

ERIC LOTH

Rolls-Royce Commonwealth Professor of Engineering, and
Chair of Department of Mechanical and Aerospace Engineering,
University of Virginia

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EDUCATION

University of Michigan, Ann Arbor, MI. Ph.D. in Aerospace Engineering, "Injection of Under-expanded Air Jets into Water," advised by Prof. G.M. Faeth (1985 -1988)
Pennsylvania State University, University Park, PA. M.S. in Aerospace Engineering, "A Numerical Solution of the Downwash Associated with a Blown-Flap System," advised by Prof. B.W. McCormick (1984 - 1985);
West Virginia University, Morgantown, WV B.S. in Aerospace Engineering (1979-1983)

EMPLOYMENT (since PhD)

University of Virginia Mechanical & Aerospace Engineering, Charlottesville, VA
Chair of Mechanical & Aerospace Engineering: (2015–present)
Professor and Assoc. Chair for Aerospace Engineering: (2010–present)
Principal of the International Residential College: (2013–present)
University of Illinois at Urbana-Champaign, Aerospace Engineering*, Urbana IL
Adjunct Professor (2010-present, since joining the University of Virginia)
Professor and Assoc. Head for Undergrad. Studies (2008–2009)
Professor, Willett Faculty Scholar & Affiliate of Mech. Sci. & Eng (2002–2009)
Associate Professor & Affiliate of Mech. Sci. & Eng: (1995–2002);
Assistant Professor (1990-1995);
Naval Research Lab, Lab for Computational Physics & Fluid Dynamics, Washington. D.C.
Aerospace Engineer: CFD of spacecraft nozzles (1989 -1990)
Berkeley Research Associates, Springfield, VA
Staff Scientist: CFD of blast waves & shock-vortex interactions (1988 - 1989)

VISITING APPOINTMENTS

Cambridge University (UK), Visiting Scholar, Engineering Dept. (fall 2004, spring 2011)
National Energy Technology Lab, ORISE Summer Faculty, Morgantown WV (2002)
Brown University, Visiting Associate Prof. (fall 1997 sabbatical)
University of California at San Diego, Visiting Associate Prof. (fall 1997 sabbatical)
Molten Metal Technology, Sr. Research Engineer, Waltham MA (summers 1996 & 1997)
Naval Research Lab, Senior Fellow & ASEE Summer Faculty, Washington, D.C. (1995)
Arnold Engineering and Development Center, AFOSR Summer Faculty, TN (1993)
Science Applications Intl. Corp., Senior Research Engineer, VA (summers 1990, 1991)

* Department name was Aeronautical & Astronautical Engineering until 2003

AWARDS and HONORS (since PhD)

ARPA-E Congressional Showcase in Washington DC (March, 2017)
Popular Science's "[Brilliant Minds of New Energy Revolution](#)" (June 2015)
Rolls-Royce Commonwealth Professor, University of Virginia (2014)
Aerospace Advisory Panel for the Governor of Virginia (2011-2014)
NASA Patent Application Award (August 2012)
NSF Innovation Corps Commemoration Ceremony (July 2012 at NSF HQ)
NASA Group Achievement Award for "Large-Scale Low-Boom Supersonic Inlet" (June 2011)
Yip Fellow, Cambridge University, U.K. Easter Term (April-June, 2011)
Scientific Committee, International Conference of Multiphase Flow (2009-2010)
Fellow of ASME (December, 2008)
Academy of Distinguished Alumni of Aerospace Engineering at WVU (2008-)
UIUC List of Teachers Ranked Excellent (1990, '91, '92, '93, '95, '97, '02, '05)
Engineering Council Award for Excellence in Advising, UIUC ('07)
Willett Faculty Scholar, UIUC College of Engineering (2002-)
Faculty Fellow, National Center for Supercomputing Applications (2000, 2001, 2002)
NASA "Revolutionize Aviation" Team Award (2001)
Associate Fellow of AIAA (2000-)
Who's Who (2000 -)
Who's Who in Science and Engineering (1996-)
Senior Fellow, Naval Research Lab, Washington D.C. (1995)
Teacher of the Year, AAE Department, UIUC (1994)
UIUC Campus Research Board Award (1990, 1994)
Finalist, UIUC Vice-Chancellor Teaching Scholars (1994)
UIUC College of Engineering Advisors List, for advising excellence (1993)
Men of Achievement (1992-)
UIUC International Paper Co. Undergraduate Instructional Support Award (1991)
National Science Foundation Research Initiation Award (1990)
Department of Navy Exceptional Performance Award (1989)

ADMINISTRATIVE ACTIVITIES (since 2000)

Chair of Mechanical and Aerospace Engineering Dept., University of Virginia (2015-present)
Principal of International Residential College of University of (2013-present)
SEAS Promotion and Tenure Committee, University of Virginia (2013-2015)
MAE Graduate Studies Committee, University of Virginia (2012-2015)
Standing Committee of External Evaluators for Italian Institute of Technology (2013-present)
Associate Chair of Aerospace Engineering Dept., University of Virginia (2010-2015)
Chair, Tenure-Track Faculty Search Committee of MAE Department (2010-2013)
Chair of SEAS Faculty Hiring Strategic Plan, University of Virginia (2011-2012)
SEAS Promotion and Tenure Committee, University of Virginia (2010-2011)
Associate Head of Undergraduate Studies for AE Dept., Illinois (2008-2009)
Faculty Search Committee of AE Department (1999-2006, Chair in 2007-2008)
College of Engineering Executive Committee (2002-2008)
College of Engineering Research and Planning Committee (2004-2009)
Chair of AAE Department Planning Committee (2002-2009)
Chair of AAE Department Graduate Policy Committee (2002-2009)
Search Committee for Head of Computer Science Department (2000-2001)
Chair of AAE Department Faculty Meetings (1999-2001)
Chair of College of Engineering Awards Committee (1999-2001)

INVITED PRESENTATIONS

- 1) "Morphing Rotors for Extreme-Scale Wind Turbines," Mechanical Engr. & Appl. Mechanics, University of Pennsylvania, Philadelphia, PA, December, 2016.
- 2) "Technology Innovation in Off Shore Wind Systems," International Partnering Forum, Providence, RI, October, 2016.
- 3) S. Candon & E. Loth "Observation of Novel Dynamics for a Low-Boom Relaxed-Compression Supersonic Inlet" National Institute of Aerospace, Oct. 2015.
- 4) "Morphing Wind Turbines," Mechanical & Aerospace Engineering, Princeton University, Princeton, NJ, March 2015.
- 5) S. Candon & E. Loth "Acoustically Induced Shock Oscillation of a Low-Boom Inlet" AIAA Aerospace Sciences Meeting, AIAA-2015-1048, Kissimmee, FL, Jan. 2015.
- 6) "Extreme Scale Downwind Rotors," Sandia national Laboratories Turbine Blade Workshop, Albuquerque NM, October 2014.
- 7) "Segmented Ultralight Morphing Rotors for Wind Turbines," National Renewable Energy Laboratory, Golden CO, July 2014.
- 8) "Nanotextured Hemophobic Surfaces," NanoTech (Advanced Materials and Characterization), Washington DC, June 2014.
- 9) "Durability of Nanocomposite Superhydrophobic Coatings," Chemical Engineering, Massachusetts Institute of Technology (MIT), Cambridge, Mass, March 2014.
- 10) "Icephobic and Hemophobic Nanocomposite Superhydrophobic Coatings," Mechanical Engineering, Harvard University, Cambridge, Mass, March 2014.
- 11) "Drop Heat Transfer and Interaction for Compressed Air Energy Storage," Osney Thermo-Fluids Laboratory, Department of Engineering Science, University of Oxford, England, March 2013.
- 12) M. Rybalko* and E. Loth "Pressure and Shock Dynamics of a Low-Boom Inlet," Aerospace Sciences Meeting, AIAA 2013-0015, Grapevine, Texas, January 2013.
- 13) E. Loth, N. Titchener, H. Babinsky and L. Povinelli "A Canonical NSBLI Flow Relevant to External Compression Inlets," Aerospace Sciences Meeting, (Invited Presentation and Paper), AIAA 2013-0016, Grapevine, Texas, January 2013.
- 14) N. Titchener, H. Babinsky and E. Loth "Effects of Various Vortex Generator Configurations on a Normal Shock Wave / Boundary Layer interaction," Aerospace Sciences Meeting, AIAA 2013-0018, Grapevine, Texas, January 2013.
- 15) "Nano-Texturing for Energy Storage," Department of Mechanical Engineering, University of Minnesota, October 2012.
- 16) "Next Generation of Off-Shore Wind Turbines," Governor's Conference on Energy, Richmond, VA, October 2012.
- 17) "Segmented Ultralight Morphing Turbines," Fluids Seminar, Department of Engineering, University of Cambridge, England, June 2011.
- 18) E. Loth "A Discrete Equation of Motion for Particle of Finite Size and Reynolds Number," AIAA Fluid Dynamics Meeting, Honolulu, Hawaii, June 2011.
- 19) M. Rybalko* & E. Loth "Simulations of a Supersonic Single-Stream Axisymmetric Inlet," AIAA Applied Aerodynamics Meeting, Honolulu, Hawaii, June 2011.
- 20) T. Gillen* & E. Loth "Simulations of a Supersonic Dual-Stream Axisymmetric Inlet," AIAA Applied Aerodynamics Meeting, Honolulu, Hawaii, June 2011.

- 21) A. Steele*, I. Bayer, Y.H. Yeong*, and E. Loth "Adhesion strength and superhydrophobicity in polyurethane/organoclay nanocomposites" TechConnect World, Boston, June 2011.
- 22) "Durable Nanocomposite Superhydrophobic Surfaces," Nanostar Symposium, Charlottesville, May 2011.
- 23) "Flow Control for Quiet Supersonic Inlets," Plenary Speaker Virginia Space Grant Consortium, Richmond, VA, April 2011.
- 24) "SBLI Vortex Generator Flow Control Physics," 4th Annual Shock-Wave/Boundary Layer Interaction Flow Control and Modeling Workshop, Cleveland, OH, April 2011.
- 25) "Morphing for Extreme-Scale Wind Turbines," Virginia Off-Shore Wind Supply Forum, Richmond, December 2010.
- 26) "Supersonic Inlet Flow Control," Department of Mechanical Engineering, University of Delaware, April 2009.
- 27) "Vortex Generators for Supersonic Turbulent Boundary Layers," Department of Aerospace and Ocean Engineering, Virginia Polytechnical Institute and State University, April 2009.
- 28) "Stable and Accurate Loosely-Coupled Scheme for Unsteady Fluid-Solid Interaction," Department of Aerospace and Ocean Engineering, Virginia Polytechnical Institute and State University, March 2008.
- 29) "High Accuracy and Stability Techniques for Fluid-Structure Simulation," Department of Mechanical Engineering, University of Illinois at Chicago, April 2007.
- 30) "Electrolytic Micro-Bubbler Matrices," Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, May 2006.
- 31) "Particle Dispersion in a Turbulent Boundary Layer via DNS and RANS flows," Department of Engineering, University of Cambridge (U.K.), November 2004.
- 32) "Micro-Fabrication for Generation of Bubbles and their Dispersion in Turbulent Flows," Combined seminar for Mechanical and Industrial Engineering and the Iowa Institute of Hydraulic Research, University of Iowa, Iowa City, IA, September 2003.
- 33) "Boundary Layer Control for Supersonic Inlets," Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA October 2002.
- 34) "Mesoflaps for Supersonic Inlet Flow Control," AIAA Fluid Dynamics Meeting, St. Louis, MO, June 2002.
- 35) "Smart Materials for Mesoflap Bleed and Injection," ASME Summer Fluids Engineering Meeting, FEDSM2001-18277, New Orleans, May-June 2001.
- 36) "Mesoflaps for Supersonic Engine Inlets," Department of Aero. & Astro. Engineering, Massachusetts Institute of Technology, Cambridge MA, Feb. 2000.
- 37) "Mixing Layer Turbulence and Bubble Deformation," Division of Engineering and Applied Sciences, Harvard University, Boston MA, Nov. 5, 1997.
- 38) "Free Shear Layer Turbulence and Ellipsoidal Bubble Forces," Center for Fluid Mechanics, Turbulence and Computation (Division of Applied Mathematics), Brown University, Providence RI, Sept. 9, 1997.
- 39) "Dynamics and Dispersion of Bubbles in a Turbulent Free Shear Layer," Naval Undersea Warfare Center, Newport RI, July 1996.
- 40) "Adaptive Grid Technology for Two-Phase Compressible Flow" Molten Metal Technology, Waltham, MA, May 1995
- 41) "Large Eddy Simulations of a Supersonic Shear Layer" University of Michigan, Mechanical Engineering Department, April 1993.
- 42) "Dynamics of Compressible and Two-Phase Fluids" Virginia Polytechnical Institute and State University, Blacksburg, VA, February, 1992.

- 43) "Vorticity and Mixing Layer Simulations" Naval Research Laboratory, Laboratory for Computational Physics, June 1991.
- 44) "Study of Plane Turbulent Under-expanded Air Jets in Water." Dayton Research Institute, Dayton, OH, July 1988.

TEACHING & PROFESSIONAL ACTIVITIES

TEACHING ACTIVITIES

Courses Taught (D=developed, R=major revision) since arriving at UVA in 2010

MAE 3210 (Undergrad) Fluid Dynamics 1
MAE 4511/4512 (Undergrad) Mechanical Engineering Special Topics
MAE 4513/4514 (Undergrad) Aerospace Engineering Special Topics
MAE 6592 (Graduate) Turbulence and Multiphase Flow (D)
MAE 6592 (Graduate) Multiphase Numerical Methods (D)
MAE 7510/8591 (Graduate) Research Seminar (R)
MAE 7720 (Graduate) Computational Fluid Dynamics II (with Va Tech)

Supervision of Graduate Students since arriving at UVA in 2010

Graduated 7 M.S. thesis and 4 Ph.D. dissertation students

Supervision of Graduate Students at University of Illinois (1990-2010)

Graduated 22 M.S. thesis and 21 Ph.D. dissertation students

PROFESSIONAL ACTIVITIES

Journal Reviewer:

AIAA Journal, AIAA Journal of Aircraft, AIAA J. of Heat Transfer & Thermophysics, AIAA J. of Propulsion & Power, Applied Energy, Applied Surface Science, ASME J. of Fluids Engineering, Computers & Fluids, Experiments in Fluids, Experimental Thermal & Fluid Sciences, International J. of Multiphase Flow, J. of Computational Physics, J. of Fluid Mechanics, J. of Heat Transfer, J. of Micromechanics & Microengineering, J. of Wind Engineering & Indust. Aero., Langmuir, Measurement Science and Technology, Particles & Particle Systems Characterization, Physics of Fluids, Powder Technology, Shock Waves, Theoretical and Computational Fluid Dynamics, and Wind Energy

Professional/Conference Committees:

Chair, Aerospace Department Chair Association, AIAA, 2017-
Technical Review Committee, TechConnect World, 2015
Vice-Chair, AIAA Air Breathing Propulsion Systems Integration Committee, 2015-
Member, AIAA Air Breathing Propulsion Systems Integration Committee, 2009-
Associate Editor, Advances in Aerospace Science and Applications, 2008-
Program Committee, 2007 International Conference of Multiphase Flow
Organizing Committee, 2005 APS Fluid Dynamics
Organizing Committee, 2004 International Conference of Multiphase Flow
Fluid Dynamics Program Committee, 2004 AIAA Aerospace Sciences Meeting
Fluid Dynamics Program Chair, 2003 AIAA Aerospace Sciences Meeting
Organizing Committee, 2002 AIAA Theoretical Fluid Dynamics Conference
Fluid Dynamics Program Committee, 2002 AIAA Aerospace Sciences Meeting
Organizing Committee, 2001 International Conference of Multiphase Flow
Member, 26th Intl. Combustion Symposium Program Review Committee, 1995
Member, AIAA Fluid Dynamics Technical Committee, 1995-
Member, ASME Coordinating Group for Fluid Measurement, 1991-
Member, ASME Coordinating Group on Two-Phase Flow, 1991-

Conference Session Chair:

"Inlet Distortion & Characterization" 2017 AIAA Sci Tech Forum
"Novel Inlet Systems" 2016 AIAA Sci Tech Forum
"Wind Energy Innovative Concepts" 2015 AIAA Wind Energy Symposium
"Aeronautical Research & Technology in Europe" 2014 AIAA Aerospace Sci. Meeting
"Supersonic Inlets" 2013 AIAA Aerospace Sci. Meeting
"Propeller/Rotorcraft and Wind Turbines" 2012 AIAA Fluids Dynamics Meeting
"Supersonic Inlet Aerodynamics", 2012 AIAA Aerospace Sciences Meeting
"Inlet Flow Control", 2012 AIAA Aerospace Sciences Meeting
"Multiphase Flows", 2011 AIAA Fluids Dynamics Meeting
"Multiphase Flows", 2009 AIAA Fluids Dynamics Meeting
"Numerical Methods for Multiphase Flows", 2008 ASME Fluid Engineering Conf.
"Fluid-Structure Interactions", 2007 AIAA Fluid Dynamics Meeting
"Fluid Dynamics in Honor of Prof. Faeth", 2006 AIAA Aerospace Sciences Meeting
"Turbulent Boundary Layer Modeling ", 2004 AIAA Aerospace Sciences Meeting
"MEMS for Fluid Dynamics", 2003 ASME Fluids Engineering Meeting
"Virtual Reality for Flow Visualization", 2003 ASME Fluids Engineering Meeting
"Viscous Flows", 2002 AIAA Fluids Dynamics Meeting
"Multiphase Flows", 2002 AIAA Fluids Dynamics Meeting
"Transition and Receptivity", 2002 AIAA Aerospace Sciences Meeting
"Bubble Dynamics", 2001 International Conference of Multiphase Flow
"MEMS for Fluid Measurement", 2001 ASME Fluids Dynamics Meeting
"Gas Turbine Inlet Flow Controls", 2000 AIAA Fluids Dynamics Meeting
"Numerical Methods - Advances", 2000 AIAA Aerospace Sciences Meeting
"Boundary Layers", 2000 AIAA Aerospace Sciences Meeting
"Modeling Multiphase Flows", 1999 ASME Fluids Dynamics Meeting
"Flow Control", 1999 ASME Fluids Dynamics Meeting
"Multiphase Flows", 1999 AIAA Fluids Dynamics Meeting
"Numerical Methods for Multiphase Flows", 1998 ASME Fluids Engr. Meeting
"Shock Interaction Flows", 1997 AIAA Aerospace Sciences Meeting

RESEARCH FUNDING

CURRENT GRANTS AND CONTRACTS

1. E. Loth “Segmented 50 MW Segmented Ultralight Morphing Rotors for Wind Energy”, ARPA-E, \$3,709,723; April 2016 - March 2019.
2. E. Loth “Computations to Support of Experimental Icing Test of Full-Scale Swept Wings”, University of Illinois/NASA, \$235,835; January 2014 - May 2017.
3. E. Loth “Unsteady Flow Physics of Particle Separators”, Rolls-Royce, \$530,000; May 2011 - December 2016.
4. E. Loth “Anti-Icing Nano-Composite Polymer Coatings”, Rolls-Royce, \$443,000; June 2012 - May 2016.
5. E. Loth “Three-Dimensional Unsteady Swept Icing Aerodynamics” NASA AS&ASTAR Program, \$55,000, August 2016- July 2017.

PREVIOUS GRANTS AND CONTRACTS

1. E. Loth “Anti-Insect Fouling Coatings”, Boeing Company (Seattle), \$185,000; January 2014 - March 2016.
2. E. Loth “Nano-Texture Coatings and Spray Simulations for Open Accumulators”, University of Minnesota, \$500,000; August 2010 - August 2015 (part of a \$2,000,000 National Science Foundation grant to University of Minnesota).
3. E. Loth “Ultralight Pre-Aligned Rotor for Off-shore Wind”, Alliance for Sustainable Energy/NREL, \$80,000; January 2014 - November 2015.
4. E. Loth “Ultralight Technologies for Off-Shore Wind Cost-of-Energy Savings”, Dominion Resources, \$150,000; March 2013 - February 2015.
5. E. Loth “Nano-Textured Protective Coatings for Structurally Integrated Panels”, Virginia Commonwealth Research Commercialization Fund, \$150,000; October 2012 – August 2014.
6. M. Bragg and E. Loth "Experimental Icing Simulation Capability for Full-Scale Swept Wings" NASA Glenn Research Center, \$541,989, Jan. 2012- Dec. 2013.
7. E. Loth "Methodology of a Computational Icing Research Tunnel" NASA Glenn Research Center, \$675,570, January 2009- December 2012.
8. E. Loth and A. Steele "Ultra-lubricating and Hemocompatible Nanocomposite Coatings for Surgical Devices" National Science Foundation I-Corps Program, \$50,000, Feb. 2012- July 2012.
9. E. Loth “Low-Cost Nano-composite Coatings for Wind Turbine Surfaces”, AREVA, \$310,500; July 2010 - June 2012.
10. E. Loth “Feasibility of Water Aluminum Reactor Power for UUVs”, Northrop-Grumman, \$100,000; August 2010 - December 2011.
11. E. Loth, M. Bragg, G. Elliott, & A. Broeren "Development of a Large-Scale Low-Boom Supersonic Inlet for Investigating Micro-Array Flow Control" NASA Glenn Research Center, \$787,292; March 2008 - June 2011.
12. M. Bragg, G. Elliott, D. Bodony & E. Loth " Bypass Flow Analysis" Gulfstream/Rolls Royce, \$666,251; January 2008 – June 2011.
13. E. Loth, G. Elliott, & M. Bragg, "μVG’s for Supersonic Inlets" Gulfstream/Rolls Royce, \$700,788; January 2008 – June 2011.
14. E. Loth "SBLI Flow Control with μVG’s using LES" NASA Glenn Research Center, \$263,190; May 2007 - December 2010.

15. E. Loth "Nano-Texturing for Fluid Power Efficiency" Center for Compact, Clean and Efficient Fluid Power, NSF Engineering Research Center, \$353,100 July 2006 - August 2010.
16. E. Loth "Carbon Nano-Tube Additives to Reduce Volumetric and Pressure Losses" Center for Compact, Clean and Efficient Fluid Power, NSF Engineering Research Center, \$543,900; July 2006 - June 2010.
17. I. Jasuik, E. Loth and I. Bayer "Novel Biocompatible Bone Adhesion Technology" Grainger Foundation, \$100,000, January 2009- December 2009).
18. E. Loth and H. Babinsky "Understanding Micro-ramp Control for Shock Boundary Layer Interactions" Air Force Office of Scientific Research, \$120,000; June 2006-June 2007.
19. E. Loth, "Unstructured Multiphase Code Development" Arnold Engineering Development Center, \$142,000, June 2004 - September 2007.
20. E. Loth "CFD for Refrigerated Display Cases" Carrier Corporation, \$50,000; June 2006 - May 2007.
21. E. Loth, "Optimization of the Icing Research Tunnel" NASA Glenn Research Center, NAG3-2623, \$75,000, October 2005 - October 2006.
22. E. Loth & J.C. Dutton "Supersonic Bump Compression", Boeing, Phantom Works (St. Louis), \$165,115, August 2003 – March 2006.
23. E. Loth, M. Bragg & A. Hamed "Simulation of Icing Technology on Turbomachinery" Ohio Aerospace Institute, \$150,000, March 2004 – October 2005.
24. E. Loth, "Virtual Icing Research Tunnel" NASA Glenn Research Center, NAG3-2623, \$261,880, June 2001 - December 2004.
25. M. Bragg, P. Voulgaris, N. Sarter, E. Loth, M. Selig, K. Sivier, T. Baser, W. Perkins, and C. Wickens "Smart Icing Systems" NASA Lewis Research Center, NAG 3-2135, Phase I: \$2,196,181, January 1997- March 2004.
26. E. Loth "Closed-Loop Control of Air Curtains" Air Conditioning Research Center, ACRC-136, \$67,000, Sept. 2001- Aug. 2003.
27. E. Loth, S. White, P. Guebelle, D. Tortorelli, J. Dutton, A. Alleyne, D. Davis "Smart Mesoflaps for Aeroelastic Transpiration to Control Shock/Boundary-Layer Interactions" DARPA/AFOSR, F49620-98-1-0490, Phase I: \$268,914, July 1998 - June 1999; Phase II: \$2,069,595, July 1999 - September 2002.
28. M. Bragg and E. Loth "Effect of Large-Droplet Ice Accretions on Airfoil and Wing Aerodynamics and Control", Federal Aviation Administration, DTFA 96-G-023, \$900,199, June 1996 – December 2002.
29. E. Loth, "MEMS-based Microbubble Simulations for Ultra-Efficient Drag Reduction" DARPA, MDA-972-01-C-0042, \$119,345, March 2001 - September 2002.
30. J. Molner and E. Loth "Contaminant Dispersion around Large Urban Buildings" National Center for Supercomputing Applications, \$39,766, August 2001 - July 2002.
31. E. Loth "Bubble Dispersion in Non-Equilibrium Turbulent Boundary Layers" Office of Naval Research, N00014-96-1-0312, \$291,302, January 1996 - May 2000.
32. E. Loth and P. Hrnjak "Understanding and Reducing Refrigerated Air Curtain Entrainment" Air Conditioning Research Center, \$125,820, Aug. 1999 - July 2001.
33. E. Loth "Virtual Rendering of Multiphase Flows" National Center for Supercomputing Applications, \$26,000, August 2000 - July 2001.

34. E. Loth and A. Alleyne "Defining Microsensor Capabilities for Supersonic Boundary Layer Control " NASA Glenn Research Center, \$24,000, July 1999 – Oct. 1999.
35. E. Loth, P. Guebelle, S. White, D. Tortorelli "Smart Microflaps for Aeroelastic Transpiration for SBLI Flow Control" Air Force Office of Scientific Research, F49620-98-1-0381, \$85,401, March 1998 - November 1998.
36. E. Loth "Simulation of Icing Clouds and Droplet Impingement on Test Models" NASA Lewis Research Center, NAS 3-97011, \$124,072, Jan. 1997 - September 1999.
37. E. Loth and D. Jeffers "UIUC Engineering Orientation for Students with Disabilities" PURSUIT (supported through NSF), \$12,078, April 1996 - April 1997.
38. E. Loth "Interaction Between Turbulence Modulation and Bubble Dispersion" Office of Naval Research, N00014-92-J-1157, \$256,000, October 1991 - December 1995.
39. E. Loth "Computational Methodology for Wind Tunnel Spray Bar Droplet Dispersion" Sverdrup (Arnold Engineering Development Center), AF SVERDRUP A955-11, \$52,000, August 1993 - November 1995.
40. W. Schowalter, M. Bragg, M. Brewster, R. Buckius, R. Burton, J. Dutton, B. Jones, H. Krier, E. Loth, J. Peters, W. Solomon "Renovation Of Mechanical Engineering Laboratory" National Science Foundation, \$750,000, October 1992 - October 1993.
41. E. Loth "Research Experience for Undergraduates" National Science Foundation Grant No. CTS-9010594x, \$8,000, April 1992 - August 1992.
42. E. Loth "Experimental and Computational Study of Supersonic Mixing Layers" National Science Foundation Grant No. CTS-9010594, \$70,000, July 1990 - Dec. 1992.
43. E. Loth "Investigation of Transient Compressible Flows Past 2-D and 3-D Objects" Science Applications International Corporation, DNA SAIC 21900208-82, \$90,886, Jan. 1990 - July 1992.
44. K. Kailasanath and E. Loth "Supersonic Nozzle and Test Body Computations." Strategic Systems Planning Office JON44-3310-0-9, \$250,000, January 1989 - January 1990 (granted to Naval Research Laboratory, Washington, D.C.).

PUBLICATIONS

BOOKS and BOOK CHAPTERS

1. E. Loth, Fluid Dynamics of Bubbles, Drops and Particles, Cambridge University Press (expected to be published in 2018).
2. E. Loth and C. Qin “Isothermal Compressed Air Energy Storage through Spray Cooling” in Energy Storage, editor S. Bauer, Wiley (expected to be published in 2017).
3. E. Loth “Numerical Methods for Multiphase Flow” in Handbook on Multi-Phase Flows, editor C. Crowe, CRC Press, 2016.
4. A. Milionis, I.S. Bayer, and E. Loth “Recent Progress in Evaluating Mechanical Durability of Liquid Repellant Surfaces” in Advances in Contact Angle, Wettability and Adhesion, editor K.L. Mittal, John Wiley & Sons, 2015.
5. I.S. Bayer, A.J. Davis and E. Loth “Liquid Repellant Amorphous Carbon Nanoparticle Networks” in Advances in Contact Angle, Wettability and Adhesion, editor K.L. Mittal, John Wiley & Sons, 2015.
6. E. Loth “Overview of Multiphase Modeling” in Handbook on Multi-Phase Flows, editor C. Crowe, CRC Press, 2006.

PATENTS

1. P. Snyder, E. Loth, and D. Barone "Particle Separator", U. S. US20160363051 A1, filed Aug. 15, 2014; issued Dec. 15, 2016
2. Loth, E. and Selig, M.S., "2-D Fairing for a Wind Turbine Tower," US Patent Application WO 2014205348 A1, filed June 20, 2014; published May 19, 2016.
3. A. Milionis, K. Dang, I. S. Bayer, J Languasco “Superhydrophobic/Superoleophobic Nanocomposite Coatings by One-Step Water-Based Spray”, U.S. Provisional Patent Application No. 62/174,238, filed Jun. 11, 2015.
4. I. Bayer, E. Loth and A. Steele “Superhydrophobic nanocomposite coatings”, U.S. Patent No. US20140113144 A1, filed Jun. 8, 2012; issued April 24, 2014.
5. E. Loth, H. Babinsky and S. Lee "Vortex Generators to Control Boundary Layer Interactions" US8656957, filed September 30, 2009; issued Feb. 25, 2014.
6. E. Loth, M. Selig and A. Steele "Morphing Segmented Wind Turbine and Related Method", U. S. US20130064663 A1, filed June 20, 2012; issued Mar. 14, 2013.
7. E. Hsiao-Weckslar, A. Shorter, E. Loth, G. Kogler, J. Thomas and J. Gilmer "Portable Active Fluid Powered Foot and Ankle Orthosis", US20110112447, filed Oct. 5 2010; issued May 12, 2011.
8. I. Bayer, E. Loth and A. Steele “Composite material compositions and methods”, U.S. Patent No. US20100068434 and WO2010017558, filed Aug. 10, 2009; issued Jan. 13, 2011.
9. E. Loth, J.C. Dutton, P. Geubelle, S. White, A. Alleyene, D. Tortorelli, S. McIlwain, and D. Davis, " Methods and Apparatus for Control of Shock/Boundary-Layer Interactions" US6651935; filed June 12, 2002; issued November 25, 2003.
10. E. Loth "Mesoflap Passive Transpiration System and Method for Shock/Boundary Layer Interaction Control" US5971327; filed July 29, 1998; issued October 26, 1999.
11. J. Loth, E. Loth, and F. Loth "Isolated Combustion and Diluted Expansion Piston Engine" US5239959, filed June 22, 1992; issued Aug. 31, 1993.

JOURNAL ARTICLES

(* indicates former or current students supervised by EL)

1. K. Krishnan*, A. Milionis, E. Loth, TE Farrell, JD Crouch & DH Berry “Influence of Hydrophobic and Superhydrophobic Surfaces on Reducing Aerodynamic Insect Residues” ACS Applied Surface Science Vol. 392, pp. 723-731, 2017.
2. C. Qin, E. Loth, S. Lee & P. Moriarty “Hydraulic-Electric Hybrid Wind Turbines: Tower Mass Savings and Energy Storage Capacity” Renewable Energy, Vol. 99, pp. 69-79, 2016.
3. S. Candon*, M. Rybalko* and E. Loth “Acoustically Induced Shock Oscillations in a Low-Boom Inlet” AIAA Journal, Vol. 54, pp. 2134-2148, 2016
4. C. Qin* & E. Loth “Numerical Description of a Pressure-Swirl Nozzle Spray” Chemical Engineering and Processing Vol. 107, pp. 68-79, Sept. 2016.
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130. B. Wood*, E. Loth, and P. Geubelle "Mesoflaps for Aeroelastic Transpiration for SBLI Control," AIAA Aerospace Sciences Meeting, Reno NV, January 1999, AIAA 99-0614.
131. T. Dunn* and E. Loth "Effects of Simulated-Spanwise-Ice Shapes on Airfoils: Computational Investigation" AIAA Aerospace Sciences Meeting, Reno NV, January 1999, AIAA 99-0093.
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