Matthew J. Ringuette

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EDUCATION

Doctor of Philosophy in Aeronautics (Fluid Mechanics) (2004)
California Institute of Technology, Pasadena, CA
Dissertation Title: *Vortex Formation and Drag on Low Aspect Ratio, Normal Flat Plates*
Advisor: Professor Morteza Gharib
Minor in Science, Ethics, & Society

Master of Science in Aeronautics (2000)
California Institute of Technology, Pasadena, CA

Bachelor of Science in Aeronautical & Mechanical Engineering (1999)
Rensselaer Polytechnic Institute, Troy, NY
Tau Beta Pi, Founders Award

EMPLOYMENT HISTORY

University at Buffalo, The State University of New York Buffalo, NY
2014−present: *Associate Professor, Director of Undergraduate Studies in Aerospace Engineering*
2008−2014: *Assistant Professor*
Department of Mechanical and Aerospace Engineering

Princeton University Princeton, NJ
2005−2008: *Postdoctoral Research Associate*
Department of Mechanical and Aerospace Engineering

California Institute of Technology Pasadena, CA
2000−2004: *Research/Teaching Assistant*
Graduate Aeronautical Laboratories (GALCIT)

Rensselaer Polytechnic Institute Troy, NY
Summer 1999: *Designed & fabricated pipe-flow experiment for teaching lab.*
Department of Mechanical, Aerospace, and Nuclear Engineering

Summer 1998−Spring 1999: *Undergraduate Researcher*
Department of Mechanical, Aerospace, and Nuclear Engineering

Summer 1997: *Undergraduate Researcher*
Department of Civil and Environmental Engineering

RESEARCH INTERESTS

Experimental fluid mechanics, vortex dynamics, unsteady aerodynamics, bio-inspired propulsion with applications to autonomous air and underwater vehicles, fluid-structure interactions, and high-speed flow.

HONORS AND AWARDS

Professor of the Year (teaching award), Tau Beta Pi, NY Nu Chapter at the University at Buffalo (2010)

Air Force Office of Scientific Research (AFOSR) Young Investigator Research Program Award (2010) for proposal: "Flapping-Wing Propulsion Characterized Using Optimal Vortex Formation." Funding: $359,510 over 3 years.

Honorary Member, Pi Tau Sigma, National Mechanical Engineering Honor Society (2009)

GRANT SUPPORT

Portion as PI or Co-PI: $1.8 M of $2.9 M total awarded; current funding: $382 K.

Current Funding (2)

1. National Science Foundation, CBET Major Research Instrumentation (MRI) Program, "MRI: Acquisition of a High-Speed 3D Velocimetry System to Study Complex Flows," $413,082, plus $177,035 UB cost share, PI: M. J. Ringuette (MAE), Co-PIs: Joseph Atkinson (CSEE), Sean Bennett (GEO), Hui Meng (MAE), Jihyung Yoo (MAE), percent credit: 20% each investigator, 9/1/2018−8/31/2019.

2. National Science Foundation, CBET Fluid Dynamics Program, "Lift Management for Unsteady Translating Wings Using a Rotating, Swept Wing Tip," $299,658, PI: M. J. Ringuette, percent credit: 100%, 9/1/2017−8/31/2020.

Completed Grants (4)

1. National Science Foundation, CBET Fluid Dynamics Program, "The Three-Dimensional Flow Structure and Forces of Flapping-Wing Hovering from Experiments," $288,573, PI: M. J. Ringuette, percent credit: 100%, 9/1/2013−11/30/2017. Also, $5,000 REU Supplement awarded for Summer 2015.

2. CUBRC, Inc., Subcontract, "Onsite Support for Tunable Diode Laser Absorption Spectroscopy," $23,206, PI: M. J. Ringuette, Percent credit: 100%, 10/1/2013−11/29/2013.

3. Air Force Office of Scientific Research, Multidisciplinary Research Program of the University Research Initiative (MURI), "Fundamental Processes in High-Temperature Hypersonic Flows," $1,495,651, PI: P. E. DesJardin, Co-PI: M. J. Ringuette, percent credit: 50%, 9/1/2010−8/31/2015.

4. Air Force Office of Scientific Research, Young Investigator Program, "Flapping-Wing Propulsion Characterized Using Optimal Vortex Formation," $359,510, PI: M. J. Ringuette, Percent credit: 100%, 6/15/2010−6/14/2013.

PUBLICATIONS

Boldface authors indicate current or former students and postdoctoral scholars supervised.
* further indicates undergraduate students.
† further designates graduate students.
‡ further refers to postdoctoral scholars.
§ indicates Ringuette as the corresponding author.

Peer-Reviewed Journal Articles (12)

1. **Carr, Z. R.**†‡, **DeVoria, A. C.**†, and Ringuette, M. J.§ "Aspect Ratio Effects on Rotating Wings: Circulation and Forces." *J. Fluid Mech.*, Vol. 767, 2015, pp. 497-525. DOI: 10.1017/jfm.2015.44

2. **Dufrene, A.**†, Holden, M., and Ringuette, M. J.§ "Microwave Shock-Speed Diagnostic Development and Analysis of Expansion Tunnel Viscous Effects." *AIAA J.*, Vol. 53, No. 3, 2015, pp. 573-587. DOI: 10.2514/1.J053139

3. **DeVoria, A. C.**†, **Carr, Z. R.**†‡, and Ringuette, M. J.§ "On Calculating Forces from the Flow Field with Application to Experimental Volume Data." *J. Fluid Mech.*, Vol. 749, 2014, pp. 297-319. DOI: 10.1017/jfm.2014.237

4. **Carr, Z. R.**† and Ringuette, M. J.§ "The Flow Structure of Low-Aspect-Ratio Rotating Wings from Dye Visualization." *AIAA J.*, Vol. 52, No. 5, 2014, pp. 1081-1086. DOI: 10.2514/1.J052592

5. **DeVoria, A. C.**† and Ringuette, M. J.§ "The Force and Impulse of a Flapping Plate Performing Advancing and Returning Strokes in a Quiescent Fluid." *Exp. Fluids*, Vol. 54:1515, 2013. DOI: 10.1007/s00348-013-1515-5

6. **DeVoria, A. C.**† and Ringuette, M. J.§ "On the Flow Generated on the Leeward Face of a Rotating Flat Plate." *Exp. Fluids*, Vol. 54:1495, 2013. DOI: 10.1007/s00348-013-1495-5

7. **Carr, Z. R.**†, **Chen, C.**†, and Ringuette, M. J.§ "Finite-Span Rotating Wings: Three-Dimensional Vortex Formation and Variations with Aspect Ratio." *Exp. Fluids*, Vol. 54:1444, 2013. DOI: 10.1007/s00348-012-1444-8

8. **DeVoria, A. C.**[†] and Ringuette, M. J.[§] "Vortex Formation and Saturation for Low-Aspect-Ratio Rotating Flat-Plate Fins." *Exp. Fluids*, Vol. 52, 2012, pp. 441-462. DOI: 10.1007/s00348-011-1230-z

9. Ringuette, M. J., Bookey, P., Wyckham, C. and Smits, A. J. "Experimental Study of a Mach 3 Compression Ramp Interaction at $Re_\theta = 2400$." *AIAA J.*, Vol. 47, No. 2, 2009, pp. 373-385. DOI: 10.2514/1.38248

10. Ringuette, M. J., Wu, M., and Martín, M. P. "Low Reynolds Number Effects in a Mach 3 Shock/Turbulent Boundary-Layer Interaction." *AIAA J.*, Vol. 46, No. 7, 2008, pp. 1883-1886. DOI: 10.2514/1.36213

11. Ringuette, M. J., Wu, M., and Martín, M. P. "Coherent Structures in Direct Numerical Simulation of Turbulent Boundary Layers at Mach 3." *J. Fluid Mech.*, Vol. 594, 2008, pp. 59-69. DOI: 10.1017/S0022112007009020

12. Ringuette, M. J., Milano, M., and Gharib, M. "Role of the Tip Vortex in the Force Generation of Low-Aspect-Ratio Normal Flat Plates." *J. Fluid Mech.*, Vol. 581, 2007, pp. 453-468. DOI: 10.1017/S0022112007005976

Conference Papers (14)

[‖] indicates acceptance decided by peer-reviewed abstract.
[¶] indicates acceptance decided by peer review.

1. **Chowdhury, J.**[†], **Cook, L.**[*], and Ringuette, M. J. "The Vortex Formation of an Unsteady Translating Plate with a Rotating Tip." *AIAA Paper 2019-0348, Special Session: Unsteady Aerodynamics – Surging and Surging/Pitching II, AIAA Science and Technology Forum and Exposition (SciTech Forum)*, San Diego, CA, 7-11 Jan. 2019.[‖] DOI: 10.2514/6.2019-0348

2. Jones, A., Manar, F., Phillips, N., Nakata, T., Bomphrey, R., Henningson, P., Ringuette, M. J., Percin, M., van Oudheusden, B., and Palmer, J. "Leading Edge Vortex Evolution and Lift Production on Rotating Wings." *AIAA Paper 2016-0288, 54th AIAA Aerospace Sciences Meeting (Part of Science and Technology Forum, SciTech)*, San Diego, CA, 4-8 Jan. 2016, Invited. DOI: 10.2514/6.2016-0288

3. **Carr, Z. R.**[†], **DeVoria, A. C.**[†], and Ringuette, M. J. "Aspect Ratio Effects on the Leading-Edge Circulation and Forces of Rotating Flat-Plate Wings." *AIAA Paper 2013-0675, 51st AIAA Aerospace Sciences Meeting*, Grapevine, TX, 7-10 Jan. 2013.[‖] DOI: 10.2514/6.2013-675

4. **Carr, Z. R.**[†], **Chen, C.**[†], and Ringuette, M. J. "Vortex Formation and Forces of Low-Aspect-Ratio, Rotating Flat-Plate Wings at Low Reynolds Number." *AIAA Paper 2012-3280, 42nd AIAA Fluid Dynamics Conference*, New Orleans, LA, 25-28 June 2012.[‖] DOI: 10.2514/6.2013-675

5. **Carr, Z. R.**†, **Chen, C.**†, and Ringuette, M. J. "The Effect of Aspect Ratio on the Three-Dimensional Vortex Formation of Rotating Flat-Plate Wings." *AIAA Paper 2012-912, 50th AIAA Aerospace Sciences Meeting*, Nashville, TN, 9-12 Jan. 2012.‖ DOI: 10.2514/6.2012-912

6. **DeVoria, A.**†, **Mahajan, P.**†, and Ringuette, M. J. "Vortex Formation and Saturation for Low-Aspect-Ratio Rotating Flat Plates at Low Reynolds Number." *AIAA Paper 2011-396, 49th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan. 2011.‖ DOI: 10.2514/6.2011-396

7. Beekman, I., Priebe, S., Ringuette, M. J., and Martín, M. P. "Effect of Wall Temperature and Mach Number on the Turbulence Structure of Hypersonic Boundary Layers." *AIAA Paper 2009-1328, 47th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan. 2009.‖ DOI: 10.2514/6.2009-1328

8. Sahoo, D., Ringuette, M. J., and Smits, A. J. "Experimental Investigation of a Hypersonic Turbulent Boundary Layer." *AIAA Paper 2009-780, 47th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan. 2009.‖ DOI: 10.2514/6.2009-780

9. Ringuette, M. J., and Smits, A. J. "Wall-Pressure Measurements in a Mach 3 Shock-Wave Turbulent Boundary Layer Interaction at a DNS-Accessible Reynolds Number." *AIAA Paper 2007-4113, 37th AIAA Fluid Dynamics Conference*, Miami, FL, June 2007.‖ DOI: 10.2514/6.2007-4113

10. Ringuette, M. J., Wu, M., and Martín, M. P. "Coherent Structures in DNS of Turbulent Boundary Layers at Mach 3." *AIAA Paper 2007-1138, 45th AIAA Aerospace Sciences Meeting*, Reno, NV, Jan. 2007.‖ DOI: 10.2514/6.2007-1138

11. Ringuette, M. J., Martín, M. P., Smits, A. J., and Wu, M. "Characterization of the Turbulence Structure in Supersonic Boundary Layers using DNS Data." *AIAA Paper 2006-3539, 36th AIAA Fluid Dynamics Conference*, San Francisco, CA, June 2006.‖ DOI: 10.2514/6.2006-3539

12. Martín, M. P., Smits, A., Wu, M., and Ringuette, M. J. "The Turbulence Structure of Shockwave and Boundary Layer Interaction in a Compression Corner." *AIAA Paper 2006-497, 44th AIAA Aerospace Sciences Meeting*, Reno, NV, Jan. 2006.‖ DOI: 10.2514/6.2006-497

13. Milano, M., Ringuette, M. J., Noca, F., and Gharib, M. "Force Computation from DPIV Measurements for a Flat Plate Performing Drag-Maximizing Oscillations." *2nd Intl. Symp. on Aqua Bio-Mechanisms (ISABMEC)*, Honolulu, HI, 2003 (Published as a CD).

14. Milano, M., Ringuette, M. J., and Gharib, M. "Drag Maximization for a Flat Plate Oscillating in a Single Direction." *7th Intl. Symp. on Fluid Control, Measurement and Visualization (FLUCOME)*, Sorrento, Italy, 2003.¶

Other Conference / Meeting Presentations and Videos (19)

1. **Chowdhury, J.**[†] and Ringuette, M. J. "A Simple Analytical Vortex Loop Model for the Unsteady Lift of Rotating Wings." *71st APS Division of Fluid Dynamics Meeting*, Atlanta, GA, November 2018.

2. Ringuette, M. J. and **Chowdhury, J.**[†] "Driven Gust-Like Wing Motions Versus Impinging Gusts: Review and Discussion." *AVT-282: Unsteady Aerodynamic Response of Rigid Wings in Gust Encounters, 41st AVT Panel Business Meeting Week*, Turin, Italy, April 2018.

3. **Burge, M.**[†] and Ringuette, M. J. "Forces Produced by a Flapping Wing During Stroke Reversal." *70th APS Division of Fluid Dynamics Meeting*, Denver, CO, November 2017.

4. **Burge, M.**[†] and Ringuette, M. J. "Circulation Produced by a Flapping Wing During Stroke Reversal." *69th APS Division of Fluid Dynamics Meeting*, Portland, OR, November 2016.

5. **Burge, M.**[†] and Ringuette, M. J. "Vortex Topology of a Flapping Wing." Video submitted to the Gallery of Fluid Motion, Entry #V0072, shown at the *69th APS Division of Fluid Dynamics Meeting*, Portland, OR, November 2016. Available at: https://gfm.aps.org/meetings/dfd-2016/57d892f1b8ac31179100081b

6. **Burge, M.**[†], **Wysochanski, C.**[*], and Ringuette, M. J. "Vortex Loop Topology During the Stroke Reversal of a Flapping Wing." *68th APS Division of Fluid Dynamics Meeting*, Boston, MA, November 2015.

7. **Burge, M.**[†], **Favale, J.**[*], and Ringuette, M. J. "The Effects of Pitching Rate and Aspect Ratio on the 3-D Flow Structure of Two-Degree-of-Freedom Flapping Wings." *67th APS Division of Fluid Dynamics Meeting*, San Francisco, CA, November 2014.

8. Ringuette, M. J., **Carr, Z. R.**[†‡], and **DeVoria, A.**[†] "'Very Fast' Rotational Surge (Case 2B) and Aspect Ratio Effects on Flow Structure, Circulation, & Forces." *AVT-202: Extension of Fundamental Flow Physics to Practical MAV Aerodynamics, 34th AVT Panel Business Meeting Week*, Brussels, Belgium, October 2014.

9. **Mahajan, P.**[†] and Ringuette, M. J. "Vortex Structure of Low-Aspect-Ratio Rotating Flat-Plate Wings." *63rd APS Division of Fluid Dynamics Meeting*, Long Beach, CA, November 2010.

10. **DeVoria, A.**[†] and Ringuette, M. J. "Vortex Formation in the Starting Flow of Rotating Low-Aspect-Ratio Plates." *63rd APS Division of Fluid Dynamics Meeting*, Long Beach, CA, November 2010.

11. **DeVoria, A.**[†], **Bapst, J.**[*], and Ringuette, M. J. "Vortex Formation Time for a Sweeping Fin." *62nd APS Division of Fluid Dynamics Meeting*, Minneapolis, MN, November 2009.

12. Priebe, S., Beekman, I., Ringuette, M. J., and Martín, M. P. "Chasing Eddies and Their Wall Signature in Turbulent Boundary Layers at Mach 3 Through 10." *61st APS Division of Fluid Dynamics Meeting*, San Antonio, TX, November 2008.

13. Ringuette, M. J., and Smits, A. J. "Unsteady Wall-Pressure Loading in a Mach 3 Compression Ramp Flow at $Re_\theta = 2400$." *60th APS Division of Fluid Dynamics Meeting*, Salt Lake City, UT, November 2007.

14. Ringuette, M. J., Wu, M., and Martín, M. P. "Superstructures in Compressible Turbulent Boundary Layers." *59th APS Division of Fluid Dynamics Meeting*, Tampa, FL, November 2006.

15. Ringuette, M. J., Martín, M. P., and Smits, A. "Characterizing Coherent Structures in Supersonic, Turbulent Boundary Layers." *58th APS Division of Fluid Dynamics Meeting*, Chicago, IL, November 2005.

16. Milano, M., Ringuette, M. J., and Gharib, M. "A Study of Optimal Average Lift Production by a Flapping Flat Plate." *57th APS Division of Fluid Dynamics Meeting*, Seattle, WA, November 2004.

17. Ringuette, M. J., Milano, M., and Gharib, M. "Self-Organizing Evolution Strategy for Lift Maximization of a Flat Plate Periodically Flapping in a Single Direction." *55th APS Division of Fluid Dynamics Meeting*, Dallas, TX, November 2002.

18. Ringuette, M. J., Gharib, M., Choi, F., Assad, C., and Noca, F. "Leading Edge Vortex Formation Number for an Accelerating Airfoil." *54th APS Division of Fluid Dynamics Meeting*, San Diego, CA, November 2001.

19. Hirsa, A., Korenowski, G. M., Ringuette, M. J., Joshi, A., and Lopez, J. M. "Measurements in a High Reynolds Number Deep-Channel Viscometer." *51st APS Division of Fluid Dynamics Meeting*, Philadelphia, PA, November 1998.

Invited Colloquium Talks (7)

1. "Three-Dimensional Vortex Formation, Vortex Circulation, and Forces for Rotating and Flapping Wings." Department of Mechanical & Aerospace Engineering, University of Florida, Gainesville, March 22, 2016.

2. "Vortex Formation of Low-Aspect-Ratio Bio-Inspired Fins and Wings." Department of Mechanical Engineering, The City College of New York, Nov. 14th, 2013.

3. "Unsteady Vortex Formation of Low-Aspect-Ratio Bio-Inspired Propulsors." Syracuse University, Syracuse, NY, Nov. 2nd, 2012.

4. "The Fluid Dynamics of Bio-Inspired Propulsion." School of Engineering & Applied Sciences Emeritus Luncheon. University at Buffalo, The State University of New York, Buffalo, NY, April 28th, 2009.

5. "Unsteady, Three-Dimensional Vortex Flows with Applications to Bio-Inspired Propulsion." University at Buffalo, The State University of New York, Buffalo, NY, October 23rd, 2008.

6. "Characterizing Unsteady, Three-Dimensional Vortices in Low- and High-Speed Flows." University at Buffalo, The State University of New York, Buffalo, NY, April 14th, 2008.

7. "Characterizing Unsteady, Three-Dimensional Vortices in Low- and High-Speed Flows." University of Minnesota, Minneapolis, MN, March 3rd, 2008.

Invited Congress and Workshop Talks

1. "Three-Dimensional Vortex Formation, Vortex Circulation, and Their Relationship to Forces for Low-Aspect-Ratio Rotating Wings." Mini-symposium, Bioflight I: Models (Experimental, Numerical, and Theoretical) at the 17th U.S. National Congress on Theoretical & Applied Mechanics, June 15-20, 2014, at Michigan State University.

2. "Vortex Formation and Forces of Low-Aspect-Ratio Bio-Inspired Propulsors in Starting Flows." Extreme Flows Workshop, May 16-18, 2014, at Princeton University.

Other Presentations

1. **DeVoria, A.**† and Ringuette, M. J. "Vortex Identification and Tracking for LRDG." *Low-Reynolds-Number Discussion Group meeting at 51st AIAA Aerospace Sciences Meeting*, Grapevine, TX, 7-10 Jan. 2013.

2. Ringuette, M. J. and **DeVoria, A.**† "Vortex Identification and Tracking for LRDG." *Low-Reynolds-Number Discussion Group meeting at 42nd AIAA Fluid Dynamics Conference*, New Orleans, LA, 25-28 June 2012.

RESEARCH SUPERVISION (Graduated 4 Ph.D.s, currently supervising 1 Ph.D., 1 M.S.)

Past Postdoctoral Scholars Supervised

Name	*Dates*	*Current Status*
Zakery Carr	Feb.–Nov. 2013	Research Scientist, CUBRC

Current and Past Graduate Students Supervised

Student	*Degree*	*Grad. Date*	*Current Status*
Juhi Chowdhury	Ph.D.	Exp. June 2020	
Matthew Burge	Ph.D.	Oct. 21, 2016	Teaching Assistant Prof., UB
Adam DeVoria	Ph.D.	April 29, 2013	Postdoc, U. Florida
Zakery Carr	Ph.D.	Jan. 17, 2013	Employed, CUBRC (above)
Aaron Dufrene	Ph.D.	Jan. 3, 2013	Research Scientist, CUBRC

Karan Shah	M.S.	Exp. June 2020	
Michael Rossi*	M.S. Project	May 14, 2015	Employed, Boeing
*Co-Advised with P. DesJardin			
Chao Chen	M.S. Course	Feb 1, 2013	Employed, Boston
Adam DeVoria	M.S.	Jan. 14, 2011	(see above)

Undergraduate Students Supervised (16)

Cameron Smith, Spring 2019 via MAE 498 (will continue Summer 2019 funded through MAE Zimmer award). Assisting with the setup and data acquisition for force measurements on a translating wing with a moving tip, for an NSF grant.

Luke Cook, Summer 2018, funded through MAE Zimmer award; Fall 2018 via MAE 498. Used the new wing design of Gustafson for dye visualization experiments, after adapting it to a new linear motor setup for an NSF grant.

Olivia Gustafson, Spring 2018, funded through MAE Zimmer award. Assisted with improvements to the design of Gagnon, including programmable actuation via an Arduino and a carbon-fiber wing with embedded dye tubes for an NSF grant. Will begin a position at NOAA in Summer 2019.

Stephen Gagnon, Summer-Fall 2017, funded through MAE Zimmer award. Designed and built a wing with a moving tip and flow visualization capability, to visualize vortex formation, for an upcoming, then awarded, NSF grant. Attending UB for a Ph.D.

Alberto Padovan, Fall 2016-Spring 2017, co-advised with Dr. David Salac; Fall 2016 funded through MAE Zimmer award, Spring 2017 via MAE 498. Constructed a digital video microscope and executed a procedure to fabricate polymer vesicles, ultimately for vesicle deformation studies to determine material properties. Attending Princeton U. for a Ph.D.

Mae Sementilli, Summer 2016, funded through MAE Zimmer award. Examined the evolution of castor-oil droplets rising in water with high-speed video and image processing. Went on to attend graduate school at UB.

David Ritter, Summer 2015. Assisted on flapping-wing and wall-effects studies.

Clara Wysochanski, Spring-Summer 2015; Summer 2015 funded through an NSF REU Supplement. Assisted in conducting flapping-wing visualization experiments and performing a study on tank wall effects.

James Favale, Spring-Summer 2014, funded through MAE Zimmer award; volunteered Fall 2014, Spring 2015. Aided in implementing a flapping-wing dye visualization system for an NSF grant. Went on to obtain an M.S. at U. Illinois, Urbana-Champaign, then a position at Honeywell.

Eric Niedermeier, Summer 2012-Fall 2012, funded through MAE Zimmer award. Designed and fabricated a preliminary smoke-line visualization system for the MAE teaching wind tunnel.

Timothy Shea, Summer 2012, funded through MAE Zimmer award. Designed and fabricated a prototype of a 2-DOF experimental flapping-wing model for an AFOSR grant. Went on to work for small engineering firm in Ithaca, NY.

Joshua Weisberger, Fall 2011-Spring 2012, performed setup/testing of the MAE teaching wind tunnel, started the design of the visualization system. Later graduated with an M.S. and Ph.D. from UB.

Richard Kennedy, Fall 2011-Spring 2012. Same topic as above, went on to do UG research at Texas A&M. Went on to obtain an M.S. from Ecole Polytechnique, an M.S. from Caltech, and a Ph.D. from U. Maryland (expected 2019). NDSEG Fellowship Awardee, Spring 2016.

James Trzaskos, Summer 2010-Spring 2011. Assisted in the preliminary design of a 2-DOF flapping-wing rig. Went on to a Summer 2011 internship then a full-time position at Innovation First designing bio-inspired robotic toys.

John Sisti, Summer 2010. Aided in the initial setup and vibration testing of the MAE teaching wind tunnel. Received an M.S. from UB, Summer 2013.

Jonathan Bapst, Spring 2009-Spring 2010 partly funded through MAE Zimmer award. Assisted in the entire research lab setup, including the design of the first water-tank facility. Pursued a graduate degree at U. Washington.

High School Students Supervised

Gina Bianco, Summer 2015, funded by NSF. Designed and tested a bench-top soap-film tunnel for bluff-body wake visualization; produced a final report.

Mary Elise Brady, Summer 2014, funded by NSF and organized through Buffalo-area Engineering Awareness for Minorities (BEAM) and SEAS Research Honors Summer Program (4 wks in Aug.). Assisted in setting up and testing the preliminary flapping-wing dye-injection flow visualization system; gave a final presentation.

Thesis/Project Committee Member

Student	***Degree***	***Date***
Shivam	M.S.	May 2019
Darsh Nathawani	M.S.	May 2019
Joshua Weisberger	Ph.D.	July 2018
Nicholas DiGregorio	M.S.	April 2018
Nicole Varble	Ph.D.	Jan. 2018
Sanyasi S. Veeturi	M.S. Project	Aug. 2017
Divya R. Vani	M.S. Project	Aug. 2017
Vahid Azadeh	Ph.D.	July 2017 (External Examiner for CCNY, Advisor: Yiannis Andreopoulos, Dept. of Mech. Engr.)
Tejas Purandare	M.S. Project	May 2017
Zhongwang Dou	Ph.D.	Jan. 2017
Mohsen Daghooghi	Ph.D.	Jan. 2015
Diing-wen Peng	Ph.D.	May 2014
Richard Bottom II	M.S.	May 2014
John Sisti	M.S.	July 2013
Zakery Carr	M.S.	May 2013
Wei Xie	Ph.D.	May 2012
Benjamin Knox	M.S.	July 2011
Joseph Richter	M.S.	July 2011
Jared Kuhl	M.S.	July 2011
Todd Dorazio	M.S.	Dec. 2010
Michael Bonarski	M.S.	Aug. 2010

Jun Zha	M.S.	Dec. 2009
Rahul Mulinti	M.S.	July 2009

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

Member, AIAA Fluid Dynamics Technical Committee (Feb. 2019−present).
Member, American Institute of Aeronautics and Astronautics (AIAA).
Member, American Physical Society (APS), Division of Fluid Dynamics (DFD).
Member, NATO RTO Task Group AVTG-282: Unsteady Aerodynamic Response of Rigid Wings in Gust Encounters (2015−present).
Member, NATO RTO Task Group AVT-202: Extension of Fundamental Flow Physics to Practical MAV Aerodynamics (2011−2014).
Member, Low Reynolds Number Aerodynamics Discussion Group (Organized through AIAA Fluid Dynamics Technical Committee).
Reviewer for: Journal of Fluid Mechanics, Physical Review Fluids, Experiments in Fluids, Journal of Fluids & Structures, AIAA Journal, PLOS ONE, Bioinspiration & Biomimetics, AIAA Journal of Aircraft, AIAA Journal of Spacecraft & Rockets, IEEE Journal of Ocean Engineering, Aerospace Science & Technology, Journal of Visualization, Journal of Fluids Engineering, Experimental Thermal & Fluid Science.

DEVELOPMENT ACTIVITIES

Workshop, "Tomographic PIV & Shake-the-Box 4D-PTV One-Day Workshop at APS 2017," organized by LaVision, Inc. (Nov. 18, 2017).
Workshop, "LaVision Tomographic PIV One-Day Workshop at APS 2015," organized by LaVision, Inc. (Nov. 21, 2015).
Workshop (invited along with Z. R. Carr), "Rotating-Wing Flows" with four other experimental and computational investigators, Air Force Research Lab at Wright-Patterson Air Force Base (May 2013).
Workshop, "2012 CMMI CAREER Proposal Writing Workshop," organized by Kansas State U. Division of Continuing Education, hosted by U. Nevada (March 2012).
Workshop, "Application of High-Performance Computing to the Study and Design of Micro Air Vehicles," Air Force Research Lab at Wright-Patterson Air Force Base (Feb. 2010).
Workshop, "Research Grant Writing at UB," SUNY Center for Professional Development (Nov. 2008).

TEACHING

University at Buffalo, The State University of New York Buffalo, NY
MAE 335: Fluid Mechanics, undergraduate level course
Spring 2009, 2010, 2011; Fall 2011, 2012
MAE 338: Fluid Mechanics and Heat Transfer Laboratory, undergraduate level course
Fall 2008, 2009, 2010, 2014; Supervised Instructor Fall 2012
MAE 424: Aerodynamics, undergraduate level course

4 credits with laboratory component: Spring 2012, 2014, 2015, 2016
3 credits, no laboratory component (moved to MAE 339): 2017, 2018, 2019

MAE 498: Undergraduate Research, Fall 2016; Spring 2017, Fall 2018, Spring 2019

MAE 499: Independent Study, undergraduate level, Fall 2010, Spring 2012

MAE 502: Physical Fluid Dynamics, graduate level course, Fall 2009, 2010, 2011; Spring 2014; Fall 2015, 2016, 2017, 2018

Princeton University Princeton, NJ

Substitute lecturer for MAE 335: Fluid Dynamics, undergraduate course (2006–2008)

SERVICE

Professional

Member, AIAA Fluid Dynamics Technical Committee (Feb. 2019−present).

ARO Proposal Review, Mechanical Sciences Division of the Engineering Sciences Directorate, 2018.

NSF Panel Review for Chemical, Bioengineering, Environmental, and Transport Systems (CBET), 2018.

Session Chair: Session L18, Flapping Wings, *70th Annual APS Division of Fluid Dynamics Meeting*, Denver, CO, Nov. 20, 2017.

Abstract Reviewer: *55th AIAA Aerospace Sciences Meeting (Part of Science and Technology Forum, SciTech, held Jan. 2017)*, July 12, 2016.

NSF Panel Review for Chemical, Bioengineering, Environmental, and Transport Systems (CBET), 2016.

Session Chair: Session A27, Biofluids: Flapping, *68th Annual APS Division of Fluid Dynamics Meeting*, Boston, MA, Nov. 22, 2015.

Abstract Reviewer: *54th AIAA Aerospace Sciences Meeting (Part of Science and Technology Forum, SciTech, held Jan. 2016)*, July 1, 2015.

Session Chair: Session G30, Aerodynamics: Flapping and Flexible Wings, *67th Annual APS Division of Fluid Dynamics Meeting*, San Francisco, CA, Nov. 2014.

Abstract Reviewer: *53rd AIAA Aerospace Sciences Meeting (Part of Science and Technology Forum, SciTech, held Jan. 2015)*, June 24, 2014.

NSF Panel Review for Chemical, Bioengineering, Environmental, and Transport Systems (CBET), 2014.

Abstract Reviewer: *52nd AIAA Aerospace Sciences Meeting (Part of Science and Technology Forum, SciTech, held Jan. 2014)*, July 19, 2013.

Session Chair: Session 201-FD-46/APA-34, Low Reynolds Number Vortex Physics, *50th AIAA Aerospace Sciences Meeting*, Nashville, TN, Jan. 2012.

Abstract Reviewer: *42nd AIAA Fluid Dynamics Conference (held June 2012)*, Dec. 2011.

Session Chair: Session 127-FD-31, Leading Edge Vortices and Vortex Interactions, *49th AIAA Aerospace Sciences Meeting*, Orlando, FL, Jan. 2011.

Session Chair: Session 40-FD-13, Pitching, Plunging, and Rotating Wings, *40th AIAA Fluid Dynamics Conference*, Chicago, IL, June 2010.

Session Chair: Session HV, Swimming III, *62nd Annual APS Division of Fluid Dynamics Meeting*, Minneapolis, MN, Nov. 2009.

Session Chair: Session BM, Bio-Fluids: Flight II, *61st Annual APS Division of Fluid Dynamics Meeting*, San Antonio, TX, Nov. 2008.

University

Review of IMPACT Proposals (2016)

School of Engineering & Applied Sciences

Member, SEAS Undergraduate Academic Planning Committee (APC) (Oct. 2014−present).
Marshall for Commencement ceremonies (May 2013, 2015−2018).
Member, EAS 207/208/209 Teaching Faculty search committee (May 2017).
Freshman mentor for EAS 202: Engineering Impact On Society (Spring 2013, 2014).
Lab tours/research discussion for high school students attending National Grid Engineering Camp (July 30, 2013).
MAE Venue creator for annual BEAM TREK outreach event held in May (2010−2013).
Research presentation/lab tour during special tour for Western NY area science teachers (April 2010).
Research presentation for IDEX, Inc. visit to School of Engineering & Applied Sciences (Jan. 2010).
Faculty Advisor, NASA Space Grant Outreach Fellowship student (2009−2010 academic year).
Junior Faculty Panel Member, Future Faculty Workshop (May 2009).

Departmental

Director of Undergraduate Studies in Aerospace Engineering (Oct. 2014−present).
Member, MAE Executive Committee (2014−present).
Member, Undergraduate Studies Committee (May 2010−present).
Career Development Committee (CDC) member for 3 faculty (Spring 2019−present).
Member, Core Strategic Team, MAE Strategic Planning effort (Spring 2018).
Member, Fluid-Thermal Sciences Faculty Search Committee (Spring 2014 search, 2015−2016 search, 2016−2017 search; contributor to 2017−2018 search).
A coordinator for teaching lab upgrades (2008−2013 via Lab Upgrade Subcommittee; 2013−present via Undergraduate Studies Committee).
Proposed the new MAE 339 Aerospace Engineering Lab course (2 cr), co-developed with Dr. Matthew Burge, leveraging upgrade efforts; Burge first taught it in Fall 2017.
Contributor/examiner for Fluid-Thermal Sciences Ph.D. Qualifying Exam, fluids section (2011, 2012, 2014−2017).
Member, MAE Zimmer Scholarship Selection Committee (Fall 2014−Fall 2018).
MAE Open House (multiple per year, 2014−present).
Co-Chair, MAE Ph.D. Teaching Fellows Selection Committee (Fall 2015, Spring 2016).
Member, MAE Teaching Assistant Professor Search Committee (Summer 2014 search, Spring 2016 search).
Member, EAS 230 Teaching Assistant Professor Search Committee (Summer 2015 search, 2015−2016 search).
Co-organizer, MAE Graduate Seminar Series, MAE 503 (Fall 2010−Fall 2011).
MAE Open House: Aerodynamics Lab tours (Spring/Fall, 2010−2014).
Judge, MAE Poster Competition for graduate students (March 2010).
Faculty Advisor, Pi Tau Sigma Mechanical Engineering Honors Society, NY Delta Lambda Chapter at SUNY Buffalo, (2009−2011).
Coordinator, preparation of Fluids & Heat Transfer lab for ABET review (Oct. 2008).