

# Thomas J. Juliano, Ph.D.

Assistant Professor

University of Notre Dame Department of Aerospace and Mechanical Engineering  
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## **Education:**

Doctor of Philosophy, August 2010

Purdue University, West Lafayette, IN 47907

*Instability and Transition on the HiFiRE-5 in a Mach-6 Quiet Tunnel*

Master of Science in Aeronautical and Astronautical Engineering, December 2006

Purdue University, West Lafayette, IN 47907

*Nozzle Modification for High-Reynolds-Number Quiet Flow in the Boeing/AFOSR Mach-6 Quiet Tunnel*

Bachelor of Science with Honor in Engineering and Applied Science (Aeronautics), June 2004

California Institute of Technology, Pasadena, CA 91126

## **Employment History:**

Assistant Professor

Department of Aerospace and Mechanical Engineering

University of Notre Dame, Notre Dame, IN

August 2014 – Present

Summer Faculty Fellow

U.S. Air Force Summer Faculty Fellowship Program

U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH

June – July 2015, June – July 2016

Research Associate

National Academy of Sciences/National Research Council

U.S. Air Force Research Laboratory, Wright-Patterson Air Force Base, OH

September 2012 – July 2014

Carried out collaborative experiment with colleagues at DLR Cologne in H2K Hypersonic Wind Tunnel

Consulted on design of AFRL Hypersonic Ludwig Tube

Spearheaded analysis of HiFiRE-5 flight test data

Post-doctoral Researcher

Ohio State University, Columbus, OH

September 2010 – August 2012

Managed research group's day-to-day operations

Mentored and advised graduate students

Communicated with collaborators in industry and academia

Thomas J. Juliano

Supervised unsteady flow testing in 6"x22" Transonic Wind Tunnel

Assisted with complementary testing at NASA Langley hover test facility and 14'x22' Subsonic Wind Tunnel

Contributed to grant proposal composition

Taught classes when a substitute was needed: Intro to Aero Eng., Intro Thermodynamics, and Flight Testing

Graduate Student Staff Research & Teaching Assistant

Purdue University, West Lafayette, IN

August 2004 – July 2010

Executed investigation yielding improved performance of Boeing/AFOSR Mach-6 Quiet Tunnel  
Designed \$25k HIFiRE-5 model featuring adjustable nosetip and numerous instrumentation options

- Utilized machine shop know-how to create a model relatively easy to build and use
- Interfaced with the shop contracted for fabrication

Collaborated with colleagues at other institutions on the DARPA HTV-2 Aerothermodynamics Integrated Product Team

Led a team of students that designed, assembled, and tested a computer-controlled electromechanical pressure regulator to enhance efficiency of the Mach-6 Quiet Tunnel

Served as Teaching Assistant for undergraduate and graduate aerodynamics laboratory courses

- Gained additional experience with subsonic experimental techniques and instrumentation (including dye flow visualization and Laser Doppler Velocimetry)
- Critiqued and graded laboratory reports

Undergraduate Engineering Intern

Equity Engineering Group, Inc., Shaker Heights, OH

Summer 2003

Undergraduate Research Assistant

NASA Glenn Research Center Microgravity Combustion Branch, Cleveland, OH

Summer 2001, Summer 2002

**Honors & Awards:**

AFOSR Young Investigator Program Awardee, 2016

Air Force Research Laboratory Summer Faculty Fellow, 2015 & 2016

American Helicopter Society, Test & Evaluation discipline, Best Paper Award 2012 for "Blade Tip Pressure Measurements Using Pressure-Sensitive Paint"

**Refereed Publications in Preparation:** (underline denotes advisee)

14. M. T. Lakebrink, K. G. Bowcutt, T. Winfree, C. C. Huffman, and T. J. Juliano,

"Optimization of a Mach 6 Quiet Wind Tunnel Nozzle", in preparation from #30, below.

13. A. Houpt, S. Gordeyev, T. Juliano, and S. Leonov, "Optical Measurement of Transient

Plasma Impact on Corner Separation in M=4.5 Airflow", in preparation from #27, below.

12. S. Gordeyev and T. J. Juliano, "Optical Characterization of Nozzle-Wall Mach-6 Boundary Layers", in preparation from #26, below.

11. T. J. Juliano, L. Paquin, and M. P. Borg, “Measurement of HIFiRE-5 Boundary-Layer Transition in a Mach-6 Quiet Tunnel with Infrared Thermography”, in preparation from #25, below.

**Refereed Publications:** (underline denotes advisee)

10. S. A. Stanfield, R. L. Kimmel, D. Adamczak, and T. J. Juliano, “Boundary Layer Transition Experiment During Reentry of HIFiRE-1”. *Journal of Spacecraft and Rockets*, 52(3):637–649, May–June 2015.
9. T. J. Juliano, D. Adamczak, and R. L. Kimmel, “HIFiRE-5 Flight Test Results”. *Journal of Spacecraft and Rockets*, 52(3):650–663, May–June 2015.
8. T. J. Juliano, M. P. Borg, and S. P. Schneider, “Quiet Tunnel Measurements of HIFiRE-5 Boundary-Layer Transition”. *AIAA Journal*, 53(4):832–846, April 2015.
7. J. W. Gregory, K. J. Disotell, D. Peng, T. J. Juliano, J. Crafton, and N. M. Komerath, "Inverse Methods for Deblurring Pressure-Sensitive Paint Images of Rotating Surfaces," *AIAA Journal*, 54(9):2045–2061, September 2014.
6. K. J. Disotell, D. Peng, T. J. Juliano, J. W. Gregory, J. W. Crafton, N. M. Komerath. “Single-shot temperature- and pressure-sensitive paint measurements on an unsteady helicopter blade”, *Experiments in Fluids*, Vol. 55, Issue 2, Article 1671, pp. 1–15, February 2014.
5. S. Gordeyev, N. De Lucca, E. J. Jumper, K. Hird, T. J. Juliano, J. W. Gregory, J. Thordahl, and D. J. Wittich III. “Comparison of unsteady pressure fields on turrets with different surface features using pressure-sensitive paint”, *Experiments in Fluids*, Vol. 55, Issue 1, Article 1661, pp. 1–20, January 2014.
4. D. Peng, C. D. Jensen, T. J. Juliano, J. W. Gregory, J. Crafton, S. Palluconi, and T. Liu. “Temperature-Compensated Fast Pressure-Sensitive Paint”, *AIAA Journal*, 51(10):2420–2431, October 2013.
3. T. J. Juliano, K. J. Disotell, J. W. Gregory, J. Crafton, and S. Fonov. “Motion-Deblurred, Fast-Response Pressure-Sensitive Paint on a Rotor in Forward Flight”, *Measurement Science and Technology*, Vol. 23, March 2012.
2. T. J. Juliano, P. Kumar, D. Peng, J. W. Gregory, J. Crafton, and S. Fonov. “Single-Shot, Lifetime-Based Pressure-Sensitive Paint for Rotating Blades”, *Measurement Science and Technology*, Vol. 22, June 2011.
1. T. J. Juliano, S. P. Schneider, S. Aradag, and D. Knight. “Quiet-Flow Ludwig Tube for Hypersonic Transition Research”, *AIAA Journal*, 46(7):1757–1763, July 2008.

**Peer-Reviewed, Archival Conference Publications:** (underline denotes advisee)

31. A. W. Houpt, B. E. Hedlund, S. V. Gordeyev, T. Juliano, and S. B. Leonov, “Transient Plasma Impact on Spectra of Flow Disturbances in a Corner Separation Zone at Mach 4.5”, AIAA Paper 2016-4304, June 2016.
30. M. T. Lakebrink, K. G. Bowcutt, T. Winfree, and T. J. Juliano, “Optimization of a Mach 6 Quiet Wind Tunnel Nozzle”, AIAA Paper 2016-3659, June 2016. ITAR restricted.
29. S. Gordeyev and T. J. Juliano, “Optical Measurements of Transitional Events in a Mach-6 Laminar Boundary Layer”, AIAA Paper 2016-3348, June 2016.
28. S. P. Schneider, T. Juliano, and T. Corke, “Developing Large Quiet Tunnels at Mach 6 and Mach 8”, AIAA Defense 2016-9050, March 2016. ITAR restricted.
27. A. Houpt, S. Gordeyev, T. Juliano, and S. Leonov, “Optical Measurement of Transient Plasma Impact on Corner Separation in M=4.5 Airflow”, AIAA Paper 2016-2160, January 2016.

26. S. Gordeyev and T. J. Juliano, "Optical Characterization of Nozzle-Wall Mach-6 Boundary Layers", AIAA Paper 2016-1586, January 2016.
25. T. J. Juliano, L. Paquin, and M. P. Borg, "Measurement of HIFiRE-5 Boundary-Layer Transition in a Mach-6 Quiet Tunnel with Infrared Thermography", AIAA Paper 2016-0595, January 2016.
24. T. J. Juliano, R. L. Kimmel, S. Willems, A. Guelhan, and R. M. Wagnild, "HIFiRE-1 Boundary-Layer Transition: Ground Test Results and Stability Analysis", AIAA Paper 2015-1736, January 2015.
23. T. J. Juliano, R. L. Kimmel, S. Willems, A. Guelhan, and S. P. Schneider, "HIFiRE-1 Surface Pressure Fluctuations from High Reynolds, High Angle Ground Test", AIAA Paper 2014-0429, January 2014.
22. S. Willems, A. Guelhan, T. J. Juliano, and S. P. Schneider, "Laminar to turbulent transition on the HIFiRE-1 cone at Mach 7 and high angle of attack", AIAA Paper 2014-0428, January 2014.
21. T. J. Juliano, D. Adamczak, and R. L. Kimmel, "HIFiRE-5 Flight Test Heating Analysis", AIAA Paper 2014-0076, January 2014.
20. S. Gordeyev, N. De Lucca, E. Jumper, K. Hird, T. J. Juliano, J. W. Gregory, J. Thordahl, and D. J. Wittich. The Comparison of Unsteady Pressure Field over Flat- and Conformal-Window Turrets using Pressure Sensitive Paint, AIAA Paper 2013-3137, June 2013.
19. N. De Lucca, S. Gordeyev, E. Jumper, K. Hird, T. J. Juliano, J. W. Gregory, J. Thordahl, and D. J. Wittich. The Estimation of the Unsteady Aerodynamic Force Applied to a Turret in Flight, AIAA Paper 2013-3136, June 2013.
18. K. Hird, T. J. Juliano, J. W. Gregory, S. Gordeyev, N. De Lucca, E. Jumper, J. Thordahl, and D. J. Wittich. Study of Unsteady Surface Pressure on a Turret via Pressure-Sensitive Paint, AIAA Paper 2013-3135, June 2013.
17. R. L. Kimmel, D. Adamczak, T. J. Juliano, and the DSTO AVD Brisbane Team. HIFiRE-5 Flight Test Preliminary Results, AIAA Paper 2013-0377, January 2013.
16. K. Disotell, T. Juliano, D. Peng, J. Gregory, J. Crafton, and N. Komerath. Unsteady Pressure-Sensitive Paint Measurements on an Articulated Model Helicopter in Forward Flight, AIAA Paper 2012-2757, June 2012.
15. A. N. Watkins, B. D. Leighty, W. E. Lipford, O. D. Wong, K. Z. Goodman, J. Crafton, A. Forlines, L. P. Goss, J.W. Gregory, and T. J. Juliano. Deployment of a Pressure Sensitive Paint System for Measuring Global Surface Pressures on Rotorcraft Blades in Simulated Forward Flight, AIAA Paper 2012-2756, June 2012.
14. O. D. Wong, A. N. Watkins, K. Z. Goodman, J. Crafton, A. Forlines, L. Goss, J.W. Gregory, T. J. Juliano. Blade Tip Pressure Measurements Using Pressure Sensitive Paint, American Helicopter Society Paper 2012-000233, May 2012.
13. D. Peng, C. D. Jensen, T. J. Juliano, J. W. Gregory, J. Crafton, and S. Palluconi. Temperature-Compensated Fast Pressure-Sensitive Paint, AIAA Paper 2012-1186, January 2012.
12. T. J. Juliano, D. Peng, C. Jensen, J. W. Gregory, T. Liu, J. Montefort, S. Palluconi, J. Crafton, and S. Fonov. PSP Measurements on an Oscillating NACA 0012 Airfoil in Compressible Flow, AIAA Paper 2011-3728, June 2011.
11. C. D. Jensen, K. A. Gompertz, D. Peng, T. J. Juliano, P. Kumar, J. W. Gregory, and J. P. Bons. Unsteady Compressible Flow on a NACA 0021 Airfoil, AIAA Paper 2011-670, January 2011.
10. T. J. Juliano and S. P. Schneider. Instability and Transition on the HIFiRE-5 in a Mach-6 Quiet Tunnel, AIAA Paper 2010-5004, June 2010.

9. D. C. Berridge, A. Chou, C. A. C. Ward, L. E. Steen, P. L. Gilbert, T. J. Juliano, S. P. Schneider, and J. E. Gronvall. Hypersonic Boundary-Layer Transition Experiments in a Mach-6 Quiet Tunnel, AIAA Paper 2010-1061, January 2010.
8. B. M. Wheaton, T. J. Juliano, D. C. Berridge, A. Chou, P. L. Gilbert, K. M. Casper, L. E. Steen, and S. P. Schneider and H. B. Johnson. Instability and Transition Measurements in the Mach-6 Quiet Tunnel, AIAA Paper 2009-3559, June 2009.
7. T. J. Juliano and S. P. Schneider. Laminar-Turbulent Transition on the HTV-2 in a Mach-6 Quiet Tunnel, AIAA Missile Sciences Meeting Paper 8-2, November 2008. DTIC number ADB348940. Unclassified; distribution limited to U.S. Government and contractors.
6. T. J. Juliano, R. Segura, M. P. Borg, K. Casper, M. J. Hannon, Jr., B. M. Wheaton, and S. P. Schneider. Starting Issues and Forward-Facing Cavity Resonance in a Hypersonic Quiet Tunnel, AIAA Paper 2008-3735, June 2008.
5. M. P. Borg, S. P. Schneider, and T. J. Juliano. Effect of Freestream Noise on Roughness-Induced Transition for the X-51A Forebody, AIAA Paper 2008-0592, January 2008.
4. S. P. Schneider and T. J. Juliano. Laminar-Turbulent Transition Measurements in the Boeing/AFOSR Mach-6 Quiet Tunnel, AIAA Paper 2007-4489, June 2007.
3. T. J. Juliano and S. P. Schneider. Transition Research and Improved Performance in the Boeing/AFOSR Mach-6 Quiet Tunnel, AIAA Paper 2007-0535, January 2007.
2. S. P. Schneider, T. J. Juliano, and M. P. Borg. High-Reynolds-Number Laminar Flow in the Mach-6 Quiet-Flow Ludwig Tube, AIAA Paper 2006-3056, June 2006.
1. M. P. Borg, S. P. Schneider, and T. J. Juliano. Inlet Measurements and Quiet Flow Improvements in the Boeing/AFOSR Mach-6 Quiet Tunnel, AIAA Paper 2006-1317, January 2006.

**Other Archival Publications:**

1. T. J. Juliano. Laminar-Turbulent Transition on the HTV-2 in a Mach-6 Quiet Tunnel. 132 pages. June 2009. DTIC number ADB352458. Unclassified; distribution limited to U.S. Government and contractors.

**Invited Presentations:**

5. T. J. Juliano, "Design of a Large Hypersonic Quiet Tunnel at the University of Notre Dame". High Speed Systems Division, U.S. Air Force Research Laboratory. WPAFB, OH, 21 July 2015.
4. T. J. Juliano, "Development of Large-Scale Quiet Tunnels Supporting T&E". *Hap Arnold's New Horizon: The Future Role of Ground Test in High Speed System Development*, 31st AIAA Aerodynamic Measurement Technology and Ground Testing Conference, AIAA Aviation 2015. Dallas, TX, 22 June 2015.
3. T. J. Juliano and R. L. Kimmel, "Summary of HIFiRE-5 Flight Data Reduction". Presented at DLR Cologne Supersonic and Hypersonic Technology Department Colloquium, February 2013.
2. R. L. Kimmel and T. J. Juliano, "HIFiRE-1 Hypersonic Flight Test". Presented at DLR Cologne Supersonic and Hypersonic Technology Department Colloquium, February 2013.
1. T. J. Juliano, "Instability and Transition on the HIFiRE-5 in a Mach-6 Quiet Tunnel". Presented at DLR Cologne Supersonic and Hypersonic Technology Department Colloquium, February 2013.

**Students Advised:**

4. Yates, Harrison. August 2015–Current. Ph.D. student.
3. Running, Carson. August 2015–Current. Ph.D. student.
2. Paquin, Laura. January 2015–May 2016. Independent undergraduate research.
1. Huffman, Christopher. January 2015–Current. Ph.D. student.

**Dissertation Advisory Committee Membership:** (student, advisor, and graduation year)

9. Jasinski, Christopher. Prof. T. Corke.
8. Giles, Ian. Prof. T. Corke.
7. Samper, Thomas. Prof. T. Corke.
6. Hickman, Adam. Prof. S. Morris.
5. Nguyen, Minh. Profs. E. Jumper and R. M. Rennie
4. Takakura, Tamuto. Prof. S. Morris. 2016.
3. Marshall, Curtis. Prof. T. Corke. 2016.
2. Ranade, Piyush. Prof. E. Jumper. 2016.
1. Coleman, Dustin. Prof. F. Thomas. 2015.

**Courses Taught:**

2. AME 40462, Aerospace Design. Spring 2015–16, 25–30 students.
1. AME 60635, Intermediate Fluid Mechanics. Fall 2015, 25 students.

**Teaching Workshops Attended:**

2. R. Brent and R. Felder, “Effective Teaching: A Workshop”, April 7–8, 2016.
1. Kaneb Center for Teaching and Learning, “New Faculty Excellence in Teaching”, August 18–19, 2014.

**Grants & Funding:**

6. Summer Faculty Fellowship Program, AFOSR, “Experimental Investigation of Hypersonic Boundary-Layer Transition”. \$50,000. June 2016, two months. Sole PI.
5. Defense University Research Instrumentation Program, AFOSR, “Large Hypersonic Quiet Tunnel: Test Section and Driver Tube Heater”. \$390,400. March 2016, one year. Lead PI (with T. Corke).
4. Young Investigator Program, AFOSR, “Plasma-Actuated Flow Control of Hypersonic Crossflow-Induced Boundary-Layer Transition in a Quiet Tunnel”. \$360,000. January 2016, 3 years. Sole PI.
3. Defense University Research Instrumentation Program, AFOSR, “Hypersonic Quiet Tunnel Air Supply & Driver Tube”. \$888,500. August 2015, one year. Lead PI (with T. Corke).
2. Phase I STTR, AFOSR, “Impact of Hypersonic Flight Environment on EO/IR Sensors”. \$1,000. July 2015, one year. PI (with R. M. Rennie, lead PI).
1. Summer Faculty Fellowship Program, AFOSR, “Experimental Investigation of Hypersonic Boundary-Layer Transition”. \$48,400. June 2015, two months. Sole PI.

**Professional Organizations & Service:**

AIAA Senior Member  
Session chair at numerous AIAA SciTech and Aviation conferences  
Reviewer for AIAA SciTech and Aviation conferences

Thomas J. Juliano

Reviewer for *AIAA Journal*, *Journal of Spacecraft and Rockets*, *Sensors*, *Experimental Thermal and Fluid Science*, *Journal of Propulsion and Power*, *International Journal of Heat and Fluid Flow*, and *Journal of Visualization*

Co-host of NATO Science & Technology Organization AVT-240: Hypersonic Boundary-Layer Transition Prediction working group meeting at University of Notre Dame, April 2016

**Departmental & University Service:**

Member, Institute for Flow Physics and Control Faculty Search Committee

Member, Young Leaders of Notre Dame

Faculty advisor, AIAA student chapter

Faculty advisor, Design-Build-Fly club

**Other:**

Private pilot with instrument rating