

# CURRICULUM VITA

## Jeffrey A. Roux

Mechanical Engineer and Engineering Educator with 45 years of experience in heat transfer, infrared engineering, vacuum technology, solar energy, remote sensing, and aerodynamic heating. Experienced in both experimental and analytical modeling for data reduction and interpretation. Experienced in the spectral measurement of radiative properties from diverse media such as cryocontamination, fiberglass insulation, and rocket engine exhaust plumes. Wrote computer programs for applications in aerodynamic heating, infrared optical properties of thick and thin films, solar heating, solar cooling, and optical systems. Experience in experimental and numerical modeling of the thermochemical processes in the manufacture of composite materials. Experience with infrared instrumentation such as infrared scanning camera and Fourier transform spectrometer. Experienced in the thermal management of cooling of electronic systems. Experienced in teaching heat transfer at short courses and also at undergraduate and graduate levels at the University of Mississippi.

### Experience

He has analyzed the aerodynamic heating data for the NASA Space Shuttle and developed analytical models for predicting the reentry thermal environment. Research engineer with in-depth experience in thermophysics, analytical modeling, computer program development, and measurement techniques. He has developed analytical and experimental techniques to determine the density and optical properties (refractive index and absorption index of thin film cryocontamination). He has applied an infrared scanning camera to spatially map the infrared heat flux field of specific species in rocket engine exhaust plumes. He has designed both solar heating and refrigeration systems. He has determined the monochromatic radiative properties of low density fiberglass insulation and float glass. He developed a thermochemical model for the pultrusion manufacturing process of composite materials. Also, he has used remote sensing technique applied to oil exploration. He has experimentally and computationally developed approaches for the thermal management of high heat flux electronics.

### Recognition

2015/16 Outstanding Mechanical Engineering Department Teacher Award  
2014/15 Engineering School Outstanding Faculty Member of the Year Award  
2011/12 Outstanding Mechanical Engineering Department Teacher Award  
2003/04 Engineering School Outstanding Teacher of the Year Award  
2003/04 Outstanding Mechanical Engineering Department Teacher Award  
2013 ASME Life Fellow  
2004 AIAA Associate Fellow

2002 ASME Fellow  
2000/01 Outstanding Mechanical Engineering Department Teacher Award  
1998/99 Engineering School Outstanding Faculty Member of the Year Award  
1996/97 ASME Meritorious Service Award for Region XI  
1994/95 Outstanding Mechanical Engineering Department Teacher Award  
1990/91 Engineering School Outstanding Faculty Member of the Year Award  
1991 Burlington Northern Faculty Achievement Award for Teaching and Scholarship  
1987/88 Outstanding Mechanical Engineering Department Teacher Award  
1987 Ralph R. Teetor Educational Award, Society of Automotive Engineers  
1983/84 Engineering School Outstanding Faculty Member of the Year Award  
Registered Professional Engineer (Mississippi); 1987-present  
Member of Tau Beta Pi  
Member of Pi Tau Sigma  
Member of AIAA Thermophysics Technical Committee Member - 1981 through 1983: Session  
Chairman at 20th Thermophysics Conference at Williamsburg, VA)  
General Chairman of 1983 AIAA 18th Thermophysics Conference, Montreal, Canada  
Member of ASME (Session Chairman on Radiative Transfer at 1981, (Milwaukee, WI), and 1982,  
(St. Louis, MO), Heat Transfer Conferences)  
Reviewer for numerous professional research journals  
Principal Investigator for grants from National Science Foundation, Department of Energy,  
Tennessee Valley Authority, Mississippi Mineral Resources Institute, Oak Ridge National  
Laboratory, U. S. Air Force, U. S. Army, NASA  
Author of over 140 papers and journal articles on subjects relating to heat transfer, infrared  
measurements, solar energy, pultrusion manufacturing, propulsion, energy conservation, and  
optics (also numerous technical reports involving heat transfer)

### **Education**

Ph.D., Mechanical Engineering, 1970, University of Tennessee  
M.S., Mechanical Engineering, 1968, University of Tennessee  
B.S., Mechanical Engineering, 1967, Louisiana State University

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History: good health, U.S. citizen

Employment: Northrop Services, Inc., Huntsville, Alabama (1970-1972) member of  
technical staff, senior engineer.

ARO, Inc., Tullahoma, Tennessee (1972-1979, research engineer; 1979-1980,  
Senior Lead Engineer; 1980-1981, Section Supervisor of Research Section –

12 member section)

University of Mississippi (January 1981 - 1986, Associate Professor; 1986, - 2007, Professor of Mechanical Engineering and Chairman; 2007-2015; professor, conducting research and teaching heat transfer and thermal science courses.)

## **Publications:**

1. "Radiative Heat Transfer of Coatings on a Cryogenic Surface," Ph.D. Dissertation, University of Tennessee, 1970. Also available as AEDC-TR-71-90(AD722820), April 1971, Arnold Engineering Development Center, Arnold Air Force Station, Tennessee.
2. "Spectral Absolute Reflectance Measurements of CO<sub>2</sub> Frosts in the 0.5 to 12.0 Micron Region," presented at the ASTM/IES/AIAA 5th Space Simulation Conference, National Bureau of Standards, Gaithersburg, MD, September 1970, published in AIAA Journal, Vol. 9, No. 7, July 1971, pp. 1328-1334. Available as AEDC-TR-70-108, July 1970. Also available in Space Simulation, NBS Publication 336, U.S. Department of Commerce, National Bureau of Standards, October 1970.
3. "Spectral Infrared Reflectance Measurements of H<sub>2</sub>O Frosts," presented at the AIAA 6th Thermophysics Conference, Tullahoma, Tennessee, April 1971. AIAA Journal, Vol. 9, NO. 9, September 1971, pp. 1836-1842. Also available as AEDC-TR-70-215.
4. "Radiative Transfer Properties of High Albedo CO<sub>2</sub> and H<sub>2</sub>O Cryodeposits," presented at the AIAA 10th Aerospace Sciences Meeting, San Diego, California, January 1972. Published in Thermal Control and Radiation, Vol. 31, MIT Press, Cambridge, Massachusetts, 1973.
5. "Eigenvalues and Eigenvectors for Solutions to the Radiative Transport Equation," AIAA Journal, Vol. 10, No. 7, July 1972, pp. 973-976.
- 5a. "Erratum and Addenda: Eigenvalues and Eigenvectors for Solution to the Radiative Transport Equation," AIAA Journal, Vol. 11, No. 5, May 1973, pp. 767-768.
6. "Effect of Boundary Conditions on the Radiative Reflectance of Dielectric Coatings," presented at the AIAA 11th Aerospace Sciences Meeting, Washington, DC, January 1973. Published in the AIAA Progress Series in Astronautics and Aeronautics: Thermophysics and Spacecraft Control, Vol. 35, edited by R.G. Hering, MIT Press, Cambridge, Massachusetts, 1974, pp. 131-144.
7. "Comparison of Three Techniques for Solving the Radiative Transport Equation, " presented at the AIAA 8th Thermophysics Conference, Palm Springs, California, July 1974. Published in the AIAA Progress Series in Astronautics and Aeronautics: Thermophysics and Spacecraft Control, Vol. 35, edited by R.G. Hering, MIT Press, Cambridge, Massachusetts, 1974, pp. 3-22. Also published as AEDC-TR-73-200.
8. "Radiative Transport Analysis for Plane Geometry with Isotropic Scattering and Arbitrary Temperature," AIAA Journal, Vol. 12, No. 9, September 1974, pp. 1273-1277.

9. "Mie Scattering by Spheres in an Absorbing Medium," Journal of the Optical Society of America, Vol. 64, No. 12, December 1974, pp. 1593-1597.
10. "Development and Operation of a Hemi-Ellipsoidal Mirror Infrared Reflectometer," presented at AIAA 19th Thermophysics Conference, Denver, Colorado, May 27-29, 1975. Published in Applied Optics, Vol. 15, pp. 940-950, April 1976.
11. "Radiative Transfer with Anisotropic Scattering and Arbitrary Temperature for Plane Geometry," AIAA Journal, Vol. 13, No. 9, September 1975, pp. 1203-1211.
12. "Radiative Properties," Heat Transfer at Low Temperatures, edited by W. Frost, Plenum Press, New York, NY, 1975, pp. 309-324.
13. "Focusing Properties and Operation of a Hemi-Ellipsoidal Mirror Infrared Reflectometer," Radiative Transfer and Thermal Control, edited by A.M. Smith, Progress in Astronautics and Aeronautics, Vol. 49, AIAA, New York, NY 1976, pp. 47-66.
14. "Combined Conduction and Radiative Heat Transfer in an Absorbing and Scattering Medium," presented at ASME National Heat Transfer Conference, Salt Lake City, Utah, August 15-17, 1977. Published in Journal of Heat Transfer, No. 100, No. 1, pp. 98-104, February, 1978.
15. "Application of an IR Scanning Camera to Rocket Plume Studies," Presented at AIAA 13th Thermophysics Conference, Albuquerque, NM, June 27-29, 1977. Also published in Thermophysics of Spacecraft and Outer Planet Entry Probes, edited by A.M. Smith, Progress in Astronautics and Aeronautics, Vol. 56, AIAA New York, NY, 1977, pp. 273-288. Also available as AEDC-TR-77-16, June, 1978.
16. "Infrared Transmission of Contaminated Cryocooled Optical Windows," presented at AIAA 16th Aerospace Sciences Meeting, Huntsville, Alabama, January 16-18, 1978. Published in AIAA Journal, Vol. 16, September, 1978, pp. 984-990.
17. "IR Optical Properties of Bipropellant Contaminants," presented at USAF/-NASA International Spacecraft Contamination Conference, U.S. Air Force Academy, Colorado, March 7-9, 1978. Published in Proceedings of the USAF/-NASA International Spacecraft Contamination Conference, AFML, Wright-Patterson AFB, Ohio, AFML-TR-78-190/NASA-CP-2039, April, 1979, pp. 412-455. Available as AEDC-TR-29-28, December 1979.

18. "Solar Reflectance of Cryodeposits: Part I – H<sub>2</sub>O on LN<sub>2</sub> Cooled Black Paint," presented at 2nd AIAA/ASME Thermophysics and Heat Transfer Conference, Palo Alto, California, May 24-26, 1978. Published in Thermophysics and Thermal Control, edited by R. Viskanta, Progress in Astronautics and Aeronautics, Vol. 65, AIAA, New York, NY, 1979, pp. 66-80.
19. "Solar Reflectance of Cryodeposits: Part II – CO<sub>2</sub> on Black Paint and Stainless Steel," presented at 2nd AIAA/ASME Thermophysics and Heat Transfer Conference, Palo Alto, California, May 24-26, 1978. Published in Thermophysics and Thermal Control, edited by R. Viskanta, Progress in Astronautics and Aeronautics, Vol. 65, AIAA, New York, NY, 1979, pp. 66-80.
20. "IR Scanning Camera Measurements of an Exhaust Plume from an Axisymmetric Nozzle Afterbody Model at Transonic Mach Numbers," presented at SPIE's 22nd Annual Technical Symposium, San Diego, California, Aug. 28-31, 1978. Published in Modern Utilization of Infrared Technology IV, SPIE, Vol. 156, 1978, Bellingham, Washington. Also available as AEDC-TR-78-55, March, 1979.
21. "Multispectral Radiation Measurements of Rocket Exhaust Plumes in a Space Simulation Chamber," presented at SPIE's 22nd Annual Technical Symposium, San Diego, California, August 28-31, 1978. Published in Modern Utilization of Infrared Technology IV, SPIE, Vol. 150, 1978, pp. 184-192, Bellingham, Washington.
22. "Development of an Automatic Controller for the AGA 680 Thermovision System," presented at the Fourth Biennial Infrared Information Exchange, St. Louis, MO, August 22-24, 1978. Published in Proceedings of the Fourth Biennial Infrared Information Exchange, edited by R.A. Miller, AGA Corp., Secaucus, NJ, 1979, pp. D7-D19.
23. "Optical Properties of Bipropellant Exhaust Constituents Cryopumped at 77K," presented at AIAA 13th Aerospace Sciences Meeting, New Orleans, LA., January 15-17, 1979. Published in Journal of Spacecraft and Rockets, Vol. 16, November 1979, pp. 373-381. Also available as AEDC-TR-79-50, August, 1979.
24. "Microcomputer System for Controlling an Infrared Scanning Camera," Proceedings of APIE, Vol. 230 Minicomputers and Microprocessors in Optical Systems, Bellingham, Washington, pp. 120-129, April 1980.
25. "Infrared Radiation of Tactical Missile Plumes at Simulated Flight Conditions," presented at 12th JANNAF Plume Technology Meeting, U.S. Air Force Academy, Colorado Springs, Colorado, November 18-20, 1980.

26. "Flow Field and Radiation Measurements of a Rocket with Six Engines," presented at 12th JANNAF Plume Technology Meeting, U.S. Air Force Academy, Colorado Springs, Colorado, No. 18-20, 1980.
27. "Thermophysics - Aerospace Highlights 1921," Astronautics and Aeronautics 12, December 1981, pp. 102-104.
28. "IR Optical Properties of Thin H<sub>2</sub>O, NH<sub>3</sub>, and CO<sub>2</sub> Cryofilms," Journal of the Optical Society of America, Vol. 22, No. 6, June 1982, pp. 720-728. Also available as AEDC-TR-79-57.
29. "Ideal Ramjet: Optimum M<sub>∞</sub> for Fuel Limit and Material Limit," J. A. Roux, Journal of Spacecrafts and Rockets, Vol. 19, No. 3, May/June, 1982, pp. 286-287.
30. "Determination of Radiative Properties from Transport Theory and Experimental Data," presented at AIAA 16th Thermophysics Conference, Palo Alto, California, June 23-25, 1981. Spacecraft Radiative Transfer and Temperature Control. Edited by T.E. Horton, Progress in Astronautics and Aeronautics, Vol. 83, AIAA, New York, NY, 1982, pp. 22-37.
31. "IR Optical Properties of Thin CO, NO, CH<sub>4</sub>, HCl, N<sub>2</sub>O, O<sub>2</sub>, and Ar Cryofilms," presented at AIAA 21st Aerospace Sciences Meeting, Reno, Nevada, January 10-13, 1983. Spacecraft Contamination: Sources and Prevention, AIAA Progress in Astronautics and Aeronautics, Vol. 91, New York, 1984, pp. 139-161.
32. "Finite Element Analysis of Radiative Transport in Fibrous Insulation," presented at AIAA 18th Thermophysics Conference, Montreal, Canada, June 1-3, 1983. Journal of Energy, Vol. 7, No. 6, Nov./Dec. 1983, pp. 702-709.
33. "Infrared Optical Properties of Solid Mixtures of Molecular Species at 20K," presented at AIAA 18th Thermophysics Conference, Montreal, Canada, June 1-3, 1983. Spacecraft Contamination: Sources and Prevention, AIAA Progress in Astronautics and Aeronautics, Vol. 91, New York, 1984, pp. 162-179.
34. "IR Optical Properties of Solid MMH, N<sub>2</sub>O<sub>4</sub>, and N<sub>2</sub>H<sub>4</sub> at Cryogenic Temperatures," Journal of the Optical Society of America, Vol. 73, No. 9, September 1983, pp. 1181-1188.
35. Space Contamination: Sources and Prevention: J. A. Roux and T. D. McCay, Editors AIAA Progress in Aeronautics and Astronautics, Vol. 91, AIAA, New York, NY, 1984.

36. Combustion Non-Intrusive Diagnostics, T. D. McxGay and J. A. Roux, Editors AIAA Progress in Aeronautics and Astronautics, Vol. 92, AIAA, New York, NY, 1984.
37. "Numerical Investigation of Natural Convection in a Vertical Rectangular Enclosure," A. Shohadaee, J. A. Roux and A. M. Smith, presented at the Fourth International Conference on Applied Numerical Modeling, December 28-31, 1984, Tainan Taiwan, Republic of China. Applied Numerical Modeling, Proceeding of 4th International Conference, pp. 551-558.
38. "Biangular Reflectance for an Absorbing and Isotropically Scattering Media," J. A. Roux and A. M. Smith, AIAA Journal, Vol. 23, No. 4, April 1985, pp. 624-635.
39. "Solar Zeolite Refrigeration System," S. C. Chang and J. A. Roux, ASME Journal of Solar Energy Engineering, Vol. 107, No. 3, August 1985, pp. 189-195.
40. "Gray Fluid Inside a Transparent Solar Collector Receiver Tube," M. J. Chang and J. A. Roux, 1985 Annual Meeting of the Mississippi Academy of Sciences, Jackson, MS, February 21-22, 1985. ASME Journal of Solar Energy Engineering, Vol. 109 No. 1, February 1987, pp. 30-33.
41. "The Effect of Radiant Barriers on Conduction and Radiation Heat Transfer in Fibrous Insulations," J. W. Rish,III and J. A. Roux, Proceedings of the Eighth International Heat Transfer Conference in San Francisco, CA, August 1986, pp. 721-729.
42. "Parabolic Solar Collector with Glass Pipe and Black Fluid," M. J. Chang and J. A. Roux, ASME Journal of Solar Energy Engineering, Vol 108, No. 2, May 1986, pp. 129-134.
43. "Experimental Investigation of a Zeolite Refrigeration and Heat Pump System," M. Bhattacharryya and J. A. Roux, Proceedings of the 21st Intersociety Energy Conservation Engineering Conference, San Diego, CA, August 1986, Vol. 2, pp. 766-771.
44. "Evaluation of Emission Integrals for the Radiative Transport Equation," J. W. Rish,III and J. A. Roux, AIAA Journal, Vol. 24, No. 12, December 1986, pp. 2049-2052.
45. "Heat Transfer Analysis of Fibrous Insulations With and Without Radiant Barriers for Summer Conditions," J. W. Rish,III and J. A. Roux, Journal of Thermophysics and Heat Transfer, Vol. 1, No. 1, Jan. 1987, pp. 43-49.
46. "Reciprocity of the Directional-Hemispherical and Hemispherical-Directional Reflectances for a Radiatively Absorbing and Scattering Medium," H.Y. Yeh and J.A. Roux, Proceedings of the 4th National Conference on Mechanical Engineering, Chinese Society of Mechanical Engineering, Hsin-Chu, Taiwan, pp. 525-533, December 1987.



47. "The Resistance of Fibrous Insulations Undergoing Coupled Conduction and Radiation Heat Transfer," J.W. Rish, III and J.A. Roux, Thermal Conductivity 19, edited by D.W. Yarbrough, Plenum Press, New York, 1988, Vol. 19, pp. 497-510.
48. "Spectral Radiative Properties of Fiberglass Insulation," H.Y. Yeh and J.A. Roux, Journal of Thermophysics and Heat Transfer, Vol.2, No. 1, pp. 75-81, January, 1988.
49. "Performance of a Black Liquid Flat Plate Solar Collector Using Double Wall Polycarbonate Sheet," M.A. Zarif and J.A. Roux, Developments In Theoretical and Applied Mechanics, University of Mississippi, pp. 445-453, 1988.
50. "Apparent Thermal Conductivity of High Density and Low Density Fiberglass Insulations," S. Yajnik and J.A. Roux, Thermal Conductivity 20, D.P.H. Hasselman and J.R. Thomas, Jr., eds., Plenum, New York (1989), pp. 25-38.
51. "Transient Coupled Conduction and Radiation Heat Transfer Through Ceiling Fiberglass/Gypsum Board Composite," H.Y. Yeh and J.A. Roux, Insulation Materials, Testing, and Applications, ASTM STP 1030, D.L. McElroy and J.F. Kimpflen, Eds, American Society for Testing and Materials, Philadelphia, 1990, 545-560.
52. "Spectral Radiative Properties of Expanded Polystyrene Insulation," S. Yajnik and J.A. Roux, Insulation Materials, Testing, and Applications, ASTM STP 1030, D.L. McElroy and J.F. Kimpflen, Eds, American Society for Testing and Materials, Philadelphia, 1990, pp. 561-574.
53. "Numerical Investigation of Natural Convection Within a Triangular Enclosure," M. Ghassemi and J.A. Roux, ASME HTD Vol. 107, Heat Transfer in Convective Flows, Proceedings of the ASME 1989 National Heat Transfer Conference, August 1989, pp. 169-175.
54. "A Transient Two-Dimensional Numerical Analysis of Thermal Bridges in Attic Insulation," Das, A.R. and Roux J.A., 1990 ASME International Computers in Engineering Conference, Boston, MA, August, 1990, Computers In Engineering 1990, Vol 2, ASME, pp. 417-424.
55. "Heat Transfer Analysis for a Pultrusion Process," R. Gorthala, J.A. Roux, and J.G. Vaughan, Fiber Tex 90, Clemson, S.C., August, 1991, NASA CP-3128, pp. 263-280.
56. "Impact of Pultrusion Pull Speed on Temperature and Degree of Cure Profiles Within a Composite Material," R. Gorthala, J.A. Roux, and J.G. Vaughan, Proceedings of SPI Composite Institute's 46th Annual Conference, Washington, D.C., February 1991, The Society of the Plastics Industry Inc., pp. 13D:1-6.

57. "Characterization and Optimization of the Pultrusion of Structural Shapes," J.G. Vaughan, R. Gorthala, and J.A. Roux; ASCE Specialty Conference on Advanced Composites, Las Vegas, NV, February 1991; Advanced Composite Materials in Civil Engineering, Edited by S.L. Iyer, Co-editor R. Sen, American Society of Civil Engineers, pp. 12-23.
58. "Combined Conduction, Radiation Heat Transfer and Mass Transfer in Fibrous Attic Insulations" R. Gorthala, J.A. Roux, and P.W. Fairey; presented at the Second Symposium on Insulation Material: Testing and Applications, Oct. 1991, Gatlinburg, TN., Insulation Materials, edited by Graves and Wysocki, ASTM STP 1116, Vol. 2, pp. 371-388.
59. "Comparison of Heat Transfer Modeling with the Experimental Results for Residential Attic Insulations," R. Gorthala, J.A. Roux, W.P. Levins, and K.E. Wilks; presented at Second Symposium on Insulation Materials: Testing and Applications, Oct. 1991, Gatlinburg, TN., Insulation Materials, edited by Graves and Wysocki, ASTM STP 1116, Vol. 2, pp. 326-354.
60. "Impact of Kinetic Parameters on Heat Transfer Modeling for a Pultrusion Process," R. Gorthala, J. Roux, J.G. Vaughan, R.P. Donti, and A. Hassouneh, Society for the Advancement of Material and Processing Engineering Vol. 37, 37th International SAMPE Symposium, March 1992. Anaheim, CA., pp. 1117-1131.
61. "Prediction of Thermal and Curing Characteristics for the Pultrusion of Fiberglass Composites," Y.R. Chachad, J.A. Roux, J.G. Vaughan, E. Lackey, and A. Hassouneh, Developments in Theoretical and Applied Mechanics, Vol. XVI, University of Tennessee Space Institute, April 12-14, 1992, Nashville, TN, pp. III.I.30-37.
62. "Characterization of Mechanical and Thermal Properties of Advanced Composite Pultrusions," J.G. Vaughan, J.A. Roux, P. Raju Mantena, Proceedings of the 1992 NSF Design and Manufacturing Systems Conference, January 8-10, 1992, Atlanta, GA, pp. 1141-1145.
63. "Influence of Processing Parameters on Pultrusion Quality with EPON 9000 Series Resins," R. Gorthala, J.A. Roux, J.G. Vaughan, P. Ubrich, and Walt Breitigam, Effective Methods of Pultrusion Technology, Society of Manufacturing Engineers, Los Angeles, CA., April 29-30, 1992.
64. "Investigation of Thermal Gradients in Electrically Annealed Float Glass," S.K. Kumpaty and J.A. Roux, the 28th ASME National Heat Transfer Conference, Transport Phenomena in Materials Processing, San Diego, CA, August 9-12, 1992, pp. 153-160.

65. "Material Properties Related to the Pultrusion of Graphite/Epoxy Composite Materials," J.G. Vaughan, P.R. Mantena, R.P. Donti, E. Lackey, Y. R. Chachad, J. A. Roux, K. Balasubramaniam, and D. Ladnier, Proceedings of the 8th Annual ASM/ESD Advanced Composites Conference, Nov. 2-5, 1992, Chicago, IL, pp. 333-342.
66. "Mechanical and Thermal Behavior of Pultruded Advanced Composites," J.A. Roux, P.R. Mantena, and J.G. Vaughan, Proceedings of the 1993 NSF Design and Manufacturing Systems Conference, Vol. 1, Charlotte, NC., January 6-8, 1993, pp. 285-291.
67. "Temperature and Degree of Cure Modeling for the Pultrusion of Graphite Composites," Y. R. Chachad, J.A. Roux, J.G. Vaughan, E. Lackey, and A. Hassounch, 48th Annual SPI Composites Conference Proceedings, Cincinnati, OH, February 1993, pp. 21-C/1---21-C/7.
68. "Temperature and Cure Characterization of Pultruded Composites and Kinetic Analysis of Epoxy-Resin Systems Using a Differential Scanning Calorimeter," Y.R. Chachad, H. Golestanian, M. Valliappan, J.A. Roux, and J.G. Vaughan, 38th International SAMPE Symposium, May 10-13, 1993, Advanced Materials: Performance Through Technology Insertion, Vol. 38, pp. 1275-1290.
69. "Comparison of Processing Parameters for Pultruded Graphite/Epoxy and Fiberglass/Epoxy: A Heat Transfer and Curing Model," R. Gorthala, J.A. Roux, J.G. Vaughan, and R.P. Donti, 47th Annual SPI Composites Conference Proceedings, February 3-6, 1992, Cincinnati, OH, pp. 2-A/1--2-A/9, Journal of Reinforced Plastics and Composites, Vol. 13, April 1994, pp 288-300.
70. "Total Heat Transfer Due to the Variation in Fiberglass Insulation Thickness in Attics," K.T. Harris, T.A. McCarty, J.A. Roux, and R. Gorthala, ASME 29th National Heat Transfer Conference, August 8-11, 1993, Atlanta, GA., Radiative Heat Transfer-Theory and Applications, Ed. A.M. Smith and J.H. Chan, pp. 1-10.
71. "Transient Conductive, Radiative Heat Transfer Coupled with Moisture Transport in Attic Insulations," R. Gorthala, K.T. Harris, J.A. Roux, T.A. McCarty, Journal of Thermophysics and Heat Transfer, Vol. 8, No. 1, Jan. - March 1994, pp 125 - 132.
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73. "Experimental and Computational Tests Involving R-11, R-19, and R-30 Fiberglass Insulations," K.T. Harris, T.A. McCarty, J.A. Roux, Journal of Thermal Insulation and Building Envelopes, Vol. 17, January 1994, pp. 197-218. Also published in ASME HTD - Vol. 291, June 1994, pp. 135-144.

74. "A Model to Predict Resin Pressure/Back Flow in the Tapered Inlet of a Pultrusion Die," R. Gorthala, J.A. Roux, and J.G. Vaughan, Proceeding of the 48th Annual Conference of the Society of the Plastics Industry, Feb. 8-11, 1993, Cincinnati, OH pp 2-D/1--2-D/6. (selected as "Best Processing Paper" of Conference) Journal of Reinforced Plastics and Composites, Vol. 13, No. 6, June 1994, pp. 484-497.
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76. "Die and Post-Die Temperature and Cure in Graphite/Epoxy Composites," M. Valliappan, J.A. Roux, J.G. Vaughan, and E.S. Arafat, Composites Part B: Engineering, Vol. 27B, No. 1, January 1996, pp. 1-9.
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78. "Substrate Barrier Effects for a R-19 Fibrous Insulation Batt," K.T. Harris, T.A. McCarty, and J.A. Roux, Journal of Thermal Insulation and Building Envelopes, Vol. 19, July 1995, pp. 28-48. Also ASME 1995 National Heat Transfer Conference, August 5-9, 1995, Portland, OR.
79. "Manufacturing Model for Three-Dimensional Irregular Pultruded Graphite/Epoxy Composites," Y. R. Chachad, J. A. Roux, J. G. Vaughan, and E. S. Arafat, Composites Part A: Manufacturing, Vol.27A, No. 3, March 1996, pp.201-210.
80. "Temperature and Cure in Pultruded Composites Using Multi-Step Reaction Model for Resin," M. Valliappan, J. A. Roux, and J. G. Vaughan, Journal of Reinforced Plastics and Composites , Vol. 15, No. 3, March 1996, pp.295-321.
81. "Effect of Pull Speed on Die Wall Temperatures for Flat Composites of Various Sizes," Y.R. Chachad, J.A. Roux, J.G. Vaughan, and E.S. Arafat, Journal of Reinforced Plastics and Composites, Vol. 15, No.7, July 1996, pp.718-739.
82. "Effect of Pultrusion Variables on the Cure of Shell EPON 862/W Epoxy/FiberglassSystem," R. Shanku, J. G. Vaughan, and J. A. Roux , 41st International SAMPE Symposium, March 1996, Anaheim,CA, Vol. 41, No. 2, pp. 1530-1541.
83. "Thermal Investigation of Pultruded Graphite Composites for Various Processing Conditions and Thicknesses," Y. R. Chachad, J. A. Roux, and J. G. Vaughan, Engineering Plastics, Vol. 9, No. 2, September 1996, pp. 91-108.

84. "Pultrusion, You Can Push It Through a Die", J. G. Vaughan, E. Lackey, and J. A. Roux, Processing and Fabrication of Advanced Materials V, Edited by T. S. Srivatsan and J. J. Moore, A publication of TMS, Cincinnati, OH, October 1996, pp 419-429.
85. "Substrate Barrier Effects on the Total Heat Transfer for a R-30 Fibrous Insulation Batt," K. T. Harris, J. A. Roux, and T. A. McCarty, Journal of Thermal Insulation and Building Envelopes, Vol. 20, No. 2, October 1996, pp. 158-180.
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## Research Grants Received (1981-present)

- Radar Power Technology-Phase 6, US Army Space and Missile Defense Command, \$280,000, March 2006-July 2007. (A. Elsherbeni - principal investigator/ J. A. Roux - thermal leader)
- Radar Power Technology-Phase 5, US Army Space and Missile Defense Command, \$250,000, March 2005-March 2006. (A. Elsherbeni - principal investigator/ J. A. Roux - thermal leader)
- Radar Power Technology-Phase 4, US Army Space and Missile Defense Command, \$1,000,000, March 2004-March 2005. (C. E. Smith - principal investigator/ J. A. Roux - thermal leader)
- Radar Power Technology-Phase 3, US Army Space and Missile Defense Command, \$1,000,000, March 2003-March 2004. (C. E. Smith - principal investigator/ J. A. Roux - thermal leader)
- Radar Power Technology-Phase 2, US Army Space and Missile Defense Command, \$1,000,000, March 2001-March 2002. (C. E. Smith - principal investigator/ J. A. Roux - thermal leader)
- Radar Power Technology-Phase 1, US Army Space and Missile Defense Command, \$1,000,000, August 2000-March 2001. (C. E. Smith - principal investigator/ J. A. Roux – thermal leader)
- Thermo-Kinetic Modeling of the Pultrusion Process, Werner Company, \$20,000, May 1998 - August 1999. (Vaughan, Lackey B co-investigators)
- Enhanced Pultruded Composite Materials: Extended, USAF, F33615-96-C-5629, \$49,000, May 1, 1998 - April 30, 1999. (Vaughan - co-investigator)
- Enhanced Pultruded Composite Materials, USAF, F33615-96-C-5629, \$98,000, May 1, 1996 - April 30, 1998. (Vaughan - co-investigator)
- Mississippi: Composite Materials Group - Composite Materials Processing, NSF EPSCoR, OSR-9452857, \$512,825, August 1995 - August 1998.
- Advanced Composite Materials Processing, National Science Foundation (NSF), EHR-9108767/OSR-9108767, \$2,182,625, March 1992-October 1995.
- Characterization of Mechanical and Thermal Properties of Advanced Composite Pultrusions, Electric Power Research Institute/National Science Foundation/North East Mississippi Electric Power Association, \$278,648, August 15, 1991-February 28, 1995.
- Research to Optimize the Pultrusion Process for the Manufacturing of Composite Materials, USAF, F33615-91-C-5727, \$291,073, August 15, 1991-September 30, 1994.
- Conservation of Thermal Energy Via Coupled Conduction, Radiation, and Mass Transfer In Fibrous Insulation, Department of Energy, \$46,875, September 29, 1991-June 30, 1995.
- Composite Materials Processing, National Science Foundation (NSF), RII-8902064, \$1,102,552, May 1, 1989 - April 30, 1992.
- Engineering Research Equipment: Experimental Equipment to Measure Transient Heat and Moisture Transport Through Fibrous Insulations, National Science Foundation (NSF), CTS-8905471, \$50,400, July 1, 1989-December 31, 1991.
- Dynamic Thermal Modeling of Electric Annealing/Tempering Lehrs, Ford Motor Company, No.

3105-803898, \$54,775, May 1, 1989-April 30, 1990.

Spectroscopic Measurements on Residential Insulation Materials, Oak Ridge National Laboratory (ORNL), S-3145, \$2,000, March 16, 1986-March 15, 1988.

Access to Supercomputers for Non-gray Radiative Heat Transfer Computations, National Science Foundation (NSF), MEA-8217974, \$6,570, July 1, 1986-June 30, 1987.

Experimental Determination of Radiative Heat Transfer Characteristics of Fibrous and Foam Insulations, U.S. Department of Energy (DoE), DE-ACO5-84OR21400, \$49,335, July 1, 1986-June 30, 1987.

Energy Conservation Through the Use of Natural Mississippi Zeolites for Solar Refrigeration and Heat Pumping, Mississippi Mineral Resources Institute (MMRI), MMRI-86-15, \$7,000, July 1, 1985-June 30, 1986.

Conservation of Radiative Transfer Through Fibrous Insulation, Tennessee Valley Authority, TV-64115A, \$27,310, July 1, 1984-August 1, 1985.

Use of Natural Mississippi Zeolites for Solar Air-Conditioning, Mississippi Mineral Resources Institute, MMRI-85-5F, \$7,000, July 1, 1984-June 30, 1985.

Infrared Spectroscopy Measurements on Fibrous and Foam Insulation Materials, Oak Ridge National Laboratory (ORNL), S-3145, \$2,000, March 15, 1984-March 15, 1986.

Radiative Properties and Heat Transfer Analysis of Fibrous Insulations, National Science Foundation (NSF), MEA-8217974, \$135,348, July 1, 1983-June 30, 1986.

Use of Natural Mississippi Zeolites for Innovative, Economic Refrigeration and Thermal Control, Mississippi Mineral Resource Institute (MMRI), MMRI-83-25, \$10,000, July 1, 1983-June 30, 1984.

Investigation of Why Underground Geological Features Can Be Determined from LANDSAT Data, Mississippi Mineral Resources Institute, MMRI-82-15, \$13,740, July 1, 1982-June 30, 1983.

High Efficiency Black Fluid Solar Collector, U.S. Department of Energy (DOE), DE-FG4481R41487, \$10,400, July 1, 1981-September 30, 1983.

### **Theses and Dissertations Directed to Completion (44 --- 8 Ph.D. and 36 M.S.)**

M.S., Mechanical Engineering, L. Tiruveedula, Engineering Science, May 2016  
M.S., Mechanical Engineering, N. Masuram, Engineering Science, May 2015  
M.S., Mechanical Engineering, J. Choi, Engineering Science, May 2014  
M.S., Mechanical Engineering, N. Shakya, Engineering Science, May 2013  
M.S., Mechanical Engineering, S. Ranjit, Engineering Science, August 2012  
M.S., Mechanical Engineering, D. Palikhel, Engineering Science, May 2011  
M.S., Mechanical Engineering, R. Mitlapalli, Engineering Science, August 2010  
M.S., Mechanical Engineering, B. Runga, Engineering Science, August 2009  
Ph.D., Mechanical Engineering, A. Jeswani, Engineering Science, December 2006  
M.S., Mechanical Engineering, K. Gupta, Engineering Science, August 2006

M.S., Mechanical Engineering, Z. Williams, Engineering Science, May 2006  
M.S., Mechanical Engineering, J. Patel, Engineering Science, August 2005  
M.S., Mechanical Engineering, R. Kulkarni, Engineering Science, August 2003  
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M.S., Mechanical Engineering, S. Gadam, Engineering Science, December 1998  
M.S., Mechanical Engineering, K. S. Raper, Engineering Science, December 1997  
Ph.D., Mechanical Engineering, K. Harris, Engineering Science, May, 1996  
Ph.D., Mechanical Engineering, M. Valliappan, Engineering Science, May, 1996  
Ph.D., Mechanical Engineering, Y.R. Chachad, Engineering Science, August, 1995  
M.S., Mechanical Engineering, S. Kumpati, Engineering Science, May, 1995  
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Ph.D., Mechanical Engineering, R. Gorthala, Engineering Science, May, 1992  
M.S., Mechanical Engineering, Y.R. Chachad, Engineering Science, December, 1991  
Ph.D., Mechanical Engineering, S. Kumpaty, Engineering Science, May, 1991  
M.S., Mechanical Engineering, J. Richardson, Engineering Science, December 1989  
M.S., Mechanical Engineering, T.S. Lim, Engineering Science, August, 1989  
M.S., Mechanical Engineering, A. Das, Engineering Science, August 1989  
M.S., Mechanical Engineering, P. Jayanthi, Engineering Science, August, 1988  
M.S., Mechanical Engineering, M. Ghassemi, Engineering Science, May 1988  
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