

JOSEPH S. JEWELL, PH.D., P.E.

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West Lafayette, IN 47907
(765) 494-6549

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www.joejewell.com
Google Scholar Profile

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- CITIZENSHIP** United States (active **Top Secret** security clearance)
- CURRENT APPOINTMENT** **Purdue University**, West Lafayette, Indiana
Assistant Professor, Aeronautics and Astronautics AUG 2019–PRESENT
- Principal Investigator, Boeing-AFOSR Mach 6 Quiet Tunnel
 - Center Member, Hypersonic Low-Disturbance Wind Tunnel Laboratory
- PAST APPOINTMENTS** **U.S. Air Force Research Laboratory**, Wright-Patterson AFB, Ohio
Research Scientist, Aerospace Systems Directorate APR 2014–JUL 2019
- Spectral Energies, LLC, 2017–2019
 - National Research Council [Research Associate Award](#), 2015–2017
 - Universal Technology Corporation, 2014–2015
 - Hypersonic Sciences Branch
 - Advisor: Dr. Roger L. Kimmel
 - AFOSR “Star Team” Award (Top 10% of USAF basic research groups) 2016
- EDUCATION** **California Institute of Technology**, Pasadena, California
Doctor of Philosophy, Aeronautics 2008–2014
- Thesis: *Boundary-layer transition on a slender cone in hypervelocity flow with real gas effects*
 - NDSEG Fellowship, Boeing Fellowship, J.K. Cooke Foundation Graduate Scholarship
 - Advisor: Prof. Joseph E. Shepherd
 - Committee: Dr. Ivett A. Leyva, Prof. Hans G. Hornung, Prof. Tony Leonard, Prof. Guillaume Blanquart
- University of Oxford**, Oxford, United Kingdom
Master of Science (by Research), Engineering Science 2005–2008
- [Rhodes Scholar](#) (Michigan and Keble College 2005)
 - Thesis: *Boundary layer transition in hypersonic flows*
 - Advisors: Prof. Li He and Dr. David Gillespie
- University of Michigan**, Ann Arbor, Michigan
Master of Science in Engineering, Aerospace Engineering 2004–2005
- [NDSEG Fellowship](#)
 - Advisor: Prof. Werner J.A. Dahm
- California Institute of Technology**, Pasadena, California
Bachelor of Science (with Honor), Aeronautics and History 2000–2004
- Senior Thesis: *Violence in the Medieval Church before the First Crusade* (won Rodman W. Paul History Prize)
 - Honeywell SURF Fellowship, Noland Leadership Award, Jack Kent Cooke Foundation Undergraduate Scholarship (academic full ride), U.S. Presidential Scholar
 - Advisors: Prof. Tony Leonard and Prof. Warren Brown

JOURNAL
ARTICLES

12. C.L. Running, T.J. Juliano, J.S. Jewell, M.P. Borg and R.L. Kimmel. “Hypersonic Shock-Wave/Boundary-Layer Interactions on a Cone/Flare.” *Experimental Thermal and Fluid Science* (2019), Vol. 109. In press, available online, doi: [10.1016/j.expthermflusci.2019.109911](https://doi.org/10.1016/j.expthermflusci.2019.109911).
11. P. Paredes, M.M. Choudhari, F. Li, J.S. Jewell, R.L. Kimmel and E.C. Marineau. “Nonmodal Growth of Traveling Waves on Blunt Cones at Hypersonic Speeds.” *AIAA Journal*, Vol. 57, No. 11 (2019), pp. 4738–4749.
10. T.J. Juliano, J.S. Jewell and R.L. Kimmel. “Effects of Attitude on HIFiRE-5b Boundary-Layer Transition.” *Journal of Spacecraft and Rockets*, Vol. 56, No. 4 (2019), pp. 1045–1059.
9. R.L. Kimmel, D.W. Adamczak, M.P. Borg, J.S. Jewell, T.J. Juliano, S. Stanfield and K.T. Berger. “First and Fifth Hypersonic International Flight Research Experimentation’s Flight and Ground Tests.” *Journal of Spacecraft and Rockets*, Vol. 56, No. 2 (2019), pp. 421–431.
8. P. Paredes, M.M. Choudhari, F. Li, J.S. Jewell, R.L. Kimmel, E.C. Marineau and G. Grossir. “Nosetip Bluntness Effects on Transition at Hypersonic Speeds.” *Journal of Spacecraft and Rockets*, Vol. 56, No. 2 (2019), pp. 369–387.
7. J.S. Jewell, R.L. Kimmel, D.W. Adamczak, J. Poggie, K.M. Porter and T.J. Juliano. “HIFiRE-5b Flow Computations and Attitude Determination via Comparison with Flight Data.” *Journal of Spacecraft and Rockets*, Vol. 55, No. 6 (2018), pp. 1356–1368.
6. T.J. Juliano, J. Poggie, K.M. Porter, R.L. Kimmel, J.S. Jewell and D.W. Adamczak. “HIFiRE-5b Heat Flux and Boundary-Layer Transition.” *Journal of Spacecraft and Rockets*, Vol. 55, No. 6 (2018), pp. 1315–1328.
5. J.S. Jewell, J.H. Miller and R.L. Kimmel. “Correlation of HIFiRE-5a Flight Data with Computed Pressure and Heat Transfer.” *Journal of Spacecraft and Rockets*, Vol. 54, No. 5 (2017), pp. 1142–1152.
4. J.S. Jewell, I.A. Leyva and J.E. Shepherd. “Turbulent spots in hypervelocity flow.” *Experiments in Fluids*, Vol. 58:32, April 2017.
3. J.S. Jewell and R.L. Kimmel. “Boundary Layer Stability Analysis for Stetson’s Mach 6 Blunt Cone Experiments.” *Journal of Spacecraft and Rockets*, Vol. 54, No. 1 (2017), pp. 258–265.
2. J.S. Jewell, N.J. Parziale, I.A. Leyva and J.E. Shepherd. “Effects of Shock-Tube Cleanliness on Hypersonic Boundary Layer Transition at High Enthalpy.” *AIAA Journal*, Vol. 55, No. 1 (2017), pp. 332–338.
1. J.A. Meier, J.S. Jewell, C.E. Brennen and J. Imberger. “Bubbles emerging from a submerged granular bed.” *Journal of Fluid Mechanics*, Vol. 666, pp. 189–203, January 2011.

- PAPERS IN
REVIEWED
PROCEEDINGS
36. E.K. Benitez, J.S. Jewell and S.P. Schneider. “Focused Laser Differential Interferometry for Hypersonic Flow Instability Measurements with Contoured Tunnel Windows.” *AIAA SciTech 2020*, January 2020, Orlando, FL. AIAA 2020-1282.
 35. M.W. Winter, R. Green, E. Josyula, J. Hayes, J.S. Jewell and B. Hagen. “Experimental Investigation of Optical Distortion in Hypersonic Flows at Mach 6.” *AIAA SciTech 2020*, January 2020, Orlando, FL. AIAA 2020-1971.
 34. P. Hsu, N. Jiang, J.S. Jewell, J. Felver, S. Roy, M.P. Borg, M. Rynders, A. Ciccarello and R.L. Kimmel. “100-kHz PLEET for hypersonic flow velocity measurements in a Mach 6 Ludwig Tube.” *AIAA SciTech 2020*, January 2020, Orlando, FL. AIAA 2020-1019.
 33. T.J. Juliano, J.S. Jewell and R.L. Kimmel. “HIFiRE-5b Boundary-Layer Transition Length and Turbulent Overshoot.” *AIAA Aviation 2019*, June 2019, Dallas, TX. AIAA 2019-2970.
 32. O.S. Elliott, R.B. Greendyke, J.S. Jewell and J.R. Komives. “Effect of CO₂ Concentration in the Hypersonic Boundary Layer on Second Mode Disturbances.” *AIAA Aviation 2019*, June 2019, Dallas, TX. AIAA 2019-2851.
 31. E. Jagde, R.E. Kennedy, S.J. Laurence, J.S. Jewell, and R.L. Kimmel. “Visualizations of Boundary-Layer Transition on a Sharp Cone at Mach 6.” *AIAA Aviation 2019*, June 2019, Dallas, TX. AIAA 2019-3080.
 30. R.E. Kennedy, E. Jagde, S.J. Laurence, J.S. Jewell, and R.L. Kimmel. “Visualizations of Hypersonic Boundary-Layer Transition on a Variable Bluntness Cone.” *AIAA Aviation 2019*, June 2019, Dallas, TX. AIAA 2019-3079.
 29. J.S. Jewell, A. Hameed, N.J. Parziale and S.P. Gogineni. “Disturbance Speed Measurements in a Circular Jet via Double Focused Laser Differential Interferometry.” *AIAA SciTech 2019*, January 2019, San Diego, CA. AIAA 2019-2293.
 28. O.S. Elliott, R.B. Greendyke, J.S. Jewell and J.R. Komives. “Effect of Carbon-based Ablation Products on Boundary Layer Stability.” *AIAA SciTech 2019*, January 2019, San Diego, CA. AIAA 2019-0625.
 27. P. Paredes, M.M. Choudhari, F. Li, J.S. Jewell and R.L. Kimmel. “Nonmodal Growth of Traveling Waves on Blunt Cones at Hypersonic Speeds.” *AIAA SciTech 2019*, January 2019, San Diego, CA. AIAA 2019-0876.
 26. T.J. Juliano, J.S. Jewell and R.L. Kimmel. “HIFiRE-5b Boundary-Layer Transition — With Attitude.” *AIAA Aviation 2018*, June 2018, Atlanta, GA. AIAA 2018-2891.
 25. C.L. Running, T.J. Juliano, J.S. Jewell, M.P. Borg and R.L. Kimmel. “Hypersonic Shock-Wave/Boundary-Layer Interactions on a Cone/Flare Model.” *AIAA Aviation 2018*, June 2018, Atlanta, GA. AIAA 2018-3702.

24. L.E. Mackey, I.D. Boyd, T. Leger and J.S. Jewell. “Turbulent Hypersonic Flow Effects on Optical Sensor Performance.” *AIAA Aviation 2018*, June 2018, Atlanta, GA. AIAA 2018-3712.
23. M. Winter, R. Green, C. Borchetta, E. Josyula, J.R. Hayes, J.S. Jewell and B. Hagen. “Experimental Investigation of Image Distortion in a Mach 6 Hypersonic Flow.” *AIAA Aviation 2018*, June 2018, Atlanta, GA. AIAA 2018-4197.
22. J.S. Jewell, R.E. Kennedy, S.J. Laurence and R.L. Kimmel. “Transition on a Variable Bluntness 7-Degree Cone at High Reynolds Number.” *AIAA SciTech 2018*, January 2018, Kissimmee, FL. AIAA 2018-1822.
21. P. Paredes, M.M. Choudhari, F. Li, J.S. Jewell, R.L. Kimmel, E.C. Marineau and G. Grossir. “Nosetip bluntness effects on transition at hypersonic speeds: experimental and numerical analysis under NATO STO AVT-240.” *AIAA SciTech 2018*, January 2018, Kissimmee, FL. AIAA 2018-0057.
20. R.L. Kimmel, D.W. Adamczak, M.P. Borg, J.S. Jewell, T.J. Juliano, S. Stanfield and K.T. Berger. “HIFiRE-1 and -5 Flight and Ground Tests.” *AIAA SciTech 2018*, January 2018, Kissimmee, FL. AIAA 2018-0056.
19. J.S. Jewell, R.L. Kimmel, D.W. Adamczak, J. Poggie, K.M. Porter and T.J. Juliano. “Correlation of HIFiRE-5b Flight Data With Computed Pressure and Heat Transfer for Attitude Determination.” *AIAA Aviation 2017*, June 2017, Denver, CO. AIAA 2017-3133.
18. T.J. Juliano, J. Poggie, K.M. Porter, R.L. Kimmel, J.S. Jewell and D.W. Adamczak. “HIFiRE-5b Heat Flux and Boundary-Layer Transition.” *AIAA Aviation 2017*, June 2017, Denver, CO. AIAA 2017-3134.
17. J.S. Jewell, C.C. Huffman and T.J. Juliano. “Transient Startup Simulations for a Large Mach 6 Quiet Ludwig Tube.” *AIAA SciTech 2017*, January 2017, Grapevine, TX. AIAA 2017-0743.
16. R.L. Kimmel, M.P. Borg, J.S. Jewell, K.-Y. Lam, R. Bowersox, R. Srinivasan, S. Fuchs and T. Mooney. “AFRL Ludwig Tube Initial Performance.” *AIAA SciTech 2017*, January 2017, Grapevine, TX. AIAA 2017-0102.
15. J.S. Jewell, N.J. Parziale, K.-Y. Lam, B.J. Hagen and R.L. Kimmel. “Disturbance and Phase Speed Measurements for Shock Tubes and Hypersonic Boundary-Layer Instability.” *AIAA Aviation 2016*, June 2016, Washington, DC. AIAA 2016-3112.
14. J.S. Jewell and R.L. Kimmel. “Boundary Layer Stability Analysis for Stetson’s Mach 6 Blunt Cone Experiments.” *AIAA SciTech 2016*, January 2016, San Diego, CA. AIAA 2016-0598.
13. J.S. Jewell, J.H. Miller and R.L. Kimmel. “Correlation of HIFiRE-5 Flight Data With Computed Pressure and Heat Transfer.” *AIAA Aviation 2015*, June 2015, Dallas, TX. AIAA 2015-2319.

12. N.J. Parziale, J.S. Jewell, I.A. Leyva and J.E. Shepherd. “Effects of Shock-Tube Cleanliness on Slender-Body Hypervelocity Instability and Transition Studies at High-Enthalpy.” *53rd AIAA Aerospace Sciences Meeting*, January 2015, Kissimmee, FL. AIAA 2015-1786.
11. J.S. Jewell, J.E. Shepherd and I.A. Leyva. “Shock tunnel operation and correlation of boundary layer transition on a cone in hypervelocity flow.” *Proceedings of the 29th International Symposium on Shock Waves*. (Madison, WI. July 2013. Paper ISSW29-000300.) Springer International: Cham (Switzerland). pp. 723–728.
10. J.S. Jewell, J.E. Shepherd and I.A. Leyva. “Supplemental data for ‘Shock tunnel operation and correlation of boundary layer transition on a cone in hypervelocity flow.’” July 2013. (Accompanies ISSW29-000300.) Available at: <http://www.joejewell.com/publications.html>
9. J.S. Jewell, R.M. Wagnild, I.A. Leyva, G.V. Candler and J.E. Shepherd. “Transition within a hypervelocity boundary layer on a 5-degree half-angle cone in air/CO₂ mixtures.” *51st AIAA Aerospace Sciences Meeting*, January 2013, Grapevine, TX. AIAA 2013-0523.
8. J.S. Jewell, N.J. Parziale, I.A. Leyva and J.E. Shepherd. “Turbulent Spot Observations within a Hypervelocity Boundary Layer on a 5-degree Half-Angle Cone.” *42nd AIAA Fluid Dynamics Conference and Exhibit*, June 2012, New Orleans, LA. AIAA 2012-3062.
7. N.J. Parziale, J.S. Jewell, J.E. Shepherd and H.G. Hornung. “Optical Detection of Transitional Phenomena on Slender Bodies in Hypervelocity Flow.” NATO RTO-MP-AVT-200. San Diego, CA. April 2012.
6. A. Mitrea, N.J. Parziale, J.S. Jewell, J.E. Shepherd and H.G. Hornung. “Time Resolved Heat-Flux Measurements on a CEV Candidate Shape at High Enthalpy.” NATO RTO-MP-AVT-200. San Diego, CA. April 2012.
5. N.J. Parziale, J.S. Jewell, J.E. Shepherd and H.G. Hornung. “Shock Tunnel Noise Measurement With Resonantly Enhanced Focused Schlieren Deflectometry.” *Proceedings of the 28th International Symposium on Shock Waves*. (Manchester, UK. July 2011. Paper ISSW28-2817.) Springer Verlag: Berlin, Heidelberg. pp. 747–752.
4. J.S. Jewell, I.A. Leyva, N.J. Parziale and J.E. Shepherd. “Effect of Gas Injection on Transition in Hypervelocity Boundary Layers.” *Proceedings of the 28th International Symposium on Shock Waves*. (Manchester, UK. July 2011. Paper ISSW28-2767.) Springer Verlag: Berlin, Heidelberg. pp. 735–740.
3. R.M. Wagnild, G.V. Candler, I.A. Leyva, J.S. Jewell and H.G. Hornung. “Carbon dioxide injection for hypervelocity boundary layer stability.” *48th AIAA Aerospace Sciences Meeting*. January 2010, Orlando, FL. AIAA 2010-1244.

2. I.A. Leyva, J.S. Jewell, S. Laurence, H.G. Hornung and J.E. Shepherd. “On the impact of injection schemes on transition in hypersonic boundary layers.” *16th AIAA/DLR/DGLR International Space Planes and Hypersonic Systems and Technologies Conference*. October 2008, Bremen, Germany. AIAA 2009-7204.
 1. M. Cooper, J.[S.] Jewell and J.E. Shepherd. “The effect of a porous thrust surface on detonation tube impulse.” *39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*. July 2003, Huntsville, AL. AIAA 2003-4822.
- THESES &
TECHNICAL
REPORTS**
9. J.S. Jewell. *Boundary-layer transition on a slender cone in hypervelocity flow with real gas effects*. Ph.D. Thesis. California Institute of Technology, Pasadena, CA. Defended May 15, 2014.
 8. J.S. Jewell and J.E. Shepherd. “T5 Conditions Report: Shots 2526–2823.” GALCIT Report FM2014.002. June 2014.
 7. N.J. Parziale, J.S. Jewell, B.E. Schmidt, J. Rabinovitch and R. Dunne. “Fluid Mechanics of Everyday Objects.” Gallery of Fluid Motion for the 2013 APS Division of Fluid Dynamics Meeting. November 2013. Pittsburgh, PA. arXiv:1310.2670 [physics.flu-dyn].
 6. J.A. Meier, J.S. Jewell and C.E. Brennen. “Gas bubbles emerging from a submerged granular bed.” Gallery of Fluid Motion for the 2009 APS Division of Fluid Dynamics Meeting. October 2009. Minneapolis, MN. arXiv:0910.3185v1 [physics.flu-dyn].
 5. N.J. Parziale, H.G. Hornung, J.E. Shepherd, B. Valiferdowski and J.S. Jewell. “The Effect of Forebody Geometry on Turbulent Heating and Thermal Protection System Sizing for Future Mars Mission Concepts.” GALCIT Report FM 2009.001. December 21, 2009.
 4. J.S. Jewell. *Boundary layer transition in hypersonic flows*. MSc Thesis, University of Oxford, Department of Engineering Science, Parks Road, Oxford OX1 3PJ, United Kingdom. Michaelmas 2008.
 3. A.K.-W. Beierholm, I. Leyva, S.J. Laurence, J.[S.] Jewell and H.G. Hornung. “Transition Delay in a Hypervelocity Boundary Layer using Nonequilibrium CO₂ Injection.” GALCIT Report FM 2008.001, October 26, 2008.
 2. J.S. Jewell. “Self-actuating valve for pulse detonation engine.” Explosion Dynamics Laboratory Report, Graduate Aeronautical Laboratories, California Institute of Technology, October 2002.
 1. S. Eley, D. Englund, J. Ferguson, J.[S.] Jewell, D. Stick and N. Wozny. “Optical Properties of ZBLAN Microspheres Produced in Microgravity.” NASA RGSFOP Final Report, April 2002. (Published online, but has been cited a number of times, including in six US Patents since 2013, Nos. 10080275, 9533915, 9526914, 9232618, 8618509, 8389958.)

TALKS, (Not including those referenced as conference papers above.)

ABSTRACTS,

& POSTERS

23. *44th AIAA Dayton-Cincinnati Aerospace Sciences Symposium*. “Effects of Carbon Dioxide on Hypersonic Boundary Layer Stability over Sharp and Blunt Cones.” 44DCASS-005. Dayton, OH. March 2019. O.S. Elliott, R.B. Greendyke, J.S. Jewell and J.R. Komives.
22. Invited Lecture: Georgia Tech, Guggenheim School of Aerospace Engineering. “[High-Speed Boundary-Layer Instability and Transition to Turbulence: Fundamentals and Applications](#).” Atlanta, GA. January 2019.
21. Chair’s Distinguished Lecture: University of Michigan, Department of Aerospace Engineering. “[High-Speed Boundary-Layer Instability and Transition to Turbulence: Fundamentals and Applications](#).” Ann Arbor, MI. January 2019.
20. Invited Lecture: Purdue University, School of Aeronautics and Astronautics. “[High-Speed Boundary-Layer Instability and Transition to Turbulence: Fundamentals and Applications](#).” West Lafayette, IN. November 2018.
19. “Lasers, Optics, and High Speed Flight Experiments.” Miami Valley Astronomical Society. Dayton, OH. February 2018.
18. NATO STO AVT-240: Hypersonic Boundary-Layer Transition Prediction. “Transition on a Variable Bluntness 7-Degree Cone at High Reynolds Number.” University of Tennessee Space Institute, Tullahoma, TN. April 2017.
17. *42nd AIAA Dayton-Cincinnati Aerospace Sciences Symposium*. “Transient Startup Simulations for a Large Mach 6 Quiet Ludwig Tube.” 42DCASS-197. Dayton, OH. March 2017.
16. *AIAA SciTech 2017*. “AMT Update Presentation—Measurement Techniques.” Grapevine, TX. January 2017. (Invited presentation for AMT Technical Committee event.)
15. *4th Arab-American Frontiers of Science, Engineering, and Medicine*. “Earth and Planetary Atmospheric Entry Flows: Impact and Control of Laminar-to-Turbulent Transition.” Abu Dhabi, UAE. November 2016. (Travel grant awarded by NASA/NSF/National Academies.)
14. NATO STO AVT-240: Hypersonic Boundary-Layer Transition Prediction. “Infrared and Pressure Measurements of Crossflow Instability Modes, and Other Work at AFRL/RQHF.” Notre Dame, IN. April 2016.
13. *41st AIAA Dayton-Cincinnati Aerospace Sciences Symposium*. “Boundary Layer Stability Analysis for Stetson’s Mach 6 Blunt Cone Experiments.” 41DCASS-027. Dayton, OH. March 2016.
12. *40th AIAA Dayton-Cincinnati Aerospace Sciences Symposium*. “Correlation of HIFiRE-5 Flight Data With Computed Pressure and Heat Transfer.” 40DCASS-048. Dayton, OH. March 2015.

11. “Hypervelocity Flow and Planetary Entry.” Miami Valley Astronomical Society. Dayton, OH. March 2015.
10. NATO STO AVT-240 and RTG-082: Hypersonic Boundary-Layer Transition Prediction. “Progress at AFRL/RQ and Future Plans.” Tucson, AZ. March 2015.
9. Invited Session FD-16: Experiments in Energy Exchange in High Speed Flows, *53rd AIAA Aerospace Sciences Meeting*. “Boundary-Layer Transition on a Slender Cone in Hypervelocity Flow with Real Gas Effects.” Kissimmee, FL. January 2015.
8. Invited Lecture: University of Notre Dame, Department of Aerospace and Mechanical Engineering. “Hypervelocity Boundary Layer Transition: Characterization and Control via Nonequilibrium Thermochemistry.” Notre Dame, IN. April 2013.
7. *Proceedings of the 65th Annual Meeting of the APS Division of Fluid Dynamics*, Vol. 57, No. 17, San Diego, CA. “Transition within a hypervelocity boundary layer on a 5-degree half-angle cone in freestream air/CO₂ mixtures.” November 2012.
6. International Workshop on Hypersonic Stability and Transition, Sedona, AZ. “Transition within a hypervelocity boundary layer on a 5-degree half-angle cone in freestream air/CO₂ mixtures.” October 2012.
5. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Transition within a hypervelocity boundary layer on a 5-degree half-angle cone in freestream air/CO₂ mixtures.” October 2012.
4. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Turbulent Spot Observations within a Hypervelocity Boundary Layer on a Thin Cone.” May 2012.
3. *Proceedings of the 63rd Annual Meeting of the APS Division of Fluid Dynamics*, Vol. 55, No. 16, Long Beach, CA. “Transition delay in hypervelocity boundary layers via CO₂ injection.” November 2010.
2. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Transition delay in hypersonic boundary layers via CO₂ injection.” October 2010.
1. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Towards transition delay in hypersonic boundary layers via CO₂ injection.” May 2010.

**PEER REVIEW
SERVICE**

Journal of Fluid Mechanics

Physics of Fluids

The Aeronautical Journal

AIAA Journal

Journal of Spacecraft and Rockets

Journal of Thermophysics and Heat Transfer

Experimental Thermal and Fluid Science

Journal of Fluids Engineering

Entropy

AIAA SciTech

2015, 2016, 2017, 2018, 2019

AIAA Aviation

2015, 2016, 2017, 2018

AFOSR Turbulence and Transition, core proposals (PM: Dr. R. Ponnappan)

AFOSR Aerothermodynamics (+TT), core, YIP, and DURIP proposals (PM: Dr. I.A. Leyva)

ONR Hypersonics core proposals (PM: Dr. E.C. Marineau)

AFRL Summer Faculty Fellowship Program proposals, panel member

DoD National Defense Science and Engineering Graduate Fellowship, selection panelist

National Science Foundation (NSF), selection panelist

FWF Der Wissenschaftsfonds (Austrian Science Fund; equivalent to NSF), fluids proposals

Maryland Industrial Partnerships (MIPS) Program, proposals

Session Chair, *AIAA Aviation 2015* (FD-04, Boundary Layer Transition: Hypersonic Flows)

Session Chair, *AIAA Aviation 2016* (FD-42, High-Speed Boundary-Layer Transition)

Session Chair, *AIAA Aviation 2016* (AMT-03, Velocimetry)

Session Chair, *AIAA SciTech 2017* (AFM-03, Launch Vehicle, Atmospheric Entry, Hypersonic Flight and Aeroassist Technology)

Session Chair and Organizer, *AIAA Aviation 2017* (Invited Session AMT-03/FD-05, Advanced Measurement Capability Needs for Understanding Hypersonic Laminar-to-Turbulent Transition)

Session Chair, *AIAA SciTech 2018* (FD-53, Stability and Transition V: High-Speed Cones)

Session Chair, *AIAA Aviation 2018* (AMT-04, Luminescent Measurement Techniques for Fluid Flows and Combustion)

Session Chair, *AIAA SciTech 2019* (AMT-24/APA-52: Aerodynamic Measurements III - Wind Tunnel Testing)

Session Chair, *AIAA Aviation 2019* (AMT-04, Novel Measurements of Aerodynamic Forces)

Session Chair, *AIAA SciTech 2020* (AMT-13, Implementation in Facilities with Unique Measurement Challenges)

**POPULAR
BOOK**

UP YOUR SCORE: The Underground Guide to the SAT (2001–2002) By Larry Berger, Michael Colton, Joe Jewell, Manek Mistry, and Paul Rossi. Book published nationally by Workman Publishing Company, at one point ranked in the top 100 on the Amazon.com bestseller list. New York, 2000. (ISBN: 0761119884)

**HONORS
& AWARDS
(SELECTED)**

Rhodes Scholarship
AIAA Associate Fellow
NATO-AVT “Panel Excellence Award” for AVT-240
AFOSR “Star Team” Award (Top 10% of USAF basic research groups)
National Research Council [Research Associate Award](#)
NDSEG Fellowship
Boeing Fellowship
[Jack Kent Cooke Foundation Graduate Scholarship](#)
United States Presidential Scholar (White House)

**TEACHING,
ADVISORY,
& THESIS
COMMITTEE
EXPERIENCE**

Purdue University, West Lafayette, Indiana
School of Aeronautics and Astronautics AUG 2017—PRESENT
Elizabeth Benitez advisory/thesis committee (co-advised with Prof. Steven Schneider)
- Mentored graduate student (PhD expected 2021) on optical techniques for hypersonic flow during summer 2017 laboratory work at AFRL.
- Advisory committee; thesis committee from summer 2018; co-chair from fall 2019.

A total of 6 PhD advisory committees (2 as Chair or Co-Chair) and 9 MS Thesis advisory committees (4 as Chair or Co-Chair) at Purdue AAE and ME.

School of Aeronautics and Astronautics AUG 2019—PRESENT
AAE 333: Introduction to Fluid Mechanics
- Instructor of record for Purdue’s first fluid physics course for third-year aerospace majors
- Received 4.3/5.0 student rating for Fall 2019

Air Force Institute of Technology, Wright-Patterson AFB, Ohio
Department of Aerospace Engineering AUG 2018—JULY 2019
Lt Col Olivia Elliott advisory committee (Prof. Robert Greendyke)
- Mentored graduate student (PhD defended July 2019) on computational thesis project examining ablative CO₂ effects on hypersonic transition.
- Collaboration/publications based on computations and analysis, both classified and for the open literature.

California Institute of Technology, Pasadena, California
Aeronautics Department AUG 2010—JUN 2012
Ae 150: Aerospace Engineering Seminar
- Organized, scheduled, and hosted speakers to create a coherent and educational program for the required GALCIT first-year graduate seminar
- Received Teaching Quality Feedback Report average ratings (out of 5.0) of 5.0, 4.5 and 4.9, respectively, for the three terms in the most recent year of instruction

Mechanical Engineering Department

MAR 2004–JUN 2004

ME 96: Mechanical Engineering Lab (fluid mechanics and heat transfer)

- Prepared experimental setup and engaged in troubleshooting, gave lectures and lab demos, graded reports

PROFESSIONAL AFFILIATIONS

American Institute of Aeronautics and Astronautics

- Associate Fellow
- Member, Aerodynamic Measurement Technology Technical Committee
- Liaison, Thermophysics Technical Committee

American Physical Society (Division of Fluid Dynamics)

American Society of Mechanical Engineers

Royal Aeronautical Society (UK)

NATO STO AVT-240 (int'l working group, Hypersonic Boundary Layer Transition Prediction)

- Full Member, appointed December 2015 through the US NATO delegation

NATO STO AVT-352 (Hypersonic Turbulence)

NATO STO AVT-346 (Hypersonic Boundary-Layer Transition on Complex Geometries)

Association of American Rhodes Scholars

ACADEMIC SERVICE (PURDUE)

Aerodynamics Area Committee

2019–PRESENT

National and International Scholarship Office Selection Committee

2019–PRESENT

Purdue University Hypersonics Consortium Committee

2019–PRESENT

- Technical Lead, Applied aerodynamics/aerothermodynamics and system concepts for hypersonic systems

Purdue Hypersonics Building Design Committee

2020–PRESENT

ACADEMIC SERVICE (CALTECH)

Exchange Programs and Study Abroad Committee

2008–2014

Scholarships and Financial Aid Committee

2008–2013

Convocations (Commencement Speaker Selection) Committee

2008–2013

Institute Fine Arts Committee

2003–2004, 2009–2013

Bookstore Committee

2008–2012

Upperclass (Transfer) Admissions Committee

2003–2004

Housing Committee

2001–2003

Campus Center Design Committee

2001–2002

Admissions Director Search Committee (*alternate*)

2003–2004

Institute Grievance Committee (*alternate*)

2003–2004

PROFESSIONAL EXPERIENCE

PrepMe Corporation, Chicago, Illinois

Co-Founder and Vice President of Education

JUN 2001–JAN 2008

- Named one of *Business Week's* “Top 25 Best Entrepreneurs Under 25” in October 2006
- Overall responsibility for test-preparation course development and instructional excellence
- Business experienced triple-digit growth in each of my last four years, finishing with six-figure revenues

- Managed team of three to ten course and question developers over a period of five years, including all research and writing functions
- With partners, won the 2005 *Fortune* Small Business Plan Competition and 2005 University of Chicago New Venture Challenge

Whirlpool Corporation, Benton Harbor, Michigan

Engineering Intern

JUN 2004—SEP 2004

- Engineering and Research Division
- Performed computational fluid dynamics analysis and CFD software evaluation of internal turbulent cooling flows
- Presented results of study to division manager and other executives

California Institute of Technology, Pasadena, California

Research Assistant / Summer Research Fellow

JAN 2001—JUN 2004

- Five separate projects on advanced propulsion, biophysics, optics, and sound propagation in air/water mixtures
- Completed 106 zero-gravity parabolas on the NASA KC-135 “Vomit Comet” microgravity research aircraft
- Co-authored a conference paper on pulse detonation engine thrust characteristics and made two technical presentations, at Caltech for the SURF Seminar and at Honeywell Corporation as a sponsored researcher

ADDITIONAL *Related to engineering, science, and technical education*

QUALIFICATIONS

- Professional Engineer (Michigan No. 68851) [Mechanical: Thermal and Fluid Systems](#)
- Referee, Ohio FIRST Lego League robotics competition (district, regional, state finals)
- Held Michigan substitute teacher permit; experience teaching in middle school, high school, and college classrooms
- NASA KC-135 physiological training certificate 2001
- FCC Amateur Radio License, [W8HAT](#)
- Science outreach classroom volunteer

OTHER INTERESTS

Outside science and engineering

- Avid musician; principal timpanist/percussionist in symphonic bands and orchestras at Caltech, University of Michigan and Oxford. Performed at the Vienna Musikverein with the Oxford University Philharmonia Orchestra. Freelance gigs as concert percussionist, including with the Santa Monica Symphony Orchestra.
- Marching band drum and percussion instructor for 13 years, including four Michigan state marching band championships 2002, 2003, 2008, 2016
- Keble College Boat Club, Oxford, Men’s Coxed Eight and Coxed Four. Only American to row in the First VIII, Torpids 2007.
- Greater Dayton Rowing Association, Men’s and Mixed Coxed Eight and Coxed Four.
- Executive Committee for [Bacchus: Oxford University Wine Society](#)
- Invited Judge, [International Wine Challenge](#), London, UK 2009, 2010, 2011, 2012