*Last Edited: 5/18/2016*

# CURRICULUM VITAE

## Dr. Donald W. Radford


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## EDUCATION

Post Doc., **Rensselaer Polytechnic Institute**, Materials Engineering, 5/87-7/88
*"Development of High Temperature Composite Materials"*

Ph.D., **Rensselaer Polytechnic Institute**, Materials Engineering, May 1987
Dissertation: *"Shape Stability in Composites"*

MASc., **University of British Columbia**, Metallurgical Engineering, Dec. 1982
Thesis: *"Fracture Toughness of a Carbon Fibre-Epoxy Composite"*

BASc., **University of British Columbia**, Mechanical Engineering, May 1980

## ACADEMIC POSITIONS

7/11-Present ***Professor, Mechanical Engineering***
Colorado State University Fort Collins, CO 80523

2007-Present ***Affiliate Graduate Faculty, Mechanical Engineering***
University of Maine, Orono, ME 04469

12/05-7/14 ***Director, Motorsport Engineering Research Center***
Colorado State University Fort Collins, CO 80523

7/94-6/11 ***Associate Professor, Mechanical Engineering***
Colorado State University Fort Collins, CO 80523

8/05-7/08 ***Associate Department Head of Graduate Studies, Mechanical Engineering***
Colorado State University Fort Collins, CO 80523

1/01-1/02 ***Rockwell/Anderson Professorship***
Colorado State University Fort Collins, CO 80523

8/00-11/05 ***Coordinator, Motorsport Engineering Program***
Colorado State University Fort Collins, CO 80523

8/88-6/94 ***Assistant Professor, Mechanical Engineering***
Colorado State University Fort Collins, CO 80523

8/88-Present ***Director, Composite Materials, Manufacture and Structures Laboratory***
Colorado State University Fort Collins, CO 80523

6/87-6/88 ***Postdoctoral Research Associate, Materials Engineering***
Rensselaer Polytechnic Institute, Troy, NY 12180

8/82-5/87 ***Graduate Research Assistant, Materials Engineering***
Rensselaer Polytechnic Institute, Troy, NY 12180

8/80-7/82 ***Graduate Research Assistant, Metallurgical Engineering***
University of British Columbia, Vancouver, BC, Canada

## SABBATICALS

5/09-8/09 ***Benjamin Meaker Visiting Professor, Sabbatical, Aerospace Engineering***
University of Bristol, UK

10/08-4/09 ***Visiting Professor, Sabbatical, Materials Engineering***
University of British Columbia, Canada

5/92-8/92 ***Summer Faculty Fellow – Design for Manufacturability Studies***
Naval Surface Warfare Center, Code 2834, Annapolis, MD 21402

## OTHER POSITIONS

8/86-Present ***Engineering Consultant, Composite Materials,*** Fort Collins, CO

## PROFESSIONAL EXPERIENCE *(Details)*

7/11-present **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Professor*

- Research and teaching in the sub-area of Advanced Materials with specific emphasis on advanced fiber reinforced composite materials.

12/05-7/14 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Director, Motorsport Engineering Research Center*

- Development of focus area in Motorsport Engineering and the University "named" center.
  - From initiation of the program through Fall 2006, 4 faculty members were involved. MERC CIOSU dissolved – 7/14.
  - The Motorsport Engineering Graduate program grew from 5 graduate students in 2002 to 16 graduate students, on-site in Fall 2005. The largest incoming groups of graduate students were admitted in fall 2005 and fall 2006. Throughout 2006 and 2007 in excess of 20 graduate students were enrolled.
  - From 2002 to 2010 a total of approximately 45 Motorsport graduate students were enrolled.
  - The Motorsport Engineering Research Center is a separate 10 acre campus and includes a 6,000ft$^2$ office complex and a 14,000ft$^2$ laboratory building.
- Administrative duties related to the Center, including annual reporting, program planning, graduate student recruiting, program promotion.
- Development of graduate-level course entitled: "Racecar Engineering: Design and Development".

7/94-6/11 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Associate Professor*

- Research in the field of composite materials, including:
  - Manufacturing distortion of composite components
  - Development of viscoelastic coefficients for a transversely orthotropic material through modeling and experimentation
  - Ultra-lightweight EMI shielding, experimental and simulation
  - Processing of LaRC polyimides, in conjunction with NASA Langley, as composite matrix materials and as high temperature foams
  - Studies involving matrix property variations through nanoclay additions
  - Processing of high temperature C/C composites
  - Defect initiation and propagation by microwave NDE
  - Impact fatigue of composites and composite bonded joints.
- Interaction with ENSIETA in Brest, France and advising of summer interns.
- Development of graduate-level course entitled, "Materials Issues in Mechanical Design".
- Faculty advisor for Colorado State's Formula SAE Race Car (1999 – 2005).
- Served as the CSU member on the Colorado Advanced Materials Institute – Industry/University Board.
- Coordinator, ME Senior Design Practicum. Member of Management Team since inception, of new approach involving implementing formal industry practice, in 1996. Continued evolution of Practicum – leading to Design Across the Curriculum.

8/08-8/09 **Colorado State University,** *Mechanical Engineering*
*Sabbatical Leave*

- 10/08-3/09: Visiting Professor, Materials Engineering, *University of British Columbia, Canada*. Research in distortion during manufacture of composites and in tailored damping of composite materials.
- 5/09-8/09: Benjamin Meaker Visiting Professor, Institute for Advanced Studies, *University of Bristol, UK*. Research in distortion during manufacture of composites and in dynamic mechanical properties of high temperature inorganic composites.

8/05-7/08 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Associate Department Head of Graduate Studies*

- Chair the Departmental Graduate committee.
- Responsible for all aspects of the Graduate program, including recruiting & retention, quality of graduate advising, PhD diagnostic, promotional materials.
- Involved at the College level in development of recruitment strategies.
- Graduate Program development, including:
  - Reorganization to reflect areas of study at various laboratories
  - Recruiting development focused on increasing PhD fraction

1/01-1/02 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Rockwell/Anderson Professorship*

- Research efforts in composite materials.
- Development of Motorsport Engineering, including incorporation of composites.

8/00-11/05 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Motorsport Engineering Program Coordinator*

- Research related to composite materials in the motorsport industry, including:
  - Composites for internal engine applications, including engine valves
  - Development of new chassis design and assembly procedures
  - Development of chassis testing practices, including stiffness investigation, and impact studies
  - Engine friction studies related to coatings and lubricants using floating liner research engine
  - Braking materials studies using brake friction dynamometer
  - Tire technology investigation and testing
  - Nanocomposites in tailored damping studies
  - Nanofluids in motorsport applications
- Development of Motorsport Engineering graduate program within Mechanical Engineering.
- Responsible for the development of the new 10-acre, 20,000ft$^2$ facility dedicated to Motorsport Engineering at the CSU Foothills Campus.
- Responsible for "Development Activities" that have supplied laboratory furnishings and laboratory equipment for facility laboratories at the Motorsport Engineering Complex.

8/88-6/94 **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Assistant Professor,*

- Research on warpage in composite laminates, ultra-lightweight EMI shielding, thermoplastic composite joining, and high temperature composites.
- Development of graduate-level course in composite materials entitled, "Advanced Composite Materials".
- Development of Composite Materials, Manufacture, and Structures Laboratory.
- Faculty advisor for Colorado State's solar car program. Development of an all-composite solar race car for the 1990 Sunrayce USA and continued effort in 1993 Sunrayce student competition.
- Coordinator of "Space Materials" sessions for SPACE '92 in Denver, in June 1992. Session chairman at the 6th Technical Conference of the American Society for Composites.

1992 **Naval Surface Warfare Center, (David Taylor Labs),** Annapolis, MD
*American Society of Engineering Educators Summer Fellowship*

- Re-Design for manufacture of a shipboard plastic waste processor.

8/88-Present **Colorado State University,** *Mechanical Engineering* Fort Collins, CO
*Director, Composite Materials, Manufacture and Structures Laboratory*

- Development of focus area in Composite Materials and the University CIOSU.
- Administrative duties related to the Laboratory, including annual reporting, program planning, graduate student recruiting, program promotion.
- Responsible for "Development Activities" leading to the acquisition of approximately $0.5M in Laboratory infrastructure.

8/86-Present **Consultant, Composite Materials Design and Manufacture,** Fort Collins, CO

1987-1988 **Rensselaer Polytechnic Institute,** *Materials Engineering* Troy, NY
*Postdoctoral Research Associate*

- Research in unique methods of improving mechanical and environmental properties at high temperature through the use of composites technology.
- Development of chemical vapor infiltrated/filament wound C/C tubes for tension-torsion testing.
- Coordination and integration of student research projects within the RPI ONR/DARPA high temperature composites (HiTASC) program.
- Development and instruction of a new course in composite materials at RPI entitled, "Production and Testing of Composites". (First given Fall 1987.)
- Design and planning of 7500 $ft^2$ of new laboratory space for composite materials development and testing. Layout of new CVD area and furnace console.

1982-1987 **Rensselaer Polytechnic Institute,** *Materials Engineering* Troy, NY
*Graduate Research Assistant*

- Research included prediction of warping of composites during fabrication, development of shape stable composites, asymmetric laminates, and hygrothermal behavior of asymmetric laminates. Optical (image analysis), thermal (DSC), and mechanical methods were applied to these topics.
- Developed laminated plate software that is now commercially available as PC-Laminate.

- Instructed segments of professional short course on composites at RPI. Experience in composites workshops and demonstrations in conjunction with DuPont at Oshkosh, and at MIT.
- Involvement in RPI ARO Rotorcraft Technology Center and in the RPI NASA/AFOSR Composite Materials and Structures Program.
- Adviser for conceptual design, layout, and fabrication of the RP3 Sailplane. This program involved primarily undergraduate participation in the fabrication of an all composite glider.

1980-1982 **University of British Columbia,** *Metallurgical Engineering* Vancouver, CAN
*Graduate Research Assistant*

- Produced glass fiber and carbon fiber/epoxy materials - fracture toughness research.
- Developed measurement and test equipment for research in fracture toughness and time dependent failure of composite materials.

1980-1982 **University of British Columbia,** *Metallurgical Engineering* Vancouver, CAN
*Graduate Teaching Assistant*

- Demonstrated lab experiments in Materials Science to engineering undergraduates.

1980 **University of British Columbia,** *Metallurgical Engineering* Vancouver, CAN
*Technician*

- Developed composites research autoclave.
- Executed tests to set up composites research autoclave for general Departmental use.

## HONORS and AWARDS

- SAMPE Fellow Award (2015) — Society for the Advancement of Material and Process Engineering *(less than 1% of SAMPE membership, fewer than 150 fellows named in 50 years)*
- Outstanding Paper Award – SAMPE – International SAMPE Technical Conference (2010) — Society for the Advancement of Materials and Process Engineering, *"Process Improvements for the Resin Transfer Molding of Composite Intake Valves for Internal Combustion Engines"*
- Benjamin Meaker Visiting Professorship 2008/2009 — Institute for Advanced Studies, University of Bristol, UK
- Visiting Professor, 10/2008 – 3/2009 — University of British Columbia, CAN
- Outstanding Paper Award – SAMPE – International SAMPE Technical Conference (2007) — Society for the Advancement of Materials and Process Engineering, *"RTM of High Temperature Polymers for Engine Valves"*
- Provost's N. Preston Davis Award for Instructional Innovation (2006) — CSU. *Unit award recognizing the contributions of the ME Senior Practicum Management Team to the development of innovative design education.*
- Outstanding Paper Award – SAMPE – International SAMPE Technical Conference (2004) — Society for the Advancement of Materials and Process Engineering, *"Tooling Development for a Multi-Shell Monocoque Chassis Design"*
- Rockwell-Anderson Chair in Mechanical Engineering (2001) — Colorado State University.
- 31st Technical Conference Chairman (1999) — Society for the Advancement of Materials and Process Engineering
- U.S. Navy-ASEE Summer Faculty Fellow (1992) — American Society of Engineering Educators.
- Ralph R. Teetor Educational Award (1992) — Society of Automotive Engineers.
- Award of Excellence, Engineering Dean's Council Award (1991) — College of Engineering, CSU. *In recognition of outstanding achievement and professionalism in education and service to the Mechanical Engineering Program.*
- Pi Tau Sigma Honorary Member (1990) — Colorado State University, ME.
- Charles S. and Helen Humphrey Fellowship (1982/83) — Rensselaer Polytechnic Institute. Academic Achievement Prize.

PUBLISHED WORKS ***("times cited" from Google Scholar unless otherwise noted)***

**Books:**

1. Radford, D.W., "PC-LAMINATE, Educational and Engineering Design Tool for use in Field of Laminated Composites", (Composites Design Software), ***Technomic Publishing Co.***, 1989. **ISBN-13: 978-0877626466**

**Refereed Journal Articles:**

1. Jeswin, J., Radford, D.W., Venayagamoorthy, S.K., and Heyliger, P.H., "Mechanics of Extendable Wind Turbine Blades", ***ASME Journal of Solar Energy Engineering***, 2016, In-Press.
2. Rahman, A.S. and Radford, D.W., "Cure Cycle Optimization of an Inorganic Polymer Matrix Material for High Temperature Fiber Reinforced Composites", ***Composites: Part A,*** Vol.85, June 2016, pp.84-93. (http://dx.doi.org/10.1016/j.compositesa.2016.03.001)
3. Forsling, H.P., Gutkowski, R.M., Radford, D.W., and Balogh, J., "Load Tests of Damaged Railroad Timber Stringers Repaired by Shear Spiking", ***Structures and Buildings***, ISSN: 0965-0911, Vol 165, No.SB6, June 2012, pp. 309-321.
4. O'Rourke, B.D., Radford, D.W. and Stanglmaier, R.H., "Tri-Axial Force Measurements on the Cylinder of a Motored SI-Engine Operated on Lubricants of Differing Viscosity", ***ASME Journal of Engineering for Gas Turbines and Power***, Vol.132, No.9, September 2010.
5. Peterson, M.L., Reiser, II, R.F. Kuo, Pei-Hsin, Radford, D.W., McIlwraith, C.W., "The Effect of Temperature on Race Times on a Synthetic Surface", ***Equine Veterinary Journal***, Vol.42, No.4, 2010, pp. 351-357. (doi: 10.1111/j.2042-3306.2010.00072.x) *(12/2013 times cited: 12)*
6. Gutkowski, R.M., Miller, N.J., Radford, D.W. and Balogh, J., "Z-Spike Rejuvenation of Timber Railroad Bridge Members", ***Structures and Buildings***, ISSN: 0965-0911, Vol 163, No.4, August 2010, pp. 275-284.
7. Radford, D.W. and Antonio, A., "Enhancing the Deformation of Shape Memory Sandwich Panels", ***Strain: An International Journal for Experimental Mechanics***, (2010) doi: 10.1111/j.1475-1305.2009.00722.x.
8. Bridge, J.W., Peterson, M.L., Radford, D.W. and McIlwraith, C.W., "Thermal Transitions in High Oil Content Petroleum-Based Wax Blends used in Granular Sport Surfaces", ***Thermochimica Acta Journal***, 498, 2010, pp.106–111. *(12/2013 times cited: 10)*
9. Radford, D.W., "Balancing Mechanisms of Distortion to Yield Distortion Free/Shape Stable Composites", ***Journal of Reinforced Plastics and Composites***, Vol. 29, No.12, 2010, pp. 1875-1892. doi:10.1177/0731684409340707 *(12/2013 times cited: 4)*
10. Radford, D.W., Grabher, A.E., and Bridge, J.W., "Inorganic Polymer Matrix Composite Strength Related to Interface Condition", ***Materials***, 2(4), 2216-2227; 2009, doi:10.3390/ma2042216.
11. Holloway, B.L. and Radford, D.W., "Mechanical Coupling Due to Composite Structural Damage and Repair", ***SAE International Journal of Materials and Manufacturing***, Vol. 1, No.1, April 2009, pp.849-858.

12. Burgers, T.A., Gutkowski, R.M., Balogh, J., and Radford, D.W., "Repair of Full-Scale Timber Bridge Chord Members by Shear Spiking", ***Journal of Bridge Engineering***, Vol. 13, No.4, July/August 2008, pp.310 – 318. *(8/2010 times cited: 2)*
13. Gutkowski, R.M., Schilling, T.J., Balogh, J., and Radford, D.W., "FRP Z-Spike Repairing of Wood Railroad Crossties", ***Journal of Structural Engineering***, Vol. 134, No.2, 2008, pp.248 – 257.
14. Buckley, R., Radford, D.W., and Stanglmaier, R.H., "Characterization and Processing of Carbon Fiber Reinforced PETI-RFI", ***Journal of Advanced Materials***, Vol. 40, No.2, 2008, pp.17 - 32.
15. Melo, J.D.D and Radford, D.W., "Time and Temperature Dependence of the Viscoelastic Properties of CFRP by Dynamic Mechanical Analysis", ***Journal of Composite Structures***, Vol. 70, 2005, pp.240-253. *(12/2013 times cited: 20)*
16. Melo, J.D.D and Radford, D.W., "Viscoelastic Properties of PEEK/IM7 Related to Temperature"***, Journal of Reinforced Plastics and Composites,*** Vol.24, No.5, 2005, pp.545-556.
17. Melo, J.D.D. and Radford, D.W., "Time and Temperature Dependence of the Viscoelastic Properties of PEEK/IM7", ***Journal of Composite Materials***, Vol.38, No.20, 2004, pp.1815-1830. *(8/2010 times cited: 6)*
18. Radford, D.W., Scott, E., and Fitzhorn, P.A., "A Liftless Electronic 100ms Shift System For Motorcycle-Engined Racecars", ***SAE-2002 Transactions, Journal of Engines***, 2003, p.2796.
19. Weidner, L.R., Radford, D.W., and Fitzhorn, P.A., "A Multi-Shell Assembly Approach Applied to Monocoque Chassis Design", ***SAE 2002 Transactions, Journal of Passenger Cars - Mechanical Systems***, 2003, p.2486. *(2/2010 times cited: 1)*
20. Radford, D.W., Peterson, M.L., Senan, A., and Fitzhorn, P.A., "Application Of Dynamic Mechanical Analysis To The Evaluation of Tire Compounds", ***SAE 2002 Transactions, Journal of Passenger Cars- Mechanical Systems***, 2003, p.2492.
21. Melo, J.D.D and Radford, D.W., "Elastic Properties of PEEK/IM7 Related to Temperature", ***Journal of Reinforced Plastics and Composites,*** Vol.22, No.12, 2003, pp.1123-1139. *(8/2010 times cited: 3)*
22. Melo, J.D.D and Radford, D.W., "Viscoelastic Characterization of Transversely Isotropic Composite Laminae", ***Journal of Composite Materials***, Vol.37, No.2, 2003, pp.129-145. *(12/2013 times cited: 19)*
23. Melo, J.D.D and Radford, D.W., "Elastic Characterization of PEEK/IM7 Using Coefficients of Thermal Expansion", ***Composites, Part A***, Vol.33, 2002, pp.1505-1510. *(8/2010 times cited:5)*
24. Radford, D.W., VanGoethem, D., Gutkowski, R.M., and Peterson, M.L., "Composite Repair of Timber Structures", ***Construction and Building Materials,*** Vol.16, No.7, 2002, pp.417-425. *(12/2013 times cited: 50)*
25. Melo, J.D.D and Radford, D.W., "Determination of the Elastic Constants of a Transversely Isotropic Lamina using Laminate Coefficients of Thermal Expansion", ***Journal of Composite Materials***, Vol.36, No.11, 2002, pp.1321-1329. *(12/2013 times cited: 13)*
26. Radford, D.W. and Rennick, T.S., "Separating Sources of Manufacturing Distortion in Laminated Composites", ***Journal of Reinforced Plastics and Composites,*** Vol.19, No.8, 2000, pp.621-641. *(12/2013 times cited: 53)*

27. Olivero, D.A. and Radford, D.W., "Non-Contact Percolation and Conductivity in Microsphere Composites", ***Journal of Advanced Materials,*** Vol. 31, No.1, 1999, pp.42 - 50. *(8/2010 times cited: 2)*
28. Olivero, D.A. and Radford, D.W., "A Multiple Percolation Approach to EMI Shielding Composites Incorporating Conductive Fillers", ***Journal of Reinforced Plastics and Composites***, Vol. 17, No.8, 1998, pp.674-690. *(12/2013 times cited: 15)*
29. Radford, D.W. and Goetschel, D.B., "Multi-Shell Composite Pressure Vessel Optimization", ***Journal of Advanced Materials,*** Vol. 28, No.4, July 1997, pp.8-19.
30. Goetschel, D.B. and Radford, D.W., "Analytical Development of Through-Thickness Properties of Composite Laminates", ***Journal of Advanced Materials,*** Vol. 28, No.4, July 1997, pp.37-46. *(12/2013 times cited: 24)*
31. Barber, B.W. and Radford, D.W., "Impact Fatigue Behavior of Composite Tube/Metal End Fitting Bonded Joints", ***Composites Engineering***, Vol. 5, No.8, 1995, pp.995-1009. *(12/2013 times cited: 6)*
32. Radford, D.W., "Volume Fraction Gradient Induced Warpage in Curved Composite Plates", ***Composites Engineering***, Vol. 5, No.7, 1995, pp.923-934. *(12/2013 times cited: 32)*
33. Gray, S., Ganchev, S., Qaddoumi, N., Beauregard, G., Radford, D., and Zoughi, R., "Porosity Level Estimation in Polymer Composites Using Microwaves", ***Materials Evaluation***, Vol. 53, No.4, March 1995, pp.404 - 408. *(12/2013 times cited: 31)*
34. Radford, D.W., "Volume Fraction Effects in Ultra-Lightweight Composite Materials for EMI Shielding", ***Journal of Advanced Materials,*** Vol. 26, No.1, October 1994, pp.45 - 53. *(12/2013 times cited: 10)*
35. Radford, D.W. and Zelenak, S., "Effect of Flux Temperature on Dual Resin Bond Performance", ***Journal of Advanced Materials,*** Vol. 25, No.2, January 1994, pp.54 - 62.
36. Radford, D.W., "Cure Shrinkage Induced Warpage in Flat Uni-Axial Composites", ***Journal of Composites Technology & Research***, JCTRER, Vol. 15, No.4, Winter 1993, pp. 290-296. *(12/2013 times cited: 38)*
37. Radford, D.W. and Cheng, B.C., "Metallized Microballoon Filled Composite EMI Shielding Materials", ***Journal of Testing and Evaluation***, JTEVA, Vol. 21, No.5, September 1993, pp.396 - 401. *(8/2010 times cited: 5 [7 - Scopus])*
38. Radford, D.W. and Cheng, B.C., "Ultra-Lightweight Composite Materials for EMI Shielding", ***SAMPE Quarterly,*** Vol. 24, No.4, July 1993, pp.54 - 61. *(8/2010 times cited: 5 [6 - Scopus])*
39. Zelenak, S., Radford, D.W. and Dean, M.W., "Dual Resin Bonded Joints in Polyetheretherketone (PEEK) Matrix Composites", ***SAMPE Quarterly***, Vol. 24, No.3, April 1993, pp.38 - 46.
40. Radford, D.W. and Diefendorf, R.J., "Shape Instabilities in Composites Resulting from Laminate Anisotropy", ***Journal of Reinforced Plastics and Composites***, Vol 12, No.1, January 1993, pp.58 - 75. *(12/2013 times cited: 56)*
41. Radford, D.W., Winckler, S.J., and Diefendorf, R.J., "Asymmetric Composites", ***Kovové Materiàly (Metallic Materials)***, Vol.26, No.2, 1988, pp.209 - 213.

**Refereed Chapters in Books:**

1. Radford, D.W. and Tong, T., Thermal Processing, ***CRC Handbook of Thermal Engineering***, F. Kreith, Ed. 2000.

**Refereed Proceeding/Transactions:**

1. Jackson, P.R. and Radford, D.W., "Monazite Fiber Coating for Strength and Toughness Improvement of Geopolymer Matrix Composites", ***48th International SAMPE Technical Conference***, Long Beach, CA, May 24, 2016.
2. Radford, D.W. and Hedin, K.M., "Fused Deposition Technology Applied to Thermoplastic Matrix Placement and Wetout in Filament Winding", **ICCM-20**, Copenhagen, Denmark, July 2015.
3. Rahman, S. and Radford, D.W., "Inorganic Polymer Matrix Material Processing Optimization", ***45th International SAMPE Technical Conference,*** Wichita, KS, Oct. 22, 2013.
4. Radford, D.W. and Nivala, P.T., "DMA as a Method of Measuring Toughness in Inorganic Polymer Matrix Composites", **ICCM-19**, Montreal, Canada, August 2013.
5. Radford, D.W., Buchler, C., Rollin, M. and Nivala, P.T., "Elevated Temperature Structural Properties Evaluation of a SiC Reinforced Polysialate Matrix Composite", ***SAMPE 2013***, Long Beach, CA, May 2013.
6. Radford, D.W. and Nivala, P.T., "Co-Molded Metallic Components as Thermal Barrier Protection in Resin Transfer Molded Composite Valves for Internal Combustion Engines", ***43rd International SAMPE Technical Conference,*** Fort Worth, TX, Oct. 18, 2011.
7. Radford, D.W. and Nivala, P.T., "Process Improvements for the Resin Transfer Molding of Composite Intake Valves for Internal Combustion Engines", ***42nd International SAMPE Technical Conference,*** Salt Lake City, UT, Oct. 12, 2010.
8. Nivala, P.T. and Radford, D.W., "The Effectiveness of Toughness Modifications of Inorganic Polymer Matrix Composites as Measured by Static Flexure Testing", ***42nd International SAMPE Technical Conference,*** Salt Lake City, UT, Oct. 12, 2010.
9. Radford, D.W. and Nivala, P.T., "Dynamic Mechanical Analysis Assessment of the Effectiveness of Toughness Modifications of Inorganic Polymer Matrix Composites", ***SAMPE 2010***, Seattle, WA, May 2010.
10. Radford, D.W. and Antonio, A., "Shape Memory Sandwich Panels", ***ICCM-17***, Edinburgh, Scotland, July 2009.
11. O'Rourke, B.D., Radford, D.W. and Stanglmaier, R.H., "Tri-Axial Force Measurements on the Cylinder of a Motored SI-Engine Operated on Lubricants of Differing Viscosity", Paper #ICES2009-76037, ***Proceedings of the ASME ICES2009***, Milwaukee, WI, May 2009.
12. Leahy, P.D., Antonio, A. and Radford, D.W., "Shape Memory Composites Applied to the Construction of a Conformable Racing Car Seat", Paper #2008-01-2973, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.
13. Cate, D. and Radford, D.W., "Determining the Effect of Material Properties on Operating Temperatures of Fiber Reinforced Internal Combustion Engine Poppet Valves", Paper #2008-01-2946, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.
14. Holloway, B.L. and Radford, D.W., "Mechanical Coupling due to Composite Structural Damage and Repair", Paper #2008-01-2940, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.

15. Buckley, R.T. and Radford, D.W., "RTM of High Temperature Polymers for Engine Valves", ***39th International SAMPE Technical Conference***, Cincinnati, OH, Nov. 1, 2007.
16. Nelson, J.L. and Radford, D.W., "Tailored Structural Damping from Embedded Nano-Composite Layers", Paper #2006-01-3649, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
17. O'Rourke, B.D., Stanglmaier, R.H., and Radford, D.W., "Development of a Floating-Liner Engine for Improving the Mechanical Efficiency of High-Performance Engines", Paper #2006-01-3636, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
18. Buckley, R.T., Miwa, J.T., Stanglmaier, R.H., and Radford, D.W., "Light-Weight Valve Train Development for High Performance Engines", Paper #2006-01-3635, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
19. Holloway, B.L., Radford, D.W., and Weidner, L.R., "Static Compliance Measurement as a Method of Assessing Damage", Paper #2006-01-3616, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
20. Antonio, A., Nivala, P., and Radford, D.W., "Tailoring the Energy Absorption Profile of a Carbon Fiber Impact Attenuator", Paper #2006-01-3615, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
21. Radford, D.W., Fitzhorn, P.A., Sakurai, H. and Stanglmaier, R.H., "Engineering the Motorsport Engineer", Paper #2006-01-3609, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
22. Burgers, T., Gutkowski, R.M., Balogh, J. and Radford, D., "Shear Spike Repair of Timber Railroad Bridge Chord Members", ***Proceedings, IABSE Symposium on Responding to Tomorrow's Challenges in Structural Engineering***, Budapest, Hungary, 2006.
23. Gutkowski, R.M., Radford, D. and Shilling, T., "Composite Repair of Railroad Cross-Ties by Shear Spiking", ***Proceedings, Structural Faults and Repair-2006***, Edinburgh, Scotland, 2006.
24. Miwa, J., Buckley, R., Stanglmaier, R, and Radford, D.W., "Exploring the Potential Advantages of Light-Weight Valves in Internal Combustion Engines", ***Proceedings of the ASME ICES2006***, May 2006, Paper No. ICES2006-1318.
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30. Harper, T.W. and Radford, D.W., "A Quantitative Approach to Determining the Foaming Parameters for Polymers", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004, 743-758.
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53. Olivero, D.A. and Radford, D.W., "Mechanical Performance of Compression Molded and Injection Molded Blends of LaRC Polyimide and Polyetherimide (PEI)", ***ICCM-11***, Gold Coast, Australia, July 14 - 18, 1997.
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63. Radford, D.W., Sadeh, W.Z., and Cheng, B.C., "Composite Materials Microstructure for Radiation Shielding", IAF-92-0324 ***43rd Congress of the International Astronautical Federation***, Washington, D.C., Sept. 1992. *(8/2010 times cited: 1)*
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66. Radford, D.W., Sadeh, W.Z., and Cheng, B.C., "Materials Issues for Lunar/Martian Structures", IAF-91-302 ***42nd Congress of the International Astronautical Federation***, Montreal, CANADA, October 1991. *(8/2010 times cited: 1)*
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68. Diefendorf, R.J., Radford, D.W., and Winckler, S.J., "Asymmetric Composites - Hygrothermal Stability of Flat Plates", ***Verbundwerk, 91 – 3rd International Conference on Reinforced Materials and Composite Technologies***, Weisbaden, Germany, October 1991. *(8/2010 times cited: 3)*
69. Radford, D.W., "Manufacturing Warpage in Flat Uni-axial Composite Laminates", ***5th Technical Conference - Composite Materials in Transition***, American Society for Composites, East Lansing, MI., June 1990, (Technomic Publishing Co.).
70. Radford, D.W. and Diefendorf, R.J., "Shape Instabilities in Composites Resulting from Laminate Anisotropy", ***4th Japan-United States Conference on Composite Materials***, Washington, DC., June 1988, (Technomic Publishing Co.), p.439. *(8/2010 times cited: 2)*
71. Radford, D.W. and Teghtsoonian, E., "Fracture Toughness of Carbon Fibre-Epoxy Composites", ***International Conference on Testing, Evaluation and Quality Control of Composites***, Surrey University, Guildford, England, September 13-14, 1983, pp.27-35 Editor: T. Feest.

**Non-Refereed Journal Articles/Chapters/Proceedings/Transactions:**

1. Radford, D.W. and Nivala, P.T., "Co-Molded Metallic Components as Thermal Barrier Protection in Resin Transfer Molded Composite Valves for Internal Combustion Engines", SAMPE Journal, Vol.48, No.3., May/June 2012, pp.28-36.
2. Radford, D.W. and Nivala, P.T., "Process Improvements for the Resin Transfer Molding of Composite Intake Valves for Internal Combustion Engines", SAMPE Journal, Vol.46, No.6, November/December 2010, pp.41-47.
3. Bridge, J.W., Grabher, A.E., Radford, D.W., "Preliminary Investigation of Geopolymer Matrix-Ceramic Fiber Composites for High Temperature Structural Applications", ***22nd Asian-Pacific Technical Exchange and Advisory Meeting on Marine Structures***, Istanbul, Turkey, Oct. 6 - 9, 2008.
4. Radford, D.W. P.C. Fuqua, and L.R. Weidner, "Tooling Development for a Multi-Shell Monocoque Chassis Design", ***SAMPE Journal***, Vol.41, No.1, January/February 2005, pp.6-17.
5. Radford, D.W. and Fu, S., "A Route to Shape Correct/Shape Stable Laminates", **SME Technical Paper**, TP03PUB299, November 19, 2003
6. Melo, J.D.D. and Radford, D.W., "Time and Temperature Dependence of the Viscoelastic Properties of PEEK/IM7", **SME Technical Paper**, TP03PUB199, August 20, 2003.
7. Olivero, D.A. and Radford, D.W., "Integrating EMI Shielding into Composite Structure", ***SAMPE Journal***, v33, n1 (97) p 51.
8. Willson, B. and Radford D., "CSU M85 Corsica Conversion", ***SAE Special Publications, SAE International Conference and Exposition***, Mar 2, 1990, Detroit, MI, (804) pp.33-43.
9. Radford, D.W., "A Technique for Measuring the Through-Thickness Properties of Laminated Composite Materials", ***Industry-University Advanced Materials Conference II***, Materials Research Society, Denver, CO., March 1989, pp.710-721.
10. Winckler, S.J. and Radford, D.W., "Capglide Program", ***SAMPE Journal***, Materials News, Vol.22, No.2, March/April 1986.

**Other (technical reports):**

1. Gutkowski, R.M., Miller, N.J., and Radford, D.W., "Field Application of Z-Spike Rejuvenation to Salvage Timber Railroad Bridges", ***MPC Report 11-245***, Mountain Plains Consortium, North Dakota, Fargo, N.D. December 2011.
2. Miller, N.J., Gutkowski, R.M., Balogh, J. and Radford, D.W., "Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members", ***MPC Report 08-208***, Mountain Plains Consortium, North Dakota, Fargo, N.D. 2008, 42 pp
3. Burgers, T., Gutkowski, R., Radford, D. and Balogh, J., "Composite Repair of Full-Scale Timber Bridge Chord Members through the Process of Shear Spiking", ***MPC Report 05-173***, Mountain Plains Consortium, North Dakota, Fargo, N.D. 2005, 90 pp. *(8/2010 times cited: 3)*
4. Schilling, TJ, Gutkowski, R.M., and Radford, D., "Composite Repair of Railroad Crossties through the Process of Shear Spiking", ***MPC Report 04-163***, Mountain Plains Consortium, North Dakota, Fargo, N.D. 2004, 116 pp. *(8/2010 times cited: 3)*
5. Radford, D.W., Peterson, M.L., and VanGoethem, D., "Composite Repair of Timber Structures", ***MPC Report No. 00-112***, Mountain Plains Consortium, North Dakota, Fargo, N.D., June 2000.

## CONTRACTS & GRANTS

### Externally-funded Projects as PI

**1. Direct Manufacture of Continuous Fiber Reinforced Composites**
Sponsor: State of Colorado – Advanced Industries, Roccor. LLC $80,000 2016
Involvement: PRINCIPAL INVESTIGATOR Combining 3D printing and continuous fiber placement.

**2. Dual Resin Bonding Process Development**
Sponsor: Roccor. LLC $15,000 2015
Involvement: PRINCIPAL INVESTIGATOR Process to join end fittings to C/PEEK spokes.

**3. Seal Wear Testing**
Sponsor: Stolle Manufacturing $15,000 2014
Involvement: PRINCIPAL INVESTIGATOR Wear test development for bodymaker seals.

**4. Independent Energy Baseline Analysis and Senior Design of Stolle Standun Bodymaker**
Sponsor: Stolle Manufacturing $115,000 2011-2013
Involvement: PRINCIPAL INVESTIGATOR Energy baseline for manufacture of aluminum cans.

**5. Inorganic Polymer Matrix High Temperature Composites**
Sponsor: Pyromeral Systems $15,000 2009-2011
Involvement: PRINCIPAL INVESTIGATOR Materials testing at high temperature.

**6. Composite Valve Demonstration**
Sponsor: MärkischesWerk GmbH $135,000 2007-2009
Involvement: PRINCIPAL INVESTIGATOR Development of fiber reinforced composite IC engine valves

**7. Shape Memory Composite Structures**
Sponsor: Composite Technology Development $30,000 2005-2009
Involvement: PRINCIPAL INVESTIGATOR Sandwich panels and seat application.

**8. Geopolymer Matrix High Temperature Composites**
Sponsor: MärkischesWerk GmbH $60,000 2006-2008
Involvement: PRINCIPAL INVESTIGATOR Materials studies related to RTM processing

**9. Modular Virtual Environment Cabin Prototype Composite Shell Development**
Sponsor: Pathfinder-SBIR $110,000 2005-2007
Involvement: PRINCIPAL INVESTIGATOR Development of composite cabin structure

**10. Materials Science of Polyimide Foams**
Sponsor: NASA STTR/MonTec, $140,000 2000-2003
Involvement: PRINCIPAL INVESTIGATOR Development of processing technology and testing.

**11. Characterization of Carbon Foam Materials for Thermal Management Applications**
Sponsor: CAMI, $18,000 2001-2002
Involvement: PRINCIPAL INVESTIGATOR Development of properties database.

**12. High-Temperature-Capable Polymer Matrix Composites**
Sponsor: Advanced Materials Institute of Colorado, $10,000 1999-2000
Involvement: PRINCIPAL INVESTIGATOR Evaluation of candidate matrix materials.

**13. Composite Repair of Timber Railroad Infrastructure**
Sponsor: USDOT - Mountain Plains Consortium, $30,883 1999-2000
Involvement: PRINCIPAL INVESTIGATOR Development of repair technology utilizing composites.

**14. Plasma Spray of Polymers**
Sponsor: Global Plastec, $25,000 1997-1998
Involvement: PRINCIPAL INVESTIGATOR Studies of plasma gun design and materials evaluation..

**15. Impact Fatigue Study of Composite to Aluminum Joints**
Sponsor: Advanced Materials Institute of Colorado, $20,000 1996-1998
Involvement: PRINCIPAL INVESTIGATOR Studies of environmental effects on impact fatigue.

**16. Manufacturing Distortion in Composites**
Sponsor: Lockheed Fort Worth Company, $20,000 1995-1996
Involvement: PRINCIPAL INVESTIGATOR Measurement and control of distortion from manufacture.

**17. A Composite Materials Alternative Pressure Vessel**
Sponsor: Advanced Materials Institute of Colorado, $10,000 1994-1995
Involvement: PRINCIPAL INVESTIGATOR Preliminary studies of design optimization of composites.

**18. Tire Printer Prototype Final Design and Manufacture**
Sponsor: MAMTC/MAURO, $12,800 1994-1995
Involvement: PRINCIPAL INVESTIGATOR. Hardware and process development.

**19. The Development of Ultra-Lightweight EMI Shielding Materials**
Sponsor: National Science Foundation, $90,000 1992-1995
Involvement: PRINCIPAL INVESTIGATOR. Metallized hollow microspheres in polymers as an EMI shielding mechanism.

**20. Process Definition for Tire to Letter Bonding and Conceptual Design**
Sponsor: MAMTC/MAURO, $11,600 1994
Involvement: PRINCIPAL INVESTIGATOR. Studies for improved rubber bonding.

**21. Hot Wall System Design Updates for Improved PVD Efficiency**
Sponsor: AMP Incorporated, Technology Division, $10,000 1993-1994
Involvement: PRINCIPAL INVESTIGATOR. Studies for improved reactor efficiency.

**22. Preliminary Investigation of Fe-Ni Alloys**
Sponsor: AMP Incorporated, Technology Division, $10,000 1993-1994
Involvement: PRINCIPAL INVESTIGATOR. Studies of alloy deposition potential.

**23. The Determination of the Mechanical Performance of a Generic Carbon Fiber Reinforced PEEK Composite Sub-Assembly**
Sponsor: Ball Aerospace $42,891 1990-1991
Involvement: PRINCIPAL INVESTIGATOR Studies on the performance of bonded PEEK components to develop a database of design allowables for space structures.

**24. Joining of Carbon/Carbon Composites**
Sponsor: Advanced Materials Institute of Colorado, $5,000 1990-1991
Involvement: PRINCIPAL INVESTIGATOR. Preliminary studies in the area of joining of components formed from C/C composites, particularly with respect to reinforcement across the bond.

**25. Innovative Terminations in Braided Reinforced Hoses**
Sponsor: Advanced Materials Institute of Colorado, $5,000 1989-1990
Involvement: PRINCIPAL INVESTIGATOR. Preliminary studies in the area of joining of composites to metal endfittings for high strain rate applications.

**26. Lightweight Composite Components**
Sponsor: Advanced Materials Institute of Colorado, $5,000 1989-1990
Involvement: PRINCIPAL INVESTIGATOR. Preliminary studies in the area of density reductions in composite materials through the introduction of hollow microsphere fillers.

**27. The Enhancement of Interlaminar Properties of Advanced Composite Materials**
Sponsor: Colorado State University, Graduate School, $4,500 1988-1989
Involvement: PRINCIPAL INVESTIGATOR. Investigative studies in the area of in-situ grown transverse reinforcements in carbon fiber reinforced composites.

## Externally-funded Projects as Co-PI

**1. Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members - Continuation**
Sponsor: USDOT - Mountain Plains Consortium $11,130 2009-2011
Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Field Repair Efforts.

**2. Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members - Continuation**
Sponsor: USDOT - Mountain Plains Consortium $32,771 2008-2009

Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Field Repair Efforts.

**3. Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members - Continuation**
Sponsor: USDOT - Mountain Plains Consortium $15,666 2007-2008
Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Field Repair Efforts.

**4. Z-Spike Rejuvenation to Salvage Timber Railroad Bridge Members**
Sponsor: USDOT - Mountain Plains Consortium $32,915 2006-2007
Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Field Repair Efforts.

**5. Pultruded Composite Shear Spike for Repair of Timber Bridges**
Sponsor: USDOT - Mountain Plains Consortium $41,118 2004-2005
Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Scale-up of technique.

**6. Pultruded Composite Shear Spike for Repair of Large Timber Members**
Sponsor: USDOT - Mountain Plains Consortium $25,218 2001-2002
Involvement: Co-PRINCIPAL INVESTIGATOR R. Gutkowski Scale-up of technique.

**7. REU Site: Studies in Mechanical Engineering**
Sponsor: NSF 1996-1998
Involvement: Co-PRINCIPAL INVESTIGATOR S. James Undergraduate grant program.

**8. Composite Materials for High Speed Industrial Components**
Sponsor: Advanced Materials Institute of Colorado, $10,000 1993-1994
Involvement: Co-PRINCIPAL INVESTIGATOR. P.R. Heyliger Preliminary studies in the area of impact fatigue of composite tubes and components.

## Externally-funded Projects as Member

**1. REU Site: Studies in Vibration and Sound**
Sponsor: NSF 2003-2005
Involvement: MEMBER Undergraduate grant program.

**2. Institute for Advanced Composites Manufacturing Innovation (IACMI)**
Agency: US Dept of Energy
Proposed Start: 9/1/14; Proposed Duration: 5 yr; Amount Requested:$3,500,000
Response: Awarded – July 2015

## PAPERS PRESENTED/INVITED LECTURES

### Papers Presented

1. "Monazite Fiber Coating for Strength and Toughness Improvement of Geopolymer Matrix Composites", ***48th International SAMPE Technical Conference***, Long Beach, CA, May 24, 2016.
2. "Fused Deposition Technology Applied to Thermoplastic Matrix Placement and Wetout in Filament Winding", **ICCM-20**, Copenhagen, Denmark, July 20, 2015.
3. "DMA as a Method of Measuring Toughness in Inorganic Polymer Matrix Composites", ***ICCM-19***, Montreal, Canada, Aug. 1, 2013
4. "Co-Molded Metallic Components as Thermal Barrier Protection in Resin Transfer Molded Composite Valves for Internal Combustion Engines", ***43rd International SAMPE Technical Conference,*** Fort Worth, TX, Oct. 18, 2011.
5. "Process Improvements for the Resin Transfer Molding of Composite Intake Valves for Internal Combustion Engines", ***42nd International SAMPE Technical Conference,*** Salt Lake City, UT, Oct. 12, 2010
6. "Dynamic Mechanical Analysis Assessment of the Effectiveness of Toughness Modifications of Inorganic Polymer Matrix Composites", ***SAMPE 2010***, Seattle, WA, May 2010.
7. "Shape Memory Sandwich Panels", ***ICCM-17***, Edinburgh, Scotland, July 2009.
8. "Fibre-Matrix Interface Effects on Internal Damping of Inorganic Polymer Matrix Composites", Poster, ***ACCIS Annual Conference***, Bristol, UK, June 30, 2009.
9. "Shape Memory Composites Applied to the Construction of a Conformable Racing Car Seat", Paper #2008-01-2973, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.
10. "Crank Angle Resolved Friction Measurements on a Motored Floating Liner Engine", MSEC18–PowertrainTesting and Measurement, Oral Only – Co-Author, Bryan O'Rourke, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.
11. "Mechanical Coupling due to Composite Structural Damage and Repair", Paper #2008-01-2940, ***SAE Motorsports Engineering Conference***, Charlotte, NC, December 2 – 4, 2008.
12. "RTM of High Temperature Polymers for Engine Valves", ***39th International SAMPE Technical Conference***, Cincinnati, OH, Nov. 1, 2007.
13. "Engineering the Motorsport Engineer", Paper #2006-01-3609, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
14. "Development of a Floating-Liner Engine for Improving the Mechanical Efficiency of High-Performance Engines", Paper #2006-01-3636, ***SAE Motorsports Engineering Conference***, Dearborn, MI, December 5 – 7, 2006.
15. "The Effect of Physical Part Constraint on Manufacturing Distortion", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004.
16. "A Quantitative Approach to Determining the Foaming Parameters for Polymers", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004.
17. "Design of Structually Coupled Composite Beams Under Combined Bending and Tension Loading", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004.

18. "Part-Tool Interaction Induced Distortion on Flat Tooling Plates", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004.
19. "Montmorillonite Nanoclays as Reinforcements in Thermoplastic Polyimide Matrix Nanocomposites", ***36th International SAMPE Technical Conference***, SanDiego, CA, Nov. 15 - 18, 2004.
20. "A Route to Shape Correct/Shape Stable Laminates", ***ICCM-14***, San Diego, CA, July 2003.
21. "Composite Repair of Timber Structures", ***Society of Experimental Mechanics Annual Conference on Experimental Mechanics***, Portland, OR, June 4 – 6, 2001.
22. "Densification of C/C Composites using Pulsed Chemical Vapor Infiltration", ***ICCM-12***, Paris, France, July 6 – 9, 1999.
23. "Measurement of Manufacturing Distortion in Flat Composite Laminates"; ***ICCM-12***, Paris, France, July 6 – 9, 1999.
24. "Mechanical Performance of Compression Molded and Injection Molded Blends of LaRC Polyimide and Polyetherimide (PEI)", ***ICCM-11***, Gold Coast, Australia, July 14 - 18, 1997.
25. "Determination of Manufacturing Distortion in Laminated Composite Components", ***ICCM-11***, Gold Coast, Australia, July 14 - 18, 1997.
26. "Bonded, Multi-Shell Composite Pressure Vessel Development", ***28th International SAMPE Technical Conference***, Seattle, WA, November 4 - 7, 1996.
27. "Modern Trends in Fiberglass Composite Design", ***SAE International Truck & Bus Meeting and Exposition***, Winston-Salem, NC, November 14, 1995.
28. "Microwave Nondestructive Investigation of Multiple Impacted Composite Laminates", ***ICCM-10***, Vancouver, Canada, August 14 - 18, 1995.
29. "Impact Fatigue Behavior of Composite Tube/Metal End Fitting Bonded Joints", ***1st International Conference on Composites Engineering (ICCE/1)***, New Orleans, LA, August 1994.
30. "Millimeter Wave Nondestructive Evaluation of Glass Fiber/Epoxy Composites Subjected to Impact Fatigue", ***International Symposium on Optics, Imaging, and Instrumentation, SPIE***, San Diego, CA, July 24 - 29, 1994.
31. "Composite Materials Microstructure for Radiation Shielding", ***43rd Congress of the International Astronautical Federation***, Washington, D.C., September 1992.
32. "Materials Issues for Lunar/Martian Structures", ***42nd Congress of the International Astronautical Federation***, Montreal, CANADA, October 1991.
33. "Ultra-Lightweight EMI Shielding Materials", ***6th Technical Conference - Composite Materials, Mechanics and Processing***, American Society for Composites, Albany, NY., October 1991.
34. "Electric/Solar Cars", ***1991 Spring Conference***, Rocky Mountain Electrical League, Colorado Springs, CO., May 1991.
35. "Solar Powered Vehicles", ***6th Annual Mobile Sources/Clean Air Conference***, National Center for Vehicle Emissions Control and Safety, Boulder, CO., September 1990.
36. "Manufacturing Warpage in Flat Uni-axial Composite Laminates", ***5th Technical Conference - Composite Materials in Transition***, American Society for Composites, East Lansing, MI., June 1990.

37. "A Technique for Measuring the Through-Thickness Properties of Laminated Composite Materials", ***Industry-University Advanced Materials Conference II, Materials Research Society***, Denver, CO., March 1989.
38. "Shape Instabilities in Composites Resulting from Laminate Anisotropy", ***4th Japan-United States Conference on Composite Materials***, Washington, DC., June 1988.
39. "Asymmetric Composites -- Hygrothermal Stability of Flat Plates", ***2nd Annual ASM/ESD Advanced Composites Conference/Exposition***, Dearborn, MI., November 1986.
40. "Fracture Toughness of Advanced Composites", ***20th Annual Conference of Metallurgists***, Hamilton, Ontario, Canada, August 1981.

## Invited Lectures

1. "Overview of IACMI and how it relates to Colorado", Keynote Lecture, ***SAMPE Rocky Mountain Fall Workshop***, Fort Collins, CO, September 18, 2015.
2. "Combining 3D Printing with Continuous Fiber Placement", ***SAMPE Rocky Mountain Fall Workshop***, Fort Collins, CO, September 18, 2015.
3. "Engineering the Composites Engineer", ***IACMI-CSU Site Visit***, August 12, 2015
4. "Composites and Additive Manufacture", ***MECH 502, Advanced/Additive Manufacturing Engineering***, Fort Collins, CO, October 31, 2014.
5. "Composites and Advanced Manufacturing Techniques/Initiatives" ***Boeing-CSU Site Visit***, October 24, 2014.
6. "Composites in Pipeline Applications" ***Pipeline Research Council Corrosion Committee Meeting***, Denver, CO, October 23, 2014
7. "Composite Engine Valves – Resin Transfer Molding Development", ***SME Northern Colorado Chapter Seminar***, Westminster, CO, September 17, 2013.
8. "High Temperature Composites Activities at CSU", ***University of Wyoming, Mechanical Engineering Departmental Seminar***, Laramie, WY, April 25, 2013.
9. "Composites in the Rocky Mountains", Keynote Lecture, ***SAMPE Rocky Mountain Fall Workshop***, Loveland, CO, September 14, 2012.
10. "High Temperature Composites Research at CSU", ***UBC Composites Group Meeting***, Vancouver, BC, Canada, January 5, 2012.
11. "Resin Transfer Moulded Composites for Application at High Temperature", ***Institute Lecture***, University of Bristol, Bristol, UK, July 14, 2009.
12. "Composites Research at Colorado State", ***Advanced Composites Centre for Innovation and Science***, University of Bristol, Bristol, UK, May 29, 2009.
13. "Engineering the Motorsport Engineer in Composites", ***American Society of Metallurgists, British Columbia Chapter Meeting***, Vancouver, Canada, Mar. 25, 2009.
14. "Composite Structural Coupling due to Repair", ***Materials Engineering Department Presentation***, University of British Columbia, Vancouver, Canada, Feb. 4, 2009.
15. "Effectiveness of Composites Education", ***SAMPE Education Panelist***, SAMPE 2008, Long Beach, CA, May 22, 2008.
16. "Engineering the Motorsport Engineer", ***CSU College of Engineering Alumni Breakfast***, Denver, CO, May 7. 2008.
17. "Composite Materials Research at CSU", ***ATK Composites***, UT, May 15, 2007.
18. "Mechanical Engineering Design Practicum/Design Across the Curriculum", ***ME Advisory Panel Meeting***, CSU, Fort Collins, CO, April 15, 2005.
19. "Composite Materials at CSU – Research Across Length Scales", ***Johns-Manville Seminar Series***, Johns-Manville, Denver, CO, Sept. 13, 2004.
20. "Mechanical Engineering Senior Design Practicum", ***ME Advisory Panel Meeting***, CSU, Fort Collins, CO, Nov. 2002.
21. "Characterization of Carbon Foam Materials", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May, 2002

22. "Composite Repair of Timber Members", ***Mountain Plains Consortium Site Visit***, CSU, Fort Collins, CO, Mar. 20, 2001
23. "Workshop on Composite Materials Processing", ***University of Maine***, Orono, ME, Jan. 2001
24. "Motorsport Education in the USA", ***Motorsport in Education Symposium***, Motorsport/Industry Association, Kenelworth, Midlands, UK, Nov., 2000.
25. "High-Temperature Polymer Matrix Composites", May, 2000.
26. "Shape Stability in Composites", ***Composite Materials Research Seminar***, EPFL – Lausanne, Switzerland, Sept., 1999
27. "Fatigue Damage - Ultra-High Modulus Carbon Fiber Reinforced Plastics", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May 6, 1999.
28. "Composite Repair of Railroad Timbers", ***Mountain Plains Consortium Site Visit***, CSU, Fort Collins, CO, Nov., 10, 1998.
29. "Study of Composite to Aluminum Joints", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May, 1998.
30. "Impact Fatigue Study - Composite to Al Joints", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May, 1997.
31. "Modern Trends in Fiberglass Composites Design", ***SAE Truck and Bus Meeting***, Rayleigh-Durham, NC, Nov. 14, 1996.
32. "Low Cost Composite Pressure Vessels", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May 4, 1995.
33. "Composites for Industrial Components", ***Colorado Advanced Materials Institute Annual Meeting***, Golden, CO, May 6, 1993.
34. "Plastic Waste Processor Manufacturability Review", ***Project Final Presentation***, Naval Surface Warfare, David Taylor Research Center, Annapolis, MD, July 28, 1992.
35. "The CSU Solar Car Project 1989 – 91", ***Sigma XI Meeting***, CSU, Fort Collins, CO, Feb. 14, 1992.
36. "Electric/Solar Cars", ***Rocky Mountain Electrical League Meeting***, Denver, CO, May 7, 1991.
37. "Sunrayce - Practical Solar Cars?", ***Weber Junior High School***, Fort Collins, CO, Mar. 4, 1991.
38. "Sunrayce Project and Race Overview", ***Fort Collins Light & Power Meeting***, Fort Collins, CO, Feb. 27, 1991.
39. "Sunrayce Project and Race Overview", ***Fort Collins Rotary Luncheon***, Fort Collins, CO, Jan. 30, 1991.
40. "Sunrayce Project and Race Overview", ***CSU Ram Jets***, CSU, Fort Collins, CO, Nov. 28, 1990.
41. "Sunrayce Project and Race Overview", ***Solar and Renewable Energy Laboratory Seminar***, University of Colorado, Boulder, CO, Nov. 14, 1990.
42. "Sunrayce Project and Race Overview", ***Denver Solar Electric Society Meeting***, Denver, CO, Nov. 13 1990.
43. "Sunrayce Project and Race Overview", ***Gates Rubber Technical Club Meeting***, Denver, CO, Nov. 1, 1990.
44. "Sunrayce - Practical Solar Cars?", ***Clean Air Conference***, Denver, CO, Sept. 13, 1990.

45. "Sunrayce Project and Race Overview", ***Fort Collins Chamber of Commerce Meeting***, Fort Collins, CO, Aug. 8, 1990.
46. "Sunrayce Project Update", ***Old Car Council Meeting***, Denver, CO, May 2, 1990.
47. "Sunrayce Project Update", ***Engineering/Industry Days***, Fort Collins, CO, April 27, 1990.
48. "Shape Stability in Composites", ***USAF Academy Materials Seminar Series***, Colorado Springs, CO, April 10, 1990.
49. "Sunrayce Project Update", ***SERTOMA Luncheon Meeting***, Fort Collins, CO, Jan. 17, 1990
50. "Joining of Carbon/Carbon", ***Advanced Materials Institute Annual Meeting***, Golden, CO, Nov. 30, 1989.
51. "View of Critical Composite Topics", ***Engineering/Industry Days***, Fort Collins, CO, Mar. 3, 1989.
52. "Shape Stability in Composites", ***American Society of Metallurgists Chapter Meeting***, Denver, CO, Mar. 2, 1989.
53. "Lightweight Composites", ***Advanced Materials Institute Annual Meeting***, Golden, CO, Feb. 23, 1989.
54. "Composite Joints", ***Advanced Materials Institute Annual Meeting***, Golden, CO, Feb. 23, 1989.
55. "Shape Stability in Composites", ***Agricultural & Chemical Engineering Department Seminar***, CSU, Fort Collins, CO, Sept. 30, 1988.

## OTHER ACTIVITES/ACCOMPLISHMENTS – PUBLICATIONS/SCHOLARLY RECORD

### Patents

**1995, Device for personalizing tires (1996)** MAURO, Charles R., Radford, Donald W.

**PATENT:** Abstract of WO 9633064 (A1) Translate this text A device (16) for producing raised lettering (14) on the sidewall (12) of an tire (10) includes a mechanism (24, 26, 28) for mounting the tire (10) in position to expose its outer sidewall (12). A mold member (40) with a plurality of annular channels (84) defined in the front surface (42) and a plurality of support members (106) each adapted to hold an alphanumeric elastomeric member (14) in the form of the mirror image of a preselected alphanumeric symbol are provided. The support members (106) include an interlocking arrangement (126, 128) to form a series of symbols into a preselected legend for producing the raised lettering (14). The support members (106) are secured to the annular channels (84) through devices (120, 122) while the interlocking device (126, 128) provides sufficient fluctuation between the connected support member (106). With the mold member (40) positioned on the outer sidewall (12) of the tire (10), an electrical heating element (102) is provided within the mold member (40) to heat and fuse the elastomeric members (14) directly to the sidewall (12) of the tire (10). ***This was the outcome of a MAMTC project.***

**1995, Device and method for personalizing tires (1997)** Mauro, Charles R., Radford, Donald W.

**PATENT:** Abstract A device for producing raised lettering on the sidewall of an elastomeric line includes a mechanism for mounting the tire in position to expose its outer sidewall. A mold member is provided having front and rear surfaces, an outer boundary, and an axial opening defining a radially inner boundary. The mold member is sized and shaped to cover the exposed outer sidewall of the tire with the front surface thereof when the tire is disposed on the mounting mechanism. A plurality of annular channels are defined in the mold member front surface radially spaced between the inner and outer boundaries of the mold member. A plurality of support members are each adapted for holding an alphanumeric elastomeric member in the form of the mirror image of a preselected alphanumeric symbol. The support members include an arrangement for selectively interlocking the support members with each other to form a series of symbols into a preselected legend for producing the raised lettering. A device is provided for securing each of the support members to one of the radially spaced channels for sliding movement therealong, the support member interlocking device providing sufficient fluctuation between connected support member to permit positioning of a series of the interlocked support members along any selected one of the spaced channels. A mechanism is provided for positioning the mold member against the outer sidewall of the tire and includes a device for aligning and centering the mold member against the tire sidewall. Finally, an electrical heating element is provided within the mold member and disposed proximate the channels to heat and fuse the elastomeric symbols directly to the outer sidewall of the tire. ***This was the outcome of a MAMTC project.***

### Provisional Patent

**2013, Combination of Fiber Placement and Matrix Material Placement via 3D printing to form unique fiber reinforced composites,** Radford, Donald W.

**DESCRIPTION:** The concept suggests combining automated fiber placement with 3D printing focusing on the goal of adding significant manufacturing and design flexibility to the field of fiber reinforced composites.

# TEACHING

## Courses Taught

- ME331 - **Introduction to Engineering Materials:** Required course for undergraduate mechanical engineering students at CSU. Metals, polymers and ceramics, and electronic materials. Includes a laboratory.
- ME404/5 - **Senior Design:** Required for all seniors in Mechanical Engineering at Colorado State University. Projects included composites and testing programs, including the development of strain measurement hardware for mechanical testing, of a filament winder and an autoclave for composites production.
- ME486 - **Senior Practicum:** Required for all seniors in Mechanical Engineering at Colorado State University. Fall 1996 effort initiated to significantly enhance Senior Design experience by developing a concurrent engineering thrust. This effort has developed into a unique capstone experience based on international engineering competition projects.
- ME411 - **Manufacturing Engineering:** Manufacturing processes and their effect on materials are discussed. An engineering senior technical elective, and is in addition offered as a distance education course.
- ME430 - **Advanced Composite Materials**
- ME530 - **Advanced Composite Materials**
- ME532 - **Material Issues in Mechanical Design**
- ME580 – **Composites Product Development**
- ME680 - **Racecar Engineering: Design and Development**
- ME695 - **Graduate Independent Study - Composites Manufacture:** Advanced topics in the manufacture of polymer, ceramic and metal matrix composite materials and structures.

## Development of New Courses

- ME331 – **Introduction to Engineering Materials – Laboratory:** Major revision, first offered Fall 2010. Laboratory experiments developed to specifically reinforce key course learning goals and to make use of small scale testing to allow each student to generate a physical feel for the response of engineering materials to heat treatment and other modifications.
- ME430 - **Advanced Composite Materials** First offered Fall 1989 [Last offered as ME430 - Fall 1992.] Constituent materials behavior. Synergistic response of constituent materials. Manufacturing methods.
- ME486 – **Senior Practicum** First offered Fall 2000 [Previously ME404/405] Developed modified approach to the Senior Capstone through changes related to development and formalization of a Practicum approach. This is an out-growth of efforts initiated in Fall 1996 in ME404/5.
- ME530 - **Advanced Composite Materials** First offered Fall 1993 Replaces ME430. Design for composites and processing technology. Constituent materials behavior. Synergistic response of constituent materials. Course is an engineering graduate course and is available on video as a distance education offering.
- ME532 - **Material Issues in Mechanical Design** First offered Fall 1995 Concepts for selecting optimal materials. Failure of materials in mechanical design applications.
- ME580 – **Composites Product Realization:** First offering Fall 2015. Lectures plus hands-on component. A detailed overview of all components of the design and development approach, as applied to products to be produced from fiber reinforced composite materials. The course is intended to develop a basis for the transformation of a product from traditional design to a design optimized for composite materials, including design, costing and fabrication. The hands-on component is related to composites fabrication.
- ME680 – **Racecar Engineering: Design and Development** First offered Fall 2007 Overview of approaches taken to design a modern high performance racecar. Builds on prerequisite courses in composite materials, engines, CFD, and vehicle dynamics.

## Development of New Teaching Techniques

- Senior Practicum, (ME486) Developed to mimic and Industry Design Experience. Developed modified approach to the Senior Capstone through changes related to development and formalization of a Practicum approach. Methodology development led to N. Preston Davis Award for Instructional Innovation (Joint recipient with other class developers - 2006)
- Mediasite Course Delivery Development, (ME530 – Fall 2007, ME411 – Spring 2008). Involved during the preliminary trials of Mediasite software and associate hardware for streaming delivery of lecture content. Helped better understand effective incorporation of the technology.

Note that throughout the majority of the time period listed on the previous page under Teaching/Summary of Teaching Evaluations, I was involved as a member of the ME486 (Senior Practicum) Management Team. This covered the time period from 1997 through Spring 2007. During this time, ME486 used a separate exit survey, focusing on course improvement, rather than using the standardized course/faculty survey. Input from students who have completed the Senior Practicum are include in the Appendices.

## ADVISING:

### Graduate Student Advisor

- Regis Mercera MSME Dec. 1991, "Project Management for CSU Solar Rayce Car".
- Sami Lazghab MSME May 1993, "Singularities in Planar Elastostatics by the Boundary Element Iterative Method".
- Steve Zelenak MSME May 1993, "Joint Morphology of Dual Resin Bonded Carbon Fiber/PEEK/PEI Composites".
- Boyle Cheng MSME Dec. 1993, (NASA Fellow) "Ultra-Lightweight Composite EMI Shielding Materials".
- Brian Barber MSME Aug. 1994, "Impact Fatigue Behavior of Composite Tube/Metal End Fitting Bonded Joints".
- Roger Ross MSME May 1995, "The Densification of C/C Composites Using Pulsed Chemical Vapor Infiltration".
- Dave Olivero MSME May 1997, "Percolation in Particulate Composites for EMI Shielding".
- Eric Carlson MSME Aug. 1997, (Plan B) "Composite Multishell Pressure Vessels".
- Tim Rennick MSME Dec. 1998, "Manufacturing Distortion in Composites"
- Karl Thiel MSME May 1999, (Plan B) (Distance Education, Materials)
- Frank DeTura MSME Dec. 2000, (Plan B) "Haynes 263 Tool Life Study". (Distance Education, Materials)
- D. VanGoethem MSME Dec. 2001, "Design of Structurally Coupled Composite Beams Under Combined Bending and Torsional Loading"
- Daniel Melo PhD. Aug 2002, "Elastic and Viscoelastic Characterization of Transversely Isotropic Composite Laminae"
- Lyle Pater MSME Aug 2003, (Plan B) (Distance Education, Materials)
- William Haworth MSME Aug 2003, (Plan B) (Distance Education, Materials)
- Ana Perica MSME Aug 2003, "Montmorillonite Nanoclays and Ceramic Nanoparticulates as Candidate Reinforcements in Thermoplastic Polyimide Matrix Nanocomposites"
- Todd Harper MSME Dec 2003, "A Quantitative Approach to Determining the Foamability and Optimal Foaming Parameters of New Polymers"
- Michelle Hsai MSME May 2004, (Plan B)
- Bryan Smithee MEng Dec. 2005, (Distance Education, Materials)
- Scott Nold MEng May 2006, (Distance Education, Materials)
- Niraj Pansare MSME May 2006, "Part-Tool Interaction Induced Distortion In Symmetric Composite Laminates Manufactured On Flat Tooling Plates"
- Kevin Norman MSME May 2007, "The Development of a Turbocharged Race Engine Application" (Co-Advisor).
- David Dummer MSME Aug 2007, "3D Percolation Model for the Prediction of Critical Volume Fraction in Particulate Composites"
- Richard Buckley PhD. Aug. 2007, "Extending the Performance of Net Shape Molded Fiber Reinforced Polymer Composite Valves for use in Internal Combustion Engines" (Co-Advisor).
- Tye Lathrop MEng Dec. 2007, (Distance Education)
- Blake Holloway MSME May 2008, "Mechanical Coupling due to Composite Structural Damage and Repair"
- Darin Cate MSME Dec. 2008, "Determining the Effect of Material Properties on Operating Temperatures of Fiber Reinforced Internal Combustion Engine Poppet Valves"
- Andy Grabher MSME Dec. 2008, "Processing Techniques and Evaluation of Geopolymer as a Matrix Material in Fiber Reinforced Composite Engine Exhaust Valves"
- Bryan O'Rourke MSME Dec. 2008, "Crank Angle Resolved Friction Measurements on a Motored Engine"
- Peter Nivala MSME Aug. 2009, "A Simulation Method and Laboratory Brake Friction Dynamometer for Tribology Studies"
- Lucas Weidner MSME May 2010, (Plan B) "Composite Multishell Racecar Chassis".
- Samsur Rahman PhD, Aug. 2015, "Toughnening of High Temperature Geopolymer Matrix for Continous Fiber Reinforced Composites Applications"
- Allyson Antonio MSME May 2016, "Enhancing the Deformability of Elastic Memory Sandwich Composites with Elastic Memory/Conventional Epoxy Hybrid Facesheets"

### Current Graduate Advisees

- Patrick Jackson PhD Candidate
- Kevin Hedin MSME Candidate

- Kent Warlick MSME Candidate
- Patrick Rodriguez MSME Candidate
- Sai Meruva MSME Candidate
- Ryan Sherrill MSME Candidate
- Jacob Nelson MSME Candidate
- Aaron Lalley PhD Candidate

## Graduate Committee Memberships (for past 5 years):

0 # M.E. - Plan C
1 # M.S. - Plan B
10 # M.S. - Plan A
4 # Ph.D.

## OTHER ACTIVITIES/ACCOMPLISHMENTS – TEACHING/ADVISING

## Exchange/Visiting Scholar Advisor

The following international students have each spent 12-20 weeks in the Composites Lab at CSU working under my guidance. The experience here at CSU is used to fulfill a portion of each student's academic requirements at the home institution.

- Quentin Poligny ENSTA Bretagne - Summer 2015, "Non-Contact Strain Measurement"
- Maxence Delomier ENSTA Bretagne - Summer 2015, "Geopolymer Specimen Evaluation"
- Florian Grard ENSTA Bretagne - Summer 2013, "Geopolymer Specimen Evaluation"
- Celia Germain ENSTA Bretagne - Summer 2012, "Inorganic/Organic Polymer Hybrids"
- Felix Ballanger ENSTA Bretagne - Summer 2012, "Inorganic/Organic Polymer Hybrids"
- Damien Toulouse ENSTA Bretagne - Summer 2011, "Composite Valve Development"
- Julian Barthoud ENSTA Bretagne - Summer 2011, "Composite Valve Development"
- Alia Pierce Univ. of Karlsruhe – 2009-2010, "The Use of Sustainable Basis Composites in Motorsport"
- Kelig LeRoux ENSIETA - Summer 2007, "Shape-Memory Composite Race Seat Development"
- Richard LeFailler ENSIETA – Summer 2007, "Shape-Memory Composite Race Seat Development"
- Thomas Moreels ENSIETA – Summer 2006, "Racecar Pedal Assembly Design Study"
- Sandrine Gegauff ENSIETA – Summer 2005, "Racecar Torsional Stiffness Measurement"
- Arnoud Trannin ENSIETA – Summer 2005, "Racecar Torsional Stiffness Measurement"
- Xavier Heraudeau ENSIETA – Summer 2004, "Oven Design and Fabrication"
- Mathieu Medal ENSIETA – Summer 2003, "Scale Pad Software Development"
- Vincent Giroud ENSIETA – Summer 2003, "FSAE Engine Dynamometer Preparation"
- Carolyn Fabrizi ENSIETA -Summer 2002, "Paddle Shift Control Development"
- Virginie Desblumortier ENSIETA - Summer 2001, "Composite Drivecase Development"
- Vivian Rajau ENSIETA - Spring 2000, "Racecar Chassis Design"

## Undergraduate Research Scholar Advisor (Research Experiences for Undergraduates)

- Jason Castillo REU Vibrations – Summer 2005, "Formula SAE Suspension Evaluation"
- Joyce Rosenbaum REU Vibrations – Summer 2005, "Optimization of Formula SAE Exhaust Tuning"
- Nate Burnett REU Vibrations – Summer 2005, "Formula SAE Suspension Dynamics Simulation"
- Justin Vangraefschepe REU Vibrations – Summer 2004, "Dynamic Characterization of Composites
- Shon Cook REU Vibrations – Summer 2004, "Racecar Spring Damper/Ackerman Geometry"
- Kyle Strabala REU Vibrations – Summer 2004, "Dynamic Tire Simulation"
- Dan Wood REU Vibrations - Summer 2003, "Adams Car Vehicle Dynamics Modeling"
- Charles Schuler REU Vibrations – Summer 2003, "Dynamic Analysis of Viscoelastic Properties"
- Steve Brandl REU Vibrations – Summer 2003, "Sandwich Beam Testing of Tire Compounds"
- Dan Derringer REU Materials – Summer 1998, "Measurement of Manufacturing Distortion"
- Jonathan Davis REU Materials – Summer 1998, "Measurement of Manufacturing Distortion"
- Doug VanGoethem REU Materials – Summer 1997, "Sub-Scale Flexure Testing in DMA"
- Jason Nichol REU Materials – Summer 1997, "Distortion Measurement in Angle Brackets"
- Marianne Boschelli REU Materials – Summer 1996, "Microwave NDT of Composites"
- Sarah Hummel REU Materials - Summer 1996, "Mechanical Testing of LaRC-SI"

## COMMITTEES

### University Committees:

- Faculty Council – representing the Department of Mechanical Engineering, 2011-2013.
- University Representative on the State of Colorado Board for the Colorado Advanced Materials Institute (CAMI), 1998 – 2002

### College Committees:

- Engineering College Distance Education Committee, 2010 – 2013.
- Engineering College Graduate Recruiting Committee, 2006 – 2008.
- Engineering College Code Committee, Chair, 2002 – 2003.
- Engineering College Policy and Procedure Committee, Chair, 2001 – 2003.
- Engineering College Professional Development Committee, Chair, 1996 - 1998.
- Engineering College Faculty Awards Committee, Chair, 1992.
- Engineering College Professional Development Committee, 1988 - 1989, 1994 - 1996, 1997 - 1998.

### Department Committees

- Mechanical Engineering – Tenure & Promotion Committee, Chair, 2011 - 2014.
- Mechanical Engineering – Faculty Search Committee, Member, 2012 – 2013.
- Mechanical Engineering – ABET Accreditation Committee, 2012 – 2013.
- Mechanical Engineering - Laboratory Manager Search Committee, Chair, 2011 – 2012.
- Civil Engineering – Grade Appeal Committee, Chair, Fall 2009.
- Mechanical Engineering – Executive Committee, August 2005 – July 2008.
- Mechanical Engineering – Graduate Committee, Chair, August 2005 – July 2008.
- Mechanical Engineering – Mechanics and Materials Working Group, Chair, 2000 – 2008.
- Mechanical Engineering - Faculty Search Committee, Member, 2008
- Mechanical Engineering - Faculty Search Committee, Member, 2004
- Mechanical Engineering - Code Committee, Chair, 1999.
- Mechanical Engineering - Undergraduate Curriculum Committee, 1996 - 1999.
- Mechanical Engineering - Department Head Search Committee, 1995 - 1996.
- Mechanical Engineering - Graduate Curriculum Committee, 1993 - 1994.
- Mechanical Engineering - Advisory Committee, 1992 - 1994, 1995-1998.

## PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Society for the Advancement of Material and Process Engineering (SAMPE), 1988
    - Senior Director, SAMPE – Rocky Mountain Chapter, 1998-2010.
    - SAMPE Fellow, 2015
- Society of Automotive Engineers (SAE), 1988
- American Society for Metals, International (ASM), 1988
- Materials Research Society (MRS), 1988
- American Society of Mechanical Engineers (ASME), 1988

### Review/Editorial Boards

- Editor, SAMPE Journal of Advanced Materials, January 2006 – April 2011.

**Organizing Panels**

- Technical Co-Chair, Organizing Committee, CAMX 2016, Anaheim, CA
- Organizing Committee, Rocky Mountain SAMPE, Technical Workshop, Loveland, CO, September, 2011 - 2014.
- Session Chair, Ceramic Matrix Composites, ICCM-19, Montreal, Canada, August 2013.
- Member, Organizing Committee, 2008 SAE Motorsport Engineering Conference, Chassis/Vehicle Component.
- Co-Chair, Organizing Committee, 36th International SAMPE Technical Conference, San Diego, CA, Nov. 2004.
- Organizing Committee, 1st Annual Rocky Mountain SAMPE Symposium, Denver, CO March 2002.
- Session Co-Chair, 2001 SEM Annual Conference, Portland, OR, June 4-6, 2001
- Co-Chair, Organizing Committee, 31st International SAMPE Technical Conference, Chicago, IL, Oct 1999.
- Session Co-Chair, SPACE '94, Albuquerque, NM, February 1994.
- Co-Editor, SPACE '92, Proceedings of the Third International Conference, Denver, CO, May 1992.
- Session Co-Chair, SPACE '92, Denver, CO, May 1992.
- Session Chair, 6th Technical Conference, American Society for Composites, Albany, NY, October 1991.

**Grant Refereeing**

- NSERC, Site Visit Committee Chair, Automotive Partnership Canada Project, 2014
- Natural Resources And Applied Sciences (NRAS) Endowment, Reviewer/Referee, 2009
- National Science & Engineering Research Canada (NSERC), Reviewer/Referee, 1998-present
- CRDF, Reviewer/Referee, 2005
- NSERC, Reviewer/Referee, 2004
- NSF SBIR, Reviewer/Referee, 2000

**Manuscript Refereeing**

- Bioresource Technology, Reviewer, 2008
- Journal of Applied Polymer Science, Reviewer, 2006 – present.
- Journal of Materials in Civil Engineering, Reviewer, 2006
- IMECE, Reviewer, 2006
- Editorial Review Board, Member, Composites, Part A, 2005 – present
- Journal of Composite Materials, Reviewer, 2004 – present.
- Editorial Review Board, Member, Composites, Part B, 2000 – present
- Editorial Review Board, Member, IEEE Transactions, 1998 – present
- Journal of Polymer Composites, Reviewer, 1998 – present.
- Editorial Review Board, Member, Composites Engineering, 1994 – present
- Editorial Review Board, Member, Journal of Advanced Materials, 1994-2011.
- McGRAW-HILL - Manufacturing Processes - 3rd Ed. J.A. Schey, Reviewer, 1997
- Review of Proposed Materials Science Textbook for Saunders College Publishing, 1992.
- Review of Schaum's Outline for Materials Engineering, McGraw-Hill Publishing, 1991.

## OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

### Administrative Service

***Associate Dept Head - Graduate Studies, 2005-2008.***

- Coordinated major realignment of graduate program, including site focus, and recruiting changes
- Chaired Departmental Graduate Committee

***Director, Motorsport Engineering Research Center (CIOSU), 2005–2013.***

- Development of focus area in Motorsport Engineering and the University "named" center.
- Development of associated course content, seminars, etc.
- Organization of various seminars
- Administrative duties related to the Center, including annual reporting, program planning, graduate student recruiting, program promotion.

***Director, Composite Materials, Manufacture and Structures Lab (CIOSU), 1990–present.***

- Development of focus area in Advanced Composites and the University "named" center.
- Organization of various events.
- Support for numerous student composites design and development projects.
- Administrative duties related to the Center, including annual reporting, program planning, graduate student recruiting, program promotion.

### Consultations related to professional expertise

- Numerous industry consultations, including locally with companies such as the Hach Company and Ball Aerospace, nationally with companies such as Hughes and Lockheed-Martin, and internationally with companies including Pyromeral Systems.

### Expert Testimony

- Have been retained to support legal activities related to fiber reinforced composite product issues and to vehicle liability cases.

### Workshops on Composite Materials Processing

- Have offered workshops on the basics of composite materials processing and composites fabrication. These have included a large hands-on component to better train the attendees in the intricacies of processing.

### Undergraduate Senior Project Advising

- Have advised over 100 senior practicum projects.
    - 2015-16:
        - 3D Printed Composite Cascade Basket: Boeing Commercial Aircraft
        - Contour 3D Printing with Path Definition: Internal
        - Extruder Head for combining Continuous Fiber Placement and 3D Printing: Internal
        - Predicting Failure of Composite Joint with Defects: Boeing Commercial Aircraft
        - Flexible Coated Fabrics for High Temperatures: Boeing Commercial Aircraft
    - 2014-15:
        - Cascade Basket Manufacturing Design for RTM: Boeing Commercial Aircraft
        - Composite Fiber Placement + 3D Printing Machine Development: Internal
        - High Temperature Oxide/Oxide Composites: Boeing Commercial Aircraft
    - 2013-14:
        - Composite Cascade Basket Manufacturing Design: Boeing Commercial Aircraft
        - Composite Fiber Placement + 3D Printing Machine Development: Internal
        - Composite Gas Turbine Bypass Air Valve Development: Woodward Governor
        - Seal Wear Test Apparatus Development: Stolle Machinery