

Randall M. Mathison

Associate Professor • The Ohio State University
Department of Mechanical and Aerospace Engineering • Gas Turbine Laboratory
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EDUCATION

The Ohio State University, Columbus, OH

Ph.D., Mechanical Engineering, August 2009

Dissertation: Experimental and Computational Investigation of Inlet Temperature Profile and Cooling Effects on a One and One-Half Stage High-Pressure Turbine Operating at Design-Corrected Conditions

Advisor: Prof. Michael G. Dunn

The Ohio State University, Columbus, OH

M.S. Mechanical Engineering, March 2004

Thesis: Measurement and Analysis of an Air Film Damping System

Advisor: Prof. Michael G. Dunn

Iowa State University, Ames, IA

B.S. Mechanical Engineering, May 2002

EXPERIENCE

The Ohio State University Department of Mechanical and Aerospace Engineering

Associate Professor (August 2019 to Present)

- Courses Taught: ME4510 Heat Transfer, AeroE 5751 Advanced Air Breathing Propulsion, ME7527 Jet Propulsion, (detailed listing below)
- Current graduate students: 4 PhD, 2 M.S.
- Students graduated: 2 PhD, 5 M.S. with thesis, 51 non-thesis M.S.
- Contract research for Pratt & Whitney, Honeywell Aerospace, Universal Technology Corp, Ohio Federal Research Network, General Electric

Assistant Professor (August 2013 to 2019)

The Ohio State University Gas Turbine Laboratory, Columbus, OH

Senior Research Engineer (August 2009 to August 2013)

- Planned, executed, and analyzed data for full-scale cooled experiments performed in Turbine Test Facility
- Generated computational predictions for turbine experiments utilizing FINE/Turbo
- Planned and operated tip rub and damping experiments in Compressor and Fan Spin Pit Facilities
- Presented work to sponsors, at technical conferences, and in publications
- Mentored graduate students in their experimental and computational research

The Ohio State University, Department of Mechanical and Aerospace Engineering, Columbus, OH

Instructor of record for ME500: Engineering Thermal Sciences (Fall Qtr., 2010, 85 students, Student Evaluation Average: 4.8/5)

The Ohio State University Gas Turbine Laboratory, Columbus, OH

Graduate Research Associate (July 2002-August 2009)

- Performed complete experimental research program on air-film damping system
- Designed and helped assemble two large combustor emulators for Turbine Test Facility
- Operated combustor emulators and cooling facilities for two experimental programs
- Analyzed large data set for turbine operating at design corrected conditions
- Advanced experimental capabilities of laboratory through calibrations, software development, novel implementations of instrumentation, and proof-of-concept experiments

Iowa State University, Ames, IA

Transfer Processes Laboratory, Undergraduate Research Associate (May 2001-August 2001)

Virtual Reality Applications Center, Undergraduate Research Associate (May 1999- August 2001)

HONORS AND AWARDS

- College of Engineering Lumley Research Award, The Ohio State University, 2019.
- ASME International Gas Turbine Institute Dillip R. Ballal Early Career Engineer Award (recognizing early career engineers for technical achievement in the field of turbomachinery), 2013.
- IGTI/ASME Heat Transfer Committee Best Paper Award, 2010, for Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Heat Transfer for the Blade of a Cooled Stage and One-Half High-Pressure Turbine--Part I: Influence of Vane Cooling and Disk Cavity Purge Flow," ASME Turbo Expo, Glasgow, Scotland, GT2010-22713.
- IGTI/ASME Heat Transfer Committee Best Paper Award, 2006, for Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Harral, J.W., and Heitland, G., 2006, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part I: Experimental Approach," ASME Turbo Expo, Barcelona, Spain, GT2006-90966, and Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Harral, J.W., and Heitland, G., 2006, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part II: Experimental Results," ASME Turbo Expo Barcelona, Spain, GT2006-90968.
- Outstanding Doctoral Student, NASA/DoD URETI on Aeropropulsion and Power Technology, 2007

ARCHIVAL PUBLICATIONS

(papers in bold prepared with a graduate student)

1. Christensen, L.E., Celestina, R.A., Sperling, S.J., Mathison, R.M., Aksoy, H., Liu, J.S. "Infrared Temperature Measurements of the Blade Tip for a Turbine Operating at Corrected Engine Conditions", recommended for journal publication by ASME Turbo Expo review process.
2. Celestina, R.A., Sperling, S.J., Christensen, L.E., Mathison, R.M., Aksoy, H., Liu, J.S. "Development of New Single and High-Density Heat-Flux Gauges for Unsteady Heat Transfer Measurements for a Rotating Transonic Turbine", recommended for journal publication by ASME Turbo Expo review process.
3. Nickol, J.B., Mathison, R.M., Dunn, M.G., Liu, J.S., Malak M.F., "Unsteady Heat Transfer and Pressure Measurements on the Airfoils of a Rotating Transonic Turbine With Multiple Cooling Configurations", *J. Eng. Gas Turbines Power*. April 2017, 139(9):092601-092601-10. doi: 10.1115/1.4036059
4. Nickol, J.B., Mathison, R.M., Dunn, M.G., Liu, J.S., Malak M.F., "An Investigation of Coolant Within Serpentine Passages of a High-Pressure Axial Gas Turbine Blade", *J. Turbomach.* April 2017, 139(9):091006-091006-8. doi: 10.1115/1.4036109
5. Nickol, J.B., Mathison, R.M., Malak, M.F., Rana, R., Liu, J.S. "Time-Resolved Heat Transfer and Surface Pressure Measurements for a Fully Cooled Transonic Turbine Stage," *ASME. J. Turbomach.* 2015;137(9):091009-091009-11. doi:10.1115/1.4029950.
6. Habib, A.J., Barton, J.L., Mathison, R.M., and Dunn, M.G., 2014, "Wireless Telemetric Data Acquisition and Real-Time Control for a High Measurement-Density Internal Heat Transfer Experiment", *ASME Journal of Turbomachinery*, 137(4): 041003.
7. Smith, M.A., Mathison, R.M., and Dunn, M.G., 2013, "Heat Transfer for High Aspect Ratio Rectangular Channels in a Stationary Serpentine Passage with Turbulated and Smooth Surfaces," *Journal of Turbomachinery*, 136(5): 051002.
8. Dunn, M.G. and Mathison, R.M., 2013, "History of Short-Duration Measurement Programs Related to Gas Turbine Heat Transfer, Aerodynamics, and Aeroperformance at Calspan and OSU," *Journal of Turbomachinery*, 136(4): 041004.

9. Haldeman, C.W., Dunn, M.G., Mathison, R.M., Troha, W., Vander Hoek, T., and Riahi, A., 2013, "Aeroperformance Measurements for a Fully Cooled High-Pressure Turbine Stage," *Journal of Turbomachinery*, **136**(3): 031001.
10. **Nickol, J.B., Mathison, R.M., and Dunn, M.G., 2013, "Heat-Flux Measurements for a Realistic Cooling Hole Pattern with Multiple Flow Conditions," *Journal of Turbomachinery*, **136**(3): 031010.**
11. **Green, B.R., Mathison, R.M., and Dunn, M.G., 2013, "Comparison of Harmonic and Time-Marching Unsteady CFD Solutions with Measurements for a Single Stage High-Pressure Turbine," *Journal of Turbomachinery*, **136**(1): 011005.**
12. **Green, B.R., Mathison, R.M., and Dunn, M.G., 2013, "Time-Averaged and Time-Accurate Aerodynamic Effects of Forward Rotor Cavity Purge Flow for a High-Pressure Turbine—Part I: Analytical and Experimental Comparisons," *Journal of Turbomachinery*, **136**(1): 011004.**
13. **Green, B.R., Mathison, R.M., and Dunn, M.G., 2013, "Time-Averaged and Time-Accurate Aerodynamic Effects of Rotor Purge Flow for a Modern, One and One-Half Stage High-Pressure Turbine—Part II: Analytical Flow Field Analysis," *Journal of Turbomachinery*, **136**(1): 011009.**
14. Kahveci, H.S., Haldeman, C.W., Mathison, R.M., and Dunn, M.G., 2012, "Heat Transfer for the Film-Cooled Vane of a 1-1/2 Stage High-Pressure Transonic Turbine- Part I: Experimental Configuration and Data Review with Inlet Temperature Profile Effects," *Journal of Turbomachinery*, **135**(2): 021027.
15. Kahveci, H.S., Haldeman, C.W., Mathison, R.M., and Dunn, M.G., 2012, "Heat Transfer for the Film-Cooled Vane of a 1-1/2 Stage High-Pressure Transonic Turbine- Part II: Effect of Cooling Variation on Vane Airfoil and Inner Endwall," *Journal of Turbomachinery*, **135**(2): 021028.
16. Mathison, R.M., Wishart, M.B., Haldeman, C.W., and Dunn, M.G., 2011, "Temperature Predictions and Comparison with Measurements for the Blade Leading Edge and Platform of a 1-1/2 Stage Transonic HP Turbine," *Journal of Turbomachinery*, **134**(1): 011016.
17. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2011, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part III: Impact of Hot Streak Characteristics on Blade Row Heat Flux," *Journal of Turbomachinery*, **134**(1): 011008.
18. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2011, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part II: Influence of Inlet Temperature Profile on Blade Heat Flux," *Journal of Turbomachinery*, **134**(1): 011007.
19. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2011, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part I: Vane Inlet Temperature Profile Generation and Migration," *Journal of Turbomachinery*, **134**(1): 011006.
20. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2011, "Heat Transfer for the Blade of a Cooled One and One-Half Stage High-Pressure Turbine--Part II: Independent Influences of Vane Trailing Edge and Purge Cooling," *Journal of Turbomachinery*, **134**(3): 031015.
21. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2011, "Heat Transfer for the Blade of a Cooled Stage and One-Half High-Pressure Turbine--Part I: Influence Cooling Variation," *Journal of Turbomachinery*, **134**(3): 031014.
22. Haldeman, C.W., Dunn, M.G., and Mathison, R.M., 2011, "Fully-Cooled Single Stage HP Transonic Turbine--Part I: Influence of Cooling Mass Flow Variations and Inlet Temperature Profiles on Blade Internal and External Aerodynamics," *Journal of Turbomachinery*, **134**(3): 031010.
23. Haldeman, C.W., Dunn, M.G., and Mathison, R.M., 2011, "Fully-Cooled Single Stage HP Transonic Turbine--Part II: Influence of Cooling Mass Flow Changes and Inlet Temperature Profiles on Blade and Shroud Heat-transfer," *Journal of Turbomachinery*, **134**(3): 031011.
24. Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Harral, J.W., and Heitland, G., 2008, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part I: Experimental Approach," *Journal of Turbomachinery*, **130**(2).
25. Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Harral, J.W., and Heitland, G., 2008, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part II: Experimental Results," *Journal of Turbomachinery*, **130**(2).
26. Mathison, R.M., Dunn, M.G., Weaver, M.M., and Dushko, A., 2005, "Measurement of Air Film Damping Effectiveness," *Journal of Turbomachinery*, **127**(3): pp. 557-563.

CONFERENCE PAPERS

(papers in bold prepared with a graduate student)

1. **Sperling, S.J., Celestina, R.A., Christensen, L.E., Mathison, R.M., Aksoy, H., Liu, J.S. "Variation of Cooling Mass Flow Rate and its Effect on Unsteady Aerodynamic and Heat Transfer Performance of a Rotating Turbine Stage", AIAA Propulsion and Energy Conference, August 2020, New Orleans, LA.**
2. **Christensen, L.E., Celestina, R.A., Sperling, S.J., Mathison, R.M., Aksoy, H., Liu, J.S. "Infrared Temperature Measurements of the Blade Tip for a Turbine Operating at Corrected Engine Conditions", ASME Turbo Expo, June 2020, London, England, GT2020-14528.**

3. Celestina, R.A., Sperling, S.J., Christensen, L.E., Mathison, R.M., Aksoy, H., Liu, J.S. "Development of New Single and High-Density Heat-Flux Gauges for Unsteady Heat Transfer Measurements for a Rotating Transonic Turbine", ASME Turbo Expo, June 2020, London, England, GT2020-14527.
4. Sperling, S.J., and Mathison, R.M. "Time-Accurate Evaluation of Film Cooling Jet Characteristics for Plenum and Crossflow Coolant Supplies", ASME Turbo Expo, June 2019, Phoenix, AZ, GT2019-91765 (accepted).
5. Christensen, L.E., and Mathison, R.M., "Measurement of Heat Transfer Inside a Channel Using External Infrared Thermography", AIAA Propulsion and Energy Conference, July 2018, Cincinnati, OH: AIAA-2018-4430.
6. Nickol, J., Tomko, M., Mathison, R., Liu, J.S., Morris, M., Malak, M., "Heat Transfer and Pressure Measurements for the Forward Purge Cavity, Inner Endwall, and Rotor Platform of a Cooled Transonic Turbine Stage", ASME Turbo Expo, June 2018, Oslo, Norway, GT2018-76978.
7. Sperling, S.J., and Mathison, R.M., "Time Accurate Evaluation of Shaped Hole Film Cooling Effectiveness using an Infrared Compensated Pressure Sensitive Paint Technique", Global Power and Propulsion Society North American Forum, May 7-9, 2018, Montreal, Quebec: GPPS-NA-2018-0060.
8. Liu, J.S., Morris, M.C., Malak, M.F., Mathison, R.M., Dunn, M.G., "Comparison of 3D Unsteady Transient Conjugate Heat Transfer Analysis on a High Pressure Cooled Turbine Stage with Experimental Data", ASME Turbo Expo, June 26-30, 2017, Charlotte, NC: GT2017-64596.
9. Mathison, R.M., and Dunn, M.G., "A New Rotating Facility for Investigating Cooling Passage Internal Heat Transfer", Global Power and Propulsion Forum, Jan. 16-18, 2017, Zurich, Switzerland: GPPF-2017-158.
10. Mathison, R., and D'Souza, K., "Air Breathing Propulsion Education and Research Activities at The Ohio State University", AIAA Propulsion and Energy, July 10th-12th, 2017, Atlanta, GA: AIAA-2017-4885.
11. Chen, L., and Mathison, R.M., "Determination of Transient Heat Transfer Rates for a Film Cooled Metal Plate in a Blowdown Facility using Infrared Thermography", AIAA Propulsion and Energy Conference, July 2016, Salt Lake City, Utah: AIAA-2016-5046.
12. Nickol, J.B., Mathison, R.M., Dunn, M.G., Liu, J.S., Malak, M.F., "An Investigation of Coolant Within Serpentine Passages of a High-Pressure Axial Gas Turbine Blade", ASME Turbo Expo, June 2016, Seoul, South Korea: GT2016-57776.
13. Nickol, J.B., Mathison, R.M., Dunn, M.G., Liu, J.S., Malak, M.F., "Unsteady Heat Transfer and Pressure Measurements on the Airfoils of a Rotating Transonic Turbine with Multiple Cooling Configurations", ASME Turbo Expo, June 2016, Seoul, South Korea: GT2016-57768.
14. Nickol, J.B., Mathison, R.M., Malak, M.F., Rana, R., and Liu, J.S., "Time-Resolved Heat Transfer and Surface Pressure Measurements for a Fully-Cooled Transonic Turbine Stage", ASME Turbo Expo, June 2014, Dusseldorf, Germany: GT2014-26407.
15. Habib, A.J., Barton, J.L., Mathison, R.M., and Dunn, M.G., "Wireless Telemetric Data Acquisition and Real-Time Control for a High Measurement-Density Internal Heat Transfer Experiment", ASME Turbo Expo, June 2014, Dusseldorf, Germany: GT2014-26408.
16. Smith, M.A., Mathison, R.M., and Dunn, M.G., 2013, "Heat Transfer for High Aspect Ratio Rectangular Channels in a Stationary Serpentine Passage with Turbulated and Smooth Surfaces," ASME Turbo Expo, San Antonio, TX, GT2013-94924.
17. Nickol, J.B., Mathison, R.M., and Dunn, M.G., 2013, "Heat-Flux Measurements for a Realistic Cooling Hole Pattern with Multiple Flow Conditions," ASME Turbo Expo, San Antonio, TX, GT2013-94925.
18. Dunn, M.G. and Mathison, R.M., 2013, "History of Short-Duration Measurement Programs Related to Gas Turbine Heat Transfer, Aerodynamics, and Aeroperformance at Calspan and OSU," ASME Turbo Expo, San Antonio, TX, GT2013-94926.
19. Green, B.R., Mathison, R.M., and Dunn, M.G., 2012, "Comparison of Harmonic and Time-Marching Unsteady CFD Solutions with Measurements for a Single Stage High-Pressure Turbine," ASME Turbo Expo, Copenhagen, Denmark, GT2012-69934.
20. Green, B.R., Mathison, R.M., and Dunn, M.G., 2012, "Time-Averaged and Time-Accurate Aerodynamic Effects of Forward Rotor Cavity Purge Flow for a High-Pressure Turbine—Part I: Analytical and Experimental Comparisons," ASME Turbo Expo, Copenhagen, Denmark, GT2012-69937.
21. Green, B.R., Mathison, R.M., and Dunn, M.G., 2012, "Time-Averaged and Time-Accurate Aerodynamic Effects of Rotor Purge Flow for a Modern, One and One-Half Stage High-Pressure Turbine—Part II: Analytical Flow Field Analysis," ASME Turbo Expo, Copenhagen, Denmark, GT2012-69939.
22. Haldeman, C.W., Dunn, M.G., Mathison, R.M., Troha, W., Vander Hoek, T., and Riahi, A., 2012, "Aeroperformance Measurements for a Fully Cooled High-Pressure Turbine Stage," ASME Turbo Expo, Copenhagen, Denmark, GT2012-69941.
23. Kahveci, H.S., Haldeman, C.W., Mathison, R.M., and Dunn, M.G., 2011, "Heat Transfer for the Film-Cooled Vane of a 1-1/2 Stage High-Pressure Transonic Turbine- Part I: Experimental Configuration and Data Review with Inlet Temperature Profile Effects," ASME Turbo Expo, Vancouver, Canada, GT2011-46570.
24. Kahveci, H.S., Haldeman, C.W., Mathison, R.M., and Dunn, M.G., 2011, "Heat Transfer for the Film-Cooled Vane of a 1-1/2 Stage High-Pressure Transonic Turbine- Part II: Effect of Cooling Variation on Vane Airfoil and Inner Endwall," ASME Turbo Expo, Vancouver, Canada, GT2011-46573.
25. Mathison, R.M., Wishart, M.B., Haldeman, C.W., and Dunn, M.G., 2010, "Temperature Predictions and

- Comparison with Measurements for the Blade Leading Edge and Platform of a 1-1/2 Stage Transonic HP Turbine," ASME Turbo Expo, Glasgow, Scotland, GT2010-22987.
26. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part III: Impact of Hot Streak Characteristics on Blade Row Heat Flux," ASME Turbo Expo, Glasgow, Scotland, GT2010-23855.
 27. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part II: Influence of Inlet Temperature Profile on Blade Heat Flux," ASME Turbo Expo 2010, Glasgow, Scotland, GT2010-22718.
 28. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Aerodynamics and Heat Transfer for a Cooled One and One-Half Stage High-Pressure Turbine--Part I: Vane Inlet Temperature Profile Generation and Migration," ASME Turbo Expo 2010, Glasgow, Scotland, GT2010-22716.
 29. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Heat Transfer for the Blade of a Cooled One and One-Half Stage High-Pressure Turbine--Part II: Independent Influences of Vane Trailing Edge and Purge Cooling," ASME Turbo Expo, Glasgow, Scotland, GT2010-22715.
 30. Mathison, R.M., Haldeman, C.W., and Dunn, M.G., 2010, "Heat Transfer for the Blade of a Cooled Stage and One-Half High-Pressure Turbine--Part I: Influence of Cooling Variation," ASME Turbo Expo, Glasgow, Scotland, GT2010-22713.
 31. Haldeman, C.W., Dunn, M.G., and Mathison, R.M., 2010, "Fully-Cooled Single Stage HP Transonic Turbine--Part I: Influence of Cooling Mass Flow Variations and Inlet Temperature Profiles on Blade Internal and External Aerodynamics," ASME Turbo Expo 2010, Glasgow, Scotland, GT2010-23446.
 32. Haldeman, C.W., Dunn, M.G., and Mathison, R.M., 2010, "Fully-Cooled Single Stage HP Transonic Turbine--Part II: Influence of Cooling Mass Flow Changes and Inlet Temperature Profiles on Blade and Shroud Heat-Transfer," ASME Turbo Expo, Glasgow, Scotland, GT2010-23445.
 33. Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Herral, J.W., and Heitland, G., 2006, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part I: Experimental Approach," ASME Turbo Expo, Barcelona, Spain, GT2006-90966.
 34. Haldeman, C.W., Mathison, R.M., Dunn, M.G., Southworth, S., Herral, J.W., and Heitland, G., 2006, "Aerodynamic and Heat Flux Measurements in a Single Stage Fully Cooled Turbine -- Part II: Experimental Results," ASME Turbo Expo Barcelona, Spain, GT2006-90968.
 35. Mathison, R.M., Dunn, M.G., Weaver, M.M., and Dushko, A., 2004, "Measurement of Air Film Damping Effectiveness," ASME Turbo Expo, Vienna, Austria, GT2004-53057.
 36. Haldeman, C.W., Mathison, R.M., and Dunn, M.G., 2004, "Design, Construction, and Operation of a Combustor Emulator for Short-Duration High-Pressure Turbine Experiments", Joint Propulsion Conference, Ft. Lauderdale, FL, AIAA-2004-3829.

INVITED PRESENTATIONS

1. "Turbomachinery Developments for Cleaner and More Efficient Air Transport", Wright State University, April 3, 2020.
2. "Cleaner and More Efficient Air Transport", Iowa State University, September 23, 2019.
3. "Development of Advanced Measurement Techniques for Full-Stage Turbine Experiments", Turbine Engine Technology Symposium, Dayton, OH, September 12, 2018.
4. "Gas Turbine Heat Transfer and Aerodynamics", Wright State University, February 16th, 2018.
5. "Heat Transfer Measurements for a Cooled High-Pressure Turbine with Multiple Hole Shapes and Purge Flow Variation", Turbine Engine Technology Symposium, Dayton, OH, September 14, 2016.
6. "Time-Resolved Measurements for a Fully-Cooled Transonic Turbine Stage and Development of a Telemetric Acquisition and Control System", Turbine Engine Technology Symposium, Dayton, OH, September 11, 2014.
7. "Recent Experiments/CFD Related to Purge Cavity Flows and Aeroperformance for Two Different Cooled Full Stage High-Pressure Turbines", Turbine Engine Technology Symposium, Dayton, OH, September 13, 2012.
8. "An Overview of Computational and Experimental Work at The Ohio State University Gas Turbine Laboratory", Numeca North American User Conference, San Francisco, CA, February 25, 2009.
9. "Experimental Investigation of Inlet Temperature Profile and Cooling Effects for a 1-1/2 Stage Turbine", Turbine Engine Technology Symposium, Dayton, OH, September 16, 2010.

PAPERS UNDER PREPARATION

(all papers prepared with a graduate student)

1. Haugen, C.M., Mathison, R.M., Dunn, M.G., and Rambo, J. "Modeling of Thermal Performance for a Rotating Three-Passage Serpentine with Experimental Comparison". To be submitted to the ASME Journal of Turbomachinery.

2. Pier, H.L., Chen, L., and Mathison, R.M. "Development of an Infrared Thermography Technique for Measuring Heat Transfer to a Flat Plate in a Blowdown Facility". To be submitted to Journal of Experimental Thermal and Fluid Science. (author's maiden name is Hannah Lawson)

GRADUATED STUDENTS (PhD)

1. Jacob Allenstein, 2020. "An Investigation of Jet Engine Test Cell Exhaust Stack Aerodynamics and Performance through Scale Model Test Studies and Computational Fluid Dynamics Results". The Ohio State University. Currently employed by Blue Origin.
2. Jeremy Nickol, 2016. "Airfoil, Platform, and Cooling Passage Measurements on a Rotating Transonic High-Pressure Turbine". The Ohio State University. Currently employed by Honeywell Aerospace.

GRADUATED STUDENTS (M.S. Thesis)

1. Aditya Kulkarni, 2020. "Computational and Experimental Investigation of Internal Cooling Passages for Gas Turbine Applications". The Ohio State University. Currently employed by BWX Technologies, Inc.
2. Matthew Tomko, 2016. "Impact of Purge Flow Variation on Rotor Cavity and Blade Platform Pressures for a Transonic High-Pressure Turbine". The Ohio State University. Currently Employed by ANSYS.
3. Liang Chen, 2016. "Infrared Thermography Technique for Measuring Heat Transfer to a Film Cooled Object". The Ohio State University. Currently pursuing a PhD at Ohio State.
4. Hannah Lawson, 2015. "Development of an Infrared Thermography Technique for Measuring Heat Transfer to a Flat Plate in a Blowdown Facility". The Ohio State University. Currently employed by Pratt & Whitney.
5. Timothy Lawler, 2015. "Heat Transfer for a Stationary Serpentine Passage using a Transient Thermochromatic Liquid Crystal Paint Technique". The Ohio State University. Currently Employed by Rocketdyne.

GRADUATED STUDENTS (M.S. Non-Thesis)

1. Richard Polk, ME, May 2017
2. Reshmi Syamlal, ME, May 2017
3. Neil Eveld, ME, Dec. 2017
4. Justin Beausoleil, ME, May 2018
5. James Bossart, ME, May 2018
6. Michael Caselton, ME, May 2018
7. Brandon Chapman, ME, May 2018
8. Olive Chelangat, ME, May 2018
9. Robert Clark, ME, May 2018
10. Devin Dilley, ME, May 2018
11. Robert Griffin, ME, May 2018
12. Halima Iqbal, ME, May 2018
13. Paul Lachaud, ME, May 2018
14. Nicholas Marik, ME, May 2018
15. Jack Otte, ME, May 2018
16. Parth Patel, ME, May 2018
17. Shane Raber, ME, May 2018
18. Michael Simonetti, ME, May 2018
19. Caitlin Smith, ME, May 2018
20. Madalyn Vershay, ME, May 2018
21. Lauren Watson, ME, May 2018
22. Samantha Wright, ME, May 2018
23. Peter Andrews, ME, May 2019
24. Jack Boes, ME, May 2019
25. Ryan Brady, ME, May 2019
26. Mitchell Coulter, ME, May 2019
27. Shannon Donelan, ME, May 2019
28. Julio Estrella, ME, May 2019
29. Brendan Freely, ME, May 2019
30. Suchot Kongsomboonvech, ME, May 2019
31. Ben Koon, ME, May 2019
32. Ben Lammert, ME, May 2019
33. Daniel Lang, ME, May 2019

34. Scott Lunardini, ME, May 2019
35. Ericka Lynn, ME, May 2019
36. Sara Mahaffey, ME, May 2019
37. Rahim Panjwani, ME, May 2019
38. Aaron Schmitz, ME, May 2019
39. Sean Sherry, ME, May 2019
40. Jeremy Sorensen, ME, May 2019
41. Chris Vernham, ME, May 2019
42. Seth Wieging, ME, May 2019
43. Richard Marvin, ME, Dec 2019
44. Cherise John, ME, Dec 2019
45. Michael Borner, ME, May 2020
46. Laura Dombrowski, ME, May 2020
47. John Franklin, ME, May 2020
48. Carly Head, ME, May 2020
49. Koby Kubrin, ME, May 2020
50. Kevin Leong, ME, May 2020
51. Ryan St Pierre, ME, May 2020

CURRENT GRADUATE STUDENTS

1. John Calhoun, full-time employee at GE Aviation, pursuing a PhD in Mechanical Engineering, expected graduation in 2021
2. Richard Celestina, pursuing a M.S. in Mechanical Engineering, expected graduation in 2020
3. Louis Christensen, pursuing a PhD in Aerospace Engineering, expected graduation in 2021
4. Spencer Sperling, pursuing a PhD in Aerospace Engineering, expected graduation in 2021
5. Robin Reifsnnyder, pursuing a PhD in Aerospace Engineering, expected graduation in 2024
6. Kevin McManus, pursuing non-thesis M.S. in Mechanical Engineering, expected graduation 2020

SERVICE

- Organized Saturday Aerospace Experience for Camp Engineer, an outreach to middle school students coordinated by the Ohio State Minority Engineering Program
- Advisor to OSU senior design team for AFRL Aerospace Propulsion Outreach Program, 2013-2018
- Member of ASME K-14 Gas Turbine Heat Transfer Committee
- Session Co-chair at ASME Turbo Expo in 2010 (Glasgow), 2011 (Vancouver), 2014 (Düsseldorf), 2015 (Montreal), 2016 (Seoul), 2017 (Charlotte)
- Session Chair for ASME Turbo Expo in 2018 (Oslo)
- Session Chair for Global Power and Propulsion Forum, 2017
- Reviewer of papers for ASME International Gas Turbine Institute conferences, Journal of Turbomachinery, AIAA Journal of Propulsion and Power, Journal of Power and Energy, Journal of Heat Transfer, Journal of Thermal Science and Engineering Applications

COURSES TAUGHT

1. *Advanced Air Breathing Propulsion*, Aerospace Engineering 5751, The Ohio State University, Spring Semester 2015-2018, mixed enrollment of seniors and graduate students, covering jet engine principles and design. Student evaluation of instruction cumulative score 4.6 (2015), 5.0 (2016), 4.8 (2017), 4.0 (2018), compared to college average of 4.4/5.0 for similar classes.
2. *Jet Propulsion*, Mechanical Engineering 7527, The Ohio State University, Autumn 2017, composed of graduate students, focused on advanced concepts and gas turbine engine design. Student evaluation of instruction cumulative score of 3.9/5.0. I redeveloped this course to make heavy use of GasTurb software to help students explore design considerations, and I learned a lot about how to better integrate the software with the course.
3. *Heat Transfer*, Mechanical Engineering 4510, The Ohio State University, a first course in engineering heat transfer required for all ME majors and typically taken by seniors. Taught for three semesters, with an average student evaluation of instruction score of 4.5, compared to college average of 4.1/5.0 for similar classes.
4. *Engineering Thermal Sciences*, Mechanical Engineering 500, The Ohio State University, senior students not majoring in Mechanical Engineering. Autumn 2010. Student evaluation of instruction score of 4.8, compared to college average of 4.1/5.0 for similar classes.

PROFESSIONAL AFFILIATIONS

- American Society of Mechanical Engineers (ASME), member since 1999
- Tau Beta Pi, member since 2001
- American Institute of Aeronautical Engineers (AIAA), member since 2003
- American Society for Engineering Education (ASEE), member since 2006