Dr. Cindy Harnett, co-PI: Dr. Ellen Brehob)

7. PI, “Multi-physics Simulation of a Coulter Counter”, National Science Foundation, $5,000, 10/2009 –08/2010 (no co-PIs)

8. PI, “Analysis and Optimization of a Vertical Axis H-Rotor Turbine”, Conn Renewable Energy Center, $60,000, 09/2010– 08/2011 (no co-PIs)

9. PI, “Development of a Framework for Robust Design Optimization of a Transonic Compressor Rotor”, NASA Kentucky Space Consortium, $ 59,969 (Federal amount: $29,590, Institutional match: $30,379), 01/2011–12/2012 (no co-PIs)

10. PI, “Numerical and Experimental Study of a Low Aspect Ratio Pitching Wing for MAV Applications”, NASA EPSCoR, $ 60,119 (Federal amount: $40,000, Institutional match: $20,119), 05/2011– 06/2013 (co-PIs: Dr. Sean Bailey, University of Kentucky)

11. PI, “Numerical Simulation of Gas Pulsation in a Rotary Compressor”, Hitachi Electrical Application Co., $20,000, 05/2011–06/2013 (no co-PIs)

12. PI, “Sensitivity Analysis of a Dynamic System with Proper Orthogonal Decomposition”, NASA Kentucky Space Consortium, $ 53,842 (Federal amount: $26,792, Institutional match: $27,050), 01/2012– 07/2013 (no co-PIs)

13. Co-PI, “APA-E Reversible CH4 Storage Using a Molecular Sieve Layer as Controllable Nano-Valve”, Department of Energy, $324,220 (subcontract through Gas Technology Institute), 01/2013-12/2014 (PI: Dr. Moises Carreon)

14. PI, “Build Strong Collaborative Relationships with NASA in the Area of Aeronautics”, NASA, $4,500, 10/2012–12/2013 (no co-PIs)

15. PI, “University Student Launch Initiative”, NASA, $ 15,000 (Federal amount: $10,000, Institutional match: $5,000), 01/2013–12/2013 (no co-PIs)

16. PI, “Analysis and Optimization of a Domestic Refrigerator Gasket”, General Electric Appliances, $215,876 , 09/2012–09/2014 (co-PI: Dr. Lihui Bai)

17. PI, “Simulation of Two-Phase Liquid-Gas Flow from a Dishwasher Spray Nozzle and Nozzle Optimization”, General Electric Appliances, $ 215472, 09/2012–08/2014 (co-PI: Dr. Lihui Bai)

18. Co-PI, "Modeling and Development of a Ventilation Strategy for Hot Water Heater," General Electric, $65537, 01/2014-10-2014.

19. PI, "Fluid and Structure Interaction Study of the Needle Motion in Common Rail High-Pressure Diesel Fuel Injection System", Cummins Scanis XPI Manufacturing LLC, $170,848, 09/2013–08/2015 (no co-PIs)

20. PI, "NASA Student Launce", NASA, $ 15,000 (Federal amount: $10,000, Institutional match: $5,000), 01/2015–12/2015 (no co-PIs)
21. Co-PI, "Phase I I/UCRC University of Louisville Site: Center for Efficient Vehicles and Sustainable Transportation Systems (EV-STS)", NSF, $749,779, 07/15/2016/-7/14/2021 (PI Glen Prater)
22. PI, "Verification and Enhancement of a 3D Multiphase Flow Solver for Further Investigation of Nucleate Pool Boiling Problems," NASA, $200,000, 08/01/2016-07/31/2018.
23. PI, "Sintered Inductive Metal Printer with Laser Exposure," NASA SBIR subcontractor from TecShot, 26,500, 07/07/2016-12/07/2016.

Teaching (Primary Instructor)

Semester	Course #	Course Title	Evaluation Score
Fall 2008	ME 401-01	Fluid Mechanics	2.23/5.00
Spr 2009	ME 440-01	Heat Transfer	3.79/5.00
Fall 2009	ME 401-01	Fluid Mechanics	4.07/5.00
Spr 2010	ME 638	Computational Methods in Fluid Flow and Heat Transfer	3.4/5.00
Spr 2010	ME 440-01	Heat Transfer	3.3/5.00
Fall 2010	ME 401-01	Fluid Mechanics	3.65/5.00
Spr 2011	ME 638	Computational Methods in Fluid Flow and Heat Transfer	4.33/5.00
Spr 2011	ME 401-1	Fluid Mechanics	3.38/5.00
Fall 2011	ME 401-1	Fluid Mechanics	3.65/5.00
Spr 2012	ME 645	Mechanical Engineering Structured Research Project	3.15/5.00
Spr 2012	ME 638	Computational Methods in Fluid Flow and Heat Transfer	3.71/5.00
Fall 2012	ME 671	Advanced Fluid Mechanics	4.38/5.00
Spr 2013	ME 638	Computational Methods in Fluid Flow and Heat Transfer	4.67/5.00

ME 401: Fluid Mechanics II (undergraduate required class)

ME 440: Heat Transfer (undergraduate required class)

ME 638: Computational Methods in Fluid Flow and Heat Transfer (graduate class)

ME 645: Structured Research Projects (graduate class)

ME 671: Advanced Fluid Mechanics (graduate class)

University of Louisville Service Activities

- **Seminar Organizer:** Department of Mechanical Engineering, 2009-current, organized 30+ seminars
- **Member:** Speed school library committee 2010-current
- **Member:** Department of Mechanical Engineering, Department Scholarship committee, 2010-current
- **Member:** Department of Mechanical Engineering, Faculty Search Committee, 2010
- **Technical Advisor**, University Student Launch Initiative, Aug 2012-current

Awards

- Provost's Award for Exemplary Advising, nominated, University of Louisville, 2013.
- Air Force Summer Faculty Fellowship, 2011.
- Air Force Summer Faculty Fellowship, 2010.
- Best Presentation, 30th AIAA/ASME Dayton Cincinnati Aerospace Sciences Symposium, OH, 2005.
- Best paper, Workshop on Application of Hybrid Evolutionary Algorithms to Complex Optimization Problems, July 2004, Seattle, WA, 2004.
- Achievement Award, Ohio Aerospace Institute, 2004.
- Outstanding Paper, 40th AIAA Aerospace Sciences Meeting & Exhibit, January 2002, Reno, NV, 2002.
- Alumni Fellowship, University of Florida, Gainesville, FL, (1999-2000, 2002-2003),
- Academic Achievement Award, University of Florida, Gainesville, FL, 2000.
- Huawei First Prize, Chinese Academy of Sciences, Beijing, China, 1998.

Memberships in Professional Societies

- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Mechanical Engineers (ASME)
- American Physical Society *(*APS)

Professional Service Activities

- **Session Chair**, CFD Applications on Thermal Environment, AIAA SciTech 2014.
- **Session Chair**, ASME 2013 Fluid Engineering Division Summer Meeting**,** July 10th, 2013, Incline Village, NV.
- **Session Chair**, ASME 2012 International Mechanical Engineering Congress & Exposition, Oct 14th, 2012, Houston, TX
- **Session Chair**, 41st AIAA/ASME/ASE/ASEE Joint Propulsion Conference & Exhibit, 2005, Tucson, AZ.
- **Mathematics Committee**, Lowe Elementary School, Louisville, KY, 2011-2012.

Reviewer

- AIAA Journal, Journal of Aircraft, Progress in Aerospace Sciences, Journal of Propulsion and Power, Journal of Guidance, Control, and Dynamics, Applied Mechanics Review, Computers and Fluids, Computer Modeling in Engineering & Sciences, International Journal for Numerical Methods in Fluids, International Journal of Aerospace Engineering, and Structural and Multidisciplinary Optimization, Engineering Applications of Computational Fluid Mechanics, ASME Journal of Fluid Engineering, International Journal of Multiphase Flow