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Education

- 6/88 Ph.D. Department of Aeronautics & Astronautics. MIT. Thesis title: "The evolution of a localized disturbance in a laminar boundary layer". (Supervised by M.T. Landahl, J.H. Haritonidis & S.E. Widnall)
- 9/84 MS. Department of Aeronautics & Astronautics. MIT. (Supervised by J.H. Haritonidis).
- 6/82 Sc.B (Magna cum Laude, with Honors). Division of Engineering, Brown University, Concentration in Fluids and Thermal Sciences.

Professional appointments

- 7/06 - Professor of Engineering, Brown University, Providence RI.
- 7/11 - Professor of Ecology and Evolutionary Biology (courtesy), Brown University, Providence RI
- 10/11 -7/14 Senior Associate Dean for Academic Programs. School of Engineering, Brown University, Providence RI
- 9/99 - 6/06 Associate Professor, Division of Engineering, Brown University, Providence RI.
- 7/98 - 9/99 Principal Research Scientist. Department of Aeronautics & Astronautics. Massachusetts Institute of Technology, Cambridge, MA 02139.
- 7/96 - 6/98 Harold & Esther Edgerton Associate Professor. Department of Aeronautics & Astronautics, Massachusetts Institute of Technology, Cambridge, MA 02139.
- 9/90 - 6/96 Assistant Professor. Department of Aeronautics & Astronautics, Massachusetts Institute of Technology, Cambridge, MA 02139
- 9/88 - 9/90 Post Doctoral Research Associate. Division of Applied Mathematics, Brown University, Providence RI 02912.
- 9/84 - 9/85 Mathematics and Computing Teacher. Nightingale-Bamford School, New York NY.

Publications

Books and volumes authored or edited

1. Application of Microfabrication to Fluid Mechanics. FED 197. Edited by P.R. Bandyopadhyay, K.S. Breuer & C.J. Blechinger. ASME, 1994.
Application of Microfabrication to Fluid Mechanics. Edited by K.S. Breuer, P.R. Bandyopadhyay, & M. Gad-el-Hak. ASME, November 1996.
2. Application of Microfabrication to Fluid Mechanics. Edited by F. Forster, K.S. Breuer & P.R. Bandyopadhyay. ASME, November 1998.

3. Microfluidics 1999. Edited by F. Forster, K.S. Breuer & P.R. Bandyopadhyay. ASME, November 1999.
4. Multimedia Fluid Mechanics. Homsy, G. Aref, H., Breuer, K., Hochgreb, S., Powell, K., Munson, B., Robertson, C., Cambridge University Press May 2000.
5. Microfluidics 2000. K.S. Breuer (editor), ASME November 2000
6. Microfluidics 2001. K.S. Breuer (editor), ASME November 2001
7. Microfluidics 2002. K.S. Breuer (editor), ASME November 2002
8. Microfluidics 2003. K.S. Breuer (editor), ASME November 2003
9. A Gallery of Fluid Motion. Saminy, M., Breuer, K.S., Leal, G. & Steen, P. (editors). Cambridge University Press, 2003.
10. Microscale Diagnostic Techniques. K S. Breuer (editor). Springer-Verlag 2004.
11. Multimedia Fluid Mechanics, Volume II. G. M. Homsy, H. Aref, K. S. Breuer, John W. M. Bush, Christophe Clanet, Marc Fermigier, Simone Hochgreb, J. R. Koseff, B. R. Munson, K. G. Powell, David Quere, J. J. Riley, C. R. Robertson, A. J. Smits, S. T. Thoroddsen, J. M. Wallace Cambridge University Press (2008).

Chapters in books

1. Janson, S., Helvajian, H. & Breuer, K.S. "MEMS-based propulsion systems". in Microengineering for Aerospace Systems. Ed. H. Helvajian. Aerospace Press 1999.
2. Bayt, R.L. & Breuer, K.S. "Fabrication and Testing of Cold Gas Microthrusters". In Micropropulsion for Small Spacecraft – Progress in Astronautics and Aeronautics Vol 187. Ed. M. Micci & A. Ketsdever. AIAA Press 2000.
3. Breuer, K.S. "Lubrication in MEMS", In CRC Handbook on MEMS. Ed. M. Gad-el-Hak. CRC Press, 2001.
4. Breuer, K. S. "Challenges for Lubrication in High Speed MEMS". In Nanotribology. Ed. S Hsu. Kluwer Press. 2002.
5. Breuer, K.S. "Design, Fabrication and Performance of MEMS Actuators for Flow Control". in Flow control and MEMS von Karman Institute Lecture Series. 2002. VKI. St Genevive, Belgium.
6. Breuer, K.S. "Lubrication in MEMS", In CRC Handbook on MEMS (Second Edition) Ed. M. Gad-el-Hak. CRC Press, 2005.
7. Breuer, K.S. "Lorentz Force Control of Turbulence". In Advances in Turbulence, World Scientific Press 2005.
8. Guasto J., Huang, P. and Breuer, K.S. "Evanescent Wave Measurements". In Encyclopedia of Micro and Nano-fluidics. Springer-Verlag 2007.
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10. Breuer, K.S. "Micro-Rockets" in Encyclopedia of Microfluidics. Springer-Verlag (2008).
11. Swartz, S. M., Iriarte-Díaz, J., Riskin, D. K., and K. S. Breuer. "A bird? A plane? No, it's a bat: an introduction to the biomechanics of bat flight". in: Gunnell, G. F., and Simmons, N. B., Editors: Evolutionary history of bats: Fossils, molecules, and morphology. Cambridge University Press (2012).
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Refereed journal articles

1. R. Lueptow, K. Breuer, & J. Haritonidis. (1988), Computer-aided calibration of x-probes using a look-up table, *Expt. Fluids* **6**, 115-118.
2. K. Breuer, J. Haritonidis, & M. Landahl. (1989), The control of transient disturbances in a flat-plate boundary layer through active wall motion, *of A-Fluid Dynamics* **1**, 574-582.
3. K. Breuer & M. Landahl. (1990), The evolution of a localized disturbance in a laminar boundary layer. 2 Strong disturbances, *J. Fluid. Mech.* **220**, 595-621.
4. K. Breuer & J. Haritonidis. (1990), The evolution of a localized disturbance in a laminar boundary layer. 1 Weak disturbances, *J. Fluid. Mech.* **220**, 569-594.
5. J. Cohen, K. Breuer, & J. Haritonidis. (1991), On the evolution of a wave packet in a laminar boundary layer, *J. Fluid. Mech.* **225**, 575-606.
6. K. Breuer & L. Sirovich. (1991), The use of the Karhunen-Loeve procedure for the calculation of linear eigenfunctions, *J. Comp. Phys.* **96**, 277-296.
7. K. Breuer & R. Everson. (1992), On the errors incurred calculating derivatives using Chebyshev Polynomials, *J. Comp. Phys.* **99**, 56-67.
8. K. Breuer & T. Kuraishi. (1994), Transient growth in two-dimensional and three-dimensional boundary layers, *Phys. Fluids*. **6**, 1983-1993.
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12. R. Henry, R. Hansman, & K. Breuer. (1995), Heat transfer variation on protuberances and surface roughness elements, *J. Thermophysics and Heat Transfer* **9**, 175-180.
13. S. Dinavahi, K. Breuer, & L. Sirovich. (1995), Universality of probability density functions in turbulent channel flow, *Phys. Fluids*. **7**, 1122-1129.
14. K. Breuer. (1995), Stochastic Calibration of Sensors in Turbulent Flow Fields, *Expt. Fluids* **19**, 138-141.
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16. E. Piekos & K. Breuer. (1996), Numerical modeling of micromechanical devices using the Direct Simulation Monte Carlo method, *J. Fluids Engineering-Transactions of the ASME* **118**, 464-469.
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18. R. Rathnasingham & K. Breuer. (1997), Coupled fluid-structural characteristics of actuators for flow control, *AIAA J.* **35**, 832-837.
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75. Attila Bergou, Daniel Riskin, Gabriel Taubin, Sharon Swartz & Kenneth S. Breuer “Falling with Style - Bat flight maneuvers”. APS/DFD Annual Meeting. Long Beach CA, Nov 2010.
76. Jennifer Franck, Charles Peguero, Charles Henoch & Kenneth Breuer “Characteristics of Turbulent flow over Superhydrophobic Surfaces”. APS/DFD Annual Meeting. Long Beach CA, Nov 2010.
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130. Strom, B., Kim, D., Mandre, S., & Breuer, K. Parametric dependence of energy harvesting performance with an oscillating hydrofoil, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*. San Francisco, CA, Nov 2014
131. Kim, D., Strom, B., Su, Y., Mandre, S., & Breuer, K. The effect of aspect ratio on the performance of an energy harvesting hydrofoil, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*. San Francisco, CA, Nov 2014
132. Schunk, C., Swartz, S. M., & Breuer, K. S. Near and far wake structures behind freely flying bats, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*. San Francisco, CA, Nov 2014
133. Kiser, J. R. & Breuer, K. S. An out-of-plane velocity component in dielectric barrier discharge actuator flow, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*. San Francisco, CA, Nov 2014
134. Miller, M., Strom, B., Breuer, K., & Mandre, S. Optimization of energy harvesting efficiency of an oscillating hydrofoil: Sinusoidal and non-sinusoidal trajectories, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*. San Francisco, CA, Nov 2014.

135. J Cheney, N Konow, K Middleton, K Breuer, T Roberts, E Giblin, & S Swartz. (2015), Shaping the wings of bats: Muscle and wing skin interactions. *Annual Meeting of the Society of Integrative and Comparative Biology*, Palm Beach, Jan 2015.
136. K Onoue & K Breuer. 3D characterization of leading-edge vortex formation and growth, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA.
137. J Park & KS Breuer. Measurement of strong Marangoni flow near a contact line of a water droplet on hydrophobic surfaces, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA. November 2015.
138. C Schunk, SM Swartz, & KS Breuer. The effect of wing stroke and aspect ratio on the force generation a compliant membrane flapping wing, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA. November 2015.
139. Y Su, M Miller, S Mandre, & K Breuer. The effect of wall proximity on energy harvesting using a pitching and heaving hydrofoil, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA. November 2015.
140. FZ Temel, Z Qu, M McAllaster, C de Graffenried, & K Breuer. Motility modes of the parasite *Trypanosoma brucei*, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA. November 2015.
141. H Vejdani, D Boerma, S Swartz, & K Breuer. The roles of aerodynamic and inertial forces on maneuverability in flapping flight, *Annual Meeting of the American Physical Society, Division of Fluid Dynamics*, Boston MA. November 2015.
142. D Boerma, H Vejdani, T Treskatis, J Cheney, K Breuer, & S Swartz. (2016), Aerodynamic and inertial contributions to recovery from aerial stumbles in seba's short-tailed bat, in INTEGRATIVE AND COMPARATIVE BIOLOGY. volume 56. pp. E262–E262. OXFORD UNIV PRESS INC JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA.
143. G Alon Tzezana & K Breuer. (2016), Unsteady fluid-structure interactions with a heaving compliant membrane wing, in APS Division of Fluid Dynamics Meeting Abstracts. Portland OR.
144. J Kiser & K Breuer. (2016), Unsteady aerodynamics of membrane wings with adaptive compliance, in APS Division of Fluid Dynamics Meeting Abstracts. Portland OR.
145. M Miller, J Cardona, L Block, K Kondo, M Lee, R Lorick, M Manning, I Scherl, F Simeski, A Spaulding, et al. (2016), Results from the field test of two 1 KW oscillating hydrofoil generators in a tidal canal, in APS Division of Fluid Dynamics Meeting Abstracts. Portland OR.
146. J Park, K Breuer, et al. (2016), Nanoscale measurement of apparent slip velocity near a moving contact line, in APS Meeting Abstracts. Portland OR.
147. Z Qu, R Henderikx, & K Breuer. (2016), The swimming behavior of flagellated bacteria in viscous and viscoelastic media, in APS Meeting Abstracts. Portland OR.
148. Y Su, J Cardona, M Miller, S Mandre, & K Breuer. (2016), Vortex wake interactions and energy harvesting from tandem pitching and heaving hydrofoils, in APS Division of Fluid Dynamics Meeting Abstracts. Portland OR.
149. H Vejdani, D Boerma, S Swartz, & K Breuer. (2016), Toward understanding the mechanics of hovering in insects, hummingbirds and bats, in APS Meeting Abstracts. Portland OR.
150. K. Breuer (2017) "Experimental approaches and (very) simple models of bio-inspired membrane aerodynamics" AIAA Aerodynamic Decelerator Systems Conference, Denver CO (Invited)

151. J. Bohnker and K. Breuer. Separated flow control with actuated membrane wings. *Bulletin of the American Physical Society*, 2017.
152. Y. Fan, K.-T. Wu, S. Fraden, Z. Dogic, and K. Breuer. Three-dimensional flow structure in a kinesin- driven active gel. *Bulletin of the American Physical Society*, 2017.
153. W. Lee, M. de Zordo-Banliat, Y. Su, M. Miller, and K. Breuer. Vortex trajectory and wake structure behind an energy harvesting hydrofoil. *Bulletin of the American Physical Society*, 2017.
154. J. Rehm, J. Cheney, K. Breuer, and S. Swartz. The function of wing membrane muscles in bats. In *INTEGRATIVE AND COMPARATIVE BIOLOGY*, volume 57, pages E137–E137. OXFORD UNIV PRESS INC JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA, 2017.
155. Y. Su, K. Onoue, M. Miller, and K. Breuer. Pitch and heave dynamics of an elastically-mounted cyber- physical hydrofoil. *Bulletin of the American Physical Society*, 2017.
156. H. Vejdani, D. Boerma, S. Swartz, and K. Breuer. Dynamical modeling of hovering in insects, humming- birds, and bats. In *INTEGRATIVE AND COMPARATIVE BIOLOGY*, volume 57, pages E171–E171. OXFORD UNIV PRESS INC JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA, 2017.
157. Y. Fan, K. S. Breuer, and F. Team. Simultaneous 3d tracking of passive tracers and microtubule bundles in an active gel. In *APS Meeting Abstracts*, 2017.
158. G. Alon Tzezana and K. Breuer. Thrust, drag and wake structure in flapping compliant membrane wings. *Bulletin of the American Physical Society*, 2018.
159. J. Bohnker and K. Breuer. Integrated sensing and actuation of unsteady flow-induced membrane defor- mations. *Bulletin of the American Physical Society*, 2018.
160. M. Di Luca and K. Breuer. Steady blowing to control the lift and drag on a free shear layer airfoil. *Bulletin of the American Physical Society*, 2018.
161. Y. Fan, K.-T. Wu, S. A. Aghvami, S. Fraden, Z. Dogic, and K. Breuer. The loss of isotropy due to confinement in kinesin-driven active fluids. *Bulletin of the American Physical Society*, 2018.
162. Y. Su and K. Breuer. Using cyber-physical pitch-heave systems for both energy harvesting and propulsion. *Bulletin of the American Physical Society*, 2018.

Keynote presentations and major lectures

(Complete only since 9/99)

1. Invited Lecture Series, Flow control and MEMS, von Karman Institute for Fluid Dynamics. St Genevive, Belgium April 2002
2. Plenary Talk, Active Control of Turbulence. Flow Control Symposium, Tokyo, March 2002
3. Plenary Lecture “Scientific Frontiers in Micro- and Nano-Scale Fluid Dyanmics”. ASME IMECE. New Orleans LA. Nov 2002.
4. Plenary Lecture “Microfluidics – Science and Engineering at the Edge of the Continuum”. Annual Meeting of the American Physical Society. Dallas TX Nov 2002.
5. Invited Lecturer. Flow control and MEMS, von Karman Institute for Fluid Dynamics. Ohio Aerospace Institute. March 2003
6. Invited plenary talk “Active Flow Control” 13th European Turbulence Conference, Aussois France. June 2004.

7. Invited Lectures “Active control of Turbulent Shear flows (Parts I and II). Institute for Mathematical Sciences, National University of Singapore. December 2004.
8. Principal Lecturer “Introduction to Microfluidics” International Centre for Theoretical Physics Summer School on Microfluidics, Trieste (Italy). August 2005.
9. Keynote Lecture “Slip velocities at the nanoscale” ASME Nano2005, Berkeley CA, September 2005.
10. Keynote Lecture. “Experiments in Turbulent Flow Control”. IUTAM Symposium on MEMS and Flow Control. London UK. September 2006.
11. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics University of Michigan. Ann Arbor MI. December 2006.
12. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics Michigan State University. E. Lansing MI. December 2006.
13. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics Iowa State University. Ames IA. December 2006.
14. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics” University of Wisconsin, Madison WI. December 2006.
15. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics University of Minnesota. Minneapolis, MN, December 2006.
16. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics Northwestern University, Evanston IL, March 2007.
17. Invited Seminar (Midwest Mechanics Lecture Series). “Aeromechanics of Bat Flight” Notre Dame University, South Bend IN, March 2007.
18. Invited Seminar (Midwest Mechanics Lecture Series). “Aeromechanics of Bat Flight” Illinois Institute of Technology, Chicago IL, March 2007.
19. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics University of Illinois. Champagne-Urbana IL, March 2007.
20. Invited Seminar (Midwest Mechanics Lecture Series). “Random Motions in Small-Scale Fluid Mechanics Purdue University, West Lafayette IN, March 2007.
21. Plenary speaker. New England Complex Fluid Workshop. Providence RI June 2007.
22. Keynote Speaker. “Quantum Dots in Micro and Nanometer Scale Fluid Mechanics” Dutch FOM Annual Meeting, Eindhoven. NL Jan 2008.
23. Keynote Speaker. “The Aeromechanics of Bat Flight” The International Symposium on Nature-Inspired Technology. Jeju S. Korea, June 2009.
24. Invited Speaker to Air Force Institute of Technology (AFIT) Distinguished Lecture Series, “Compliant Wing Aeromechanics - from Bats to MAVS”. Dayton OH. Dec 2010.
25. University of British Columbia, Institute for Applied Mathematics (IAM)–Pacific Institute for Mathematical Sciences (PIMS) Distinguished Colloquium Speaker. “Bacterial Microfluidics: the physics and engineering of bacterial motility”. Feb 2011
26. Keynote lecture at the International Conference for Microscale Fluid Flow and Heat Transfer, Fukuoka (Japan) “Flows near a contact line with and without evaporation”, September 2011
27. Featured speaker at the Brown University STEM recruitment weekend, April 2012.
28. Keynote speaker, “The Aeromechanics of Bat Flight”, at Israel Conference on Aerospace Sciences, Tel Aviv (Israel). March 2013
29. Keynote Speaker. “Optical Velocimetry at the Nanoscale”. 10th Symposium on Particle Image Velocimetry, Delft (Netherlands), July 2013.

30. Nick and Maggie DeWolf Lecture (Public lecture on Physics), sponsored by the Aspen Center for Physics, Aspen Colorado. Jan 2014.
31. Keynote Speaker. "Fluids and Elasticity" The International Symposium on Nature-Inspired Technology. Sapporo Japan, Feb 2014.
32. Paris Science Lectures: "Swimming at Low Reynolds Number", Ecole Superieure Physique et Chemie de Industrie" (ESPCI), Paris. May 2015.
33. Short Course: "Microscale Fluid Dynamics", Udine, Italy, May 2015.
34. Keynote Lecture, "Bat Flight Aeromechanics and Structured Wakes" Laser applications in Fluid Mechanics, Lisbon Portugal. July 2018.

Invited seminars

(Complete only since 9/99)

2000

- Presentation at AIAA Aerospace Science Meeting on MEMS Pressure sensors, January 2000.
- Presentation at NIST on Nanotribology, March 2000.
- Invited paper at AIAA Fluid Dynamics meeting. Denver CO. June 2000.

2001

- Invited paper at AIAA Aerospace Sciences Meeting, Jan. 2001.
- Northeastern University. "Active Control of Turbulent Flows". Feb 2001.
- Harvard University "Micron scale fluidic transport". October 2001.
- Invited Presentation at "Novel Applications in Microfluidics", DARPA-workshop, Reston VA, Dec 2001.

2002

- Invited Presentation at AIAA Flow Control Conference, St. Louis MO. June 2002.
- Invited Seminar at URI, October 2002.

2003

- Invited presentation, "Bacterial Microfluidics". Cal Tech. Jan 2003.
- Invited presentation, "To Slip or Not to Slip". University of California, Santa Barbara. January 2003.
- Invited Lecturer. AFOSR Workshop in Microfluidics. Los Angeles, CA May 2003.
- Invited presentation, "Revisiting the no slip boundary condition" Technion – Israel Institute of Technology. October 2003
- Invited presentation, "Revisiting the no slip boundary condition" Tel Aviv University. October 2003.
- Invited presentation, "Bacterial Microfluidics". Weizmann Institute of Science. October 2003.

2004

- Invited Seminar "Microfluidics" MIT. March 2004
- Invited Seminar "Bacterial Microfluidics" U. of Maryland". March 2004
- Invited Seminar "Microfluidics" Case Western Reserve University". March 2004

- Invited Seminar “Revisiting the no slip boundary condition” College de France, Paris. June 2004
- Invited Seminar “Revisiting the no slip boundary condition” ESPCI, Paris. June 2004
- Invited Seminar “Bacterial Microfluidics” Marine Biology Laboratory. Woods Hole MA. June 2004.
- Short Course “Microfluidics” University of Queensland, Australia. Nov 2004.
- Invited Seminar “Bacterial Microfluidics”. Australian Institute for Bioengineering and Nanotechnology, Brisbane, Australia. October 2004.
- Invited Seminar “Active Control of Turbulence Shear Flows”. University of Queensland, Brisbane, Australia. Nov 2004.

2005

- Invited Seminar “Revisiting the no-slip boundary condition” Sandia National Laboratory, Albuquerque NM, February 2005
- Invited Seminar “Bacterial Microfluidics” Michigan State University. April 2005
- Invited Lecture “Optical Methods in Microfluidics” ASME/IMECE Symposium. Orlando FL November 2005.
- Invited Seminar. “Microfluidics in Science, Engineering and Biology”. U. Mass. December 2005.

2006

- Invited Lecture “Science and Engineering in Microscale Fluid Mechanics” Lawrence Livermore National Laboratory, Livermore CA, March 2006
- Invited Lecture “Biological Fluid Mechanics – from Bats to Bacteria”. MIT Dept of Civil and Environmental Engineering, Cambridge MA, March 2006.

2007

- Invited Seminar. “Bacterial Microfluidics” University of Chicago, Dept of Physics. February 2007.
- Invited Seminar “Bacterial Microfluidics” Johns Hopkins University. Center for Environmental and Applied Fluid Mechanics. February 2007.
- Invited Seminar “Aeromechanics of Bat Flight”. Mass. Institute of Technology. Dept of Aeronautics and Astronautics. March 2007.
- Invited Seminar. “Random Motions in Small-Scale Fluid Mechanics”. California Institute of Technology. April 2007.

2008

- Invited Speaker “Quantum Dots in Micro and Nanometer Scale Fluid Mechanics” Philips Research Laboratories, Eindhoven (Netherlands) Jan 2008.
- Invited Speaker “Filamentary Mechanics” Twente University (Netherlands) Jan 2008.
- Invited Speaker “Aeromechanics of Bat Flight” Delft University (Netherlands) Jan 2008.
- Invited Speaker “Compliant Membranes in Biological Flight” AFOSR Workshop on Fluid-Structure interactions. Arlington VA. Feb 2008.
- Invited Speaker, “Aeromechanics of Bat Flow” Cambridge University (UK) May 2008.
- Invited Speaker “Mechanics of Bacterial Motility” Royal Institute of Technology, Stockholm, (Sweden) May 2008.

- Invited Speaker “The Physics and Engineering of Bacterial Microfluidics” Massachusetts Institute of Technology, Micro/Nano Technology Seminar Series Cambridge MA Nov 2008.

2009

- Invited Speaker “Drops and Filaments in Microfluidic systems” Department of Physics, University of Lyon, France Feb 2009.
- Invited Speaker “Drops and Filaments in Microfluidic systems” ESPCI, Paris France Feb 2009.
- Invited Speaker “Drops and Filaments in Microfluidic systems” LadHyX, Ecole Superior, Paris France Feb 2009.
- Invited Speaker “The Aeromechanics of Bat Flight”, Dept of Aeronautics, Imperial College, London England, Feb 2009.
- Invited Speaker to Distinguished Speaker Series, Pennsylvania State University, Feb 2009.
- Invited Speaker to “Machines and Organisms” seminar series, Cornell University, March 2009.
- Invited Speaker. “The mechanics of bacterial motility” The Jones Seminar on Science, Technology and Society. Thayer School of Engineering, Dartmouth College. May 2009.
- Invited Speaker to U. Pennsylvania. Dept of Mechanical Engineering and Applied Mechanics “Two problems in micron-scale fluid mechanics” October 2009.
- Invited Speaker to Naval Underwater Warfare Center, Newport RI. “The Physics and Engineering of Bacterial Motility”. December 2009.

2010

- Invited Speaker to NYU Courant Institute “The Physics and Engineering of Bacterial Motility”. April 2010.
- Invited Speaker to NYU-Polytechnic “The aeromechanics of bat flight”. April 2010.
- Invited Speaker to Woods Hole Oceanographic Institute. “Bacterial Motility and Mixing”. July 2010.
- Invited Speaker to Air Force Institute of Technology (AFIT) Distinguished Lecture Series, “Compliant Wing Aeromechanics - from Bats to MAVS”. Dayton OH. Dec 2010.
- Invited Seminar to MIT Physical Mathematics Seminar. “Contact Droplet Deposition and the failure of continuum mechanics”. Dec 2010.

2011

- Invited Seminar to University of British Columbia Chemical Engineering Department Seminar. “Contact Droplet Deposition and the failure of continuum mechanics”. Feb 2011.
- Invited speaker at the University of British Columbia, institute for Applied Mathematics Colloquium, “Bacterial Microfluidics: The physics and engineering of bacterial motility”. Feb 2011.
- Invited seminar at Tufts University “Two problems in micron-scale fluid mechanics” March 2011.
- Invited seminar at Johns Hopkins University. “The aeromechanics of bat flight”. March 2011.
- Invited seminar at the Chinese Academy of Sciences, Laboratory for Nonlinear Sciences “The aeromechanics of bat flight”, September 2011

- Invited seminar at the Chinese Academy of Sciences, Laboratory for Nonlinear Sciences “The mechanics of contact droplet deposition”, September 2011
- Keynote lecture at the International conference for Microscale Fluid Flow and Heat Transfer, Fukuoka (Japan) “Flows near a contact line with and without evaporation”, September 2011
- Invited seminar at Clark University “Swimming in Syrup: The mechanics of bacterial motility”. October 2011
- Invited seminar at New Jersey Institute of Technology “The mechanics of bacterial motility”. December 2011

2012

- Invited seminar, “Bacterial Microfluidics”, at Eindhoven Institute of Technology (Netherlands) January 2012
- Invited seminar, “The Aeromechanics of Bat Flight” at University of Maryland “, April 2012
- Invited seminar, “Biomechanics: from Bacteria to Bats”, UCLA, May 2012.
- Invited speaker at NSF/ARO Workshop on Animal Locomotion in Arlington VA. “The Zen of swimming and Flying”. May 2012.

2013

- Keynote speaker, “The Aeromechanics of Bat Flight”, at Israel Conference on Aerospace Sciences, Tel Aviv (Israel). March 2013
- Keynote Speaker. “Optical Velocimetry at the Nanoscale”. 10th Symposium on Particle Image Velocimetry, Delft (Netherlands), July 2013.

2014

- Invited Speaker. “Swimming in Viscoelastic Media”. Aspen Center for Physics, Winter Workshop on “Active Fluids: Bridging Complex Fluids and Biofluids”, Aspen CO. January 2014.
- Keynote speaker, “Fluids and Elasticity”, at International Conference on Nature-Inspired Technology, Hokkaido (Japan). February 2014.
- Invited speaker, “Fluids and Elasticity”, Dept of Mechanical Engineering, Virginia Tech. April 2014.
- Invited speaker, “Elasticity and bacterial motility”, Dept of Physics, Brandeis University. March 2014.
- Invited lecture, “Adaptive wing structures in bat flight”. ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS). Newport RI. September 2014.
- Invited lecture, “The Aeromechanics of Bat Flight” Dept. of Mechanical Engineering, Stanford University. October 2014.

2015

- Invited Speaker. “Fluids and elasticity: From bats to tidal energy harvesting”. GALCIT, Caltech, Jan. 2015
- Invited Speaker. “Aeromechanics of Bat Flight”. Department of Mechanical Engineering University of Illinois, Feb 2015

- Invited Speaker. “Large-amplitude aeroelastic instabilities explored using a Cyber-Physical system”. University de Pierre et Marie Curie (UPMC) Paris. April 2015.
- Invited Speaker. “Aeromechanics of Bat Flight”. ESPCI, Paris, April 2015.
- Invited Speaker “Membrane Aerodynamics” Wygnanski Feschcrist, Tel Aviv University, June 2015.

2016

- Invited Speaker. “The Aeromechanics of Bat Flight” LadHyX, Paris France, January 2016
- Invited Speaker. “The Aeromechanics of Bat Flight” Department of Mechanical Engineering, Texas A&M University, March 2016
- Invited Speaker. “The Aeromechanics of Bat Flight” Department of Physics. Boston University, April 2016.
- Invited Speaker. “The role of individual personality in bacterial motility”. Cargese Corsica, July 2017
- Invited Speaker. “Flexibility and Flow”. Department of Mechanical Engineering, University of Washington, Seattle WA. Nov 2016.
- Invited Speaker. “The Aeromechanics of Bat Flight”. Department of Organismal Biology, University of California, Berkeley CA Nov 2016.

2017

- Invited Speaker. “Slip flow at a moving contact line”. ICERM workshop on singularities in fluid mechanics, Brown University, March 2017
- Invited Speaker. “Flexibility and Flow” Department of Mechanical Engineering, University of Houston, Houston TX April 2017.
- Invited Talk: “Experimental approaches and (very) simple models of bio-inspired membrane aerodynamics” AIAA Aerodynamic Decelerator Systems Conference, Denver CO. June 2017
- Invited Seminar. “The surprising connection between bat flight and tidal energy harvesting”. Dept. of Mechanical Engineering, Vanderbilt University, Nashville TN. August 2017.
- Invited presentation (with Sharon Swartz) “BioInspired Design”. HHMI Workshop for Professors Program”. October 2017.
- Invited seminar “The surprising connection between bat flight and tidal energy harvesting”. Dept. of Mechanical Engineering, Texas Tech. Lubbock TX. October 2017.
- Invited presentation “Bat flight: dynamics and control”. Workshop in Biological motion and control. Ohio State Math. Bio. Institute (MBI). October 2017

2018

- Invited Speaker. “Bat Flight Aeromechanics and Structured Wakes”. Imperial College (London) March 2018
- Invited Speaker. “Bat Flight Aeromechanics and Structured Wakes” St Anthony Falls Lab, University of Minnesota, October 2018.

Outreach Activities (only started tracking in 2013)

2013

- Featured booth (invited by NSF) explaining our research to the general public at the AAAS Annual Meeting in Boston. Feb 2013
- Featured on “Smarter Every Day” Extended web episode (<http://www.youtube.com/watch?v=LxzyAadoyzY>). April 2013
- Participated in K-12 STEM day at Vartan Gregorian School, April 2013
- Featured speaker and session leader for “Communicating Science” workshop at Brown. June 2013.

2014

- Public lecture at the Aspen Opera House, “How Bacteria Move”, Feb 2014 (over 300 members of the public in attendance)
- Open house for Providence Community, as part of Brown 250th. March 2014
- Presentation to Middle School group from Providence Schools, March 2014
- Science Underground presentation on Bat Flight, Flatbread in Providence RI. December 2014 (with Sharon Swartz), ~ 100 members of the public in attendance.

2015

- Science Visualization Lecture by Nicole Sharp, editor of FuckYeahFluidDynamics.tumblr.com. Public lecture to ~100 attendees (Organizer).
- Science Visualization Hackathon (Organizer). November 13th 2015. 40 students and members of the public

2016

- Public lecture, A Day on College Hill (ADOCH) to students considering attending Brown University. April 2016

2017

- Collaboration with French Mathematician, Cedric Villani, to produce a series of filmed conferences popularizing science. January 2017 (extended to TV distribution in March 2018).

2018

- Science Friday: NPR segment of bat flight, web-video with interviews (with Sharon Swartz), March 2018.
- “Dracula – A song of Love and Death” by Mitch Brian. Kansas Ciuty Actors Theatre. Contributed videos of bat flight for stage production. October 12-21 2018.

Patents

1. “Microturbomachinery” A. H. Epstein, S. D. Senturia, I. A. Waitz, J. H. Lang, S. Jacobson, F. F. Ehrich, M. A. Schmidt, G. K. Ananthasuresh, M. S. Spearing, K. S. Breuer, and S. F. Nagle. U. S. Patent # 5932940. Issued: Aug 3 1999. Patent # 6392313 May 21, 2002.
2. “Method and apparatus for reducing turbulent drag”, George Em Karniadakis, Kenneth Breuer, Vasileios Symeonidis. U.S. Patent #6520455. Issued: Feb 18, 2003

3. "Kinetic Energy Harvesting using Cyber-Physical Systems". Shreyas Mandre, Kenneth Breuer, Benjamin Strom, Michael Miller, Jennifer Franck, Daegyoun Kim US Patent #10087910B2. Issued: Oct 2 2018.

Research in Progress

1. Behavior of elastic structures in microflows, with applications to bacterial motility and micro-devices.
2. Behavior of contact lines in micrometer and nanometer scale flows
3. Vertebrate flight, in particular, bat flight.
4. Energy harvesting from tidal flows.
5. Behavior of elastic structures at high Reynolds number.

Service

University

Completed:

- Faculty Representative for Brown ASME Chapter. (1999 – 2000)
- Faculty Representative for Brown AIAA Chapter. (2000 – 2001)
- Graduate Representative for Fluids, Thermal and Chemical Processes group. (2000 – 2001)
- Member, University committee on Laser Safety (sub-committee of Radiation Safety Committee). (1999 -2004)
- Member, Radiation Safety Committee. (2000 – 2004)
- Member Engineering Executive Committee (2001 – 2004)
- Director of Graduate Studies, Division of Engineering (2001 – 2004)
- Chair faculty search committee, Fluid Mechanics (2003)
- Member of University Steering Committee for Brown - Woods Hole Relations (2002 – 2004)
- Member, University Committee on Resumed Undergraduate Education (2004 – 2008)
- Graduate Representative for Fluids, Thermal and Chemical Processes group. (2005 - 2007)
- Member, Executive Committee, Wayland Collegium (2005 – 2008)
- Member, Engineering Executive Committee (2006)
- Chair, search committee for Micro- and Nano-fluid mechanics faculty.
- Engineering Representative to Undergraduate Admissions office (2006 – 2010).
- Freshman Advisor (2000 – 2009)
- Graduate representative to School of Engineering for Fluids and Thermal Sciences (2009 – 2011)
- Presenter at Brown University Ethics training workshop (BEARCORE). June 2011
- Senior Honors co-coordinator, School of Engineering, (2010 - 2011).
- Tenure, Promotion and Appointments Committee (TPAC) (AY2009-12. Vice chair AY2010-11, Chair AY2011-12)
- Member of University Committee to plan for new Physical Sciences Building (2010-2012).

- Chair of promotion committee for Professor P. Vlahovska
- University Mace Bearer (2010 – 2013)
- Presidential Committee on Undergraduate Curriculum (Sept 2012 – June 2013)
- Chair, Working Committee for the Engaged Scholars Program (Sept 2013 – June 2014)
- Senior Associate Dean for Academic Programs, School of Engineering, (Sept 2011 – June 2014)
- Representative for Fluids and Thermal Sciences (FTS) to Engineering Executive Committee (Jan 2011 – Dec 2014).
- Graduate representative, Fluids and Thermal Sciences (Fall 2014)
- Chair, Committee on the core curriculum, School of Engineering (October 2013 – Jan 2015)
- Faculty representative for ASME Chapter in School of Engineering (Sept 2012 – 2016)
- School of Engineering, Study abroad advisor (September 2015 – 2016)
- Member: Committee on Laboratory Design for New Engineering Building (Fall 2014 - 2017)
- Member, Steering Committee for the Engaged Scholars Program (Sept 2013 – 2017) (Committee assumed inactive)
- Chair, Search committee for new faculty in Fluids and Thermal Sciences (2017)
- Chair, Search committee for new faculty in Fluids and Thermal Sciences (2018-9)
- Chair, Tenure review committee for Prof Shreyas Mandre (Sept 2017 – May 2018)
- Member, selection committee for recent alumni member of the Brown Corporation (Jan 2018)

Current:

- Freshman and Sophomore Advisor (since 1999)
- Member, Academic Priorities Committee. (September 2015 – present); Vice Chair 2017-present.
- School of Engineering, Engaged Scholarship Program representative (September 2015 – present)
- School of Engineering, Curriculum committee (Sept 2016 – present)
- Engineering Executive Committee (Sept 2017 – present)
- Engineering faculty representative for Engaged Scholars Program (2013-present)

Community

Completed:

- Member, AIAA Technical Committee on Aerodynamic Measurement Technologies (1998 – 2001)
- Member, American Physical Society, Division of Fluid Dynamics Publications Committee (1999 – 2002)
- Chair, American Society of Mechanical Engineering Microfluidics Organization Committee (2000 – 2002)
- Vice-Chair, ASME Micro and Nano Fluid Dynamics Technical Committee. (2002 – 2003)
- Member of AIAA Committee on Flow Control, Architectures and Algorithms (2002 – 2007)
- Associate Editor, Journal of Fluids Engineering (2003 – 2006)

- Chairman, ASME Micro and Nano Fluid Dynamics Technical Committee. (June 2004 - 2006)
- Co-Chair. ASME NanoInstitute Committee on Nanoscale Phenomena (Dec 2003 – 2007)
- Associate editor, emicro-nano.com (Microfluidics web site) (Dec 2003 – 2008)
- Member of American Physical Society, Division of Fluid Dynamics Nominations Committee (2004 - 2007)
- Co-Organizer, International Symposium on Fluid Flow and Heat Transfer at the Microscale, Whistler, BC. September 2008.
- Advisory Board for International Symposium on Nature-Inspired Technology, JeJu S. Korea, June 2009.
- Chair APS/DFD Program Committee (Nov 2009- Nov 2010)
- Chair APS/DFD Fellowship Committee (Nov 2010 – Nov 2011)
- Vice Chair, Chair-Elect and Chair, American Physical Society, Division of Fluid Dynamics. (Nov 2009 – Nov 2012)
- Co-organizer, Fourth International Symposium on Fluid Flow and Heat Transfer in Microchannels, Tokyo JP September 2010.
- Co-organizer of NSF Workshop Mathematical and Computational Challenges in Cilia- and Flagella-Induced Fluid Dynamics. Columbus OH, October 2012.
- Chair, APS/DFD Fluid Dynamics Prize Selection Committee. 2015-2016
- Associate Editor Microfluidics & Nanofluidics (Springer), 2003 – 2017

Current:

- Reviewer for numerous archival journals, including: PNAS, Science, Nature, J. Fluid Mech. Phys Fluids, Phys. Rev. Lett., Phys Rev E. Phys Ref Fluids, Microfluidics & Nanofluidics, J. Fluids Engineering, Experiments in Fluids, AIAA Journal, Eur. Journal of Mechanics, Appl, Phys Lett. J. Exp Biology, PLOS One, PLOS Biology (Since 1990).
- Panel reviewer for National Science Foundation, Dutch Academy of Arts and Sciences, German Research foundation, Qatar Research Foundation, European Science Foundation, Israeli Science Foundation. (Since 1990), Office of Naval Research.
- Associate Editor International Journal of Heat Transfer and Fluid Flow (Elsevier) (Since 2007)
- Member of executive committee, Assembly of World Conferences on Experimental Heat Transfer, Fluid Mechanics and Thermodynamics (Since Sept 2009)
- Member, University of Eindhoven (Netherlands) High-Tech Systems Center (HTSC) International Advisory Board.

Honors and awards

- Fellow, American Society of Mechanical Engineers (ASME), 2013.
- Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 2013.
- Fellow, American Physical Society (APS), 2010.
- Paris Sciences Professor. March – May 2015.
- Chair, American Physical Society - Division of Fluid Dynamics (2011-2012).
- Brown University Mace Bearer (2010 – 2013) – lead official university processions (Convocation, Commencement, etc.)

- Midwest Mechanics Lecturer in Fluid Mechanics, 2006/7
- Harold and Esther Edgerton Associate Professor of Aeronautics and Astronautics, MIT 1996-98.
- ONR Graduate Fellowship (NDSEG) 1982-86.
- National Merit Scholar, 1978.
- Keynote Speaker invitations: ASME Nano2005, (Berkeley CA, 2005), IUTAM Symposium on Turbulence Control (London, UK, 2006), International Symposium on Nature-Inspired Technology (Jeju S. Korea, 2009), International Symposium on Fluid Flow and Heat Transfer at the Microscale (Fukuoka, Japan 2011), Israel Conference on Aerospace Sciences (Tel Aviv, Israel 2013), PIV2013 (Delft, Netherlands, 2013), International Symposium on Nature-Inspired Technology (Hokkaido, Japan, 2014).
- NSF/Science Magazine. Visualization Contest: First place 2007
- Featured in mass media: PBS NOVA, *The four-winged dinosaur*. (2008); Science Discovery Channel, *Weird Connections* (2009); BBC, *Invisible Worlds* (2009); NPR Science Friday (2018).
- Invited as external thesis examiner: Royal Institute of Technology, Sweden (1998); Eindhoven Institute of Technology, Netherlands (Jan 2012).

Students supervised (as primary supervisor)

Sc.B. (Honors) theses

At MIT:

1. Winchesley Vixama, "The effects of oscillating vortex generators on the flow about an airfoil." December 1991.
2. Lawrence Kaye, "The effect of oscillating vortex generators on airfoil performance." December 1991.
3. Victor Owuor, "An Investigation of chaos in a compound pendulum." December 1991.
4. Jean Yoshii, "Chaotic dynamics of a double pendulum." December 1991.
5. Patrick A. Cazeau, "The use of vortex frequency for wind speed control." December 1991.
6. Kathryn A. Fricks, "The use of vortex frequency for wind speed control." December 1991.
7. George R. Nagy, "Acoustic damping in a diverging duct." December 1991.
8. Joseph E. Dennis, "Acoustic damping in a diverging duct." December 1991.
9. Jeff LaDelfa, "Measuring low level turbulence in non-ideal conditions." December 1992.
10. Irene Budianto, "Measurement of fluctuating velocities in non-ideal conditions." December 1992.
11. Duane Ludwig, "Optimizing the Boundary layer trip." May 1993.
12. Melissa Wright, "Optimizing the Boundary layer trip." May 1993.
13. Heather Howard, "Unsteady lift on delta wings." December 1993.
14. Mario Campas, "Unsteady lift on delta wings." December 1993.
15. Benjamin Torres, "Control of diffuser separation using bumps." December 1994.
16. Zachira Castro, "Control of diffuser separation using bumps." December 1994.
17. Ben Erwin, "Low drag surfaces for Satellites." December 1995.
18. Yannick Trottier, "Low drag surfaces for Satellites." December 1995.
19. Dylan Glas, "Propulsion for micro-aircraft". June 1997.

20. Jaime Amaya, "Propulsion for micro-aircraft". June 1997.
21. Parag Dave, "Drag reduction using textured surfaces", June 1998.
22. Kelvin Khong, "Drag reduction using textured surfaces", June 1998.

At Brown:

23. Vanvisa Attaset "Mechanics of Confined Drops in Shear Flows, June 2002.
24. James Bird "Dynamics of bacterial flagella entanglement". June 2003.
25. Ilissa Schild "Dynamics of confined Droplets". June 2003.
26. Ravi Sirvanasum. "Design and Performance of a DSP-based PIV analyzer, June 2003.
27. Alexis Crow (Chemical Physics) "Dynamics of DNA molecules near a solid surface" June 2005.
28. Joseph Wofford "Particle image velocimetry in the wake behind bats" June 2005.
29. Emily Israeli "Dynamics of flexible airfoils" June 2006.
30. Ricardo Galvao "Dynamics of flexible airfoils" June 2006.
31. Anthony Zorzos "Characteristics of Droplets emitted from a Taylor Cone. June 2007.
32. Matthew Novick, "Vibration of an aeroelastic wing due to vortex shedding" June 2008.
33. Alex deQuitry "Holographic Imaging of an Electrospray". June 2009.
34. David Gagnon "Synchronization induced by hydrodynamic interactions" June 2010.
35. Ben Howard "High speed photography of ultrasonic atomization" June 2010.
36. Adam Hoffman "Diffusion limited evaporation in microchannels: Evaporative enhancement at the microscale" June 2010.
37. Jun Kudo "Particle Image velocimetry vortex simulation and design of displaced light sheet system" June 2010.
38. Alex Carerre. "Aerodynamic Characteristics of a Compliant Membrane Wing Model using a Dielectric Elastomer", May 2012.
39. Ian Brownstein. "Plasma actuators for control of wind turbine aerodynamics"., May 2013.
40. Benjamin Strom "Energy harvesting from unsteady wing motion", May, 2013.
41. Rebecca Corman "Non-Newtonian effects in micro valve operation", May 2013
42. Ryan McKeon "Personal cooling using a vortex gun", May 2014.
43. Colden Eldridge "Plasma Actuators for Unsteady control of Wind Turbine Aerodynamics", May 2014.
44. Michael Manning "Wake structure behind tandem energy harvesting hydrofoils", May 2016.
45. Walker Lee "Wake structures behind energy harvesting hydrofoils" May 2018.
46. Quincy McKown "Design of a low speed wind tunnel" May 2018.

Sc.M. theses

At MIT:

1. Takeo Kuraishi, "Transient growth in two- and three-dimensional boundary layers." December, 1991
2. Didier Hazan, "A new model for aircraft ice accretion." August 1993.
3. Errol Arkilic, "Gaseous flow in micro-machined channels." January 1994.
4. Margaret Grimaldi, "Roughness effects on the transition to turbulence." May 1994.
5. Ruben Rathnasingham, "Coupled fluid-structural characteristics for actuators for flow control." September 1995.

6. Ed Piekos "Numerical simulation of micro fluid flows." September 1995.
7. D.J. Orr "Roughness effects on aircraft ice accretion." June 1996.
8. Jay Moore, "Measurement of Surface Temperature on a highly-swept wing with suction." June 1996.
9. Ernest Spevak, "Turbulence correlations in confluent boundary layers." September, 1996
10. Benjamin Torres, "Measurement of roughness-enhanced heat transfer using Infra-Red techniques." June 1996.
11. Peter Kwok. "Viscous damping in micromachined devices". June 1999.
12. Nicolas Savoulides. "Dynamics of high speed microfabricated gas bearings". Dec 1999.
13. Eugene Kang. "Modeling and fabrication of actuators for flow control". Jan 2000.
14. Jorge Carretero. "Modeling and testing of a micromachined pumping system". Jan 2001.

At Brown:

15. Pong Yu (Peter) Huang "ElectroOsmotic Mixing in Microchannels" May 2003.
16. Chang-Hwan Choi "Flow rate and slip flows of Liquids in Microchannels". May 2003.
17. Maureen McCamley "Effects of Lorentz force actuation on turbulent channel flow". May 2004.
18. Kevin Wu "Progress towards active control of turbulent shear flows" May 2004.
19. Siran Manghoulehal "Control of bacterial motion". May 2005.
20. Melissa Loureico. "Droplet Deposition". Co-advised with A. Tripathi. May 2008
21. Sean Kitchner. "Mechanics of Bat Bones". Co-advised with S. Swartz. January 2009.
22. Sara Burgland "Modeling channel flow over superhydrophobic surfaces". June 2010.
23. Rick Qi. "High speed motion generated by an oscillating microfiber". June 2010.
24. Jillian Kiser "Plasma flow actuators for improved wind turbine performance", May 2014.
25. Xiongfeng Yi "Microrheology of biological fluids", May 2015.

Engineer's theses

At MIT:

1. Raghav Gorur, "Numerical Techniques Applied to the Simulation of Low Magnetic Reynolds Number Flows and of Eddy Currents in Electromagnetic Levitation Systems." January 1993

Doctoral theses

(Current position listed, if known)

At MIT:

2. Peter O'Sullivan, "Transient growth in laminar pipe flows." (Degree conferred by Brown University) October 1993.
3. Errol Arkilic, "Mass Flows and Tangential Momentum Accommodation in Silicon Micromachined Channels." December 1996. (Program Manager, NSF)
4. Aravind Padmanabhan, "Microfabrication of floating element shear stress sensor for wind tunnel applications." January 1997. (Director of Global Technology, Honeywell)
5. Ruben Rathnasingham, "System Identification and Active Control of Turbulent Boundary Layers". June 1997. (Serial Entrepreneur, Silicon Valley)
6. Robert Bayt "MEMS-based propulsion for space applications" June 1999. (NASA Johnson)

7. DJ Orr, "Performance of Micromachined High Speed Gas Bearings", Sept 1999. (Analyst, MSCI)
8. Rudy King, "Acoustic Receptivity due to Three-Dimensional Surface Roughness." Nov 1999. (Scientist, NASA Langley)
9. Ed Piekos, "Numerical Modeling of Micromachined Devices." Dec 1999. (Scientist, Sandia National Labs)
10. Jinwoo Bae "Active Control of Tip Clearance Flows", June 2001. (Manager, ILJIN Semiconductor, S. Korea)

At Brown:

11. MinJun Kim, "Bacterial Microfluidics", September 2005. (Professor, SMU.)
12. Peter Huang. "Slip flows in Near Wall Viscous Flows" September 2006. (Assoc. Prof, SUNY Binghamton)
13. Jeffrey Guasto, "Micro- and Nano-scale Colloidal Dynamics Near Surfaces", September 2008. (Asst. Prof, Tufts University)
14. Qian Bian, "Two problems in Viscous Flows" May 2010 (Beckman-Coulter)
15. Charles Peguero, "On the Manufacture and Application of Superhydrophobic Surfaces for Skin Friction Reduction in Laminar and Turbulent Flows" December 2011. (Naval Surface Warfare Center)
16. Joseph Bahlman, May 2012 (Ecology and Evolutionary Biology, Co-advised with Professor S. Swartz). (Asst Prof. Cal State San Francisco)
17. Arnold Song, "Aeromechanics of Highly Compliant Structures: Bat wings, compliant membranes and flexibly mounted flat plates" May 2013. (CCREL, Hanover NH)
18. Rye Waldman. PhD Candidate. October 2013. (Post Doc at Iowa State)
19. Cosima Schunk. September 2010 –2016. (Co-advised with Professor S. Swartz).
20. Joon Sik Park, September 2012 – 2016. (Intel Corp.)
21. Kyouhei Inoui, September 2012 – 2016. (Honda Aerospace)
22. Yi Fan, September 2011 – 2018.
23. XiJie Qu September 2014 – 2018.
24. Yunxing Su, September 2013 – present.
25. Jillian Bohnker 2014 – present.
26. Gali Alon, September 2015 – present.
27. Matteo di Luca 2016 – present.
28. Yuanhang Zhu 2018-present
29. Asimanshu Das 2018-present
30. Xiaozhou Fan 2018-present

Post-Doctoral training

(Current position listed, if known)

At MIT:

- Mark Sheplak, 1997 – 1999 (Professor, University of Florida)
- Stuart Jacobson 1997 – 1999 (DEKA)
- Anju Nayar, 1997 – 1999.

At Brown:

- Gengxin Han, 2000 – 2001. (Navistar)
- Johan Westin, 2000 – 2001. (Vattenfall, Sweden)
- Jinil Park, 2000 – 2003. (Professor, Ajou University, S. Korea)
- Michael Muller 2002 – 2003. (Dir. of Engineering, FS-Elliot)
- Xiaodong Tian 2005 – 2006. (Senior Principal Engineer, Hazan & Sawyer)
- David Willis 2006 – 2007. (Assoc. Professor, U.Mass Lowell)
- Tatjana Hubel 2007 – 2009. (Senior Scientist, Roy. Veterinary College)
- Jennifer Franck, September 2009 – 2011. (Lecturer, Brown University)
- Attila Bergou, January 2010 – July 2012 (DE Shaw, NYC)
- Oscar Curet, March 2010 - October 2012 (Asst. Prof., Florida Atlantic University)
- Tony Yu Jan 2011 – Dec 2012. (Software Engineering, indeed.com)
- Bin Liu, Sept 2010 – Aug 2013 (Asst. Prof at UC Merced)
- Rhea von Busse 2010-Aug 2013 (joint supervision with S. Swartz; Education Director, S.Dakota Science Center)
- Daegyoum Kim, May 2013 – July 2014 (Asst. Prof. KAIST, S. Korea)
- Zeynep Temel, May 2014 – October 2015 (Asst Prof, CMU).
- Hamid Vejdani, January 2015 – Sept 2017 (Asst. Prof, Lawrence Technological University).
- Kyohei Onoue, June 2016 – May 2017. (Honda Aerospace).
- Kristy Schleuter-Kuck (2018 – present)
- Varghese Matthai (2018-present)
- Yi Fan (2018 – present)