Megan C. Leftwich, Ph.D.

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Education

Ph.D. 2010 Department of Mechanical and Aerospace Engineering, Princeton University, Princeton
Advisor: Alexander J. Smits
Dissertation: The hydrodynamics of lamprey locomotion

M.A. 2007 Department of Mechanical and Aerospace Engineering, Princeton University, Princeton

B.S. 2005 Department of Mechanical Engineering and Material Science, Duke University, Durham

Positions Held

Primary Appointments

- George Washington University, Washington, DC

  2018–present Associate Professor, Department of Mechanical and Aerospace Engineering
  2012–2018 Assistant Professor, Department of Mechanical and Aerospace Engineering

- Los Alamos National Lab, Los Alamos

  2010–2011 Agnew National Security Postdoctoral Fellow, Extreme Fluids Team
  Advisor: Kathy P. Prestridge

Other, Secondary, and Visiting Appointments

- George Washington University, Washington, DC

  2018-present Secondary Appointment, Department of Biomedical Engineering
  2014–2017 Courtesy Appointment, Department of Biomedical Engineering

- Naval Surface Warefare Center, Carderock Division

  2015 ONR Summer Research Faculty Fellow
  2016 ONR Summer Research Faculty Fellow

Awards and Honors

- **SEAS Faculty Recognition Award,** George Washington University, 2018
  Awarded by the Dean of Engineering to the three highest performing faculty member in the School of Engineering and Applied Science in the previous academic year
- **SEAS Outstanding Young Researcher Award,** George Washington University, 2017
- **ONR Young Investigator Program (YIP) Award**, Office of Naval Research, 2017
- **National Lead Judge**, Siemens Foundation Competition, 2016
- **SEAS Outstanding Young Teacher Award,** George Washington University, 2016
- **Young Researcher Award**, 4$^{\text{th}}$ International Conference on Exp. Fluid Mechanics, Beijing, 2014
- **Presidential Scholarship**, Princeton University, 2005-2010
- **Pratt Fellowship**, Prat School of Engineering, Duke University, 2004
- **Deans Highest Honor List**, Duke University, 2001–2004

Publications

Dr. Leftwich's postdocs and student's are underlined, undergraduate and high school students are in **bold**.

Journal Articles (in progress): This section indicates ongoing research in the Leftwich Lab. Manuscripts listed are expected to be submitted within 6 months

P2. Baumer, A., Grossman, R., Fauci, L.J. and Leftwich, M.C. "Concentric cylinders as a model for human birth" in preparation for *Journal of Royal Society, Interface*

P1. Kulkarni, A. and Leftwich, M.C. "An investigation into the static performance of the sea lion foreflipper" in preparation for *Nature*

Journal Articles (submitted)

S1. John O. Dabiri, Sean P. Colin, Brad J. Gemmell, Kelsey N. Lucas, Megan C. Leftwich, and John H. Costello. "A shared body twitch dictates turning dynamics in primitive and modern swimmers" revision submitted to *Nature*

S2. Baumer, A., Gimovsky, A., Gallagher, M. and Leftwich, M.C. "A synthetic cervix model and the impact of softness on cerclage success" in preparation for *Journal of Royal Society, Interface*

Journal Articles (published)

J16. Parker, C., Araya, D. and Leftwich, M.C. (2017) "The effect of turbine solidity on VAWT wake dynamics" *Experiments in Fluids* 58 (12), 168, doi:10.1007/s00348-017-2451-6

J15. Lehn, A., Thornycroft, P.J.M, Lauder, G.V. and Leftwich, M.C. (2017) "The effect of input perturbation on the performance and wake dynamics of aquatic propulsion in heaving flexible foils" *Physical Review Fluids* 2(2), 023101, doi:10.1103/PhysRevFluids.2.023101

J14. Kulkarni, A., **Patel, R.**, Friedman, C. and Leftwich, M.C. (2017) "A robotic platform to study foreflipper of the California sea lion" *Journal of Visualized Experiments* (119), e54909, doi:10.3791/54909

J13. Tytell, E.D., Leftwich, M.C., Hsu, C.Y., Griffith, B.E., Cohen, A.H, Smits, A.J., Hamlet, C. and Fauci, L. (2016) "The role of body stiffness in undulatory swimming: insights from robotic and computational models" *Physical Review Fluids* 1(7), 073202, doi:10.1103/PhysRevFluids.1.073202

J12. Parker, C., and Leftwich, M.C. (2016) "The effect of tip speed ratio on a vertical axis wind turbine at high Reynolds numbers" *Experiments in Fluids* 57(5), 74, doi:10.1007/s00348-016-2155-3

J11. Posa, A., Parker, C., Leftwich, M.C. and Balaras, E. (2016) "Wake structure of a single Vertical Axis Wind Turbine" *International Journal of Heat and Fluid Flow* 61(A), 75-84, doi:10.1016/j.ijheatfluidflow.2016.02.002

J10. **Lehn, A.**, **Baumer, A.** and Leftwich, M.C. (2016) "An experimental approach to a simplified model of human birth" *Journal of Biomechanics* 49(11), pp. 2313-2317 doi:10.1016/j.jbiomech.2015.11.046

J9. Mejia-Alvarez, R., Wilson, B., Leftwich, M.C. Martinez, A. A., and Prestridge, K.P. (2015) "Design of a fast diaphragmless shock tube driver" *Shock Waves* 25(6), 635-650, doi:10.1007/s00193-015-0579-y

J8. Friedman, C., **Joel, B. W.**, **Schult, A. R.** and Leftwich, M.C. (2015) "Noninvasive 3D geometry extraction of a Sea lion foreflipper" *Journal of Aero Aqua Bio-mechanisms* 4(1), 25-31

J7. Friedman, C. and Leftwich, M. C. (2014). "The kinematics of the California sea lion foreflipper during forward swimming." *Bioinspiration & Biomimetics* 9(4), 046010, doi:10.1088/1748-3182/9/4/046010

J6. I. Yakub, A. Plappally, M.C. Leftwich, K. Malatesta, **K. C. Friedman**, S. Obwoya, F. Nyongesa, A. Usoro, R. Rivera, S. Piascowy, A. Maiga, A. B. O. Soboyejo and W. O. Soboyejo (2012). "Porosity and Filtration Characteristics of Frustum-Shaped Ceramic Water Filters." *Journal of Environmental Engineering* 139(7), 986-994, doi:10.1061/(ASCE)EE.1943-7870.0000669

J5. Leftwich, M.C., Tytell, E.D., Cohen, A.H. and Smits, A.J (2012). "Wake structures behind a swimming robotic lamprey with a passively flexible tail." *Journal of Experimental Biology* 215, 416-425, doi:10.1242/jeb.061440

J4. Keith W. Moored, Peter A. Dewey, Megan C. Leftwich, Hilary Bart-Smith and Alexander J. Smits (2011) "Bio-inspired propulsion mechanisms based on lamprey and manta ray locomotion." *Marine Technology Society Journal* 45 (4), 110118

J3. Anand Plappally, Haoqian Chen, Wasiu Ayinde, Samson Alayande, Andrew Usuro, **Katie C. Friedman**, Enoch Dare, Taiwo Ogunyale, Ismaiel Yakub, Megan C. Leftwich, Karen Malatesta, Ron Rivera, Larry Brown, Alfred Soboyejo and Winston Soboyejo (2011) "A Field Study on the Use of Clay Ceramic Water Filters and Influences on the General Health in Nigeria." *Health Behavior and Public Health* Vol 1(1): 1–14

J2. Leftwich, M.C. and Smits, A.J. (2011) "Thrust production in a mechanical swimming lamprey." *Experiments in Fluids* Vol 50(5), pp 1349–1355, doi:10.1007/s00348-010-0994-x

J1. Hultmark, M., Leftwich, M.C., and Smits, A.J. (2007) "Flowfield measurements in the wake of a robotic Lamprey." *Experiments in Fluids* Vol 34, pp 683–690, doi:10.1007/978-3-642-11633-9_5[1]

Full-Length Reviewed Conference Proceedings

C7. Posa, A., Parker, C., Leftwich, M.C. and Balaras, E. (2015) "The wake of a single vertical axis wind turbine," Proceedings of the Ninth International Symposium on Turbulence and Shear Flow Phenomena, 1D-2.

C6. Leftwich, M.C., **Joel, B.** and Friedman, C. (2014) "Sea Lion Swimming Kinematics and Geometry for Robotic Flipper Design," Proceedings of the 6th International Symposium on Aero and Aqua Bio-Mechanisms, pages 181-187.

C5. Leftwich, M.C., Parker, C. and Barskey, D., (2014) "Phase averaged wake measurements of Vertical Axis Wind Turbines," Proceedings of the 4th International Conference on Experimental Fluid Mechanics[2].

C4. Barskey, D., Posa, A., Rahromostaqim, M., Balaras, E. and Leftwich, M.C., (2014) "Experimental and Computational Wake Characterization of a Vertical Axis Wind Turbine," 32nd AIAA Applied Aerodynamics Conference, AIAA Aviation and Aeronautics Forum and Exposition Proceedings, doi: 10.2514/6.2014-3141.

C3. Friedman, G., Mejia-Alvarez, R., Prestridge, K.P., and Leftwich, M.C. (2012) "Shock-Driven Mixing: Experimental Design and Initial Conditions." Shock Compression of Condensed Matter AIP Conference Proceedings, Vol. 1426, P 1647-1650. doi:10.1063/1.3686602.

C2. Leftwich, M.C., Smits, A.J. (2011) "The role of tail resonance in thrust production and wake formation," 41st AIAA Fluid Dynamics Conference and Exhibit Proceedings, doi:10.2514/6.2011-3437.

C1. Leftwich, M.C., Yakub, I., Plappally, A., Soboyejo, A.B.O., and Soboyejo, W.O. (2009) "Understanding the Filtròn Ceramic Water Filter," Disinfection 2009 – International Ceramic Pot Filter Workshop Proceedings, pp121-128.

[1] Appeared as chapter 5 (pp 45-52) in *Animal Locomotion*, Graham K. Taylor, Michael S. Triantafyllou and Cameron Tropea (eds.). Springer-Verlag 2010

[2] Winner of the Outstanding Young Research Award

Non-Reviewed Abstracts and Conference Presentations

A65. Leftwich, M.C., Dabiri, J.O., Colin, S., Gemmell, B. J., Lucas, K. N. and Costello, J.H., (2018) "The relationship between torque and body shape of maneuvering swimmers " 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, USA. Bulletin of the American Physical Society

A64. Perrotta, G. M., Schultz, M. P. and Leftwich, M.C. (2018) "Hydrodynamic significance of sea lion skin texture " 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, USA. Bulletin of the American Physical Society

A63. Kularani, A., Fish, F. and Leftwich, M.C. (2018) "Sea lion's use their foreflippers as a static wing while maneuvering" 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, USA. Bulletin of the American Physical Society (poster).

A63. Kashi, E., Kularani, A., **Amechi, A.**, **Patel, R.** and Leftwich, M.C. (2018) "The Flow Structures Generated by a Robotic Sea Lion Foreflipper" 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, USA. Bulletin of the American Physical Society

A62. Baumer, A., **Weigel, M.**, Gimovsky, A., and Leftwich, M.C. (2018) "Impact of cervix geometry and stitch material on success of cerclage procedure " 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, USA. Bulletin of the American Physical Society

A61. Leftwich, M.C., Kulkarni, A., (2018) "The performance of a sea lion's foreflipper as a static wing" 12th European Fluid Mechanics Conference, Vienna, Austria.

A60. Leftwich, M.C., Baumer, A. (2018) "'A biomechanical investigation of the softening cervix" 8th World Congress of Biomechanics, Dublin, Ireland. P4069 (poster).

A59. Leftwich, M.C., Kularani, A., Perrotta, G., Kashi, E. (2018) "'The performance of a sea lion's foreflipper as a static wing" 8th World Congress of Biomechanics, Dublin Ireland. P4513 (poster).

A58. Leftwich, M.C., Kularani, A., Perrotta, G., Kashi, E. (2018) "Force production of the California sea lion foreflipper" 18th U.S. National Congress for Theoretical and Applied Mechanics, TS12: MS204.

A57. Costello, J.H., Colin, S., Dabiri, J.O. and Leftwich, M.C. (2017) "Role of body surface pressure and kinematics in fish turning" 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, USA. Bulletin of the American Physical Society V62 P332.

A56. Kularani, A. and Leftwich, M.C. (2017) "Aerodynamic Tests on a Static California Sea Lion Flipper" 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, USA. Bulletin of the American Physical Society V62 P177.

A55. Parker, C.M., **Hummels, R.** and Leftwich, M.C. (2017) "Flow measurement behind a pair of vertical-axis wind turbines" 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, USA. Bulletin of the American Physical Society V62 P417.

A54. Baumer, A., **Codrington, P.**, **Amechi, A.** and Leftwich, M.C. (2017) "The physical mechanism of successful treatment for cervical insufficiency" 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, USA. Bulletin of the American Physical Society V62 P157.

A53. **Palumbo, D.**, Bulusu, K.V., Cohen, C., Hernandez, P., Leftwich, M.C. and Plesniak, M.W. (2017) "Filter feeding mechanics of the silver carp (*hypophthalmichthys molitrix*) regarding porous gill rakers" 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, USA. Bulletin of the American Physical Society V62 P399.

A52. Kulkarni, A. and Leftwich, M.C. (2017) "The static performance of a sea lion foreflipper." 2017 Research Symposium on Environmental and Applied Fluid Dynamics, University of Maryland, College Park, MD, May 26, 2017.

A51. Baumer, A., Grossman, R., Fauci, L.J. and Leftwich, M.C. (2017) "An experimental study of human birth models" 6th Annual Winter Workshop on Neurolocomotion, New Orleans, USA (poster).

Z50. Kulkarani, A., **Patel, R.** and Leftwich, M.C. (2016) "A study of sea lion hydrodynamics using a robotic foreflipper platform" 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, USA. Bulletin of the American Physical Society V61 N20 P339

A49. Baumer, A., Grossman, R., Fauci, L.J. and Leftwich, M.C. (2016) "An experimental study of human birth models" 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, USA. Bulletin of the American Physical Society V61 N20 P311

A48. Grossman, R., Baumer, A., Fauci, L.J. and Leftwich, M.C. (2016) "A numerical investigation of a simplified human birth model" 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, USA. Bulletin of the American Physical Society V61 N20 P310

A47. Parker, C.and Leftwich, M.C. (2016) "Effective solidity in vertical axis wind turbines" 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, USA. Bulletin of the American Physical Society V61 N20 P223

A46. Kularani, A. A., **Patel, R.**, Friedman, C. and Leftwich, M.C. (2016) "Hydrodynamics and kinematics of sea lion swimming" Society of Engineering Science 53rd Annual Technical Meeting (SES2016), College Park, USA.

A45. Leftwich, M.C. (2016) "An investigation into sea lion swimming" Frontiers in Applied and Computational Mathematics (FACM) 2016, Newark, USA.

A44. Parker, C.M and Leftwich, M.C. (2016) "The flow surrounding a vertical axis wind turbine" 2016 Research Symposium on Environmental and Applied Fluid Dynamics, Johns Hopkins University, Baltimore, MD, May 20, 2016.

A43. Leftwich, M.C., **Patel, R.**, Kulkarni, A., and Friedman, C. (2016) "A robotic platform for studying sea lion thrust production" APS March Meeting 2016, Baltimore, USA. Bulletin of the American Physical Society V61 N1 P1479.

A42. **Patel, R.**, Friedman, C. and Leftwich, M.C. (2016) "A robotic platform to investigate the fluid dynamics of sea lion swimming" 2016 Ocean Sciences Meeting, New Orleans, USA (poster).

A41. Leftwich, M.C. (2016) "An investigation into the role of fluid dynamics in human birth." 8th International Bio-Fluids Symposium 2016, Pasadena, Ca, USA. Meeting proceedings, P51.

A40. Baumer, A., Leftwich, M.C., and Katija, K. (2016) "Larvacean locomotion: a kinematic investigation using ROV-sampled, high-definition videos" Society for Integrative & Comparative Biology Annual Meeting 2016, Portland, Or, USA. Integrative & Comparative Biology Vol. 56, pp. E13-E13

A39. Parker, C.M, **Schult, A.** and Leftwich, M.C. (2015) "The effects of Reynolds number, tip speed ratio, and solidity in VAWTs" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA. Bulletin of the American Physical Society V60 N21 P241.

A38. Baumer, A., Katija, K. and Leftwich, M.C. (2015) "Larvacean kinematics: a biological model of flapping flexible foils" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA. Bulletin of the American Physical Society V60 N21 P534.

A37. Lehn, A.M., Colin, S.P., Costello, J.H., Leftwich, M.C. and Tytell, E.D. (2015) "Volumetric flow around a swimming lamprey" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA. Bulletin of the American Physical Society V60 N21 P535.

A36. Friedman, C., **Watson, M.**, **Zhang, P.** and Leftwich, M.C. (2015) "Non-invasive 3D geometry extraction of a Sea lion foreflipper" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA. Bulletin of the American Physical Society V60 N21 P536.

A35. Pealatare, R., Baumer, A., Fauci, L. and Leftwich, M.C. (2015) "A numerical investigation of a simplified human birth model" 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, USA. Bulletin of the American Physical Society V60 N21 P442.

A34. Leftwich, M.C. (2015) "Simplified fluid dynamic models for human birth," Computational Fluid Dynamics (CFD) in Medicine and Biology II, Albufeira, Portugal. Meeting proceedings, P??.

A33. **Lehn, A.M.** and Leftwich, M.C. (2015) "The effect of input perturbation on a heaving panel," Sixth International Symposium on Bifurcation and Instabilities in Fluid Dynamics, Paris, France. Meeting proceedings, P28.

A32. Leftwich, M.C. and Friedman, C. (2014) "The hydrodynamics and kinematics of sea lion swimming," 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, USA. Bulletin of the American Physical Society V59 N20 P215.

A31. **Baumer, A.**, **Lehn, A.**, Grotberg, J and Leftwich, M.C. (2014) "An experimental and theoretical approach to a simplified model of human birth," 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, USA. Bulletin of the American Physical Society V59 N20 P393.

A30. **Lehn, A.**, Thornycroft, P.J.M, Lauder, G.V. and Leftwich, M.C. (2014) "The effect of input perturbations on swimming performance," 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, USA. Bulletin of the American Physical Society V59 N20 P8.

A29. Parker, C. and Leftwich, M.C. (2014) "Wake visualization behind multiple VAWTs in a wind tunnel using sPIV," 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, USA. Bulletin of the American Physical Society V59 N20 P253.

A28. Balaras, E., Posa, A. and Leftwich, M.C. (2014) "A numerical investigation of the wake structure of vertical axis wind turbines," 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, USA. Bulletin of the American Physical Society V59 N20 P253.

A27. **Baumer, A.**, **Lehn, A.**, Grotberg, J. and Leftwich, M.C. (2014) "An Experimental and Theoretical Model of Simplified Childbirth." BioMedical Engineering Society 2014 Annual Meeting, San Antonio, USA (Poster).

A26. **Baumer, A.**, **Lehn, A.**, and Leftwich, M. C. (2014) "Simplified models of human birth." National Science Foundation Fluid Dynamics of Living Systems Workshop, Arlington, Va, USA (Poster).

A25. **Lehn, A.**, Thornycroft, P.J.M, Lauder, G.V. and Leftwich, M. C. (2014) "The effect of input perturbations on swimming performance." National Science Foundation Fluid Dynamics of Living Systems Workshop, Arlington, Va, USA (Poster).

A24. Friedman, C., and Leftwich, M.C. (2014) "Sea Lion Flipper Geometry and Kinematics Extraction.." National Science Foundation Fluid Dynamics of Living Systems Workshop, Arlington, Va, USA (Poster).

A23. **Baumer, A.**, **Lehn, A.** and Leftwich, M.C. (2014) "The fluid dynamics of human birth." 7th World Congress of Biomechanics, Boston, USA.

A22. **Baumer, A.**, **Lehn, A.** and Leftwich, M.C. (2013) "The role of amniotic fluid in force transfer during human birth," 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, USA. Bulletin of the American Physical Society V58 N18 P105.

A21. Barsky, D. and Leftwich, M.C. (2013) "The wake of a single vertical axis wind turbine," 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, USA. Bulletin of the American Physical Society V58 N18 P346.

A20. Rahro-Mostaqim, M., Posa, A., Balaras, E. and Leftwich, M.C. (2013) "Large-eddy simulations of a single vertical axis wind turbine," 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, USA. Bulletin of the American Physical Society V58 N18 P346.

A19. **Baumer, A.**, **Lehn, A.** and Leftwich, M.C. (2013) "The role of amniotic fluid in force transfer during human birth," 2013 Biomedical Engineering Regional Career Conference (SEMABECC), Washington, DC, USA (Poster).

A18. **Lehn, A.** and Leftwich, M.C. (2013) "The Role of Fetal Offset in Removal Force During Human Delivery." BioMedical Engineering Society 2013 Annual Meeting, Seattle, USA (Poster).

A17. Leftwich, M.C. and Helfers, E. D. (2013) "Words to numbers, numbers to words," 2013 Lilly Conference of College and University Teaching, Bethesda, USA (Poster).

A16. Leftwich, M.C. (2013) "Lamprey swimming: a hydrodynamic approach," 2013 SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, USA. Bulletin P186.

A14. **Lehn, A.** and Leftwich, M.C. (2012) "The fluid dynamics of human birth," 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, USA. Bulletin of the American Physical Society V57 N17 P23.

A14. **Najdzin, D.**, **Pardo, E.**, Leftwich, M.C., and Bardet, P.M. (2012) "Flow structures in the wake of heaving and pitching foils," 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, USA. Bulletin of the American Physical Society V57 N17 P344.

A13. **Pardo, E.**, **Najdzin, D.**, Leftwich, M.C., and Bardet, P.M. (2012) "Force measurement in heaving and pitching foils," 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, USA. Bulletin of the American Physical Society V57 N17 P344.

A12. Leftwich, M.C., Mejia-Alvarez, R., and Prestridge, K.P. (2011) "A pneumatic driver for shock wave production," 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, USA. Bulletin of the American Physical Society V56 N18 P24.

A11. Mejia-Alvarez, R., Leftwich, M.C., and Prestridge, K.P. (2011) "Vertical Shock Tube for simultaneous velocity and concentration measurements of Richtmyer-Meshkov Instabilities," 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, USA. Bulletin of the American Physical Society V56 N18 P24.

A10. Tytell, E., Leftwich, M.C., Hsu, C.Y., Cohen, A., Fauci, L., Smits, A.J. (2011) "The role of stiffness in wake production for anguilliform swimmers," 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, USA. Bulletin of the American Physical Society V56 N18 P527.

A9. Mejia-Alvarez, R., Leftwich, M.C., Friedman, G., and Prestridge, K.P. (2011) "Laser Diagnostics for Simultaneous Measurements of Velocity and Concentration in Richtmyer-Meshkov Instabilities." 17th Biennial International Conference of the APS Topical Group on Shock Compression of Condensed Matter, Chicago, IL USA, Bulletin and the American Physical Society V56 N6 P9.

A8. Friedman, G., Mejia-Alvarez, R., Leftwich, M.C., and Prestridge, K.P. (2011) "Shock-Driven Mixing: Experimental Design and Initial Conditions." 17th Biennial International Conference of the APS Topical Group on Shock Compression of Condensed Matter, Chicago, IL USA, Bulletin and the American Physical Society V56 N6 P68.

A7. Leftwich, M.C., Mejia-Alvarez, R., Friedman, G., and Prestridge, K.P. (2011) "Motivation, design and fabrication of the new vertical shock tube." Postdoc Research Day, Los Alamos National Laboratory, June 16, 2011 (Poster)[3].

A6. Leftwich, M.C. and Smits, A.J. (2010) "Tail flexibility and resonance in thrust production of a robotic lamprey," 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, USA, Bulletin of the American Physical Society V55 N17.

[3]Winner of the Outstanding Poster Award, Honorable Mention

A5. Leftwich, M.C. and Smits, A.J. (2009) "Role of Flexibility in Thrust Production in a Mechanical Swimming Lamprey," 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, USA, Bulletin of the American Physical Society V54 N19 P162.

A4. Leftwich, M.C. and Smits, A.J. (2008) "Thrust Production in a Mechanical Swimming Lamprey," 61st Annual Meeting of the APS Division of Fluid Dynamics, San Antonio, USA, Bulletin of the American Physical Society V53 N15 P102.

A3. Leftwich, M.C. and Smits, A.J. (2007) "A Study of a Mechanical Swimming Lamprey," 60th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, USA, Bulletin of the American Physical Society V52 N12 P60.

A2. **Fang, L.**, **Maas, D.**, Leftwich, M.C. and Smits, A.J. (2007) "A Study of a Mechanical Swimming Dolphin," 60th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, USA, Bulletin of the American Physical Society V52 N12 P108.

A1. Hultmark, M., Leftwich, M.C. and Smits, A.J. (2006) "A Study of a Mechanical Swimming Lamprey," 59th Annual Meeting of the APS Division of Fluid Dynamics, Tampa Bay, USA, Bulletin of the American Physical Society V51 N18 P3.

Grants and Contracts

Current

1. **ONR Award, number not yet assigned:** 01/01/2019–09/30/2019
   Title: *Science Education through Independent Research Projects Inspired by the Smithsonian National Zoo*
   Investigators: M. C. Leftwich (PI)
   Agency: Office of Naval Research
   Award: $27,595
2. **ONR Young Investigator Program (YIP) Award N00014-17-1-2248:** 06/01/2017–05/31/2020
   Title: *Sea lion swimming: a model for efficient, hydrodynamically quiet propulsion*
   Investigators: M. C. Leftwich (PI)
   Agency: Office of Naval Research
   Award: $515,847
3. **ONR Award N00014-17-1-2312:** 07/01/2017–06/30/2020
   Title: *Investigating Sea Lion Locomotion as the Basis for Shape Changing UUVs*
   Investigators: M. C. Leftwich (PI), F. E. Fish, J. Tangorra
   Agency: Office of Naval Research
   Award: $1,414,399 (To MCL: ≈$365K)
4. **NSF-CBET #1604876:** 09/01/2016–08/31/2019
   Title: *Bio-inspired efficient pulsatile locomotion*
   Investigators: M. C. Leftwich (PI)
   Agency: National Science Foundation
   Award: $288,377

Completed

1. **NSF-DBI: RHASS Extension to #1437611:** 6/1/20016–03/30/2017, $3,000
2. **NSF-CBET #1437611:** 4/1/2014–3/30/2017
   Title: *EAGER: The fluid dynamics of human birth*
   Investigators: M. C. Leftwich (PI)
   Agency: National Science Foundation
   Award: $100,000
3. **STEM Academy Teaching Innovation:** 1/1/2016–6/30/2016
   Title: *MOOC videos for a non-MOOC class*
   Investigators: M. C. Leftwich (PI)
   Agency: George Washington University STEM Academy
   Award: $2,000

4. **GWU University Facility Fund:** 7/1/2014–6/30/2015
   Title: *Sea lion swimming: a model for hydrodynamically quite swimming*
   Investigators: M. C. Leftwich (PI)
   Agency: George Washington University Office of the Vice President for Research
   Award: $15,000
5. **GWU IBE Award:** 10/1/2012–6/30/2013
   Title: *The fluid dynamics of human birth*
   Investigators: M. C. Leftwich (PI)
   Agency: George Washington University Institute of Biomedical Engineering
   Award: $10,000

Invited Seminars

- "The hydrodynamics of sea lion swimming." Caltech, GALCIT seminar series, April 20, 2018.
- "The wake structures of rotating airfoils." Johns Hopkins University, Center for Environmental and Applied Fluid Mechanics (CEAFM) seminar series, February 16, 2018.
- "The hydrodynamics of sea lion swimming." University of Rochester, Mechanical Engineering Seminar Series, September 15, 2017.
- "How sea lions swim." Smithsonian Institution, National Museum of Natural History, Zoology Seminar Series, May 31, 2017.
- "The hydrodynamics of sea lion locomotion." ARL/Penn State University, Fluid Dynamics Seminar Series, April 6, 2017.
- "A simplified model to understand the fluids dynamics of human birth." Thirteenth Annual Symposium of the Burgers Program for Fluid Dynamics, University of Maryland, November 16, 2016.
- "An investigation into the role of fluid dynamic in human birth." George Washington University BME Day, November 11, 2016.
- "The hydrodynamics of sea lion locomotion." University of Houston, Fluid Dynamics Seminar Series, October 20, 2016.
- "The fluid dynamics of living systems: sea lion swimming and human birth." Stanford University, Fluid Dynamics Seminar Series, October 4, 2016.
- "How sea lions swim." Georgia Tech, Physics of Living Systems Seminar Series, September 13, 2016.
- "The fluid dynamics of living systems." The George Washington University, What's our Work (WoW^{TALK}) seminar series, April 6, 2016.
- "The hydrodynamics of sea lion swimming." University of New Orleans, Physics Department Seminar Series, January 20, 2016.
- "The evolution of engineering" TED_{X} Youth, Columbia Heights, November 21, 2015.
- "Understanding sea lion locomotion in the heart of DC." Friends of the National Zoo Dinner Series, October 1, 2015.
- "The hydrodynamics of sea lion swimming." Smithsonian Conservation Biology Institute Seminar Series, February 20, 2015.
- "The fluid dynamics of living systems: sea lion swimming and human birth." Johns Hopkins University, Mechanical Engineering Seminar Series, October 16, 2014.
- "A model to study the fluid forces of human birth." Amerimech2014, Virginia Tech, May 22, 2014.
- "Sea lion kinematics and hydrodynamics." Extreme Flows Workshop, Princeton University, May 17, 2014.
- "The fluid dynamics of human birth." Tulane University CCS Seminar Series, October 22, 2013.
- "The hydrodynamics of swimming: from sperm to Michael Phelps (but mostly lampreys)." University of Kentucky, Department of Mechanical Engineering William Maxwell Reed Seminar, October 8, 2013.
- "The hydrodynamics of swimming: from sperm to Michael Phelps (but mostly lampreys)." University of Washington Applied Math Department, September 24, 2013.
- "The hydrodynamics of swimming: from sperm to Michael Phelps (but mostly lampreys)." GW MAE Fluid Mechanics Seminar Series, May 9, 2013.

- ◇ "The fluid dynamics of human birth." The GW Symposium on Biomedical Engineering and Computing, May 2, 2013.
- ◇ "The hydrodynamics of lamprey swimming." Tulane University, Winter Workshop on Neurolocomotion, January 17, 2013.
- ◇ "Experimental investigations of the Richtmeyer-Meshkov Instability." University of Maryland, Department of Aerospace Engineering Lecture Series, March 16, 2012.
- ◇ "Experimental investigations of the Richtmeyer-Meshkov Instability." California Institute of Technology, GALCIT Lecture Series, October 14, 2011.
- ◇ "The role of flexibility and resonance in primitive, aquatic propulsion." Neutron Science and Technology Group Summer Lecture Series, Los Alamos National Laboratory, June 2, 2011.
- ◇ "Motivation, design and fabrication of the new vertical shock tube." Predictive Science Panel, Los Alamos National Laboratory, April 12, 2011 (Poster).
- ◇ "Lampreys and Shock Waves: looking for energy solutions in unlikely places." Department of Mechanical and Aerospace Engineering, George Washington University. February 24, 2011.
- ◇ "Lampreys and Shock Waves: looking for energy solutions in unlikely places." Department of Mechanical and Aerospace Engineering, Syracuse University. February 4, 2011.
- ◇ "Role of Flexibility in Thrust Production in a Mechanical Swimming Lamprey." Fluids Lab, Physics Division, Los Alamos National Lab. April 16, 2010.
- ◇ "The Hydrodynamics and Kinematics of Lamprey Swimming." Animal and Plant Biomechanics Group, University of North Carolina. March 15, 2010.
- ◇ "Role of Flexibility in Thrust Production in a Mechanical Swimming Lamprey." St. Anthony Falls Laboratory, University of Minnesota. March 10, 2010.
- ◇ "Using Ceramic Filters to Purify Water in Abeokuta, Nigeria." Princeton Institute for International and Regional Studies, Program in African Studies, Indaba Series. April 1, 2009.

Advising and Mentoring

Current Ph.D. Students

- ◇ Elizabeth Gregorio, Ph.D Expected 2023 (Co-advised with Elias Balaras)
- ◇ Alexa Baumer, Ph.D. Expected 2020
- ◇ Aditya Kulkarni, Ph.D. Expected 2020

Current M.S. Students

- ◇ Elija Kashi, M.S. Expected 2019

Current Postdoctoral Fellows

- ◇ Gino Perrotta, Ph.D.

Previous Ph.D. Students

- ◇ Colin Parker, Ph.D., 2017.
  Thesis: "An investigation into the aerodynamics surrounding vertical-axis wind turbines."
  Currently an Engineer at the Naval Surface Warfare Center at Carderock, MD.

Previous M.S. Thesis Students

- ◇ Danielle Barsky, M.S., 2014. Currently a Mechanical Engineer at ARUP Laboratories.

Previous Postdoctoral Fellows and Research Scientists

- ◇ Ken Friedman, Ph.D., 2014–2016. Currently an Aerodynamicist at Aurora Flight Sciences.

Undergraduate research supervision

Approximately 40 undergraduate student have participated in Leftwich Lab research or conducted independent senior design projects under my supervision. 5 have authored or co-authored journal papers (3 publications), 1 co-authored a full-length conference paper (1 publication), and 10 have authored or co-authored national conference presentations (21 presentations).

- 2018-2019 (6): Alexis Amechi; Paige Codrington; Melody Weigel; Brendan Lannig, Meghan Englert and Michael Emmert
- 2017-2018 (13): Alexis Amechi; Paige Codrington; Melody Weigel; Raymond Hummels (winner of the 2017-2018 GWU Undergraduate Research Award), Santiago Ardila, Zeid Hashem, Tommy Porter, Jon Starego; Ali Ahmed, Aaron Kevin Patron, Feng Xiang, Zachary Switzer, Jacari Matthews
- 2016-2017 (10): Rahi Patel (winner of the 2016-2017 GWU Undergraduate Research Award) Michael Tzeng, Monica Marandola, Molly Lycan and Matthew Spadafora (Winners of the 2017 MAE Design Showcase); Alexis Amechi; Paige Codrington; Raymond Hummels; David Palumbo; Eli Kashi
- 2015-2016 (5): Kyle Johnson; Philip Paulson; Allen Schult; Rahi Patel; Martha Wattson
- 2014-2015 (6): Andrea Lehn (winner of the 2014-2015 GWU Undergraduate Research Award); Alexa Baumer; Martha Wattson; Deandre Dixon; Anna Rose Valaika; Matthew Glasstone
- 2013-2014 (8): CJ Bell, Cameron Parvini and Claire Wilhelm; Andrea Lehn; Alexa Baumer; Josh Waldron; Matthew Glasstone; Daniel Adams; Bryan Joel (visiting from Caltech)
- 2012-2013 (9): Andrea Lehn; Alexa Baumer; Zack Huyman; Bola Samir; Prem Wells; Adam Sullier; Nicholas Ducey; Derek Nazdjin; Eduardo Pardo

High School Students

11 high school students have completed summer-long research experiences in the Leftwich Lab. One was a co-author on a national conference presentation.

- 2017-2018 (2): Remi Hensel (Lycee Rochambeau); Max Massiah (Montgomery Blair High School)
- 2016-2017 (3): Madeline Corrigan (Richard Montgomery High School); Julie Hirsch (The Holton-Arms School); Alexander Kao-Sowa (Thomas Jefferson High School for Science and Technology)
- 2015-2016 (2): Raina Mital (James Madison High School currently at University of Pennsilvania); Christine Baca (The Holton-Arms School currently at University of Virginia)
- 2014-2015 (1):Pamela Zhang (The Holton-Arms School currently at Caltech)
- 2013-2014 (2): Rebecca Linick (Thomas Jefferson High School for Science and Technology currently at Penn State University); Johanna Garfinkel (The Holton-Arms School currently at Yale University)
- 2012-2013 (1): Krista Opsahl-Ong (Thomas Jefferson High School for Science and Technology currently at Duke Univeristy)

Dissertation Committees

Ian Carr (TBD); Roxana Leontie (GWU Dept. of Computer Science, TBD), M. Reza Najjari (2018); Mahdis Bisheban (2018); Mohammad Goli (2018); Nima Mobadersany (2018); Kenan Cole (2018); Farshad Nasiri (2018); Amy McCleney (2015, chair); Andrew DeJong (2015); Mattieu Andre (2015); Seth Schroeder (2014, chair)

Masters Committees

David Phelps (2017); Elizabeth Hubler (2017, chair); Sarah E. Richer (2015, chair); Alexander Vissard (2014)

Instruction and Curriculum Development

George Washington University, 2012–present

- **MAE 4129** *Biomechanics II: Biofluid Dynamics*
  - *Semesters taught (enrollment):* Fall 2017 (5)

  - *Course description:* Mechanical analysis of physiological fluid dynamics. Application of fluid flow analysis techniques to cardiovascular, pulmonary, respiratory, and phonatory flows. Introduction to biomedical devices that manipulate physiological flows. May be taken for graduate credit with approval of department.
- ◇ **MAE 1001** *Introduction to Mechanical Engineering*
  - *Semesters taught (enrollment):* Fall 2018 (47), Fall 2017 (45), Fall 2016 (41), Fall 2015 (53)
  - *Course description:* Careers in mechanical and aerospace engineering and the necessary academic program. Teamworking and problem-solving skills for solution of design problems. Analytical and design problems and correlations between academic skills and the mechanical and aerospace engineering professions. Basic aspects of engineering ethics.
  - Because this is a first-year class, I spend some time discussing non-academic issues that university students face. Specifically, I gave three lectures that discussed topics such as: transition to college, anxiety on campus, time management, professional communication skills (how to email your professor!), and related topics. Additionally, I gave students resources to face these challenges and be successful. While much of this is covered in orientation, I feel that the students benefit by hearing it again, in a setting where they are not being overloaded with information.
- ◇ **MAE 3128** *Biomechanics I: Biosolid Dynamics*
  - *Semesters taught (enrollment):* Spring 2019 (19), Spring 2018 (18), Spring 2017 (14)
  - *Course description:* Mechanical analysis of biological systems. Characterization of living tissue. Applications of statics, solid mechanics, kinematics, and elementary dynamics to the human musculoskeletal system. May be taken for graduate credit with permission of the department.
- ◇ **ApSc 2058** *Analytical Mechanics II (Dynamics)*
  - *Semesters taught (enrollment):* Spring 2016 (42), Spring 2015 (45), Spring 2014 (40), Spring 2013 (41), Spring 2012 (67)
  - *Course description:* Second half of a one-year sequence. Concepts of dynamics: kinematics of particles, velocity and acceleration, translating and rotating reference frames, particle dynamics, motion under central and electromagnetic force, effect of Earth?s rotation, vibrations, work, kinetic and potential energy, dynamics of systems of particles.
  - I wrote two large laboratory exercises and three mini-labs. The large labs involve the following skills: hands on, open-ended problem solving (use these supplies and build a device that does the following), data collection and error analysis, introduction to research-grade experimentation (through the use of high speed cameras and device synching), image processing, Matlab data processing, and written communication. The mini-labs are done in the course of a class and use active learning strategies to teach and reinforce concepts.
- ◇ **MAE 6291** *Principles of Turbulence* (new course)
  - *Semesters taught (enrollment):* Spring 2014 (14)
  - *Course description:*
  - I created this graduate course to meet the need of the many fluid mechanics graduate students. While highly requested, this course did not exist. In addition to the lecture and note materials, I also created a list of primary sources (peer reviewed journal articles and video tutorials) to supplement the course textbooks. Finally, I created a final project that required the students to analyze real data (hotwire velocity data from a channel flow) to determine the flow properties.
- ◇ **MAE 3126** *Fluid Mechanics* (undergraduate level)
  - *Semesters taught (enrollment):* Fall 2013 (co-taucht, 49), Fall 2019 (tbd)
  - *Course description:* Fluid properties, fluid statics, integral and differential formulations of conservation of mass, momentum, and energy. Bernoulli?s equation. Dimensional analysis and similitude. Inviscid flow. Viscous flow. Experimental and computational methods in fluid mechanics.
  - I developed three laboratory exercises and three hands-on demos for the fluids class. Like ApSc 2058, the labs were incorporated into the recitation section of the course. The labs required the students to work both independently and in groups. The students had to set up simple experimental systems, collect data and analyze the results. Each student had to turn in written reports, improving their written communications skills, a form of assessment that was not heavily incorporated into the course before.

- **MAE 6221** *Fluid Mechanics* (graduate level)
  - *Semesters taught (enrollment):* Fall 2014 (23)
  - *Course description:* Continuum, kinematics of fluids; stress and strain rate tensors; fundamental equations of viscous compressible flows. Irrotational flows; sources, sinks, doublets, and vortices. Laminar flow of viscous incompressible fluids; boundary-layer concept.

Princeton University, 2005–2010, Graduate Student Assistant in Instruction

- **MAE 433** *Automatic Control Systems* (2009). Responsibilities included conducting tutorials and laboratory sessions as well as writing and grading tests, assignments and lab reports on the topics of both classical and modern control theory.
- **MAE 222** *Mechanics of Fluids* (2007). Responsibilities included teaching precepts (both content based and problem solving based) and holding office hours as well as grading tests and assignments on the topic of introductory fluid mechanics.

Duke University, 2001–2005, Undergraduate Teaching Assistant

- **MATH 31/32/25/26** *Single Variable Calculus* (2002-2005, fall and spring semesters). Responsibilities included holding laboratory and problem solving sessions, tutoring students and grading exams, assignments, and laboratory reports.

Teaching and Pedagogy Development

- **2018 KEEN National Conference**, KEEN Partnership in Dallas
  - *Semester participated:* Spring 2018
  - Learned from thought leaders and experts across engineering disciplines in interactive workshops all geared toward developing actionable tools, including faculty engagement strategies, pedagogical approaches, and extra-curricular examples you can use to serve your students.
- **Enhancing Student Success through a Model Introduction to Engineering Course**, Cal Poly in San Luis Obispo
  - *Semester participated:* Spring 2017
  - This three-day short course addressed strategies for enhancing the success of first-year engineering students through approximately one-credit hour of curriculum (a small, orientation-type course or a module in a larger Introduction to Engineering course having other objectives) that focuses on five "student development" themes: community building, professional development, academic development, personal development and orientation. Participants learned general pedagogical approaches for working with students to bring about substantive changes in their attitudes and behaviors and approaches for accomplishing important objectives under each of the five primary themes.
- **Faculty Learning Center Jr.**, George Washington University, University Teaching and Learning Center
  - *Semester participated:* Spring 2014
  - Semester-long pedagogy course designed for assistant professors that involved seminars, group discussion, individual assessment and classroom observation.
- **Senior Graduate Teaching Fellow**, Princeton University, McGraw Center for Teaching and Learning
  - *Academic year:* 2009-2010
  - Responsibilities included: leading workshops for new Assistants in Instruction (Teaching Assistants), holding "mock exams" and tutorials for introductory Physics classes, leading study–skills workshops for undergraduate students in science and engineering disciplines, and other various tasks relating to the development and understanding of teaching and learning techniques.
- Princeton University, McGraw Center for Teaching and Learning, **Classroom Observer**
  - *Academic years:* 2008-2010
  - I observed lectures and/or laboratory sessions for graduate students and post doctoral fellows in the engineering sciences who are participating in the teaching transcript program. This included pre– and post–observation meetings with instructors and pedagogical discussions.

- ◇ **Graduate Coordinator of the Study Hall**, Princeton University, McGraw Center for Teaching and Learning
  - *Academic years:* 2008-2010
  - Responsibilities include managing approximately 35 undergraduate tutors for introductory quantitative (Math, Chemistry, Physics, Economics) classes, including scheduling, hiring, promotion, etc. Over 60% of the students enrolled in supported classes (approximately half of the first and second year undergraduate students) use this service.

Professional Activities

Advisory Committees

- ◇ Steering Committee for the NSF Research Coordination Network on Neurolocomotion (Grant 1062052), 2011 to 2017
- ◇ University External Review Board member, Department of Mechanical Engineering and Material Science, Duke University, 2012 to present

International Program Chairs

- ◇ Co-organizer (with Francisco Huera-Huarte) for the minisymposia "Biomechanics of swimming and flying and bio-inspired propulsion" at the 12th European Fluid Mechanics Conference (Vienna 2018)
- ◇ Co-organizer (with Josue Sznitman) with for the session "Biolocomotion and Flows" at the 8th World Congress of Biomechanics (Dublin 2018)
- ◇ Co-organizer (With Lisa Fauci and Eric Tytell), International Symposium on the Neurobiology of Locomotion, NSF RCN Grant 1062052 (Washington, DC 2016)
- ◇ Session chair and organizer for "Reproductive Biomechanics" at the ECI conference: CFD in Medicine and Biology II (Portugal 2015)

Technical Reviews and Program Committees

- ◇ Journal reviews (partial list):
  - Nature
  - Journal of Fluid Mechanics
  - Science Advances
  - Journal of Experimental Biology
  - PLoS ONE
  - Journal of Fluid Structures
  - Science
  - Journal of Biomechanical Engineering
  - Journal of the Royal Society Interface
  - Journal of BioInspiration and Biomimetics
  - ASME 2014 Fluids Engineering Summer Meeting (FEDSM2014)
  - AIAA Aerospace Sciences Meeting
  - The American Journal of Obstetrics & Gynecology
  - Journal of Renewable and Sustainable Energy
  - Smart Materials and Structures
- ◇ Conference and Workshop Program Committees
  - Co-organizer (with David Hu and Dennice Gaymes) for "Faces of Fluid Dynamics" panel on diversity in the American Physics Society (APS) Division of Fluid dynamics (DFD) APS 71st Meeting of the Division of Fluid Dynamics, November 2018 (Atlanta 2018)
  - Co-organizer (with Mike Plesniak) for symposium 204, "Bio-inspired Propulsion" and the 18th U.S. National Congress on Theoretical and Applied Mechanics (Chicago 2018)
  - Focus Session co-organizer (with David Hu) and chair, APS 69th Meeting of the Division of Fluid Dynamics, November 2016, Session L1 Disgust: the fluid dynamics of the gross (Portland 2016)
  - Session chair at the 8th International Bio-Fluids Symposium (Pasadena 2016)
  - Co-organizer (with Kathleen Hoffman), Winter Workshop on Neurolocomotion, NSF RCN Grant 1062052 (New Orleans 2013)

  - Session chair, APS DFD Annual meeting 2011 (H28), 2012 (R15) and 2013 (R12), 2014 (L18), 2016 (L1), 2018 (M22)
  - Organizing Committee Member, APS DFD November meeting (Baltimore 2011)

- Grant Reviews:

  - NSF Panelist (2013 (2), 2014, 2018)
  - USAID-Middle East Regional Cooperation (MERC) Water Panel (2018)
  - Kuwait-MIT Center for Natural Resources and the Environment (CNRE) at MIT (2015)
  - Global Climate and Energy Project, Stanford University, Reviewer (2014)

Professional Memberships

- American Physical Society, Division of Fluid Dynamics (APS DFD), 2005 to present
- American Institute of Aeronautics and Astronautics (AIAA), 2010 to present

Service and Outreach

George Washington University, Department of Mechanical and Aerospace Engineering (MAE)

2018–present	Member, Undergraduate Curriculum Committee
2014-present	Undergraduate Academic Adviser
2014-present	Graduate Academic Adviser
2018–2019	Member, Faculty Search Committee
2014-2017	Departmental Seminar Series coordinator
2015–2016	Member, Undergraduate Curriculum Committee
2015–2016	Chair, Ad hoc committee on the Biomechanics option curriculum in MAE
2015	MAE Departmental Secretary
2013–2015	Member, Graduate Curriculum Committee

George Washington University, School of Engineering and Applied Science (SEAS)

2018-present	Member, Internal Advisory Board, Center for Women in SEAS
2018-present	Member, Senate Research Committee
2018	Member, University Research Ecosystem, Pre-Award Committee
2014-present	Member, SEAS task force on Women in Engineering
2018	Pelton Competition Judge
2018	Panelist, Colonial Days panel discussion
2017	Colonial Days admitted student lecture
2017	Member, Computer Science search committee for a Professor of the Practice position
2014–2016	Panelist, Colonial Days panel discussion
2014–2016	Judge, Research Days Biomedical Engineering
2014	Team Leader, Pelton Competition Judge
2013	Graduation Celebration Floor Marshall
2013	Team Member, Pelton Competition Judge
2013	"Meet the faculty" presentation at SEAS Freshmen Orientation,
2012	National Advisory Council faculty research presentation

George Washington University

2018	Judge, GWU Research Days
2016–2017	Internal reviewer, Goldwater Scholarship nominations
2016	Judge, GWU Research Days
2015–2016	Member, STEM Academy advisory board, member
2015	Member, STEM Academy search committee
2013–2016	Led "Flight of the Ping-Pong Ball" workshop at the VSTC Science Technology and Engineering Day
2013–2015	Senate committee on Student Grievances, January 2013 to present (chaired a hearing in May 2013)

Selected Popular Press

2018	" How Sea Lions Are Inspiring the Future of Underwater Transport" *CNN's Great Big Story*
2017	"How Do Sea Lions Swim, Glide and Sometimes Even Nab Humans?" *Smithsonian Magazine* by Kalila Morsink
2017	"Deft defecators done in 12 seconds" *Chemistry World* by Charlie Quigg
2017	"Can Sea Lions Inspire Building Deep-Sea Vehicles?" *Journal of Visualized Experiments Researcher Spotlight* by Namrata Sengupta
2016	Press from being National Lead Judge, Siemens Foundation Competition: ◇ *The American Bazaar*: "Indian American students sweep top prizes at 2016 Siemens Competition" by A.B Wire ◇ *Business Wire*: "Oregon and Texas Students Win $100,000 Scholarship Prizes in 2016 Siemens Competition in Math, Science, & Technology" ◇ *News India Times*: "8 Students Bag Top Prizes At Siemens Competition" ◇ *India West*: "Indian American High School Whiz Kids Sweep Siemens 2016 Competition" by Giovanni Albanese, Jr. ◇ *The Navhind Times*: "Indian-origin teens bag $200K in Siemens science contest in US"
2016	"Megan Leftwich" *Introductions Necessary* by Angela Goad.
2016	"GW robotics" *Voice of America*
2016	"4 inspiring women shaping the future of the STEM workforce" *Mashable*
2016	"John Dabiri: Unleashing the power of the jellyfish," *OZY* by Taylor Mayol
2015	"Sea lion flippers could inspire super-stealthy submersibles" *WIRED* by Matt Simon
2015	"Here's Why Submarines Should Look More Like Sea Lions" *Azula*by Jonnie Flemming
2015	"When new professors need housing, colleges are no help" *The Chronicle of Higher Education* by Lee St. Gardner
2015	"Summer of Science: The sea lion's smooth moves" *New York Times* by Nicholas St. Fleur
2015	"Swimming without a trace: Building a machine to mimic what sea lions naturally do" *Phys.org*
2015	"Robotic Sea Lion flipper printed to uncover the mystery behind a very peculiar swimming style" *3Ders* by Andre
2015	"Sea lion flippers could help engineers design stealthier submersibles" *Digital Trends* by Kelly Hodgkins
2015	"Here Are the Secrets that Give Sea Lions and Jellyfish Their Edge as Swimmers" *Evolution News*
2015	"Students get their feet wet with sea lion research" *The Hatchet* by Celine Bartels-Millsr
2015	"Scientists creating robo-flipper to study the secrets of how sea lions swim" *Treehugger* by Megan Treacy

2015 "Why engineers think that sea lions are the answer to underwater robotics" *Business Insider Australia* by Grace Raver

2015 "Robotic sea lion flippers could propel future submersibles" *Gizmag* by Ben Coxworth

2015 "When a Trip to the Zoo Resulted in an Engineering Breakthrough" *Smithsonian Magazine* by Sarah Joseph and Jon Betz

2015 "Scientists at work: cracking sea lions' high-thrust, low-wake swimming technique" *The Conversation* by Megan C. Leftwich

2015 "Researcher Spotlight: Natural Inspiration" *GW Today* by Lauren Ingeno

2014 "Advances in fluid dynamics" *AIAA Aerospace America 2014 in Review* (p. 23) by Michael W. Plesniak and Qiqi Wang

2013 "A Dynamics Mix: How SEAS is building one of the leading fluid dynamics programs in the country" *Synergy: The SEAS Alumni Magazine*