

# 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 Engr. (1979-1983)

## EMPLOYMENT (since PhD)

**University of Virginia** Mechanical & Aerospace Engineering, Charlottesville, VA  
Professor and Chair of Mechanical & Aerospace Engineering: (2015–present)  
Professor and Assoc. Chair for Aerospace Engineering: (2010–2015)  
**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 Comp. 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 (since PhD)

**Cambridge University (UK)**, Visiting Scholar, Engr. 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. Res. Engineer, Waltham MA (summers 1996 & 1997)  
**Naval Research Lab**, Senior Fellow & ASEE Summer Faculty, Wash., D.C. (1995)  
**Arnold Engineering and Development Center**, AFOSR Summer Faculty, TN (1993)  
**Science Applications Intl. Corp.**, Sr. Research Engineer, VA (summers 1990, 1991)

\* Department name was Aeronautical & Astronautical Engineering until 2003

## KEY ADMINISTRATIVE TEAM-BASED ACCOMPLISHMENTS (at UVA)

### While Chair of Mechanical and Aerospace Engineering, we achieved:

- MAE GRE Quantitative scores average increased to 166 (highest ever), which exceeds the average of top 10 USN&WR public engineering colleges (165.4)
- MAE PhD class grew by 27% with increased diversity (36% women and 29% URM), representing a 103% in just two years (highest ever)
- Created Partnership with UVA's School of Commerce (Ranked #6 in US News) for Masters of Engineering, whose enrollment increased by 420% in 3 years
- US News Grad Ranking of Mechanical Engr. and of Aerospace Engr. reached their highest ever combined rankings (w/ AE into top 25 for first time)
- US News Grad Ranking of Mechanical Engineering and of Aerospace Engineering **both** are now highest for any public MAE departments of up to 25 tenure and tenure-track (T3) professors (UVA's MAE has 22 T3)
- Avg. MAE T3 faculty H-index (google scholar) increased to 28.5 (highest ever)
- Avg. external research per MAE T3 faculty reached \$530K, which is approaching the average of top 10 USN&WR engineering public colleges (\$679K)
- MAE faculty more diverse, e.g. 42% of new professors were women and MAE increased number of full professors who are national fellows (now 80%)
- MAE faculty more cross-disciplinary activities, e.g. first ever joint appointments with Chem. Engr., Elec. & Comp. Engr., Civil & Env. Engr., Orthopedics, Engineering & Society, and Systems & Info. Engr.
- MAE Faculty members firsts: Presidential Early Career Award for Scientists and Engineers (Hopkins), National Academy of Inventors (Gillies); Chair NFL safety committees and appear in Superbowl commercial (Kent)
- MAE partnered to secure \$14.8M in new internal funds for infrastructure and equipment (UVA Strategic Investment Funds)
- MAE Hosted Department Heads from: Carnegie Mellon, Duke, Georgia Tech, Harvard, Illinois, Johns Hopkins, Michigan, MIT, Northwestern, Penn, Penn State, Texas, Yale, & several members of National Academy of Engineering
- MAE Increased departmental alumni giving by 521% and also developed advancement plan that resulted in first ever MAE named laboratory

### While Principal (Director) of the International Residential College, we:

- Instituted new programs which increased incoming student applicants by 310% (largest ever increase and number of applications in IRC history)
- Worked to secure \$13M in Building and Infrastructure Improvements (2017-2018)
- Developed proposal and worked with President's Office to rename Lewis House to Yen House (dedication ceremony featured UVA's President)
- Invited/Hosted Several Internationally Distinguished Guests: Jerry White (Nobel Prize Recipient), Theresa Sullivan (UVA President), Larry Sabato (3-time Emmy Award Winner), Junot Diaz (Pulitzer Prize Winner), Nat Howell (Former US Ambassador), Helena Kennedy (Baroness & Member of U.K. House of Lords), Katherine Thornton (Hall of Fame NASA Astronaut), Rita Dove (US Poet Laureate), Sasheer Zamata (Saturday Night Live TV Star), and Diana Eck (National Humanities Medal Awardee)

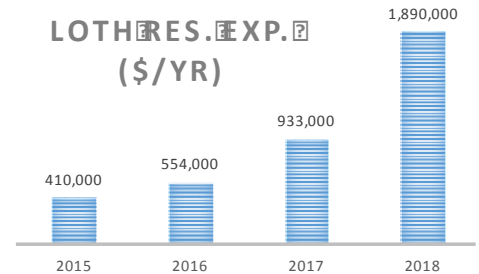
## LOTH KEY RESEARCH ACCOMPLISHMENTS (academic career)

### LOTH GRADUATE ADVISING

Currently supervising 5 Ph.D. students and a Post-Doc  
 Graduated 33 M.S. thesis and 26 Ph.D. dissertation students

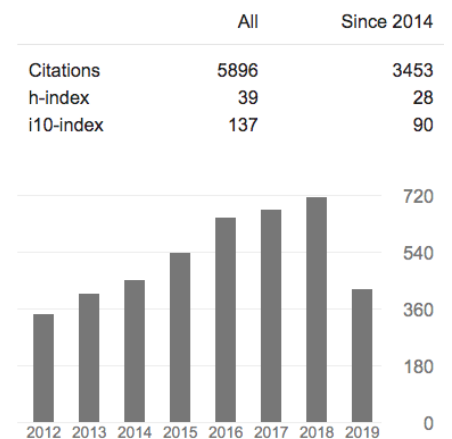
### LOTH EXTERNAL RESEARCH FUNDING

2018 Research Expenditures: \$1,885,692  
 Current Research Grants & Contract: more than \$5.8M as PI  
 Previous Research Grants & Contract: more than \$10M share as PI & \$5M share as Co-PI



### LOTH PUBLICATION RECORD

Book Chapters: 5 (and one book in preparation)  
 Patents: 6 Granted and 5 more Applications  
 Invited University Talks: 49 including Brown, Carnegie Melon, Cambridge, Duke, Harvard (twice), Oxford, MIT (twice), Penn and Princeton  
 Invited National Lab Talks: NASA, NETL, NREL, NRL, NUWC and Sandia National Labs  
 Journal Papers: more than 150  
 Conference Papers: more than 180  
 Citations: 5896 (google scholar)  
 H-Index: 39 (google scholar)



### MEDIA COVERAGE of Loth's wind turbine research:

[More than 50 media articles](#) including: [Scientific American](#), [New York Times](#), [MIT Technology Review](#), [USA Today](#), [CNBC](#), [Daily Mail](#) (London), [Los Angeles Times](#), and [Mechanical Engineering](#)

Front Cover of [Wind Energy](#) and [Energy Solutions](#)

Listed in [Popular Science](#) 2015 issue of 12 scientists who are "The Brilliant Minds Behind The New Energy Revolution"



The following pages provide details for Loth

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## **ADMINISTRATIVE ACTIVITIES**

### **ADMINISTRATIVE in National Professional Societies and others (2010-)**

Harvard Business School (Executive Ed.) Authentic Leadership Program (2019)  
Executive Committee of ASME Mech. Engr. Department Heads Association (2019-)  
Chair of AIAA Aerospace Department Chair Association (2017-2019)  
Chair of Southeast Mechanical Engineering Chairs & Heads Association (2017-2019)  
Aerospace Advisory Panel for the Governor of Virginia (2011-2014)

### **ADMINISTRATIVE at University of Virginia (2010-)**

Chair of Engineering Department Chairs Meetings (2019-present)  
Chair of Engineering Task Force for Effective Practices (2019-present)  
Chair of Mechanical and Aerospace Engineering Dept. (2015-present)  
Principal of International Residential College (2013-present)  
Chair of School of Engineering's Leadership Council (2016-17)  
Chair of Search Committee for Assoc. Dean for Engr Finance & Ops (2016-17)  
Member of Search Committee for Asst Vice President for Research Admin. (2015)  
School of Engineering Promotion and Tenure Committee (2013-2015)  
MAE Graduate Studies Committee (2012-2015)  
Associate Chair of Aerospace Engineering Dept. (2010-2015)  
Chair, MAE Tenure-Track Faculty Search Committee (2010-2013)  
Chair of SEAS Faculty Hiring Strategic Plan (2011-2012)  
School of Engineering Promotion & Tenure Committee (2010-2011)

### **ADMINISTRATIVE at University of Illinois (from 2000-2009)**

Associate Head of Undergraduate Studies for AE Dept. (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)  
AAE Department Advisory Committee (2000-2002, 2005-2006)

## AWARDS and HONORS

### **AWARDS and HONORS while at the University of Virginia (2010-)**

Research Innovation Award (May, 2019)  
Fellow of AIAA (May, 2017)  
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)  
NASA Patent Application Award (August 2012)  
NSF Innovation Corps Commemoration Ceremony (July 2012 at NSF HQ)  
NASA Group Achievement Award "Large-Scale Low-Boom Supersonic Inlet" (2011)  
Yip Fellow, Cambridge University, U.K. Easter Term (April-June, 2011)  
Invited to give more than 40 presentations at national/international conferences, at national labs (e.g., Argonne, NASA Glenn, NASA Langley, Naval Research Lab, National Renewable Energy Lab, Sandia National Lab) and at universities, e.g. Cambridge (twice), Harvard (twice), MIT (twice), Oxford, Michigan & Princeton

### **AWARDS and HONORS while at the University of Illinois & NRL (1990- 2010)**

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)

## **PROFESSIONAL RESEARCH ACTIVITIES (Journals & Conferences)**

### **Editorial Activities:**

Associate Editor, Coatings, 2014-

Associate Editor, Advances in Aerospace Science and Applications, 2008-

### **Journal Reviewer (partial list):**

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:**

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-

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 Aero. 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 Aero. Sci. 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



## TEACHING ACTIVITIES and BOOKS

### GRADUATE ADVISING ACTIVITIES

#### Supervision of Graduate Students while at University of Virginia (2010-)

Currently supervising 6 Ph.D. students

Graduated 11 M.S. thesis and 5 Ph.D. dissertation students

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

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

### COURSE 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) Wind Energy (D)

MAE 6592 (Graduate) Turbulence and Multiphase Flow (D)

MAE 6592 (Graduate) Multiphase Numerical Methods (D)

MAE 6592 (Graduate) Wind Energy (D)

MAE 7510/8591 (Graduate) Research Seminar (R)

MAE 7720 (Graduate) Computational Fluid Dynamics II (with Va Tech)

### BOOKS and BOOK CHAPTERS

1. E. Loth, Fluid Dynamics of Bubbles, Drops and Particles, Cambridge University Press (expected to be published in 2020).

### BOOK CHAPTERS

1. E. Loth and C. Qin “Isothermal Compressed Air Energy Storage through Spray Cooling” in Energy Storage, editor S. Bauer, Wiley.
2. E. Loth “Numerical Methods for Multiphase Flow” in Handbook on Multi-Phase Flows, editor C. Crowe, CRC Press, 2016.
3. 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.
4. 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.
5. E. Loth “Overview of Multiphase Modeling” in Handbook on Multi-Phase Flows, editor C. Crowe, CRC Press, 2006.



## RESEARCH FUNDING

### CURRENT GRANTS AND CONTRACTS

1. E. Loth “Segmented 50 MW Segmented Ultralight Morphing Rotors for Wind Energy”, ARPA-E, \$4,137,708; April 2016 - September 2019. Extension for \$1,979,789 for September 2019 - December 2021 submitted and under consideration.
2. E. Loth “Three-Dimensional Unsteady Swept Icing Aerodynamics” NASA AS&ASTAR Program, \$110,000, August 2016- August 2019.
3. E. Loth “Unsteady Flow Physics of Particle Separators”, Rolls-Royce, \$830,000 (via multiple annual renewals); May 2011 - December 2019. Extension for \$140,000 for January 2020 - January 2021 submitted and under consideration.
4. E. Loth “Anti-Icing Nano-Composite Polymer Coatings”, Rolls-Royce, \$743,000 (via multiple annual renewals); June 2012 - December 2019.

### PREVIOUS GRANTS AND CONTRACTS

1. E. Loth “Computations to Support of Experimental Icing Test of Full-Scale Swept Wings”, University of Illinois/NASA, \$235,835; January 2014 - May 2017.
2. E. Loth “Anti-Insect Fouling Coatings”, Boeing Company (Seattle), \$185,000; January 2014 - March 2016.
3. 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).
4. E. Loth “Ultralight Pre-Aligned Rotor for Off-shore Wind”, Alliance for Sustainable Energy/NREL, \$80,000; January 2014 - November 2015.
5. E. Loth “Ultralight Technologies for Off-Shore Wind Cost-of-Energy Savings”, Dominion Resources, \$150,000; March 2013 - February 2015.
6. E. Loth “Nano-Textured Protective Coatings for Structurally Integrated Panels”, Virginia Commonwealth Research Commercialization Fund, \$150,000; October 2012 – August 2014.
7. M. Bragg and E. Loth "Experimental Icing Simulation Capability for Full-Scale Swept Wings" NASA Glenn Research Center, \$541,989, Jan. 2012- Dec. 2013.
8. E. Loth "Methodology of a Computational Icing Research Tunnel" NASA Glenn Research Center, \$675,570, January 2009- December 2012.
9. 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.
10. E. Loth “Low-Cost Nano-composite Coatings for Wind Turbine Surfaces”, AREVA, \$310,500; July 2010 - June 2012.
11. E. Loth “Feasibility of Water Aluminum Reactor Power for UUVs”, Northrop-Grumman, \$100,000; August 2010 - December 2011.
12. 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.
13. M. Bragg, G. Elliott, D. Bodony & E. Loth "□Bypass Flow Analysis" Gulfstream/Rolls Royce, \$666,251; January 2008 – June 2011.
14. E. Loth, G. Elliott, & M. Bragg, "μVG's for Supersonic Inlets" Gulfstream/Rolls Royce, \$700,788; January 2008 – June 2011.

15. E. Loth "SBLI Flow Control with  $\mu$ VG's using LES" NASA Glenn Research Center, \$263,190; May 2007 - December 2010.
16. 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.
17. 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.
18. I. Jasuik, E. Loth and I. Bayer "Novel Biocompatible Bone Adhesion Technology" Grainger Foundation, \$100,000, January 2009- December 2009).
19. 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.
20. E. Loth, "Unstructured Multiphase Code Development" Arnold Engineering Development Center, \$142,000, June 2004 - September 2007.
21. E. Loth "CFD for Refrigerated Display Cases" Carrier Corporation, \$50,000; June 2006 - May 2007.
22. E. Loth, "Optimization of the Icing Research Tunnel" NASA Glenn Research Center, NAG3-2623, \$75,000, October 2005 - October 2006.
23. E. Loth & J.C. Dutton "Supersonic Bump Compression", Boeing, Phantom Works (St. Louis), \$165,115, August 2003 – March 2006.
24. E. Loth, M. Bragg & A. Hamed "Simulation of Icing Technology on Turbomachinery" Ohio Aerospace Institute, \$150,000, March 2004 – October 2005.
25. E. Loth, "Virtual Icing Research Tunnel" NASA Glenn Research Center, NAG3-2623, \$261,880, June 2001 - December 2004.
26. 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.
27. E. Loth "Closed-Loop Control of Air Curtains" Air Conditioning Research Center, ACRC-136, \$67,000, Sept. 2001- Aug. 2003.
28. 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.
29. 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.
30. E. Loth, "MEMS-based Microbubble Simulations for Ultra-Efficient Drag Reduction" DARPA, MDA-972-01-C-0042, \$119,345, March 2001 - September 2002.
31. J. Molner and E. Loth "Contaminant Dispersion around Large Urban Buildings" National Center for Supercomputing Applications, \$39,766, August 2001 - July 2002.
32. E. Loth "Bubble Dispersion in Non-Equilibrium Turbulent Boundary Layers" Office of Naval Research, N00014-96-1-0312, \$291,302, January 1996 - May 2000.
33. E. Loth and P. Hrnjak "Understanding and Reducing Refrigerated Air Curtain Entrainment" Air Conditioning Research Center, \$125,820, Aug. 1999 - July 2001.

34. E. Loth "Virtual Rendering of Multiphase Flows" National Center for Supercomputing Applications, \$26,000, August 2000 - July 2001.
35. E. Loth and A. Alleyne "Defining Microsensor Capabilities for Supersonic Boundary Layer Control " NASA Glenn Research Center, \$24,000, July 1999 – Oct. 1999.
36. 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.
37. 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.
38. E. Loth and D. Jeffers "UIUC Engineering Orientation for Students with Disabilities" PURSUIT (supported through NSF), \$12,078, April 1996 - April 1997.
39. E. Loth "Interaction Between Turbulence Modulation and Bubble Dispersion" Office of Naval Research, N00014-92-J-1157, \$256,000, October 1991 - December 1995.
40. 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.
41. 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.
42. E. Loth "Research Experience for Undergraduates" National Science Foundation Grant No. CTS-9010594x, \$8,000, April 1992 - August 1992.
43. E. Loth "Experimental and Computational Study of Supersonic Mixing Layers" National Science Foundation Grant No. CTS-9010594, \$70,000, July 1990 - Dec. 1992.
44. 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.
45. 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.).

## **PATENTS**

### **PROVISIONAL APPLICATIONS**

1. E. Loth, C. Noyes and J. Simpson "System and Method for Super-Rated Operation of a Wind Turbine using Energy Storage", U.S. Provisional Patent Application Serial No. 62/865,462, Filed on June, 2019

### **APPLICATIONS**

1. E. Loth, A. Milionis, Y. Yoeng and J. Sokhey "Methods and Systems for Self-Lubricating Icephobic Elastomer Coatings", U.S. Patent Appl. No. 20190144122, filed May, 2017.
2. Loth, E. and Selig, M.S., "2-D Fairing for a Wind Turbine Tower," US Patent Appl. No. 20160138567 & WO 2014205348 A1, filed June 2014; published May 2016.
3. I. Bayer, E. Loth and A. Steele "Superhydrophobic nanocomposite coatings", U.S. Patent Appl. No. 20140113144 A1, filed June 2012; published April 2014.
4. E. Hsiao-Wecksler, A. Shorter, E. Loth, G. Kogler, J. Thomas and J. Gilmer "Portable Active Fluid Powered Foot and Ankle Orthosis", U.S. Patent Appl. No. 20110112447, filed Oct. 2010; published May 2011.
5. I. Bayer, E. Loth and A. Steele "Composite material compositions and methods", U.S. Patent No. US20100068434 and WO2010017558, filed Aug. 2009; published March 2010.

### **GRANTED PATENTS**

1. P. Snyder, E. Loth, and D. Barone "Particle Separator", Patent 10227924, filed Aug. 2014; granted March, 2019
2. E. Loth, M. Selig and A. Steele "Morphing Segmented Wind Turbine and Related Method", US20130064663, filed June 2012; granted July 2017.
3. E. Loth, H. Babinsky and S. Lee "Vortex Generators to Control Boundary Layer Interactions" US8656957, filed September 2009; granted Feb. 2014.
4. 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; granted Nov. 2003.
5. E. Loth "Mesoflap Passive Transpiration System and Method for Shock/Boundary Layer Interaction Control" US5971327; filed July 1998; issued Oct. 1999.
6. J. Loth, E. Loth, and F. Loth "Isolated Combustion and Diluted Expansion Piston Engine" US5239959, filed June 1992; issued Aug. 1993.

## INVITED PRESENTATIONS

- 1) "Underground Energy Storage for Wind Turbine Farms," National Energy Technology Laboratory, Morgantown, WV, Aug. 2019.
- 2) "Morphing and Fluid-Structure Alignment for Extreme-Scale Wind Turbine Design," Mechanical & Aerospace Engr., North Carolina State University, Raleigh, NC, Sept., 2018.
- 3) "Unsteady Fluid-Structure Interactions and World's Largest Wind Turbine?," Mechanical Engr. & Appl. Mechanics, Duke University, Durham, NC, April, 2018.
- 4) "Segmented Ultralight Morphing Rotor," Aeronautical and Astronomical Engineering, University of Washington, Seattle, WA, February, 2018.
- 5) "How Large Will Wind Turbines Become?" Mechanical Engr. & Aerospace Engineering, Case Western University, Cleveland, OH, February, 2018.
- 6) "Morphing Rotors for Extreme-Scale Wind Turbines," Mechanical Engr. & Appl. Mechanics, University of Pennsylvania, Philadelphia, PA, December, 2016.
- 7) "Technology Innovation in Off Shore Wind Systems," International Partnering Forum, Providence, RI, October, 2016.
- 8) S. Candon & E. Loth "Observation of Novel Dynamics for a Low-Boom Relaxed-Compression Supersonic Inlet" National Institute of Aerospace, Oct. 2015.
- 9) "Morphing Wind Turbines," Mechanical & Aerospace Engineering, Princeton University, Princeton, NJ, March 2015.
- 10) S. Candon & E. Loth "Acoustically Induced Shock Oscillation of a Low-Boom Inlet" AIAA Aerospace Sciences Meeting, AIAA-2015-1048, Kissimmee, FL, Jan. 2015.
- 11) "Extreme Scale Downwind Rotors," Sandia National Laboratories Turbine Blade Workshop, Albuquerque NM, October 2014.
- 12) "Segmented Ultralight Morphing Rotors for Wind Turbines," National Renewable Energy Laboratory, Golden CO, July 2014.
- 13) "Nanotextured Hemophobic Surfaces," NanoTech (Advanced Materials and Characterization), Washington DC, June 2014.
- 14) "Durability of Nanocomposite Superhydrophobic Coatings," Chemical Engineering, Massachusetts Institute of Technology (MIT), Cambridge, Mass, March 2014.
- 15) "Icephobic and Hemophobic Nanocomposite Superhydrophobic Coatings," Mechanical Engineering, Harvard University, Cambridge, Mass, March 2014.
- 16) "Drop Heat Transfer and Interaction for Compressed Air Energy Storage," Osney Thermo-Fluids Laboratory, Department of Engineering Science, University of Oxford, England, March 2013.
- 17) M. Rybalko\* and E. Loth "Pressure and Shock Dynamics of a Low-Boom Inlet," Aerospace Sciences Meeting, AIAA 2013-0015, Grapevine, Texas, January 2013.
- 18) 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.
- 19) 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.
- 20) "Nano-Texturing for Energy Storage," Department of Mechanical Engineering, University of Minnesota, October 2012.

- 21) "Next Generation of Off-Shore Wind Turbines," Governor's Conference on Energy, Richmond, VA, October 2012.
- 22) "Segmented Ultralight Morphing Turbines," Fluids Seminar, Department of Engineering, University of Cambridge, England, June 2011.
- 23) E. Loth "A Discrete Equation of Motion for Particle of Finite Size and Reynolds Number," AIAA Fluid Dynamics Meeting, Honolulu, Hawaii, June 2011.
- 24) M. Rybalko\* & E. Loth "Simulations of a Supersonic Single-Stream Axisymmetric Inlet," AIAA Applied Aerodynamics Meeting, Honolulu, Hawaii, June 2011.
- 25) T. Gillen\* & E. Loth "Simulations of a Supersonic Dual-Stream Axisymmetric Inlet," AIAA Applied Aerodynamics Meeting, Honolulu, Hawaii, June 2011.
- 26) A. Steele\*, I. Bayer, Y.H. Yeong\*, and E. Loth "Adhesion strength and superhydrophobicity in polyurethane/organoclay nanocomposites" TechConnect World, Boston, June 2011.
- 27) "Durable Nanocomposite Superhydrophobic Surfaces," Nanostar Symposium, Charlottesville, May 2011.
- 28) "Flow Control for Quiet Supersonic Inlets," Plenary Speaker Virginia Space Grant Consortium, Richmond, VA, April 2011.
- 29) "SBLI Vortex Generator Flow Control Physics," 4<sup>th</sup> Annual Shock-Wave/Boundary Layer Interaction Flow Control and Modeling Workshop, Cleveland, OH, April 2011.
- 30) "Morphing for Extreme-Scale Wind Turbines," Virginia Off-Shore Wind Supply Forum, Richmond, December 2010.
- 31) "Supersonic Inlet Flow Control," Department of Mechanical Engineering, University of Delaware, April 2009.
- 32) "Vortex Generators for Supersonic Turbulent Boundary Layers," Department of Aerospace and Ocean Engineering, Virginia Polytechnical Institute and State University, April 2009.
- 33) "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.
- 34) "High Accuracy and Stability Techniques for Fluid-Structure Simulation," Department of Mechanical Engineering, University of Illinois at Chicago, April 2007.
- 35) "Electrolytic Micro-Bubbler Matrices," Department of Mechanical and Aerospace Engineering, Florida Institute of Technology, May 2006.
- 36) "Particle Dispersion in a Turbulent Boundary Layer via DNS and RANS flows," Department of Engineering, University of Cambridge (U.K.), November 2004.
- 37) "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.
- 38) "Boundary Layer Control for Supersonic Inlets," Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA October 2002.
- 39) "Mesoflaps for Supersonic Inlet Flow Control," AIAA Fluid Dynamics Meeting, St. Louis, MO, June 2002.
- 40) "Smart Materials for Mesoflap Bleed and Injection," ASME Summer Fluids Engineering Meeting, FEDSM2001-18277, New Orleans, May-June 2001.

- 41) "Mesoflaps for Supersonic Engine Inlets," Department of Aero. & Astro. Engineering, Massachusetts Institute of Technology, Cambridge MA, Feb. 2000.
- 42) "Mixing Layer Turbulence and Bubble Deformation," Division of Engineering and Applied Sciences, Harvard University, Boston MA, Nov. 5, 1997.
- 43) "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.
- 44) "Dynamics and Dispersion of Bubbles in a Turbulent Free Shear Layer," Naval Undersea Warfare Center, Newport RI, July 1996.
- 45) "Adaptive Grid Technology for Two-Phase Compressible Flow" Molten Metal Technology, Waltham, MA, May 1995
- 46) "Large Eddy Simulations of a Supersonic Shear Layer" University of Michigan, Mechanical Engineering Department, April 1993.
- 47) "Dynamics of Compressible and Two-Phase Fluids" Virginia Polytechnical Institute and State University, Blacksburg, VA, February, 1992.
- 48) "Vorticity and Mixing Layer Simulations" Naval Research Laboratory, Laboratory for Computational Physics, June 1991.
- 49) "Study of Plane Turbulent Under-expanded Air Jets in Water." Dayton Research Institute, Dayton, OH, July 1988.



## JOURNAL ARTICLES

(\* indicates former or current students supervised by EL)

1. C. Noyes\*, C. Qin\*, and E. Loth, "Pre-Aligned Downwind Rotor for a 13.2 MW wind turbine" Renewable Energy, Vol. 116, pp. 749-754, 2018.
2. S. Lee\* and E. Loth, "On ramped vanes to control normal shock boundary layer interactions" Aeronautical Journal 122, 1568-1585, 2018.
3. C. Noyes\*, C. Qin\*, E. Loth, and S. Schreck, "Measurements and predictions of wind turbine tower shadow and fairing effects" Journal of Wind Engineering and Industrial Aerodynamics 179, 297-307, 2018.
4. R. Robison\* and E. Loth, "Critical Protuberance Height for Transition of Leading Edge Boundary Layers" Journal of Aircraft 55 (5), 1905-1913, 2018.
5. A. Milionis, K.G. Krishnan\*, E. Loth, and M. Lawrence, "Dynamic wetting of human blood and plasma on various surfaces" Colloids and Surfaces B: Biointerfaces 166, 218-223, 2018.
6. Y.H. Yeong\*, A. Milionis, E. Loth, J. Sokhey, "Self-lubricating icephobic elastomer coating (SLIC) for ultralow ice adhesion with enhanced durability" Cold Regions Science and Technology 148, 29-37, 2018.
7. C. Noyes\*, C. Qin\*, E. Loth, "Pre-aligned downwind rotor for a 13.2 MW wind turbine" Renewable Energy 116, 749-754, 2018.
8. D. Barone\*, E. Loth, P.H. Snyder, "Flow Field and Efficiency of a Two-Dimensional Inertial Particle Separator" Journal of the American Helicopter Society 63 (1), 1-9, 2018.
9. C. Qin\*, G. Saunders\*, and E. Loth, "Offshore Wind Energy Storage Concept for Cost-of-rated-power savings" Applied Energy, Vol. 201, pp. 148-157, 2017.
10. K. Krishnan\*, A. Milionis, F. Tetteh\*, & E. Loth "Fruit Fly Impact on Surfaces on Aerodynamic Surfaces: Types of Outcomes and Reside Components" Aerospace Science and Technology Vol. 392, pp. 723-731, 2017.
11. E. Loth, A. Steele\*, C. Qin\*, B. Ichter\*, MS Selig and P. Moriarty, C. Noyes\*, C. Qin, and E. Loth, "Pre-Aligned Downwind Rotor for a 13.2 MW wind turbine" Wind Energy, Vol. 20, pp. 1241-1259, 2017 (featured on Issue Cover)
12. 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.
13. D. Barone\*, E. Loth and P. Snyder "Effect of Particle Size on Inertial Particle Separator Efficiency" Powder Technology Vol. 318, No. 4, pp. 177-185, Aug. 2017.
14. D. Barone\*, E. Loth and P. Snyder "Flow Field and Efficiency of a 2-D Inertial Particle Separator" American Helicopter Society (in press).
15. 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.
16. S. Candon\*, M. Rybalko\* and E. Loth "Acoustically Induced Shock Oscillations in a Low-Boom Inlet" AIAA Journal, Vol. 54, pp. 2134-2148, 2016
17. C. Qin\* & E. Loth "Numerical Description of a Pressure-Swirl Nozzle Spray" Chemical Engineering and Processing Vol. 107, pp. 68-79, Sept. 2016.

18. C. Qin\*, E. Innes-Wimsatt\* & E. Loth “Hydraulic-Electric Hybrid Wind Turbines: Tower Mass Saving and Energy Storage Capacity” Renewable Energy Vol. 99, pp. 79-89, Dec. 2016.
19. C. Triphahn\*, Jason Mickey\* and E. Loth “2D Lagrangian Parcel Volume method for drop flux on a cylinder” International Journal of Multiphase Flow Vol. 84, pp. 9-18, September 2016.
20. A. Milionis, I. Bayer & E. Loth “Recent Advances in Oil-repellant surfaces” International Material Reviews Vol. 61, February 2016.
21. S. Wang\* and E. Loth “Droplet Impact Efficiency on an Aerodynamic Surfaces with a Globally Eulerian Locally Lagrangian Method” AIAA Journal of Aircraft, pp. 1-10, 2016.
22. A. Milionis, I. Bayer & E. Loth “Recent Advances in the Mechanical Durability of Superhydrophobic Materials” Advances in Colloid and Interface Science Vol. 229, pp. 57-79, 2016.
23. K. O’Connor\*, E. Loth & M.S. Selig “Experiments on Fairing Designs for a Wind Turbine Tower” AIAA Journal, pp. 1-7, 2016.
24. A. Milionis, C. Noyes, E. Loth, I. Bayer, AW. Lichtenberger, V.N. Stathopoulos, and N. Vourdas “Water-repellant Approaches for 3-D Printed Internal Passages” Materials and Manufacturing Processes, 2016.
25. Y. Yeong, A. Milionis, E. Loth, J. Sokhey & A. Lambourne “Atmospheric Ice Adhesion on Water Repellant Coatings: Wetting and Surface Topology” Langmuir, Vol. 31, pp. 13107-13116, November, 2015.
26. S. Candon\*, M. Rybalko\* and E. Loth “Near On-Design Unsteadiness in a Supersonic Low-Boom Inlet” Journal of Propulsion & Power pp. 1-13, 2015.
27. M. Rybalko\* and E. Loth “Aerodynamic Impact of Vortex Generators on a Relaxed-Compression Low-Boom Inlet” AIAA Journal Vol. 53, pp. 3700-3711, 2015.
28. A. Milionis, J. Languasco\*, E. Loth, & I. Bayer “Analysis of wear abrasion resistance of superhydrophobic acrylonitrile butadiene styrene rubber (ABS) nanocomposite” Chemical Engineering Journal, Vol. 281, pp. 730-738, 2015.
29. G. Krishnan & E. Loth “Effects of Gas and Droplet Characteristics on Drop-Drop Collision Outcome Regimes” International Journal of Multiphase Flow, Vol. 77, pp. 171-186, 2015.
30. G. Krishnan, P. Malm & E. Loth “Superhydrophobic Resistance to Dynamic Freshwater Biofouling Inception” Biofouling, Vol. 31, pp. 789-797, 2015.
31. C. Qin\* & E. Loth “Simulation of Spray Direct Injection for Compressed Air Energy Storage” Applied Thermal Engineering pp. 24-24, January, 2016.
32. T. Gillen\* and E. Loth “Simulations and Experiments of a Dual-Stream Low-Boom Supersonic Inlet” Journal of Propulsion & Power Vol. 31, No. 6, pp. 1567-1577, Nov. 2015.
33. D. Barone\*, E. Loth and P. Snyder “Efficiency of an Inertial Particle Separator” Journal of Propulsion & Power Vol. 31, No. 4, pp. 997-1002, April 2015.
34. A. Steele\*, A. Davis\*, J. Kim\*, E. Loth, and I. Bayer “Wear Independent Similarity” ACS Applied Materials & Interfaces, 2015.
35. A. Milionis, K. Krishnan\* & E. Loth “Hemolymph Droplet Impact Outcome on Surfaces of Varying Wettability” ACS Applied Surface Science Vol. 345, pp. 36-43, 2015.

36. A. Milionis, K. Dang\*, M. Prato & E. Loth “Liquid Repellent Nanocomposites Obtained from One-Step Water-Based Spray” Journal of Materials Chemistry A, 2015.
37. B. Ichter\*, A. Steele\*, E. Loth, P. Moriarty & M. Selig "A Morphing Downwind-Aligned Rotor Concept Based on a 13.2 MW Wind Turbine", Wind Energy, 2015.
38. I. Bayer, A. Davis\*, E. Loth, and A. Steele\* “Water Jet Resistant Superhydrophobic Carbonaceous Films by Flame Synthesis and Tribocharging” Materials Today Communications Vol. 3, pp. 57-68, 2015.
39. Y. Yoeng\*, A. Milionis, E. Loth, and I. Bayer “ Microscopic Receding Contact Line Dynamics on Pillar and Irregular Superhydrophobic Surfaces” Scientific Reports Vol. 5, 2015.
40. C. Zhang, B. Yan, J. Wieberdink, P. Li, J. Van de Ven, E. Loth, & T. Simon, “Thermal analysis of a compressor for application to Compressed Air Energy Storage ” Applied Thermal Engineering Vol. 73, pp. 1402-1411, 2014.
41. C. Qin\*, E. Loth, P. Li, T. Simon and J. Van de Ven, “Spray-Cooling Concept for Wind-Based Compressed Air Energy Storage” Journal of Renewable & Sustainable Energy Vol. 6, pp. 043125, 2014.
42. E. Innes-Wimsatt\* C. Qin\*, & E. Loth, “Economic Benefits of Hydraulic-Electric Hybrid Wind Turbines” International Journal of Environmental Studies, Vol. 71, pp. 812-827, 2014.
43. Y. Yoeng\*, J. Burton\*, E. Loth, I. Bayer, “Drop Impact and Rebound Dynamics on an Inclined Superhydrophobic Surface” Langmuir Vol. 30, pp. 12027-12038, 2014.
44. A. Davis\*, Y. Yoeng\*, A. Steele\*, E. Loth, I. Bayer, “Nanocomposite Coating Superhydrophobicity Recovery after Prolonged High-Impact Simulated Rain” RCS Advances Vol. 4, pp. 47222-47226, 2014.
45. A. Davis\*, Y. Yoeng\*, A. Steele\*, E. Loth, I. Bayer, “Superhydrophobic Nanocomposite Surface Topology and Ice Adhesion” ACS Applied Materials and Interfaces Vol. 6, pp. 9272-9279, May 2014.
46. A. Davis\*, Y. Yoeng\*, A. Steele\*, E. Loth, I. Bayer, “Spray Impact Resistance of a Superhydrophobic Nanocomposite Coating” AIChE Journal Vol. 60, pp. 3025-3032, Aug. 2014.
47. A. Steele, I.S. Bayer & E. Loth “Pipe Flow Drag Reduction Effects from Carbon Nanotube Additives" Carbon Vol. 77, pp. 1183-1186, Oct. 2014.
48. S. Wang & E. Loth “A Globally-Eulerian Locally-Lagrangian Particle Concentration Scheme" Powder Technology Vol. 253, pp. 614-625, Feb. 2014.
49. Y. Yoeng\*, A. Steele, E. Loth, I. Bayer, “Spray Deposition Effects on Superhydrophobicity and Durability of Nano-Coatings” Surface Innovations Feb. 2014.
50. C. Qin\* & E. Loth “Liquid Piston Compression Efficiency with Droplet Heat Transfer” Applied Energy Vol. 114, pp. 539-550, Feb. 2014.
51. K. Clark\* & E. Loth “A Multi-scale LES Technique for Coupling Near-Field and Far-Field Domains for a Jet Flow” Computers and Fluids Vol. 88, pp. 262-271, Dec. 2013.
52. A. Steele\*, B. Nayak, A. Davis\*, M. Gupta & E. Loth “Linear Abrasion of a Titanium Superhydrophobic Surface Prepared by Ultrafast Laser Microtexturing" Journal of Micromechanics and Microengineering Vol. 23, October, pp. 2208-2217, 2013.

53. E. Loth, N. Titchener, H. Babinsky and L. Povinelli "A Canonical NSBLI Flow Relevant to External Compression Inlets," AIAA Journal Vol. 51, September, pp. 2208-2217, 2013.
54. T. Coyne\*, E. Loth, J. Koncsek, D. Davis, T. Conners and D. Howe "Simulations of a Low-Boom Axisymmetric External Compression Inlet" Aeronautical Journal July, Vol. 117, No. 1193, pp. 1-18, 2013.
55. I. Bayer, A. Steele\* & E. Loth, "A Superhydrophobic and Electroconductive Carbon Nanotube-Fluorinated Acrylic Copolymer Nanocomposites from Emulsions" Chemical Engineering Journal Vol. 221, April, pp. 552-530, 2013.
56. J. Cheek\*, I. Bayer & E. Loth "Underwater Saturation Resistance and Electrolytic Functionality for Superhydrophobic Nanocomposites" Colloid and Polymer Science Vol. 291, March, pp. 2013-2016, 2013.
57. S. Lee\* and E. Loth, "Impact of Ramped Vanes on Normal Shock Boundary Layer Interaction" AIAA Journal, Vol. 50, pp. 2069-2079, 2012.
58. R. Chin\*, E. T. Hsiao-Weckler, & E. Loth, "Fluid-Power Harvesting by Underfoot Bellows During Human Gait" ASME J. of Fluids Engineering, Vol. 134, 7 pages, 2012.
59. K. Schraeder\*, I. Bayer, D. J. Milner, E. Loth, & I. Jasuik, "A Polyurethane-based Nanocomposite Biocompatible Bone Adhesive" Journal of Applied Polymer Science, Vol. 127, pp. 4974-4982, 2012.
60. Y. Yoeng\*, A. Steele\*, E. Loth, I. Bayer, G. De Combarieu & C. Lakeman "Temperature and Humidity Effects on Superhydrophobicity of Nanocomposite Coatings" Applied Physics Letters Vol. 100, January 2012.
61. M. Rybalko\*, E. Loth and D. Lankford, "Particle Random Walk Model for Hybrid RANS/LES Turbulent Flows" Powder Technology Vol. 221, May 2012.
62. A. Steele\*, I. Bayer & E. Loth "Adhesion strength and superhydrophobicity of polyurethane/organoclay nanocomposite coatings" Journal of Applied Polymer Science Vol. 125, January 2012.
63. M. Rybalko\*, H. Babinsky, & E. Loth "Vortex Generators for a Normal Shock/Boundary Layer Interaction with a Downstream Diffuser" AIAA Journal of Propulsion and Power , Vol. 28, January 2012.
64. R. Jaiman\*, P. Geubelle, E. Loth & X. Jaio "Transient Fluid-Structure Interaction with Non-Matching Spatial and Temporal Discretizations" Computers and Fluids Vol. 50, pp. 120-135, November 2011.
65. S. Lee\*, E. Loth, & H. Babinsky, "Normal Shock Boundary Layer Control with Various Vortex Generator Geometries" Computers and Fluids , Vol. 49, pp. 233-246, October 2011.
66. R. Jaiman\*, P. Geubelle, X. Jaio & E. Loth "Combined Interface Boundary Condition Method for Unsteady Fluid-Structure Interaction" Computer Methods in Applied Mechanics and Engineering , Vol. 200, pp. 27-39, January 2011.
67. S. Lee\*, E. Loth, N. Georgiadis & J. DeBonis, "Effect of Mach Number of Flow Past Microramps" AIAA Journal Vol. 49, pp. 97-110, 2011.
68. P. Martorana\*, I. S. Bayer, A. Steele\*, and E. Loth, "Effect of Graphite and Carbon Nanofiber Additives on the Performance Efficiency of a Gear Pump Driven Hydraulic Circuit Using Ethanol" Industrial and Engineering Chemistry Research Vol. 49, pp. 11363–11368, 2010.

69. Bayer, A. Steele\*, P.F. Martorana\* & E. Loth "Fabrication of superhydrophobic polyurethane/layered silicate nano-structured composites from cyclomethicone-in-water emulsions" Applied Surface Science , pp. 823-826, Vol. 257, 2010.
70. J. Kersey\*, E. Loth, and D. Lankford "Effects of Evaporating Droplets on Shock Waves", AIAA Journal, Vol. 48, pp. 1975-1996, 2010.
71. Steele, A.,\* I. Bayer, Cannon, A., King, W., & E. Loth, Steele, A.,\* "Conformal ZnO nanocomposite coatings on micro-patterned surfaces for superhydrophobicity", Thin Solid Films , Vol. 518, pp. 5426-5431, July 2010.
72. S. Lee\*, M. K. Goettke, E. Loth, J. Tinapple, J. Benek, "Microramps Upstream of an Oblique-Shock Boundary Layer Interaction" AIAA Journal , Vol. 48, No. 1, pp. 104-118, January, 2010.
73. I. Bayer, Brown, A.\*, Steele, A.,\* & E. Loth, "Transforming Anaerobic Adhesives into Highly Durable and Abrasion Resistant Superhydrophobic Organoclay Nanocomposite Films: A New Hybrid Spray Adhesive for Tough Superhydrophobicity" Applied Physics Express Vol. 2, 125003, December, 2009; also Virtual Journal of Nanoscale Science and Technology, Vol. 21, January 2010.
74. S. Lee\* & E. Loth, "SBLI Control using Various Micro-Vortex Generator Geometries" The Aeronautical Journal Vol. 113, No. 1149, pp. 683-697, November, 2009.
75. Bayer, A. Steele\*, P. Martorana\*, Loth, E. & S. Robinson & D. Stevenson. "Biolubricant induced phase inversion and superhydrophobicity in rubber-toughened biopolymer/ organoclay nanocomposites," Applied Physics Letters Vol. 95, 2009; also in August 15, 2009 issue of Virtual Journal of Biological Physics Research.
76. B. Tillotson\*, E. Loth, J.C. Dutton, J. Mace & B. Haeffle "Experimental Study of a Mach 3 Bump Compression Flowfield" AIAA J. of Propulsion and Power May-June, Vol. 25, pp. 545-554, 2009.
77. R. Chin\*, E. T. Hsiao-Wecksler, E. Loth, G. Kogler, S. D. Manwaring, S. N. Tyson, K. A. Shorter and J. N. Gilmer "A pneumatic power harvesting ankle-foot orthosis to prevent foot-drop" Journal of Neuro-Engineering and Rehabilitation Vol. 6, No. 19, June 2009.
78. Bayer, A. Steele\*, P. Martorana\*, Loth, E. & Miller, L. "Superhydrophobic cellulose-based bio-nanocomposite films from Pickering emulsions," Applied Physics Letters Vol. 94, April 2009; and also in Virtual Journal of Biological Physics Research (published by the American Physical Society and the American Institute of Physics).
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80. A. Steele\*, I. Bayer & Loth, E. "Inherently Superoleophobic Nanocomposite Coatings by Spray Atomization," Nano Letters Vol. 9, pp. 501-505, January, 2009.
81. G. Martin\*, E. Loth, & D. Lankford "Particle Host-Cell Determination in Unstructured Grids" Computers & Fluids Vol. 38, January 2009, pp. 101-110.
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91. B. Field\* & E. Loth "Entrainment of Refrigerated Air Curtains Down a Wall" Experimental Thermal and Fluid Science Vol. 30, pp. 175-184, 2006.
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94. C. Bhargava\*, E. Loth, and M. Potapczuk "Numerical Simulation of Icing Clouds in the NASA Glenn Icing Research Tunnel", AIAA Journal of Aircraft Vol. 42, pp. 1442-1451, Nov-Dec. 2005.
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120. E. Loth, W. Sherman, A. Aumann, and T. Bocksell\*, "Virtual Rendering of Multiphase Flows", Fourth International Conference on Multiphase Flows, New Orleans, LA, May-June 2001.
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135. "Smart Mesoflaps for Control of Shock Boundary-Layer Interactions," (Invited Presentation) AIAA Fluid Dynamics 2000, Denver, Co, June, AIAA-2000-2476.
136. "Numerical Approaches for Motion of Dispersed Particles, Drops, and Bubbles," (Invited Presentation) ASME Summer Fluids Engineering Meeting, San Francisco, CA, July 1999.
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