

CURRICULUM VITAE

MEGAN C. LEFTWICH

Assistant Professor
The George Washington University
Department of Mechanical and Aerospace Engineering
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EDUCATION

- Ph.D. Department of Mechanical and Aerospace Engineering
Princeton University
Princeton, New Jersey, USA, 2010
Thesis: The hydrodynamics of lamprey locomotion.
Advisor: A. Smits
- M.A. Department of Mechanical and Aerospace Engineering
Princeton University
Princeton, New Jersey, USA, 2007
Advisor: A. Smits
- B.S.E. Department of Mechanical Engineering and Material Science
Pratt School of Engineering
Duke University
Durham, North Carolina, USA, 2005
(graduated with distinction, Magna Cum Laude)

RESEARCH INTERESTS

Research interests include the experimental study of fluid flows, especially naturally occurring flows—geophysical and biological—with a focus on biologically inspired swimming and flying, wake formation, fluid structure interactions and the role of flexibility, the hydrodynamics of groups, robotic design and control, as well as the fluid dynamics of the human body.

TEACHING INTERESTS

Teaching interests include most quantitative classes, especially those that focus on applications and opportunities to apply the knowledge learned either in laboratory settings or through independent projects. I encourage group peer work as a tool to learning quantitative and problem solving skills. I am interested in teaching pedagogy and novel methods of lecturing that make information and skills more accessible to both beginning and more advanced learners.

SELECT HONORS AND AWARDS

- 2014 Young Researcher Award, 4th International Conference on Experimental Fluid Mechanics, Beijing, China
- 2011 Outstanding Poster Award, Honorable Mention, LANL Postdoc Research Day
- 2010 Agnew National Security Fellowship, Los Alamos National Lab
- 2009 Senior Graduate Fellowship, McGraw Center for Teaching, Princeton University
- 2009 Teaching Transcript recipient
- 2005–10 Presidential Scholarship, Princeton University
- 2004 Pratt Fellowship, Pratt School of Engineering, Duke University
- 2001–05 Deans Highest Honor List, Duke University

RESEARCH EXPERIENCE

- 1/12–present Principle Investigator
Leftwich Lab, The George Washington University, Washington, District of Columbia, United States
We investigate fluid flows, primarily inspired by nature. Our principle areas of research include: the hydrodynamics of swimming, wake structures of multi-element wind farms, and the fluid dynamics associated with human birth.
- 9/10–12/11 Agnew National Security Postdoctoral Researcher
Extreme Fluids Team, Neutron Science and Technology Group, Physics Division, Los Alamos National Lab, Los Alamos, New Mexico, United States
I design and conduct experiments to study shock driven instabilities, specifically the Richtmyer-Meshkov Instability (RMI). These experiments are carried out using a variable Mach number shock tube, with Mach number ranging from 1.2–1.8. Simultaneous Particle Image Velocimetry (PIV) and Planar Laser Induced Fluorescence (PLIF) provide velocity and density fields. Particular interest is given to mixing timescales and transition to turbulence.
- 7/06–8/10 Graduate Research Assistant
Smits Lab, Princeton University, Princeton, New Jersey, United States
Conducted experimental research on primitive swimming styles, specifically related to the lamprey. This includes exploring the kinematics of locomotion, body forces, fluid–body interactions and wake characteristics using a robotic swimming lamprey. Experimental expertise includes: particle image velocimetry, laser induced fluorescent visualizations, dye flow visualizations, load cell measurements, and differential pressure measurements.
- 10/07–5/10 Graduate Research Assistant
Soboyejo Lab, Princeton University, Princeton, New Jersey, United States
Responsibilities include experimental and theoretical work to develop low cost ceramic water filters for developing regions. I modeled the flow of contaminated water through the porous filter as as it removed illness causing bacteria. In conjunction with this model, I designed and built an experiment to measure the associated coefficients and validate the assumptions made. In addition to the lab work at Princeton, I travelled to Abeokuta, Nigeria to establish a factory for the local production and sale of filters. This factory is currently producing over 400 filters a month and supports 6 full time employees.
- 1/04–5/05. Pratt Undergraduate Fellow
Duke University, Durham, NC, USA
Responsible for experimental and modeling research on the topic of journal bearing lubrications with an emphasis on the fluid structures of the lubricant under a load. This project included both experimental and theoretical work. This work was conducted under Professor Joshia Knight.

TEACHING EXPERIENCE

- 1/15–5/15 Professor and course creator
The George Washington University, Washington, DC
MAE 6291: Principles of Turbulence
I added this course to the curriculum in the spring 2015 semester. I am responsible lecture, homework assignments, quizzes and exams, as well as overall grade assignment, student interactions for this advanced fluid dynamics for MAE graduate students.

- 9/14–12/14 Professor
The George Washington University, Washington, DC
MAE 6221: Fluid Mechanics
Responsible lecture, homework assignments, quizzes and exams, as well as overall grade assignment, student interactions for introductory fluid dynamics for all MAE graduate students.
- 9/13–12/13 Professor
The George Washington University, Washington, DC
MAE 3126: Fluid Mechanics I
Responsible for laboratory and lecture materials, homework assignments, quizzes and exams, as well as overall grade assignment, student interactions and teaching assistant management.
- 1/15–5/15 Professor
1/14–5/14 The George Washington University, Washington, DC
1/13–5/13 ApSc 2058: Analytical Mechanics II
1/12–5/12 Responsible for laboratory and lecture materials, homework assignments, quizzes and exams, as well as overall grade assignment, student interactions and teaching assistant management.
- 2/09–5/09 Assistant in Instructions (Teaching Assistant)
Princeton University, Princeton, NJ, USA
MAE 433: Automatic Control Systems
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.
- 5/08–5/10 Graduate Teaching Fellow, McGraw Center for Teaching and Learning
Senior Graduate Teaching Fellow, 2009-2010 academic year
Princeton University, Princeton, NJ, USA
Responsibilities include: 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
- 9/08–5/10 Classroom Observer
Princeton University, Princeton, NJ, USA
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.
- 9/08–5/10 Graduate Coordinator of the Study Hall, McGraw Center for Teaching and Learning
Princeton University, Princeton, NJ, USA
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.

- 2/07–5/07 Assistant in Instructions
 Princeton University, Princeton, NJ, USA
 MAE 222: Mechanics of Fluids
 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.
- 8/02–4/05 Teaching Assistant
 Duke University, Durham, NC, USA
 MATH 31/32/25/26: Single Variable Calculus
 Responsibilities included holding laboratory and problem solving sessions, tutoring students and grading exams, assignments, and laboratory reports.

OTHER CONTRIBUTIONS AND SERVICE

Member, SEAS Task Force on Women in Engineering, GWU
 MAE Departmental Seminar Series coordinator, GWU MAE
 MAE Department Secretary, GWU MAE
 Session organizer, ECI Conference: CFD in Medicine & Biology II, Algrav, Portugal
 Co-organizer, Winter Workshop on Neurolocomotion, NSF RCN Grant 1062052
 Member, Graduate Curriculum Committee, GWU MAE
 Member, Student Grievance Committee, The George Washington University
 External Review Board member, Mechanical Engineering Department, Duke University
 Organizing Committee Member, APS DFD November meeting 2011
 Session Chair at APS DFD Nov. meeting (2011-2014)
 Graduate Engineering Council, Princeton University
 Graduate Engineering Ambassadors (Vice President), Princeton University
 Peer reviewer for Journal of Experimental Biology
 Peer reviewer for Journal of Fluid Mechanics
 Peer reviewer for Journal of BioInspiration and Biomimetics
 Peer reviewer for Journal of Biological Letters
 Peer reviewer for the Journal of the Royal Society Interface
 Peer reviewer for the ASME Journal of Biomechanical Engineering
 Peer reviewer for the AIAA Aerospace Sciences Meeting
 Member of American Physical Society, Division of Fluid Mechanics (APS DFD)
 Member of American Institute of Aeronautics and Astronautics (AIAA)
 Proposal reviewer for the Global Climate and Energy Project at Stanford University
 Review panelist for the National Science Foundation

PUBLICATIONS

(students under my supervision are underlined)

Articles in Refereed Journals:

- Lehn, A.M., Thornycroft, P.J.M, Lauder, G.V. and Leftwich, M.C. “The effect of input perturbation on the performance of heaving hydrofoils.” in preparation for the *Physics of Fluids*
- Parker, C., Barsky, B. and Leftwich, M.C. “The wake of a vertical axis wind turbine at high Reynolds numbers.” in preparation for the *Experiments in Fluids*
- Baumer, A., Lehn, A., Grotberg, J. and Leftwich, M.C. “An Experimental and Theoretical Model of Simplified Childbirth.” in preparation for the *Journal of Biomechanics*
- Mejia-Alvarez, R., Wilson, B., Leftwich, M.C., Martinez, A. A., and Prestridge, K.P. “Design of a fast diaphragmless shock tube driver” under consideration by *Shock Waves*.

- Friedman, C. and Leftwich, M.C., “California Sea Lion Drag Calculations. Techniques and Comparison to Other Marine Mammals” under consideration by the *Experiments in Fluids*.
- 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
- 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*, doi:10.1061/(ASCE)EE.1943-7870.0000669.
- 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.
- 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
- 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.
- 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
- 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. Appeared as chapter 5 (pp 45-52) in *Animal Locomotion*, Graham K. Taylor, Michael S. Triantafyllou and Cameron Tropea (eds.). Springer-Verlag 2010. doi:10.1007/978-3-642-11633-9_5

Articles in Refereed Conference Proceedings:

- 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-Mecanisms, pages 181-187.
- 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. (*Winner of the Young Researcher Award*)
- 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
- 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

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

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.

Non-Refereed Abstracts and Presentations:

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

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

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

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

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

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).

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).

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).

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).

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

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

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

- 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.
- 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, awarded the Outstanding Poster Award, Honorable Mention).
- 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
- 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
- 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
- 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
- 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
- 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

Invited Talks:

- “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.