Darryl L. James, Ph.D., P.E.
Department of Mechanical Engineering
Texas Tech University, Lubbock, Texas 79409-1021
Phone: (806) 834-3386, E-mail: darryl.james@ttu.edu

Education

Ph.D., Georgia Institute of Technology, 1992

MSME, Georgia Institute of Technology, 1989

BSME, Texas A&M University, 1988

Professional Experience

Associate Vice Provost for Graduate, 2014 - present

Special Assistant to the Provost 2013 - 2014

Professor: Department of Mechanical Engineering, Texas Tech University, 2009 – present.

Associate Chair 2002 - 2005.

Director of Graduate Studies, Texas Tech University, 1999 - 2001, 2002 - 2005.

Associate Professor: Department of Mechanical Engineering, Texas Tech University, 1999.

Assistant Professor: Department of Mechanical Engineering, Texas Tech University, 1993 – 1999.

Consulting

National Lab and Industrial

Sandia National Laboratories

Halliburton

Ripple Resort Media Inc.

Mullin, Hoard, & Brown, LLP

Botika Candles

Hurricane Test Laboratory, Inc.

Sun-Star Electric, Inc.

Expert Witness

Twelve retained cases

Courses Taught

Fluid Dynamics

Heat Transfer

Measurements and Instrumentation

Senior Seminar

Sustainable Energy

Thermal Fluid Systems Laboratory

Thermodynamics I

Thermodynamics II

Advanced Heat Transfer (graduate)

Convection Heat Transfer (graduate)

Radiation Heat Transfer (graduate)

Thermodynamics (graduate)

Refereed Journal Articles

1. D.L. James, W.F. Leggett, and S.W. Webb, "An investigation of axial dispersion enhanced by thermosolutal natural convection in a horizontal annular-like enclosure." *International Journal of Heat and Mass Transfer*, 65, pp 314-320, 2013.

2. Prevatt, D. O., van de Lindt, J. W., Back, E., Graettinger, A. J., Pei, S., Coulbourne, W., Gupta, R., James, D., Agdas, D., " Making the Case for Improved Structural Design: The Tornado Outbreaks of 2011." *ASCE Journal of Leadership and Management in Engineering.* Vol 12, No 4, 2012, pp 254-270.

3. Berg, J.M, James, D.L., Berg, C.F., Toda, K, and Dasgupta, P.K., "Gas collection efficiency of annular denuders: A spreadsheet-based calculator." *Analytica Chimica Acta*, Vol 664, 2010, pp 56-61.

4. Mason, M.S., James, D.L., and Letchford, C.W., "Wind loading on a cube subjected to a pulsed wall jet simulation of a stationary thunderstorm downburst." *Wind & Structures.* Vol 12, (1), 2009, pp 77-88.

5. Hughes BT, Berg JM, James DL, Ibraguimov A, Liu S, and Temkin H., "One-Dimensional Axial Simulation of Electric Double Layer Overlap Effects in Devices Combining Micro- and Nanochannels," *Microfluidics and Nanofluidics*, Vol 5, No. 6., 2008, pp. 761-764.

6. Mishra, A.R., James, D.L. and Letchford, C.W., "Physical Simulation of a Single-Celled Tornado-Like Vortex, Part B: Wind Loading on a Cubical Model," *J. Wind Eng Ind. Aero.* 96, July 2008, pp. 1258-1273.

7. Mishra, A.R., James, D.L. and Letchford, C.W., "Physical Simulation of a Single-Celled Tornado-Like Vortex, Part A: Flow Field Characterization," *J. Wind Eng Ind. Aero.* 96, July 2008, pp. 1243-1257.

8. Furlow, J.S. and James, D.L., "Convective Heat Transfer Characteristics from Combined Mechanical and Supply Pulsed Radial Reattaching Jets." *International Journal of Heat and Fluid Flow.* Vol 28, Feb, 2007, pp. 178-190.

9. Nick M. Quinn and Darryl L. James and Basak Icli and Jay Hegde and Mark DAlise and Theodore F. Wiesner, "Temperature and Tissue Destruction Profiles in Experimental and Theoretical Models of Spinal Revision Surgery." *Journal of Undergraduate Research in Bioengineering.* Vol 6, no. 1, 2006, pp. 117-123.

10. Rose, S.E. and Moody, C.B. and James, D.L. and Barhorst, A.A., "Drag Measurement and Dynamic Simulation of Martian Wind Driven Sensor Platform Concepts." *Journal of Fluids and Structures*, Vol. 22, 2006, pp. 21-43.

11. Mason, M., Letchford, C.W., and James, D.L "Pulsed jet simulated of a thunderstorm downburst, Part A: Flow field." *J. Wind Eng Ind. Aero.*, Vol. 93/7, 2005, pp. 557-580.

12. Itamura, M.T., Francis, N.D., Webb, S.W., and James, D.L.,"In-Drift Natural Convection Analysis of the Low-Temperature Operating Mode Design." *Nuclear Technology,* Vol. 148, Nov., 2004, pp. 115-124.

13. Nick M. Quinn and Darryl L. James and Theodore F. Wiesner, "Development of an Experimental Model for Temperature Measurement of Spinal Nerve Tissue." *Journal of Undergraduate Research in Bioengineering*, Vol. 4, No. 2, 2004, pp. 94-98.

Journal Articles In Preparation or Submission

1. Mayer, L.J. and James, D.L., "On Recuperation in a Solar Thermochemical Heat Engine Prototype." To be submitted to *ASME Journal of Solar Energy Engineering.*

2. McKeon, C.D., James, D.L., O'Hern. T.J., and Webb, S.W., "Predicting Transition from Selective Withdrawal to Entrainment in a Liquid-Liquid System," To be submitted to the *Physical Review Letters.*

3. Tarara, K and James, D.L., "Near Surface Flow Field Characteristics of a Tornado-Like Vortex in a Large-Scale Tornado Simulator, VorTECH." To be submitted to *J. Wind Eng Ind. Aero.*

4. Potdar, A. and James, D.L., "Surface Pressure and Flow Field Characteristics of Dynamic Radial Jet Reattachment Nozzles." In preparation.

Sandia Technical Reports, Peer Reviewed

1. Susan J. Altman, Malynda Cappelle, Paul G. Clem, Adam W. Cook, Christopher H. Cornelius, William E. Hart, Michael R. Hibbs, Clifford K. Ho, Howland D. T. Jones, Siri S. Khalsa, Rachel Noek, Amy C. Sun, Stephen W. Webb, Lucas K. McGrath, Andres Sanchez, Darryl L. James, Atar Adout, Menachem Elimelech, and Seokatae Kang, "Analysis of Micromixers and Biocidal Coatings on Water-Treatment Membranes to Minimize Biofouling." SAND REPORT, SAND2009-8316, Sandia National Laboratories, December 2009.

2. Richard B. Diver, Nathan P. Siegel, Timothy A. Moss, James E. Miller, Lindsey Evans, Roy E. Hogan, Mark D. Allendorf, John N. Stuecker, Darryl L. James, "Innovative Solar Thermochemical Water Splitting." SAND REPORT, SAND2008-0878, Sandia National Laboratories, March 2008.

Refereed Conferences

1. Levitz, B., Letchford, C.W., and James, D.L., "Internal pressure dynamics in simulated tornadoes." Submitted to 2015 ASCE Structures Congress.

2. Hogan, R.E., Miller, J. and James, D.L. "Numerical Modeling of Solar Thermochemical Splitting of Carbon Dioxide Using a Two-Step Metal-Oxide Cycle." 2012 Energy Sustainability Conference & Fuel Cell Conference, July 23-26, San Diego, CA.

3. Mayer, L.J. and James, D.L., "Experimental Analysis of Flow Crossover in a Solar Thermochemical Reactor." 2012 Energy Sustainability Conference & Fuel Cell Conference, July 23-26, San Diego, CA.

4. Luke J. Mayer and Darryl L. James, "Thermal Recuperation Modeling of a Solar Thermochemical Reactor." 2011 Energy Sustainability Conference & Fuel Cell Conference, August 7-10, Washington DC.

5. Joel Hartenberger, Timothy O'Hern, Stephen Webb, Darryl James, "Transition from Selective Withdrawal to Light Layer Entrainment in an Oil-Water System." Presentation and abstract at the 63rd Annual Meeting of the Division of Fluid Dynamics, American Physical Society, Nov. 21-23, 2010, Long Beach, California.

6. Darryl James and Stephen Webb, "Particle Tracking for Membranes with Filtration," Presentation and abstract at the 61st Annual Meeting of the Division of Fluid Dynamics, American Physical Society, Nov. 23-25, 2008, San Antonio, Texas.

7. V. John Fernandez, Parthasarathi Ghosh, and Darryl James, "Thermodynamics of Compact Downhole Turbo Generators." SPE 116777, 2008 SPE Annual Technical Conference, Sept 21-21, Denver Colorado.

8. Richard B. Diver, Nathan P. Siegel, James E. Miller, Timothy A. Moss, John N. Stuecker, and Darryl L. James, "Development of a CR5 Solar Thermochemical Heat Engine Prototype." 2008 14th Biennial CSP SolarPACES Symposium, March 4-7, Las Vegas, Nevada.

9. Hughes, B.T. and Berg, J.M. and James, D.L. and Ibraguimov, A. and Liu, S. "A One-Dimensional Model Capturing Selective Ion Transport Effects in Nanofluidic Devices," *Proceedings of IMECE2007*, 2007 ASME International Mechanical Engineering Congress and Exposition, Seattle, WA.

10. James, D.L., Webb, S.W., and Francis, N.D., "Turbulence Model Heat Transfer Predictions in an Air-Filled Square Enclosure," 13th International Heat Transfer Conference, Aug. 13-18, Sydney, Australia, 2006.

11. James, D.L., Siegel, N.P., Diver, R.B., Boughton, B.D., and Hogan, R.E., "Numerical Modeling of a Solar Thermo-Chemical Water-Splitting Reactor," 2006 ASME International Solar Energy Conference, Denver, CO, July 8 - 13, **Shared Best Paper Award**.

12. Alan A. Barhorst and Darryl L., "Elasto-dynamic Model of a Segmented Martian Tumbleweed Concept." Proceedings of the *44th AIAA Aerospace Sciences Meeting*, Paper No. 2006-0068, January, Reno, NV.

13. S. Rose, C. Moody, D. L. James, and A. A. Barhorst (2005). "Drag Measurement and Dynamic Simulation of Martian Wind Driven Sensor Platform Concepts." In Proceedings of the *43rd AIAA Aerospace Sciences Meeting*, Paper No. 2005-249, January, Reno, NV.

14. Mishra, A.R., James, D.L. and Letchford, C.W., "Comparison of Pressure Distribution on a Cubical Model in Boundary Layer and Tornado-Like Flow Fields," Presented and in proceedings of the *Tenth Americas Conference on Wind Engineering*.

15. Unhale, S.A., James, D.L. and Letchford, C.W., "Application and Analysis of RANS Based Turbulence Models for Bluff Body Aerodynamics. Part 1: Analysis of Turbulence Models," Proceedings of the *Tenth Americas Conference on Wind Engineering*; Combined paper (parts I and II) presented .

16. Unhale, S.A. and James, D.L. "Application and Analysis of RANS Based Turbulence Models for Bluff Body Aerodynamics. Part 2: Implementation of New Rough Wall Treatment," Proceedings of *the Tenth Americas Conference on Wind Engineering.*

17. James, D.L. and Webb, S.W., "Turbulent Natural Convection Heat Transfer in a Square Enclosure: Turbulence Model Comparisons." Proceedings of HT-FED2004, 2004 ASME Heat Transfer/Fluids Engineering Summer Conference, Charlotte, NC, USA, July 11-15, 2004.

Invited Presentations, External

1. "On Solar, Wind, and Tornadoes," Sandia National Laboratories, 2011.

2. "Physical Simulation of Wind Loading in a Tornado-Like Vortex," Texas Severe Storms Association Conference, 2008

3. "Simulation of Thunderstorm Downbursts and Tornadoes, " Department of Mechanical and Aeronautical Engineering, University of California-Davis, 2003,

4. "Physical Simulation of Fluid Structure Interaction in a Tornado-Like Wind Field," Texas A&M University, 2003.

Proposals and White Papers in Submission

1. "Tornado-Like Winds and their Interaction with the Built Environment." Submitted to the Hazard Mitigation program, NSF.

2. "Oxide Nanomaterials for Energy Conversion in Extreme Environments." Submitted to AFOSR FY 2013 MURI program.

Funded Research

1. PI, "Sunshine to Petrol." Sandia National Laboratories Grand Challenge, $62,196, 2009; $62,196, FY 2010; $19,800, - Jan, 2012.

2. PI, "Computational Modeling of a Molten Salt Steam Generator." Sandia National Laboratories, $58,843, 2009.

3. Co-PI, "Finite-Element Simulation for Electrothermal Characterization of High-Power Diode Laser Bars." DARPA, $199,981. 2008-2009

4. Co-PI "Control Systems, Water Recovery, Human Factors and Plant Growth." $29,760 credited to me, NASA-JSC . 2006-2008

5. Co-PI "Windstorm Mitigation Initiative." NIST, $158,077. 2003 - 2004.

6. Co-PI "Plant Research in the Engineering Development Unit and Water Reuse/Recycling." $59,880 credited, 2001-2002; $44,700 credited 2003-2005.

7. PI "CFD Investigation of Turbulent Mixed Convection in a Horizontal Concentric Annulus." $56,039, Sandia National Laboratories. 2003-2004.

8. Co-PI "Improving the Accuracy of AIRFLO3D to Perform Accurate Transient Calculations." DaimlerChrysler Corporation, $83,831 credited, 2005-2006.

9. Co-PI "Development of a Tumbleweed Inspired Instrument Carrier for Mars." Texas Space Grant Consortium, NASA-Langley. $89,564,

10. Co-PI "A Feasibility Study to Measure Time-Varying Temperatures around Spinal Instrumentation Using a Bovie Electrocautery Device." DePuy/Acromed Inc. $10,000. 2001.

11. Co-PI "Physical Simulation of Extreme Winds from Thunderstorms." Advanced Research Program, State of Texas, $148,600, 2002-2003.

Awards

Halliburton Teaching Excellence Award, 2006-2007

Finalist for Tau Beta Pi Most Outstanding Professor Award, Spring 2006

Pi Tau Sigma Best Professor Award, Fall 2004, Fall 2006, Spring 2010

Professional Memberships

ASME

Membership in Honorary Society

Pi Tau Sigma

Graduate Student Supervising

1. Karen Tarara - MS-INDS 2013, Physical modeling of tornado-like fluid structure interaction

2. Dalton McKeon MS 2012, MS topic was selective entrainment of immiscible fluids - changed to non-thesis

3. Herbert Odhiambo MS 2012, MS topic was wind loading of roofs in tornadic flows - changed to non-thesis
4. Luke Mayer - MS 2009, Development of a Large-Scale Tornado Simulator.
5. Anika Aheimer - MS 2008, An Investigation into Microwave and Ultrasound Enhanced Biodiesel Production.
6. Brice Hughes (co-advised) (MS 2007), An Investigation of Enhanced Ion Transport in Nanochannels.
7. Joe Grieco - MS 2007, Development of a biofluids reactor for microgravity applications.
8. Luis Carlos Delgado - MS 2006, Changed to course-work only option in September 06.
9. Amit Mishra - MS 2005, Wind Loading Comparison of a Cube Model in an Atmospheric Boundary Layer and a Tornado Simulator.
10. Ashutosh Potdar - MS 2005, Flow Field Characteristics of Dynamic Radial Jet Reattachment Nozzle.
11. Sanket Unhale - MS 2004, Application and Analysis of RANS Based Turbulence Models for Bluff Body Aerodynamics.
12. Bill Leggett - MS 2004, An Investigation of Enhanced Thermosolutal Axial Dispersion in a Horizontal Concentric Annular Enclosure.
13. AeRook Kim (co-advised) - MS 2004, Redesign of the NASA Controlled Ecological Life Support System Engineering Development Unit (CELSS) Nutrient Reservoir and Air Inlet Systems
14. Matt Mason (co-advised) - MSCE 2003, Pulsed Jet Simulation of Thunderstorm Downbursts
15. Lyle Fouts - MS 2003, Flow Visualization and Fluid-Structure Interaction of Tornado-Like Vortices.
16. Hailei Wang - MS 2002, Fluid-Structure Interaction of a Tornado-Like Vortex with Low-Rise Structures.

Current Students

1. Luke Mayer (began fall 2009) - PhD topic is computational and experimental modeling of a solar thermal-chemical heat engine

Subset of Service Activities

1. Thermal-Fluids Group Lead
2. Several Department Committees
3. Whitacre Chair Search - 2009-2010
4. Tenure and Promotion Committee - 2007-2008
5. Bagley Chair Search Committee - 2006
6. University Grievance Committee - 2002 - 2003
7. Board of Reviewers for the 13th International Conference on Wind Engineering, 2011
8. Member of the Scientific Committee for the Fifth International Symposium on Computational Wind Engineering, 2010
9. Meet ME Day (2005 - present)
10. Tomorrow's Leaders University Experience (2010)
11. Technical program member of the Eleventh International Wind Engineering Conference, 2003
12. Fundamentals Exam Review (Thermodynamics and/or Fluid Mechanics) '98 - '05

Papers Reviewed for:

1. *AIAA Journal of Thermophysics and Heat Transfer*
2. *Analytica Chimica Acta*
3. *ASME Journal of Energy Resources & Technology*
4. *ASME Journal of Manufacturing Science and Engineering*
5. *Experiments in Fluids*
6. FEDSM 2005, 2009 conferences
7. *Journal of Heat Transfer*
8. *Journal of Thermoplastic Composite Materials*
9. *Journal of Wind Engineering and Industrial Aerodynamics*
10. *International Journal of Heat and Mass Transfer*

11. National Heat Transfer Conferences
12. *Numerical Heat Transfer, A*
13. *Physics of Fluids*
14. *Ultrasonic Sonochemistry*
15. *Solar Energy*