

DAVID BRIAN LANDRUM
Associate Professor
University of Alabama in Huntsville
Department of Mechanical and Aerospace Engineering
Olin B. King Technology Hall, Room N267
Huntsville, AL 35899
(cell) 256-527-1464 (office) 256 824-7207
Email: david.landrum@uah.edu

EDUCATION

North Carolina State University, Ph.D. in Aerospace Engineering, 1992
Dissertation: *Simulation of Vibration-Dissociation Coupling in Nitrogen*
Advisor: Dr. G. V. Candler

Texas A&M University, M.S. in Aerospace Engineering, 1986
Thesis: *Influence of Surface Heating on the Boundary Layer Stability of Flows With Favorable Pressure Gradients*
Advisor: Dr. J. M. Macha

Texas A&M University, B.S. in Aerospace Engineering, 1984

PROFESSIONAL EXPERIENCE

August 1998 to Present: Associate Professor of Mechanical and Aerospace Engineering, Univ. of Alabama in Huntsville. Research and Teaching interests: low and high speed aerodynamics, aerospace vehicle design, rocket and airbreathing propulsion, engineering education and aerospace history.

September 1992 to August 1998: Assistant Professor of Mechanical and Aerospace Engineering, Univ. of Alabama in Huntsville.

August 1988 to August 1992: Graduate Research Assistant, Mechanical and Aerospace Engineering Dept., North Carolina State University. Investigated the coupling between the molecular dissociation rate and vibrational state of rapidly compressing and expanding gases characteristic of reentry vehicles. Developed an engineering method for calculating surface pressures and heating rates on hypervelocity vehicles with embedded shock waves.

June 1986 to July 1988: Member of Technical Staff, Aerodynamics Dept., Sandia National Laboratory, Albuquerque, NM. Project aerodynamicist for the SWERVE maneuverable reentry vehicle. Numerical, analytical, and experimental prediction of hypervelocity vehicle aerodynamics, flight mechanics, and aerothermodynamics.

June 1984 to May 1986: Graduate Research Assistant, Aerospace Engineering Dept., Texas A&M University. Conducted an experimental and numerical study of boundary layer stability in heated flows with airfoil-type pressure gradients. Participated in a numerical investigation to determine DAQ heating requirements and nonadiabatic boundary layer characteristics for a generic transport model in the NASA National Transonic Facility.

January 1982 to May 1984: Research Assistant, Texas A&M University 7 x 10 ft Low Speed Wind Tunnel. Aerodynamic analysis of aircraft, spacecraft, automotive vehicles, and structures. Pre-test planning and design; test equipment assembly; and data acquisition and analysis.

SECURITY CLEARANCE: Active Top-Secret

CONSULTING

Book Reviewer: Elsevier (2011, 2009), Cambridge Univ. Press (2010), CRC Press (2007) - aerodynamics, rotorcraft and propulsion.

National Research Council, Air Force/DoD Committee on Aerospace Propulsion, 2006

Dynetics, Inc., Huntsville, AL, March 2003 - 2005, Missile aerodynamics.

KT Engineering, Huntsville, AL, June 2000 - 2004, Expendable launch vehicle aerodynamics and propulsion.

Sparta, Inc., Huntsville, AL, August 2000 – April 2003, U.S. Missile Simulation and Intelligence Center (MSIC) Rolling Airframe Initiative Advisory Group.

International Space Systems, Inc., Huntsville, AL, December 1999 – December 2002, Analysis and design of combined cycle propulsion systems for advanced launch vehicles.

Teledyne Brown Engineering, Huntsville, AL, April 1999, Micropropulsion system analysis and design.

PROFESSIONAL ACTIVITIES & AFFILIATIONS

American Institute of Aeronautics and Astronautics:

- Associate Fellow, 2004 - present
- UAH Student Section Faculty Advisor, 1993 – present
- Region II Faculty Advisor Liaison, 2011 - present
- 2004 National Faculty Advisor of the Year
- Member of Editorial Advisory Board for AIAA Education Book Series, January 2001 – present
- Member of AIAA National Technical Activities Committee (2000 – 2009)
- Region II Deputy Director for Technical Activities (2000 – 2009)
- Member of, Plasmadynamics and Lasers TC, (1993 - 2001)
- Reviewer: *AIAA Journal*, *AIAA Journal of Spacecraft and Rockets*, *AIAA Journal of Propulsion and Power*, *AIAA Journal of Thermophysics and Heat Transfer* (1995)

Sigma Gamma Tau, Associate Advisor (2008 – present)

American Helicopter Society (member)

Association of Unmanned Vehicle Systems International (member)

American Society for Engineering Education (member)

Phi Kappa Phi

PATENTS

Patent # 8,256,203 - ROCKET BASED COMBINED CYCLE PROPULSION UNIT HAVING EXTERNAL ROCKET THRUSTERS, Awarded September 4, 2012. Co-Inventors Sean Entekin and James Blackmon.

PUBLICATIONS

Book Chapters

A Review of United States Air Force and Department of Defense Aerospace Propulsion Needs (contributor to Chapters 4 and 5), Committee on Air Force and Department of Defense Aerospace Propulsion Needs, National Research Council, The National Academies Press, DC, December 2006. ISBN 0-309-10247-2. Also available at <http://books.nap.edu/catalog/11780.html#orgs>.

Journal Articles

1. Percy, T. K. and Landrum, D. B., “Investigation of National Policy Shifts to Impact Orbital Debris Environments,” *Space Policy*, Volume 30, Issue 1, Elsevier Science Direct, April 2014. <http://dx.doi.org/10.1016/j.spacepol.2014.02.003>.
2. Besnard, L., Shtessel, Y.B., and Landrum, D.B., “Quadrotor Vehicle Control via Sliding Mode Controller Driven by Sliding Mode Disturbance Observer,” *Journal of The Franklin Institute*. (2011), doi:10.1016/j.jfranklin,2011.06.031.
3. Balasubramanyam, M.S., Lineberry, D., Chen, C. P., and Landrum, D. B., “Experimental and Numerical Investigation of a Non-Axisymmetric Strut Based Ejector,” *International Journal of Hypersonics*. vol. 1, No. 3, Sept 2010.
4. Locke, J. and Landrum, D. B., “A Study of Correlations for Heat Transfer to supercritical Hydrogen in Regenerative Cooling Channels,” *AIAA J. of Propulsion and Power*, Vol. 24, No. 1, pp. 94-103, Jan. – Feb. 2008.
5. Tournes, C. and Landrum, D. B., “F-14 Aircraft Lateral-Directional Adaptive Control Using Subspace-Stabilization,” *AIAA J. of Guidance, Control, and Dynamics*, vol. 26, No. 1, January -February, 2003, pp. 167-169.
6. Adams, R. B., and Landrum, D. B., “Analysis of a Fusion-Electric Airbreathing Earth-to-Orbit Launch Vehicle,” *AIAA J. of Propulsion and Power*, vol. 18, No. 4, July -August, 2002, pp. 933-942.
7. Adams, R. B., and Landrum, D. B., “Laser-Air Interactions in an Internal Supersonic Flowpath,” *AIAA J. of Propulsion and Power*, vol. 18, No. 4, July-August, 2002, pp. 961-963.

8. Benfield, P. J., and Landrum, D. B., "International Joint Ventures in Space: The International Space Welding Experiment," *Journal of Technology Transfer*, Vol. 23, No. 3, Fall 1998, pp. 25 - 38.
9. Darby, S. P., Landrum, D. B., and Coleman, H. W., "Assessment of Uncertainty in the Determination of Activation Energy for Polymeric Materials," *AIAA Journal of Thermophysics and Heat Transfer*, Vol. 12, No. 4, Oct. - Dec. 1998, pp. 520 - 535.
10. Landers, M. G., and Landrum, D. B., "Hinge Moment Coefficient Prediction for Nose-Mounted Canard Controls at Supersonic Speeds," *AIAA Journal of Spacecraft and Rockets*, Vol. 35, No. 3, May - June 1998, pp. 303 - 311.
11. Tournes, C., Landrum, D. B., Shtessel, Y., and Hawk, C. W., "Ramjet-Powered Reusable Launch Vehicle Control by Sliding Modes," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 21, No. 3, May-June, 1998, pp. 409 - 415.
12. Beard, R. A., and Landrum, D. B., "Effects of Kinetic Rate Uncertainty on the Predicted Performance of Solar Thermal Rockets," *AIAA Journal of Propulsion and Power*, Vol. 13, No. 6, Nov.-Dec. 1997, pp. 806 - 808.
13. Pearson, J. B., Landrum, D. B., and Hawk, C. W., "Parametric Study of Solar Thermal Rocket Nozzle Performance," *ASME Journal of Solar Energy Engineering*, Vol. 118, No. 3, August 1996, pp. 194 - 195.
14. Landrum, D. B., DeJarnette, F. R., and Boman, B. L., "Engineering Method for Calculating Surface Pressures and Heating Rates on Vehicles with Embedded Shocks," *AIAA Journal of Spacecraft and Rockets*, Vol. 29, No. 6, Nov.-Dec. 1992, pp. 756 - 764.
15. Landrum, D. B., and Candler, G. V., "Vibration - Dissociation Coupling in Nonequilibrium Flows," *AIAA Journal of Thermophysics and Heat Transfer*, Vol. 6, No. 4, Oct.-Dec. 1992, pp. 643 - 649.

Editorially Reviewed Journal Articles

1. Beard, R. M., and Landrum, D. B., "Computational Assessment of Solar Thermal Rocket Nozzle Performance," *Interface - The Alabama Supercomputer Authority Journal*, Vol. 3, No. 2, May 1995, pp. 5- 9.

Refereed Proceedings

1. Moylan, B., Landrum, D.B., and Russell G., "Investigation of the Physical Phenomena Associated with Rain Impacts on Supersonic and Hypersonic Flight Vehicles," Proceedings of the 12th Hypervelocity Impact Symposium, *Procedia Engineering 00 (2012) 000-000*, Elsevier, 2012
2. Percy, T. and Landrum, D. B., "Investigation of National Policy Shifts to Impact Orbital Debris Environments," IAC-12.A6.6.3, 63rd International Astronautical Congress, Naples, Italy, Oct. 1-5, 2012.
3. Thomas, J., Engelhaupt, D., and Landrum, D.B., "Development of a Lightweight, Monolithic, Aspheric Mirror Utilizing FDM Technology," IAC-12-C2.9.6, 63rd International Astronautical Congress, Naples, Italy, Oct. 1-5, 2012.
4. Pipitsitee, T. and Landrum, D.B., "UAHuntsville Flight Simulation Development," Proceedings of the 2008 ASME Early Career Technical Conference, Miami, FL, October 3-4, 2008.
5. Besnard, L., Shtessel, Y., and Landrum, D. B., "Control of a Quadrotor Vehicle Using Sliding Mode Disturbance Observer," AIAA Paper 2007-6316, *Proceedings of the AIAA 2007 Guidance, Navigation and Control Conference*, Hilton Head, SC, Aug. 20-23, 2007. **(Peer reviewed paper)**
6. Besnard, L., Shtessel, Y., and Landrum, D. B., "Control of a Quadrotor Vehicle Using Sliding Mode Disturbance Observer," *Proceedings of the 2007 IEEE American Control Conference*, New York, NY, July 11 - 13, 2007.
7. Taylor, T. T., and Landrum, D. B., "Preliminary Analysis of Light Sail Systems Engineering Concepts," *Proceedings of the 2001 Space Technologies & Applications International Forum (STAIF)*, Conference on Innovative Transportation Systems for Exploration of the Solar System and Beyond, Albuquerque, NM, February 11 - 14, 2001.
8. Wu, S. T., Landrum, D. B., and Stensby, J., "Teaching Engineering in the 21st Century: An Example of a New Aerospace Engineering Curriculum," *Proceedings of the International Conference on Engineering Education*, Taipei, Taiwan, Republic of China, May 1995.
9. Pearson, J. B., Landrum, D. B., and Hawk, D. B., "Parametric Study of Solar Thermal Rocket Nozzle Performance," *Proceedings of the 1995 ASME/JSME/JSES International Solar Energy Conference*, Vol. 2, Maui, Hawaii, March 1995, pp. 919-925.

Proceedings

1. Ethan Hopping, Markus Murdy, Nathaniel Stepp and Landrum, D. B., "Design of a Cost Effective Thrust stand for Introducing Thrust and Impulse," Proceedings of the AIAA 65th Southeastern Student Conference, Memphis, TN, April 7-8, 2014.
2. Stewart King, John Alcorn, Amun Jarzembski, Chad Jones, Michael Goetzka, Amy Cooper, Mary Ford, and Landrum, D. B. "A Long Endurance, Highly Maneuverable, Collaborative, Unmanned Airborne System," Proceedings of the AIAA 65th Southeastern Student Conference, Memphis, TN, April 7-8, 2014.
3. Finney, B., Fowler, A., Lin, I., Thomas, J., and Landrum, D. B., "ATeP – UAV Sensor testing Platform" Proceedings of the AIAA 64th Southeastern Student Conference, Raleigh, NC, April 8-9, 2013.
4. McElroy, McElroy, T. and Landrum, D.B., "High-Altitude Thermal Testing of a COTS Electric UAV Motor", Proceedings of the AIAA 62nd Southeastern Student Conference, Tuscaloosa, AL, April 4-5, 2011
5. Couchman, A. and Landrum, D.B., "Effectiveness of Wing-Warping Control of an Inflatable- Wing UAV", Proceedings of the AIAA 62nd Southeastern Student Conference, Tuscaloosa, AL, April 4-5, 2011.
6. "Affordable Flight Simulation in an Educational Environment," (with J. Cerny, L. Warden, A. Meyer, and R. Bryson), *Proceedings of the American Helicopter Society Forum 63*, Virginia Beach, VA, May 1-3, 2007.
7. "Affordable Flight Simulation in an Educational Environment," (with J. Cerny, L. Warden, A. Meyer, and R. Bryson), *Proceedings of the 2006 Huntsville Simulation Conference*, Oct. 17-19, 2006.
8. "Uncertainty Analysis of Heat Transfer Correlations for RP-1 Fuel in Copper Tubing," (with E. Driscoll), *Proceedings of the 52nd JANNAF Propulsion Meeting*, Las Vegas, NV, May 10-14, 2004.
9. "Dynamic Model of the Magneto hydrodynamic Bypass Scramjet Engine," (with C. Tournes), *Proceedings of the 14th International Conference on MHD Electric Power Generation and High Temperature Technologies* and **AIAA Paper 2002-2135** presented at the 33rd AIAA Plasmadynamics and Lasers Conference, Maui, Hawaii, May 20-23, 2002.
10. "Adaptive Aircraft Lateral Approach Guidance," (with C. Tournes), **AIAA Paper 2001-4204**, *Proceedings of the AIAA Guidance, Navigation, and Control Conf.*, Montreal, Quebec, Canada, August 6-9, 2001.
11. "F-14 Aircraft Lateral Adaptive Control Using Subspace-Stabilization," (with C. Tournes), **AIAA Paper 20014018**, *Proceedings of the AIAA Guidance, Navigation, and Control Conf.*, Montreal, Quebec, Canada, August 6-9, 2001.
12. "Experimental Investigation of a Supersonic Non-Axisymmetric Ejector," (N. T. Smith, C. W. Hawk, and T. Onodera), **AIAA Paper 2001-1913**, *Proceedings of the AIAA 10th International Aerospace Planes and Hypersonic Systems and Technologies Conference*, Kyoto, Japan, April 2001.
13. "Adaptive Guidance of Aircraft Directional Axis," (with C. Tournes), *Proceedings of the 33rd Southeastern Symposium on System Theory*, Ohio University, Athens, OH, March 18-20, 2001.
14. "Adaptive Control of Aircraft Lateral-Directional Axis Using Subspace Stabilization," (with C. Tournes), *Proceedings of the 33rd Southeastern Symposium on System Theory*, Ohio University, Athens, OH, March 18-20, 2001.
15. "A Collaborative Analysis Tool for Integrating Hypersonic Aerodynamics, Thermal Protection Systems, and RBCC Engine Performance for Single Stage to Orbit Vehicles," (with S. T. Stanley and R. Alexander), **AIAA Paper 99 4808**, *Proceedings of the 9th AIAA International Space Planes and Hypersonic Systems and Technologies Conference*, Norfolk, VA, November 1-5, 1999.
17. "Mixing of Supersonic Streams," (with C. W. Hawk, M. Turner, D. Wagner, and J. Lambert), *Proceedings of the 10th Annual Penn State Propulsion Engineering Research Center Symposium*, NASA Marshall Space Flight Center, Huntsville, AL, October 26 - 27, 1998, pp. 104 – 111.
18. "Mixing of Supersonic Streams," (with C.W. Hawk, D. Spetman, and D. Parkinson), *Proceedings of the 1998 JANNAF Propulsion Meeting*, Cleveland, OH, July 15 - 17, 1998.
19. "Development of a Physically Based Axial Compressor Model," (with C. Tournes), *Proceedings of the 30th Southeastern Symposium on System Theory*, West Virginia Univ., Morgantown, WV, March 8 – 10, 1998.

20. "Mixing of Supersonic Streams," (with C. W. Hawk, D. Spetman, and D. Parkinson), *Proceedings of the 1997 JANNAF Joint Meeting of the Combustion, Propulsion System Hazards, and Airbreathing Propulsion Subcommittees*, West Palm Beach, FL, October 27 – 31, 1997.
21. "Application of Plug Nozzles in Single Stage to Orbit (SSTO) Launch Vehicles," *Proceedings of the 1996 Young Faculty Research Symposium*, University of Alabama in Huntsville, Huntsville, AL, October 1996, pp. 6-14.
22. "Application of Plug Nozzles in Single Stage To Orbit (SSTO) Launch Vehicles," *Proceedings of the 1st Young Faculty Research Symposium*, University of Alabama in Huntsville, Huntsville, AL, October 1995, pp. 15 - 22.
23. "Effects of Wing Tip Shape on Climb Performance of Gliders," (with O. W. Nicks), *Proceedings of the 4th International Symposium on the Science and Technology of Low Speed and Motorless Flight*, February 1984.

Technical Papers

1. King, W. S., Landrum, D. B., Alcorn, J., and Jarzembski, A., "A Long Endurance, Highly Maneuverable, Collaborative, Unmanned Airborne System," AIAA 2015-3232, 22nd AIAA Lighter-Than-Air Systems Technology Conference, Aviation Forum 2015, Dallas, TX, June 22-25, 2015.
2. Goli, N. and Landrum, D. B., "Development of an Integrated UAS for Agricultural Imaging Applications," AIAA 2015-3286, 15th AIAA Aviation Technology, Integration, and Operations Conference, Aviation Forum 2015, Dallas, TX, June 22-25, 2015.
3. Cranford, J., Kang, C. K., Landrum, D. B. and Slegers, N., "Experimental Characterization of Butterfly in Climbing Flight," AIAA 2015-2328, AIAA Modeling and Simulation Technologies Conference, Aviation Forum 2015, Dallas, TX, June 22-25, 2015.
4. Calamaio, C. L., Griffin, R. E., Irwin, D., Howell, B., and Landrum, D. B., "Intelligent payload Module Design for Application-Oriented Research," AUUSI Unmanned Systems 2015, Atlanta, GA, May 4 – 7, 2015.
5. Landrum, D. B., "Rubber Bands and Pennies: An Introductory Aircraft Design Experience", **AIAA 2013-0656**, 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, January 7-10, 2013.
6. Landrum, D. B. and Landrum, K. B., "Silent Flight: The Exciting Life of 'Nellie' Zabel Willhite", **AIAA 2013-1146**, 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, January 7-10, 2013.
7. "Simulated High-Altitude Testing of COTS Electric UAV Motors", (with T. McElroy), **AIAA 2012-1045**, 50th AIAA Aerospace Sciences Meeting, Nashville, TN, January 9-12, 2012.
8. "Preliminary Analysis of the Rocket Plug Nozzle Combined Cycle (RPNCC) Propulsion System," (with D. Wood), **AIAA-2009-202**, 47th AIAA Aerospace Sciences Meeting including The New Horizons Forum and Aerospace Exposition, Orlando, Florida, Jan. 5-8, 2009.
9. "Analysis of the Rocket Plug Nozzle Combined Cycle Propulsion System," (with D. Wood and O. Demaneuf), **AIAA-2008-5168**, 44th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Hartford, CT, July 21-23, 2008
10. "Aerodynamic Evaluation of Offset Planar Wing Configuration," (with A. Horton), **AIAA 2006-3313**, 24th AIAA Applied Aerodynamics Conf., San Francisco, CA, June 5 - 8, 2006.
11. "Effects of Multiple Nozzles on Asymmetric Ejector Performance," **AIAA 2005-4283**, (with D. Lineberry), 41st AIAA Joint Propulsion Conf., Tucson, AZ, July 10 – 13, 2005.
12. "Effect of Tube Geometry on Regenerative Cooling Performance," **AIAA 2005-4301**, (with D. Parris), 41st AIAA Joint Propulsion Conf., Tucson, AZ, July 10 – 13, 2005.
13. "Uncertainty Analysis of Heat Transfer to Supercritical Hydrogen in Coolant Channel," **AIAA 2005-4303**, (with J. Locke), 41st AIAA Joint Propulsion Conf., Tucson, AZ, July 10 – 13, 2005.
14. "Numerical Investigation of Cold Flow Non-Axisymmetric Ejectors," (with M. S. Balasubramanyam, C. P. Chen, C. P., and D. Lineberry), **AIAA 2005-1209**, 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 10-13, 2005.
15. "Analyzing Helicopter Store Separation Using Scale Models," (with J. Obermark), AHS 4th Decennial Specialist's Conference on Aeromechanics, San Francisco, CA, January 21-23, 2004.
16. "Calibration of Vorticity Confinement Techniques for Missile Aerodynamics: Part I – Surface Confinement," (with T. M. Suttles, B. E. Greiner, and M. A. Robinson), **AIAA 2004-0719**, 42nd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 5-8, 2004.
17. "Analysis of Annular Plug Nozzle Performance and TVC," (with K. Higdon), **AIAA 2003-4908**, 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Huntsville, AL, July 20-23, 2003.

18. "Characterization of Cold Flow Non-Axisymmetric Ejectors," (with D. Lineberry and C. W. Hawk), **AIAA 2003-5231**, 39th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Huntsville, AL, July 20-23, 2003.
19. "Spinning Tail Aerodynamics of a Low Cost Precision Guided Missile," (with R. E. Kreeger), **AIAA 20033935**, 21st Applied Aerodynamics Conf., Orlando, FL, June 23-26, 2003.
20. "Using a 1908 Monoplane to Teach Aircraft Design and Analysis," (with A. Nuar), **AIAA 2003-0946**, 41st AIAA Aerospace Sciences Meeting, Reno, NV, Jan. 2003.
21. "The 1908 Quick Monoplane: First Flight in Alabama?" (with A. Nuar), **AIAA 2003-0100**, 41st AIAA Aerospace Sciences Meeting, Reno, NV, Jan. 2003.
22. "International Product Teams for Aerospace Systems Design," (with R. A. Frederick, M. S. Pawlak, D. M. Utley, C. D. Corsetti, and B. E. Wells), **AIAA 2002-4337**, 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Indianapolis, IA, July 7-10, 2002.
23. "Design Optimization of a Nuclear Reactor for Earth-to-Orbit Applications," (with T. Moton and P. Schallhorn), **AIAA 2002-0363**, 40th AIAA Aerospace Sciences Meeting, Reno, NV, January 2002.
24. "An Improved One-Dimensional Engineering Model for the Evaluation of RBCC Engine Performance," (with S. T. Stanley, S. McKamey, and J. Hatfield), **AIAA 2001-3462**, 37th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Salt Lake City, UT, July 2001.
25. "Experimental Investigation of a Supersonic Non-Axisymmetric Cold Flow Ejector," (with N. T. Smith and M. Moser), **AIAA 2001-3195**, 37th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Salt Lake City, UT, July 2001.
26. "Analysis of a Nuclear Enhanced Airbreathing Rocket for Earth to Orbit Applications," (with R. B. Adams), **AIAA 2001-3205**, 37th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Salt Lake City, UT, July 2001.
27. "Optimization of the SHX Fusion Powered Transatmospheric Propulsion Concept," (with R. B. Adams), **AIAA 2001-0959**, 39th AIAA Aerospace Sciences Meeting, Reno, NV, January 2001.
28. "Preliminary Analysis of a Fusion-Electric Airbreathing Earth-to-Orbit Launch Vehicle," (with R. B. Adams), **AIAA 00-3366**, 36th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Huntsville, AL, July 2000.
29. "Investigation of the Rocket Induced Flow Field in a Rectangular Duct," (with M. Thames, D. Parkinson, and S. Gautney), **AIAA 99-2100**, 35th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Los Angeles, CA, June 1999.
30. "High-Energy Space Propulsion Based on Magnetized Target Fusion," (with Y. C. F. Thio, B. Freeze, R. C. Kirkpatrick, H. Gerrish, and G. Schmidt), **AIAA 99-2703**, 35th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Los Angeles, CA, June 1999.
31. "Investigation of Plasma Injection in Water," (with S. Matsuura), **AIAA 99-3544**, 30th Plasmadynamics and Lasers Conference, Norfolk, VA, June 1999.
32. "Development of a Physically Based Axial Compressor Model," (with C. Tournes), **AIAA 98-3313**, 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, OH, July 1998.
33. "Thermal/Fluid Study of Perforated Plates for Transpiration Cooled Rocket Chambers," (with Mignon Thames and J. Hendricks), **AIAA 98-3442**, 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, OH, July 1998.
34. "Numerical Simulation of a Film-Cooled LOX/RP-1 Rocket Nozzle," (with R. M. Beard), **AIAA 97-3227**, 33rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Seattle, WA, July 1997.
35. "Prediction of Hinge Moment Coefficients for Nose-Mounted Canard Controls at Supersonic Speeds," (with M. G. Landers), **AIAA 97-2248**, 15th Applied Aerodynamics Conference Atlanta, GA, June 1997.
36. "Effects of Test Chamber Ambient Pressure on the Performance of Hydrogen Thrusters for Solar Thermal Rockets," (with R. M. Beard), **AIAA 97-0881**, 35th AIAA Aerospace Sciences Meeting, Reno, NV, January 1997.
37. "Evaluation of Stereolithography Rapid Prototyping for Low Speed Airfoil Design," (with R. M. Beard, P. A. LaSarge, and N. von Sprecken), **AIAA No. 97-0719**, 35th AIAA Aerospace Sciences Meeting, Reno, NV, January 1997.
38. "Dual Fuel Solar Thermal Propulsion: Computational Assessment of Nozzle Performance," (with R. M. Beard), **AIAA 96-3217**, 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL, July 1996.

39. "Effects of Kinetic Rate Uncertainty on the Predicted Performance of Small Hydrogen Thrusters," (with R. M. Beard), **AIAA 96-2856**, 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL, July 1996.
40. "Effects of Scale and Chamber Temperatures on the Performance of Hydrogen Thrusters for Solar Thermal Rockets," (with T. W. Tucker), **AIAA 96-3216**, 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL, July 1996.
41. "*Will It Fly?* A Computer-Based Aircraft Design Tool," (with E. G. Woodfin), **AIAA 96-0160**, 34th AIAA Aerospace Sciences Meeting, Reno, NV, January 1996.
42. Pearson, and C. W. Hawk), **AIAA 95-2635**, 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 1995.
43. "Performance Characterization of a Plain-Orifice Injector with Very Small Holes," (with R. M. Beard and M. L. Dings), **AIAA 95-2947**, 31st AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Diego, CA, July 1995.
44. "Experimental Investigation of the Heat Transfer to Parallel Tandem Cavities," (with S. G. Holmes), **AIAA 95-0631**, 33rd AIAA Aerospace Sciences Meeting and Exhibit, Reno, NV, January 1995.
45. "Aerothermodynamic Simulation in the UAH Aerophysics Facility Ballistic Range," (with R. A. Hayami), **AIAA 94-2598**, 18th AIAA Aerospace Ground Testing Conference, Colorado Springs, CO, June 1994.
46. "Experimental Investigation of the Heat Transfer to Cavities in Tandem," (with S. G. Holmes), **AIAA 94-2489**, 18th AIAA Aerospace Ground Testing Conference, Colorado Springs, CO, June 1994.
47. "Experimental Uncertainty in Determining Kinetic Reaction Parameters for Polymeric Materials," (with S. P. Darby), **AIAA 94-2088**, 6th AIAA/ASME Joint Thermophysics and Heat Transfer Conference, Colorado Springs, CO, June 1994.
48. "Engineering Method for Calculating Engine Inlet Face Property Profiles on High-Speed Vehicle Forebodies," (with K. Chojnacki and J. A. Blevins), **AIAA 93-3113**, 24th AIAA Fluid Dynamics Conf., Orlando, FL, July 1993.
49. "Computational Investigation of Electron Production in Solid Rocket Plumes," (with R. C. Hughes), **AIAA 93-2454**, 29th AIAA/SAE/ASME/ASEE Joint Propulsion Conference and Exhibit, Monterey, CA, June 1993.
50. "Development of a New Model for Vibration - Dissociation Coupling in Nitrogen," (with G. V. Candler), **AIAA 92-2853**, 27th AIAA Thermophysics Conf., Nashville, TN, July 1992.
51. "Engineering Method for Calculating Surface Pressures and Heating Rates on Vehicles with Embedded Shocks," (with F. R. DeJarnette and B. L. Boman), **AIAA 91-5060**, 3rd AIAA International Aerospace Planes Conference, Orlando, FL, December 1991.
52. "Vibration -Dissociation Coupling in Nonequilibrium Flows," (with G. V. Candler), **AIAA 91-0466**, 29th Aerospace Sciences Meeting, Reno, NV, January 1991.
53. "Influence of a Heated Leading Edge on Boundary Layer Growth, Stability and Transition," (with J. M. Macha), **AIAA 87-1259**, 19th AIAA Fluid Dynamics, Plasmadynamics and Lasers Conference, Honolulu, Hawaii, June 1987.
54. "Heating Requirements and Nonadiabatic Surface Effects for a Model in the NTF Cryogenic Wind Tunnel," (with J. M. Macha, L. A. Pare, and C. B. Johnson), **AIAA 88-2044**, 15th AIAA Aerodynamic Testing Conference, San Diego, CA, May 1988.

Technical Reports: Listing available upon request.

THESIS AND DISSERTATION DIRECTION

Doctor of Philosophy

Thomas Percy, "*Simplified Population Growth Modelling for Low Earth Orbit*," May 2015.

Travis Taylor, "*Implementing Planetary Meteor Impact Craters as High Gain radio Frequency Dish Reflector Antennas*," May 2012.

Bruce Moylan, "*Raindrop Demise in a High-Speed Projectile Flowfield*," August 2010.

David Lineberry, "*Characterization of a Cold Flow, Non-axisymmetric Supersonic Ejector*," August 2007.

Soichi Matsuura, "*Investigation of Plasma Injection into Water*," May 2002.

Master of Science

- Jacob Cranford**, "A Novel Experimental Method for Studying Trajectories and Wing Kinematics of Freely Flying Butterflies," August 2015.
- Nishanth Goli**, "Development of an Integrated UAS for Agricultural Imaging Applications," December 2014.
- Tyler McElroy**, "Static testing of a COTs Electric UAV Motor in an Altitude Chamber," May 2012.
- Shane Lackey**, "Weapons Bay Acoustic Suppression Using a Novel Rod in Crossflow Configuration," May 2010.
- Dustin Wood**, "Investigation of an Innovative Combined Cycle Nozzle," August 2009.
- Brian Akins**, "Development of a Ballistic Soft-catch System," August 2009.
- Thammanit Piputsitee**, "Inexpensive Flight Simulation in an Academic Environment," Dec. 2008
- Serena (Gautney) Osborne**, "Study of the Stability of Scaled Uncontrolled Kinetic Energy Projectiles," May, 2008.
- Melissa (Stumpe) Farbman**, "Trajectory Reconstruction with a Multi-Order Least Squares Sliding Window (LSSW) Filter," August 2007.
- Amanda Nelly Horton**, "Aerodynamic Testing and Analysis of Offset Planar Wings and Opposing Offset Tails," May 2007.
- Angela Sheree Long**, "Application of Response Surface Methods to Characterize Missile Performance," May 2007.
- Jing Pei**, "Introduction of Control Pins in the Vicinity of Missile Fins for Roll and Yaw Control," Dec. 2006.
- Leniack Besnard**, "Control of a Quadrotor Vehicle Using Sliding Mode Disturbance Observer," Aug. 2006
- Christi Dolbeer**, "Evaluation of Heavy Fuel Engines for Small Unmanned Air Vehicles," May 2006.
- Justin Locke**, "Analysis of Heat Transfer Correlations for Supercritical Hydrogen in Regenerative Cooling Channels," December 2005.
- Olivier Demaneuf**, "Water Tunnel Facility Design for External Flow Visualizations," December 2005.
- Kevin Higdon**, "Analysis of Annular Plug Nozzle Performance and Thrust Vector Control," May 2005.
- James Mullis** "Application of Response Surface Method to the Design of an Air Defense Interceptor," May 2005.
- Angeline Nuar**, "Aerodynamic Analysis of the Quick Monoplane," May 2005.
- LeeAnn Smith**, "Determination of Permeation Constants for Gases Through Teflon Hose Walls," May 2005.
- Timothy Suttles**, "Calibration of Vorticity Confinement Technique for Missile Aerodynamics," May 2004.
- Jeffery Obermark**, "Analyzing Helicopter Store Separation Using Scale Models," December 2003.
- Elizabeth Driscoll**, "Uncertainty Analysis on Heat Transfer Correlations for RP-1 Fuel in Copper Tubing," December 2003.
- William M. Gray**, "A Study of the Possible Use of Hybrid Rocket Systems as Targets in Ballistic Missile Defense Tests," December 2002.
- Nathaniel Smith**, "An Experimental Investigation of a Supersonic Non-Axisymmetric Cold-Flow Ejector," May 2002.
- Travis S. Taylor**, "Analysis of Advanced Solar and Laser Sail Propulsion Concepts for Near Term Interstellar Probe," May 2001.
- Robert Adams**, "Preliminary Analysis of a Fusion-Powered Transatmospheric Airbreathing Vehicle," May 2000.
- Zuhair Ibrahim**, "Numerical Simulation of the Regenerative Cooling Tubes in the 15-K FASTRAC Engine," May 2000.
- Chris Palmiter**, "Computer Program for Analyzing Continuum and Free Molecular Flows in a General Arrangement of Chambers and Vents," May 2000.
- Mignon Thames**, "A Thermal/Fluid Analysis of Perforated Plates for Transpiration Cooled Rocket Chambers," December 1998.
- Robert M. Beard**, "Numerical simulation of Film-Cooled LOX/RP-1 Rocket Nozzles," August 1997.
- Michael Landers**, "Prediction of Hinge Moment Coefficients for Nose-Mounted Canard Controls at Supersonic Speeds," August 1997.
- Stephania Darby**, "Assessment of Uncertainty in the Determination of Kinetic Reaction Parameters for Polymeric Materials," August 1997.

Timothy Tucker, "Solar Thermal Rocket Nozzle Analysis and Experiment Design", August 1996.
J. Boise Pearson, "Analysis of Low-Thrust Solar Thermal Rocket Nozzle Performance", January 1995.
Steven G. Holmes, "Experimental Investigation of the Heat Transfer to Cavities in Tandem," Dec. 1993.

Master of Engineering

Steve Herwig, "Simulation and Modeling of Warhead Dispersion," December 2006.
Judy Liaw, "Investigation of Control Methods for the Enhanced Counter Air Projectile Concept," August 2004.
Kevin Buch, "Solar Sail Material Optical Test Design," August 2003.
Matthew Tunstall, "Aerocapture Ballute Performance," December 2003.
Eric Kreeger, "Spinning Tail Aerodynamics of a Guided Missile," December 2002.
Tryshanda Moton, "Design Optimization of a Nuclear Reactor for Earth-to-Orbit Applications," May 2001.
Ren Mao, "Supersonic Freejet Facility Design," May 2000.
R. Chris Hughes, "Solid Rocket Plume Design for Microwave Interferometry Measurements," Aug. 1994.

Co-Directed Master of Science

Richard Toomey, "Advanced Interceptor Autopilot Design VIA Sliding Mode Control," with Dr. Yuri Shtessel, May 2002.

Senior Honors Thesis

Thomas Kelley, "How to Obtain a Certificate of Authorization from the Federal Aviation Administration for Small Unmanned Aircraft Systems Operations: A Student's Guide," May 2015.
Joshua Crook, "Creation of the UAHuntsville Aircraft Design Handbook," August 2012.
P. J. Benfield, "ISWE: A Case Study of International Technology Transfer," December 1996.
Eric G. Woodfin, "Will It Fly? A Computer-Based Aircraft Design Tool," December 1994.
Robert A. Beard, "Designing, Analyzing, Manufacturing, and Testing an Airfoil: A feasibility Study of the Use of the Eppler Code and Stereolithography Rapid Prototyping," May 1994.

COURSES TAUGHT

Undergraduate

Fluid Mechanics I & II
Fluid Mechanics Laboratory
Thermodynamics I & II
Aerospace Structures Laboratory
Aerodynamics Laboratory
Fundamentals of Aerodynamics
Numerical Engineering Analysis
Aircraft Stability and Control
Principles of Aeronautics & Astronautics
Aerospace Engineering Senior Project
Compressible Aerodynamics
Aircraft Design
Airbreathing Propulsion

Graduate

Hypersonic Flow
Aerothermodynamics
Compressible Fluid Dynamics
Advanced Aerodynamics
Fundamentals of Aerodynamics
Numerical Engineering Analysis
Aircraft Stability and Control
Tactical Missile Design
Compressible Aerodynamics
Graduate Seminar
Helicopter Theory
Rotorcraft Design
Intro to Unmanned Aerial Systems

UNIVERSITY AND PROFESSIONAL SERVICE

Graduate Faculty Member (1993 – present)
UAH Global studies Task Force (2014)
UAH Dean of Science Search Committee (2013 - 2014)
UAH Learning Management System Task Force (2013 - 2014)
University Graduate Council (2003 - 2005)
- Graduate Credentials Committee (2004 – 2005)
- Curriculum Committee (2003 – 2004)
SACS Reaffirmation Compliance Committee – Compliance Audit Subcommittee (2005)

UAH Faculty Senate (1998 – 2002)
 - Undergraduate Curriculum committee (1998 – 2002)
UAH Honors Council (2001 – 2002)
UAH Scholarship Review Committee (2011)
UAH Global Studies PAC (2007 - 2012)
UAH Distance Learning Committee on Faculty Concerns (2009 - 2010)
UAH Graduation committee (2008 – present)
UAH Student Success Center Assessment Committee (2006 - present)
College of Engineering Scholarship Committee (2011)
College of Engineering Promotion and Tenure Advising Committee (PTAC) (2004 – 2007, 2010 - present)
College of Engineering ABET Team (CAT) (2003 – 05, 2008 - pres)
College of Engineering Coordinator for North Alabama Engineering Academy Alliance, (2008- 1010)
COE Planning Retreat Member (2004)
COE Computer Resources Committee (1993 – 2004, Chair 2000 - 2002)
COMPASS New Student Orientation (2004)
MAE Graduate Committee (Chair, 2005 – present)
MAE Faculty Search Committee (2004 – 2006)
College of Faculty Engineering Faculty Reappoint Committee (2006)
MAE Faculty Reappointment Committee (2005 – 2006)
MAE Aerospace Engineering Program Committee (1993 – present, Chair 1996 – 1998, 2004 – 05)
MAE Aerospace Program ABET Coordinator (2001 – 2005)
MAE Laboratory Committee (2000 – present)
MAE Web Page Committee (1998 – 2002)
Louis Stokes Alliance for Minority Participation Summer Research Program Mentor (1995, 2004)
Lecturer, NSF/UAH Adventures in Engineering High School Program (1995)
Lecturer, UAH Introduction for Minorities to Engineering and Technology Program (IMET) (1994 - 1995)
Speaker, UAH Compass Orientation for Freshman Engineering Students (1992 and 1994)
Lecturer, UAH Days of Discovery for High School Students (1994)
AIAA Student Section Faculty Advisor (1992 – present)
Sigma Gamma Tau Student Section co-Advisor (2008 – present)
Baptist Campus Ministry Faculty Advisor (1994 – present)
Ratio Christi Faculty Advisor (2010 – present)

CONTINUING EDUCATION

- *UAV Conceptual Design Using Computer Simulations*, AIAA Webinar, April 3, 2013.
- *CD-adapco Star CCM+ Advanced Training*, Huntsville, AL, April 16-17, 2008
- *Micro-Aerial Vehicles: Design, Control and Navigation*, Workshop at the 2007 International Conference on Intelligent Robots and Systems (IROS), San Diego, CA, November 2, 2007.
- *CDadapco Star CCM+ Training*, Huntsville Alabama, April 2007.
- *National Rotorcraft Technology Center UH60 Airloads Workshop*, Hurst, Texas, Feb. 23-24, 2006.
- *Mini-session on the use of the AVID OAV code*, UAH, January 25, 2006.
- *AIAA Tactical Interceptor Technology Symposium*, Huntsville, AL, January 20-21, 2005.
- *Data Analysis and Development with MATLAB Products for Aerospace Applications*, Huntsville, AL December 2, 2004.
- *AIAA Short Course on Design Optimization Using Genetic Algorithms*, May 13-14, 2004, UAH.
- *AIAA Tactical Interceptor Design Symposium*, Huntsville, AL, January 16, 2004.

- *Basics of Helicopter Performance*, UAH Professional Development Short Course, Huntsville, AL, December 8-9, 2003.
- *Introduction to the NASA Aerodynamic Preliminary Analysis System (APAS)*, UAH, May 14, 2003.
- *Helicopter Aerodynamics Without Equations*, UAH Professional Development Course, Huntsville, AL, March 10, 2003,
- *AIAA/UAH Tactical Missile Design Symposium*, Huntsville, AL, January 14, 2003.
- *Aeroprediction 02 Theory and User's Course*, Redstone Arsenal, AL, September 23 – 27, 2002.
- *AIAA Deputy Director Training and Strategy Workshop*, Reno, NV, January 10, 2001.

- *CFD-Research Corporation Master class on MEMS Modeling*, CFDRC Corporation Headquarters, Huntsville, AL, September 29, 1999.
- *Web Initiative Teaching Workshop*, UAH, September 21, 1999.
- *Micro/Nano Applications for Space*, Aerospace Corporation/JPL Conference, Pasadena, CA, April 11 - 15, 1999.
- *Future Flight Propulsion: Advanced Concepts in Rocket Propulsion, Nuclear Systems, Advanced Physics, and High Energy Density Propellants*, AIAA Professional Development Short Course, Cleveland, OH, July 16-17, 1998.
- *Teaching Effectiveness for Engineering Graduate Students*, College of Engineering Workshop, North Carolina State University, August 15-16, 1991.
- *Introductory Hypersonic Aerophysics*, Sandia/Stanford (AA212) Instructional Television Course, 1988.
- *Hypersonics*, University of Texas - College of Engineering Short Course, Austin, Texas, Oct. 27-30, 1987.
- *Atmospheric Entry*, Sandia/Stanford (AA213) Instructional Television Course, Spring 1987.
- *Numerical Methods in Fluid Mechanics*, Sandia/Stanford (AA214A) Instructional Television Course, Fall 1986.
- *Computation of Three-Dimensional Boundary Layers Including Separation*, AGARD-FDP-VKI Special Course, von Karman Institute for Fluid Mechanics, Rhode-St-Genese, Belgium, April 14-18, 1986.
- *Instabilities and Transition to Turbulence*, AIAA Professional Study Seminar, Cincinnati, Ohio, July 13-14, 1985.

HONORS AND AWARDS

- *AIAA Technical Activities Committee Distinguished Service Certificate*, American Institute of Aeronautics and Astronautics, presented Jan. 5, 2010.
- *2004 National Faculty Advisor of the Year*, American Institute of Aeronautics and Astronautics, presented January 6, 2004
- *Associate Fellow*, American Institute of Aeronautics and Astronautics, 2004
- *Outstanding Student Group Advisor*, University of Alabama in Huntsville, 2002 – 2003
- *10 Year Service Award*, UAH, May 17, 2003
- *AIAA Alabama-Mississippi Section Professional of the Year*, 1999 –2000
- *AIAA Southeastern Region II Best Student Section Award*, 1998 – 99, 2005-06
- *NASA/ASEE Summer Faculty Fellow*, NASA/MSFC, 1998
- *Research Institute Mini-Grant Continuation Award*, University of Alabama in Huntsville, 1996
- *NASA/ASEE Summer Faculty Fellow*, NASA/MSFC, 1993 and 1994
- *National Defense Science and Engineering Graduate Fellowship*, North Carolina State Univ., 1989-92
- *Engineering Dean's Graduate Fellowship*, North Carolina State University, 1988-89
- *Forsythe Graduate Fellowship*, Texas A&M University, 1985-86
- *Davidson Graduate Fellowship*, Texas A&M University, 1984-85
- *AIAA/Northrop C.W. Eyres Scholarship*, Texas A&M University, 1983-84
- *Junior Engineering and Technical Society Aerospace Engineering Scholarship*, Texas A&M University, 1980-81.