

# JOSEPH S. JEWELL, PH.D.

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[Google Scholar Profile](#)

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- CURRENT APPOINTMENT** **U.S. Air Force Research Laboratory**, Wright-Patterson AFB, Ohio  
*Research Scientist, Aerospace Systems Directorate* APR 2014–PRESENT
- Spectral Energies, LLC, May 2017–present
  - 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** 10. [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\* \(2018\). In press, available online. doi: 10.2514/1.A34162.](#)

9. T.J. Juliano, J.S. Jewell and R.L. Kimmel. “Effects of Attitude on HIFiRE-5b Boundary-Layer Transition.” *Journal of Spacecraft and Rockets* (2018). **Accepted, in press.**
8. 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.” *Journal of Spacecraft and Rockets* (2018). **Accepted, in press**, doi: [10.2514/1.A34287](https://doi.org/10.2514/1.A34287).
7. 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.” *Journal of Spacecraft and Rockets* (2018). **Accepted, in press**, doi: [10.2514/1.A34277](https://doi.org/10.2514/1.A34277).
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* (2018). **Accepted, in press**, doi: [10.2514/1.A34147](https://doi.org/10.2514/1.A34147).
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

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-XXXX. **Accepted, to appear.**
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-XXXX. **Accepted, to appear.**
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-XXXX. **Accepted, to appear.**

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/CO<sub>2</sub> 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.
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 CO<sub>2</sub> 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,  
ABSTRACTS,  
& POSTERS

- (Not including those referenced as conference papers above.)
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/CO<sub>2</sub> 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/CO<sub>2</sub> 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/CO<sub>2</sub> 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 CO<sub>2</sub> injection.” November 2010.
2. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Transition delay in hypersonic boundary layers via CO<sub>2</sub> injection.” October 2010.
1. Fluid Mechanics Research Seminar, GALCIT, Pasadena, CA. “Towards transition delay in hypersonic boundary layers via CO<sub>2</sub> 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*

*AIAA Aviation*

2015, 2016, 2017, 2018, 2019

2015, 2016, 2017, 2018, 2019

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)

HONORS  
& AWARDS  
(SELECTED)

[Rhodes Scholarship](#)  
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](#)

TEACHING,  
ADVISORY,  
& THESIS  
COMMITTEE  
EXPERIENCE

**Purdue University**, West Lafayette, Indiana  
*School of Aeronautics and Astronautics* AUG 2017—PRESENT  
Elizabeth Benitez advisory/thesis committee (Prof. Steven Schneider)  
- Mentored graduate student (PhD expected 2021) on optical techniques for hypersonic flow during summer 2017 laboratory work at AFRL.  
- Continued collaboration on experiments and analysis via email, phone, and meetings  
- External member, advisory committee; thesis committee from summer 2018.



**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 GALT 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

- Senior Member
- 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 (working group, Hypersonic Boundary Layer Transition Prediction)

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

Association of American Rhodes Scholars

**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**

- EIT Certificate, California, passed FE exam, April 2010; currently pursuing PE licensure
- 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