

DANIEL LEE ARMENTROUT, Ph.D., P.E.

Business Contact Information:

The University of Alabama in Huntsville
Department of Mechanical and Aerospace Engineering
5000 Technology Dr.
Huntsville, AL 35899
256-824-5126
daniel.armentrout@uah.edu

EDUCATION: Ph.D. Physics, University of Denver, Denver Colorado, March 1991.
Dissertation Title: “An Investigation of the Acoustic Emission Generated During Stress Serrations in Al-Mg Alloys” Advisor: Steve H. Carpenter
M.S. Physics, University of Denver, Denver Colorado, June 1990.
B.A. Physics and Philosophy, Drake University, Des Moines, Iowa, May 1985.

CURRENT EMPLOYMENT

— August 15, 2019, to present
Department of Mechanical and Aerospace Engineering
The University of Alabama in Huntsville

As an Associate Clinical Professor at UAH, I have taught Introduction to Computing for Engineers, Principles of Measurement and Instrumentation, Thermodynamics I and II, and Kinematics and Dynamics of Machines. I am also an advisor for the Mechanical Engineering undergraduate students, chaired successful lecture search committees and serve as the ME ABET Coordinator.

— August 15, 2012, to August 15, 2019
Department of Mechanical and Aerospace Engineering
The University of Alabama in Huntsville

As a lecturer at UAH, I have taught Introduction to Computing for Engineers, First-Year Experience, Introduction to Mechanical Engineering, Principles of Measurement and Instrumentation, Thermodynamics I and II, Kinematics and Dynamics of Machines and Honors Thermodynamics Colloquium. I am also an advisor for the Mechanical Engineering undergraduate students, chaired successful lecture search committees and served as the ME ABET Coordinator.

— June 1, 1997, to Present
Metallurgical Consultant

As the need arises, I have performed various projects as a metallurgical consultant. Past projects include:

- Ultrasonic quality control analysis and acoustic emission monitoring of fiberglass materials,
- Material properties testing of a variety of metal and composite materials,
- Failure analysis testing of fiberglass materials,
- Treatability studies for surrogate radioactive and hazardous waste,
- Vibration analysis of the resonant shock compaction process used for waste stabilization,
- The move, re-installation and operator train for an X-ray diffractometer,
- Technology transfer of polymer encapsulation process for a decommissioning project,
- SEM and failure analysis expert in legal cases,
- Galvanic corrosion of composite core conductors, and

DANIEL L. ARMENTROUT (Continued)

PREVIOUS POSITIONS

Administration Appointments

- November 1, 2009, to July 31, 2011
Interim Chair
Department of Mechanical and Materials Engineering (MME)
University of Denver

As interim chair, I oversaw the management of the MME department including teaching, research, and service of all contributing members, managed department budget, advised and mentored undergraduate and graduate students, propose program changes, led ABET re-accreditation in mechanical engineering, reviewed student booklets and bulletins, and assisted with student recruitment. I approved teaching loads and assignments, curriculum changes in consultation with the faculty, and worked closely with the Electrical and Computer Engineering department. I was charged with many of the tactical and strategic leadership responsibilities related to the MME programs and managed the mechanical engineering assessment process. In addition, I continued to perform all of the duties of the associate chair.

- Successfully led the department through ABET accreditation,
- Prepared documents for a successful university accreditation by the Higher Learning Commission of the North Central Association of Colleges and Schools,
- Obtained approval for a PhD program in Mechanical Engineering,
- Implemented new graduate assessment program,
- Championed a new dual degree program for students.
- Expert at resolving conflict and unifying department,
- Mitigated a potentially devastating situation of a physical attraction between two employees,
- Settled disputes with external departments, and
- Improved department reputation,

- September 1, 2005, to October 31, 2009
Associate Chair
Department of Mechanical and Materials Engineering/Department of Engineering*
University of Denver

As associate chair, I advised and mentored undergraduate students, tracked student progress and performance, performed graduation checks, scheduled courses, helped decide on student department scholarships, nominated student honors, manage a number of programs for our students (Internship, Study Abroad, and Engineering/MBA program), support ABET accreditation and assessment, review student booklets and bulletins, and assist with student recruitment.

- Wrote Visual Basic macros (3,000+ lines of code) to automate student tracking and to highlight issues,
- Maintained outstanding reputation for best student advising on campus, and
- Improved student recruitment and retention.

* The Department of Engineering split into the Departments of Mechanical and Materials Engineering and Electrical and Computer Engineering on July 1, 2007.

- March 1, 2006, to June 30, 2007
Co-Chair
Department of Engineering
University of Denver

DANIEL L. ARMENTROUT (Continued)

As co-chair I oversaw the management of the Engineering department along with the Dean and Assistant Dean. I was in charge of the day-to-day management of the department while the Dean handled faculty issues and the Assistant Dean handled budgetary issues. In addition, I continued to perform all of the duties of the associate chair.

- Obtained approval for minors in Computer, Electrical, and Mechanical Engineering.

Research Appointments

- October 30, 1996, to July 31, 1999, Research Associate
August 1, 1999, to August 31, 2004, Research Associate Professor
September 1, 2004, to July 31, 2011, Lecturer faculty with Research
University of Denver

I have managed projects and advised students in their research. At the same time, I also manage and maintain the following labs and analysis instruments: the scanning electron microscope (SEM) lab, materials testing systems, acoustic emission systems, dilatometer, longitudinal and torsional Marx oscillators, materials preparation lab, corrosion lab and high voltage lab. For the university graduate students, I trained them as needed on the operation of these analyses and testing equipment.

Research Projects

Tri-State Generation and Transmission Association and Western Area Power Administration researched new composite cores conductors that have been developed for high voltage power line use which offer greater current carrying capability and lower sag when operating at high temperatures. The composite cores (carbon fibers in high temperature epoxy surrounded by glass fibers in a high temperature epoxy or alumina fibers in an aluminum matrix) were tested for potential problems which could affect the anticipated 50 year life span of the conductors.

Electrical Power Research Institute

For the seven years, I investigated factors that contribute to the stress corrosion cracking of composite materials used for making non-ceramic composite high-voltage insulators. The insulators are subjected to a variety of different factors that can contribute to component failures like high voltage, mechanical/fatigue loads, chemical attack, moisture absorption, and impact damage (gunshots). I investigated each of these factors individually as well as exploring the combined impact of several factors.

- Identified primary factors affecting composite survivability in extreme environments to improve overall insulator life, and
- Test results led major insulator suppliers to switch composites to special corrosion-resistant formulation that eliminated stress-corrosion cracking.

NASA/AFOSR

High-temperature composites are being developed and use in space vehicles and aircraft. I investigated various mechanical properties and acoustic emission generated by these high-temperature composites over a wide range of temperatures and explored failure mechanism within the materials.

- Used acoustic emission to accurately detect damage onset in composites.
- Adapted Marx oscillator to get Young's and shear moduli data across fibers for computer models.

Western Area Power Administration

Several high voltage insulators failed mechanically after an ice storm in Wyoming. I analyzed these failures looking for signs of stress corrosion cracking. In a second experiment, I help determine that the residual stress in the composites was enough to cause surface fibers to fail (stress corrode) when they are exposed to an acidic environment.

DANIEL L. ARMENTROUT (Continued)

ITN Energy/DARPA

Using a Marx oscillator, I measured the Young's and shear moduli of thin coatings applied to stainless steel tubes. The coatings are used to make power fibers – a fiber with a thin-film battery applied as a coating. Up until this project, moduli measurements have never been made of some of the component battery materials.

Teaching Appointments

- September 1, 1997, to June 2000 Adjunct Professor in the Department of Physics
- September 1, 2000, to August 31, 2004 Lecturer in the Department of Engineering
- September 1, 2004, to July 31, 2011, Faculty Lecturer with Research
- University of Denver

As a lecturer I taught Economics and Ethics for Engineers, Engineering Applications III, Engineering Concepts & Practice II, Engineering Economics, First-Year Seminar, Graduate Seminar, Instrumentation and Data Acquisition, Machine Design, Making of an Engineer, Mechanical Engineering Lab I & II, Senior Design I, II & III, Technology in the 21st Century and Thermodynamics I & II. As an adjunct physics professor, I taught Physics Preparatory, Mechanics I and Mechanics II. These courses represent a diverse mix of graduate and undergraduate mechanical engineering, general engineering, physics and university service courses.

- Demonstrated quarter-by-quarter teaching effectiveness outside my primary discipline, and
- Student evaluations for most courses were above the department average.

PREVIOUS POSITIONS

- March 1990 to August 1996
- Development Engineer
- Rocky Flats Environmental Technology Site

Rocky Flats Environmental Technology Site was a part of the DOE nuclear weapons complex. While at Rocky Flats I analyzed a wide variety of exotic materials. As a result, I was able to research and analysis these materials using well-equipped analysis facilities including: Scanning Electron Microscope (SEM), X-Ray Diffraction (XRD), optical microscopes, Acoustic Emission (AE), Fourier Transform Infrared (FTIR) spectroscopy, and X-Ray Photoelectron Spectroscopy (XPS or ESCA). As emphasis changed at this site to clean up, I adapted to conducted many treatability studies using various techniques to allow for the disposal of radioactive and hazardous wastes. Previous DOE Q Security Clearance: 1990-2000

- Developed AE monitoring system for lathe-turning operation,
- Developed keen troubleshooting and repair skills for intricate analysis equipment.
- Analyzed polymer and concrete waste encapsulation techniques,
- Authored and co-authored 19 internal reports,
- Identified failure causes for expansive concrete-encapsulated waste, and
- Developed liquid level measurement techniques for difficult-to-access radioactive storage tanks.

- December 1985 to March 1990
- Graduate Research Assistant
- Department of Physics
- University of Denver

I was responsible for all phases of my doctoral research investigating stress serrations in Al-Mg alloys. As needed during the investigation, I performed material properties testing, alloyed materials for analysis, developed computer programs for data manipulation and analysis, and performed metallographic analysis.

DANIEL L. ARMENTROUT (Continued)

PROFESSIONAL SOCIETIES

AEWG – Acoustic Emission Working Group

ASME – American Society for Mechanical Engineers

PATENT

Testing Procedure for Evaluating Diffusion and Leakage Currents in Insulators, Patent Number: 7327132, 2007, Institution, United States of America.

PUBLICATIONS

Refereed International Journals (* before student authors)

1. O'Neal, P.V., Black, C.B., Adams, E.A., & ARMENTROUT, D. Human factors associated with the mechanical use of manual bulb suction devices. *Nursing Research*. vol 68, pp 237-241 2019.
2. *B. Burks, D. ARMENTROUT and M. Kumosa, "Characterization of the Fatigue Properties of a Hybrid Composite Utilized in High Voltage Electric Transmission" *Composites Part A*, vol. 42, pp 1138-1147, 2011.
3. *B. Burks, *J. Middleton, D. ARMENTROUT and M. Kumosa, "Effect of Excessive Bending on Residual Tensile Strength of Hybrid Composite Rods" *Composites Science and Technology*, vol. 70, no. 10, pp 1490-1496, 2010.
4. *B. Burks, D.L. ARMENTROUT and M. Kumosa, "Failure Prediction Analysis of an ACCC Conductor Subjected to Thermal and Mechanical Stresses" *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 17, no. 2, pp 588-596, 2010.
5. *Belkowitz, J., ARMENTROUT, D., "The Investigation of Nano Silica in the Cement Hydration Process", *American Concrete Institute Special Publication*, Vol. 267, pp 87-100, 2009.
6. *B. M. Burks, D.L. ARMENTROUT, *M. Baldwin, *J. Buckley and M. Kumosa, "Hybrid Composite Rods Subjected to Excessive Bending Loads" *Composite Science and Technology*, vol. 69, no. 15-16, pp 2625-2632, 2009.
7. S.H. Carpenter, Kanji Ono and D. ARMENTROUT, "Acoustic Emission of Sensitized 304 Stainless Steel with Simultaneous Hydrogen Charging," *Journal of Acoustic Emission*, vol. 24, pp 119-126, 2006.
8. *L. Kumosa, D. ARMENTROUT, B. Benedikt and M. Kumosa, "An Investigation of Moisture and Leakage Currents in GRP Hollow Core Composite Cylinders," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 12, no. 5, pp 1043-1059, 2005.
9. *Lucas S. Kumosa, Maciej S. Kumosa, DANIEL L. ARMENTROUT, "Resistance to Brittle Fracture of Glass Reinforced Polymer Composites Used in Composite (Non-Ceramic) Insulators," *IEEE Transactions on Power Delivery*, vol. 20, no. 4, pp 2657-2666, 2005.
10. Maciej Kumosa, *Lucas Kumosa, and DANIEL ARMENTROUT, "Recent Advances in the Failure Analyses of Composite Non-Ceramic Insulators: Part II – The Brittle Fracture Model and Failure Prevention," *IEEE Electrical Insulation Magazine*, vol. 21, no.4, pp. 28-41, 2005.
11. *P. Rupnowski, M. Gentz, D. ARMENTROUT, J. K. Sutter, and M. Kumosa, "The Response of a Woven Graphite Fiber Polyimide Composite to Aging in Nitrogen," *Acta Materialia*, Vol. 53, pp 4555-4565, 2005.
12. M. Kumosa, *L. Kumosa, and D. ARMENTROUT, "Response to the Discussion by R. S. Gorur and B. Mobasher on Paper 'Can Water Cause Brittle Fracture Failures of Non-Ceramic Insulators in the Absence of Electric Field' by Kumosa et al.," *IEEE Transactions on Dielectrics and Electrical Insulation*, Vol. 11, pp. 323-333, 2004, *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 12, no. 3, pp. 621-626, 2005.

DANIEL L. ARMENTROUT (Continued)

13. M. Kumosa, *L. Kumosa, and D. ARMENTROUT, "Failure Analyses of Composite Non-Ceramic Insulators: Part I: Brittle Fracture Characteristics," *IEEE Electrical Insulation Magazine*, vol. 21, no. 3, pp. 14-27, 2005.
14. M. Kumosa, *L. Kumosa and D. ARMENTROUT, "Causes and Potential Remedies of Brittle Fracture Failures of Composite (Non-Ceramic) Insulators," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 11, no. 6, pp. 1037-1048, 2004.
15. R.R. DeLyser, R.W. Quine, P. Rullkoetter and D. ARMENTROUT, "A Sophomore Capstone Course in Measurement and Automated Data Acquisition," *IEEE Transactions on Education*, vol. 47, no. 4, pp 453-458, 2004.
16. *L. Kumosa, B. Benedikt, D. ARMENTROUT and M. Kumosa, "Moisture Absorption Properties of Unidirectional Glass/Polymer Composites Used in Non-Ceramic Insulators," *Composites Part A*, vol. 35, no. 9, pp 1049-1063, 2004.
17. M. Kumosa, *L. Kumosa, D. ARMENTROUT, "Can Water Cause Brittle Fractures of Composite (Non-Ceramic) Insulators in the Absence of Electric Fields?" *IEEE Transactions on Dielectrics and Electrical Insulation*, vol. 11, no. 3, pp 506-522, 2004.
18. D. ARMENTROUT, M. Kumosa, and *L. Kumosa, "Water Diffusion into and Electrical Testing of Composite Insulator GRP Rods," *IEEE Transactions on Dielectrics and Electrical Insulation*, vol 11, no. 3, pp 498-505, 2004.
19. B. Benedikt, M. Kumosa, D. ARMENTROUT, *L. Kumosa, J.K. Sutter, P.K. Predecki, "Analysis of Stresses in Aluminum Particles Embedded Inside Unidirectional and Woven Graphite/Polyimide Composites Subjected to Large Bending Loads," *Mechanics of Advanced Materials and Structures*, vol. 11, no. 1, pp 31-49, 2004.
20. *M. Gentz, D. ARMENTROUT, *P. Rupnowski, *L. Kumosa, E. Shin, J. K Sutter, and M. Kumosa, "In-Plane Shear Testing of Medium and High Modulus Woven Graphite Fiber Reinforced/Polyimide Composites," *Composite Science and Technology*, vol. 64, no. 2, pp 203-220, 2004.
21. D. ARMENTROUT, *M. Gentz, *L. Kumosa, *B. Benedikt, and M. Kumosa, "Stress Corrosion Cracking in a Unidirectional E-Glass/Polyester Composite Subjected to Static and Cyclic Loading Conditions," *Journal of Composites Technology & Research*, vol. 25, no. 4, pp. 202-218, 2003.
22. D.L. ARMENTROUT, M. Kumosa, T.S. McQuarrie, "Boron Free Fibers for Prevention of Acid Induced Brittle Fracture of Composite Insulator GRP Rods," *IEEE Transactions on Power Delivery*, vol. 18, no. 3, pp. 684-693, 2003.
23. *L. Kumosa, M. Kumosa, and D. ARMENTROUT, "Resistance to Stress Corrosion Cracking of Unidirectional ECR-glass/Polymer Composites Based on Low and High Seed ECR-glass Fibers for High Voltage Composite Insulator Applications," *Composites Part A*, vol. 34, no. 1, pp 1-15, 2003.
24. *M. Gentz, D. ARMENTROUT, *P. Rupnowski, *L. Kumosa, J.K. Sutter, and M. Kumosa, "Mechanical Behavior of a Woven Graphite/PMR-15 Composite at Room and Elevated Temperatures Determined from the $\pm 45^\circ$ Off-Axis and Iosipescu Tests," *Journal of Composites Technology & Research*, vol. 25 no. 1, pp 22-34, 2003.
25. *L. Kumosa, D. ARMENTROUT, M. Kumosa, "The Effect of Sandblasting on the Initiation of Stress Corrosion Cracking in Unidirectional E-Glass/Polymer Composites Used in High Voltage Composite (Non-Ceramic) Insulators," *Composite Science and Technology*, vol. 62, no. 15, pp 1999-2015, 2002.
26. M. Kumosa, D. ARMENTROUT, *L. Kumosa, *Y. Han, and S.H. Carpenter, "Fracture Analyses of Composite Insulators with Crimped End-Fittings: Part II- Suitable Crimping Conditions," *Composites Science and Technology*, vol. 62, no. 9, pp 1209-1221, 2002.

DANIEL L. ARMENTROUT (Continued)

27. M. Kumosa, *G. Odegard, D. ARMENTROUT, *L. Kumosa, *K. Searles, and J.K. Sutter, "Comparison of the $\pm 45^\circ$ Off-Axis and Iosipescu Shear Tests for Woven Fabric Composite Materials," *Journal of Composites Technology & Research*, vol. 24, no. 1, pp 3-16, 2002.
28. *B. Benedikt, P. Predecki, *L. Kumosa, D. ARMENTROUT, J.K. Sutter, and M. Kumosa, "The Use of X-ray Diffraction Measurements to Determine the Effect of Bending Loads on Internal Stresses in Aluminum Inclusions Embedded in a Unidirectional Carbon-Fiber/PMR-15 Composite," *Composite Sciences and Technology*, vol. 61, no. ER14, pp 1995-2006, 2001.
29. *G. Odegard, D. ARMENTROUT, *K. Searles, *L. Kumosa, J.K. Sutter, and M. Kumosa, "Failure Analysis of $\pm 45^\circ$ Off-Axis Woven Fabric Composite Specimens," *Journal of Composites Technology & Research*, vol. 23, no. 3, pp 205-224, 2001.
30. *T. Ely, D. ARMENTROUT, and M. Kumosa, "Evaluation of Stress Corrosion Properties of Pultruded Glass Fiber/Polymer Composite Materials," *Journal of Composite Materials*, vol. 35, no. 9, pp 751-773, 2001.
31. *L. Kumosa, D. ARMENTROUT, and M. Kumosa, "An Evaluation of the Critical Conditions for the Initiation of Stress Corrosion Cracking in Unidirectional E-glass/ Polymer Composites," *Composites Science and Technology*, vol. 61, no. ER4, pp 615-623, 2001.
32. *M. Megel, *L. Kumosa, *T. Ely, and D. ARMENTROUT, and M. Kumosa, "Initiation of Stress Corrosion Cracking in Unidirectional Glass/Polymer Composite Materials," *Composite Science and Technology*, vol. 61, no. ER2, pp 213-246, 2001.
33. D. ARMENTROUT, *T. Ely, S. Carpenter, and M. Kumosa, "An Investigation of Brittle Fracture In Composite Materials Used for High Voltage Insulators," *Journal of Acoustic Emission*, vol. 16, no. 1-4, pp S10-S18, 1998.
34. D.L. ARMENTROUT and S.H. Carpenter, "An Investigation of Lüders Band Deformation and the Associated Acoustic Emission in Al- 4.5% Mg Alloys," *Journal of Acoustic Emission*, vol. 15 no. 1-4, 1997, pp 43-52, 1997.
35. C.R. Heiple, S.H. Carpenter, D.L. ARMENTROUT, and A.P. McManigle, "Acoustic Emission from Single Point Machining: Source Mechanisms and Signal Changes with Wear," *Materials Evaluation*, vol. 52, no. 5, pp 590-596, 1994.
36. F.M. Kustas, J.S. Schwartzberg, S.H. Carpenter, C.R. Heiple, and D.L. ARMENTROUT, "Acoustic Emission Monitoring of Diamond-Like Carbon Coating Degradation during Sliding Wear," *Surface and Coatings Technology*, vol. 67, no. 1-2, pp 1-7, 1994.
37. S.H. Carpenter, C.R. Heiple, D.L. ARMENTROUT, F.M. Kustas, and J.S. Schwartzberg, "Acoustic Emission Produced by Sliding Friction and Its Relationship to AE from Machining," *Journal of Acoustic Emission*, vol. 10, no. 3-4, pp 97-101, 1991/92.
38. C.R. Heiple, S.H. Carpenter, and D.L. ARMENTROUT, "Comments on the Origin of Acoustic Emission in Fatigue Testing of Aluminum Alloys," *Journal of Acoustic Emission*, vol. 10, no. 3-4, pp 103-106, 1991/92.

Conference Publications (Presenter is underlined)

1. Brandon Blackmon, Yvonne Garrett, Trenton Reed, Aaron Jerome, Pamela O'Neal, and DANIEL ARMENTROUT "Positive and Negative Pressure Produced by a Blue Bulb Syringe in a Simulated Engineering Lab Model" 2016 AlaSim, Huntsville, AL, May 3-5, 2016.
2. Pamela V. O'Neal, Matthew Duchock, Robert Hicks, Jake Baldwin, Adam Dziubanek and DANIEL ARMENTROUT, "Simulation of Fluid Mediums for Suction Tube Degradation Testing" 2015 AlaSim, Huntsville, AL, May 6-7 2015.

DANIEL L. ARMENTROUT (Continued)

3. M. Kumosa, D. ARMENTROUT, *B. Burks, J. Hoffman, L. Kumosa, J. Middleton and P. Predecki, "Polymer Matrix Composites in High Voltage Transmission Line Applications" 18th International Conference on Composite Materials, Jeju Korea, Aug 21-26 2011.
4. Jonathan S. Belkowitz and Daniel ARMENTROUT. "An Investigation of Nano Silica in the Cement Hydration Process" 2010 Concrete Sustainability Conference, Tempe, AZ, April 13-15, 2010.
5. J. Belkowitz and D. ARMENTROUT. "Achieve the Ultimate Roadway with Nanotechnology in Concrete," Forty-seventh Paving and Transportation conference, University of New Mexico, Albuquerque, NM, Jan 4-5 2010.
6. S. H. Carpenter, K Ono, and D. L. ARMENTROUT, "Acoustic Emission of Sensitized 304 Stainless Steel With Simultaneous Hydrogen Charging," Progress in Acoustic Emission XIII, Edited by M. Enoki, M. Takemoto, and H. Cho, Japanese Society for Non-Destructive Inspection, Tokyo, Japan, pp 55-60, 2006.
7. Anil Parmar, Ravi Varma and D. ARMENTROUT, "Electrochemical Corrosion Studies of Alloy 22 Weld in aqueous KCl electrolytes," The 206th Meeting of The Electrochemical Society in Honolulu, HI, October 3-8, 2004.
8. M. Kumosa, M. Gentz, P. Rupnowski, D. ARMENTROUT, L. Kumosa, E. Shin and J.K. Sutter, "Mechanical Behavior of Woven Graphite/Polyimide Composites with Medium and High Modulus Graphite Fibers Subjected to Biaxial Shear Dominated Loads," The 14th International Conference on Composite Materials (ICCM-14), San Diego, CA, July 14-18, 2003.
9. M. Kumosa, M. Gentz, D. ARMENTROUT, P. Rupnowski, L. Kumosa, E. Shin and J.K. Sutter, "Analysis of Failure Mechanisms in Woven Graphite/Polyimide Composites with Medium and High Modulus Graphite Fibers Subjected to In-Plane Shear," High Temple Workshop XXIII, Jacksonville, FL, February 10-13, 2003.
10. R.R. Delyser, P. Rullkoetter, and D. ARMENTROUT, "A Novel Interdisciplinary Course Measurement and Automated Data Acquisition, An Update," 2002 Frontiers in Education Conference, Boston, MA, November 6-9, 2002.
11. B. Benedikt, M. Gentz, L. Kumosa, D. ARMENTROUT, P.K. Predecki, M. Kumosa, and J.K. Sutter, "The Use of X-ray Diffraction Measurements to Determine the Effect of Aging on Residual Stresses in Unidirectional and Woven Graphite/Polyimide Composites," 51st Denver X-Ray Conference, Colorado Springs, CO, July/August 2002, *Advances in X-ray Analysis*, Vol. 46 pp. 112-118.
12. R.R. Delyser, P. Rullkoetter, and D. ARMENTROUT, "A Novel Interdisciplinary Course Measurement and Automated Data Acquisition - An Update," 2002 Teaching and Learning with Technology Conference, Boulder, CO, June 5-6, 2002.
13. M. Kumosa, P.K. Predecki, G. Odegard, K. Searles, B. Benedikt, D. ARMENTROUT, L. Kumosa, M. Gentz, and J.K. Sutter, "Fundamental Issues Regarding the High Temperature Failure Properties of Graphite/Polyimide Fabric Composites Subjected to Biaxial Shear Dominated Loads, Proceedings of the 22nd High Temple Workshop, Santa Fe, NM, L1-L15, January 21-24, 2002.
14. T. S. McQuarrie, D. ARMENTROUT and M. Kumosa, "Improved Dielectric & Brittle Fracture Resistant Core Rods For Non-Ceramic Insulators," 2001 World Insulator Congress & Exhibition, Shanghai, China, November 18-21, 2001.
15. M. Kumosa, P.K. Predecki, G. Odegard, K. Searles, B. Benedikt, D. ARMENTROUT, L. Kumosa, M. Gentz, and J.K. Sutter, "Shear Dominated Failure Mechanisms in High Temperature Polymer Matrix Composites," Proceedings of the 7th Summer School of Fracture Mechanics, Pokrzywna, Poland, pp. 147-162, June 18-22, 2001.

DANIEL L. ARMENTROUT (Continued)

16. M. Kumosa, P.K. Predecki, G. Odegard, K. Searles, B. Benedikt, D. ARMENTROUT, L. Kumosa, M. Gentz, and J.K. Sutter, "Analysis of Failure Mechanisms and Residual Stresses in Unidirectional and Woven Graphite/PMR-15 Composites Subjected to Shear Dominated Biaxial Loads," High Temple Workshop XXI, Clearwater Beach, FL, pp. Z1-Z16, February 12-15, 2001.
17. D. ARMENTROUT, T. Ely, S. Carpenter, and M. Kumosa, "An Investigation of Brittle Fracture In Composite Materials Used for High Voltage Insulators," International Acoustic Emission Conference, Kohala Coast, Hawaii, August 9-14, 1998.
18. S.H. Carpenter, C.R. Heiple, and D.L. ARMENTROUT, "Acoustic Emission from Sliding Friction and Single Point Machining," Proceeding of Advance Materials Symposium, Sponsored by Nippon Steel and the Research Center for Advanced Science and Technology, University of Tokyo, Tokyo, Japan, pp 37-41, 1992.
19. C.R. Heiple, S.H. Carpenter, D.L. ARMENTROUT, F.M. Kustas, and J.S. Schwartzberg, "Relationships between Acoustic Emission and Experimental Variables during Sliding Friction," Progress in Acoustic Emission VI, Edited by T. Kishi, K. Takahashi, and M. Ohtsu, Japanese Society for Non-Destructive Inspection, Tokyo, Japan, pp 353-361, 1992.
20. D.L. ARMENTROUT and S.H. Carpenter, "The Effect of Precipitate Forming Elements in Al 4.5% Mg Alloys on the Measured Acoustic Emission and on Lüders Band Deformation," Progress in Acoustic Emission VI, Edited by T. Kishi, K. Takahashi, and M. Ohtsu, Japanese Society for Non-Destructive Inspection, Tokyo, Japan, pp 505-512, 1992.
21. C.R. Heiple, S.H. Carpenter, and D.L. ARMENTROUT, "Origin of Acoustic Emission Produced during Single Point Machining," 4th World Meeting on Acoustic Emission and 1st International Conference on Acoustic Emission in Manufacturing (Proceedings), Edited by S.J. Vahaviolos, American Society for Nondestructive Testing, Columbus, Ohio, pp 463-470, 1991.
22. D.L. ARMENTROUT and S.H. Carpenter, "Stress Serrations and Acoustic Emission Measured in a 3004 Al Alloy," 4th World Meeting on Acoustic Emission and 1st International Conference on Acoustic Emission in Manufacturing (Proceedings), Edited by S.J. Vahaviolos, American Society for Nondestructive Testing, Columbus, Ohio, pp 50-57, 1991.
23. C.R. Heiple, S.H. Carpenter, and D.L. ARMENTROUT, "Changes with Material Properties of Acoustic Emission Produced During Single Point Machining," Progress in Acoustic Emission V, Edited by K. Yamaguchi, H. Takahashi, and H. Niitsuma, Japanese Society for Non-Destructive Inspection, Tokyo, Japan, pp 44-50, 1990.
24. D.L. ARMENTROUT and S.H. Carpenter, "Detection and Characterization of Recrystallization in 3004 Aluminum Alloy Using Acoustic Emission," Progress in Acoustic Emission IV, Edited by K. Yamaguchi, I. Kimpara, and Y. Higo, Japanese Society for Non-Destructive Inspection, Tokyo, Japan, pp 552-558, 1988.

Major Reports

1. M. Kumosa, P.K. Predecki, D. ARMENTROUT, B. Benedikt, M. Gentz, P. Rupnowski, L. Kumosa, E. Shin and J.K. Sutter, "Fundamental Issues Regarding the High Temperature Failure Properties of Graphite/Polyimide Fabric Composites," Annual Progress Report to AFOSR and NASA Glenn, August 2003.
2. M. Kumosa, D. ARMENTROUT, L. Kumosa, B. Benedikt, T.S. McQuarrie, "Failure Analysis of Composite High Voltage Insulators," Annual Progress Report to EPRI, January 2003.
3. M. Kumosa, P.K. Predecki, D. ARMENTROUT, B. Benedikt, M. Gentz, P. Rupnowski, L. Kumosa, E. Shin and J.K. Sutter, "Fundamental Issues Regarding the High Temperature Failure Properties of Graphite/Polyimide Fabric Composites," Annual Progress Report to AFOSR and NASA Glenn, August 2002.

DANIEL L. ARMENTROUT (Continued)

4. M. Kumosa, L. Kumosa, D. ARMENTROUT, Y. Han, M. Moyle, S.H. Carpenter, A. Chughtai, T.S. McQuarrie, P.K. Predecki and D.M. Smith, Failure Analysis of Composite High Voltage Insulators, Final Report to the Electric Power Research Institute, EPRI, Palo Alto, CA: 2002. 1007464.
5. M.S. Kumosa, P.K. Predecki, B. Benedikt, D. Dragoi, L. Kumosa, P. Rupnowshi and D. ARMENTROUT., "Biaxial Failure of Graphite Reinforced Polyimide and Epoxy Fabric Composites," Final report to Air Force Office of Scientific Research, Department of Engineering, University of Denver, Denver, Colorado, August 2001.
6. M. Kumosa, Q.Qiu, B. Bansal, S.H. Carpenter, D. ARMENTROUT, M.V. Balakrishnan, Y. Zhao, T. Ely, A. Chughtai and D. Smith, Fracture Analysis of Composite Insulators, Final Report to EPRI, EPRI, Palo Alto, CA; 2001. 1006293.
7. M. Kumosa, and D. ARMENTROUT, "Stress Corrosion Experiment on Pultruded Glass/Polymer Unidirectional Composite Rod," Final report to Glasforms, Inc., 1999.
8. M. Kumosa, Y. Han, S.H. Carpenter, D. ARMENTROUT and L. Kumosa, "Suitable Crimping Conditions in Composite Suspension High Voltage Insulators," Final report to NGK, Department of Engineering, University of Denver, Denver, 1998.
9. M. Kumosa, T. Ely, D. ARMENTROUT, S.H. Carpenter and J. Ma, "Micro-Fracture Mechanisms in Glass/Polymer Insulator Materials under Combined Effect of Mechanical, Electrical and Environmental Stresses," Final Report to Bonneville Power Administration, Western Area Power Administration, Alabama Power Company, Pacific Gas and Electric, National Rural Electric Cooperative Association, and Glasforms, Inc., Department of Engineering, University of Denver, Denver, Colorado, December 1998.

FINANCIAL SUPPORT

1. Faculty advisor of a 3rd place team in the SAIC scholarship competition (Spring 2014) \$2,000
2. Faculty advisor of a 2nd place team in the SAIC scholarship competition (Spring 2013) \$3,000
3. Tri-State Generation and Transmission Association and Western Area Power Administration, "Investigation of Long Term Structural Integrity of High-Temperature Low Sag Composite Conductors," D. ARMENTROUT PI, \$147,000, May 2008 – July 2011.
4. Use of SEM and Mechanical Testing Labs, various companies and projects, D. ARMENTROUT PI, \$118,552, February 2000 – July 2011.
5. National Renewable Energy Laboratory, "Mechanical Properties of Silicon," D. ARMENTROUT PI, \$9,985 December 20, 2007 – June 19, 2009.
6. National Institute of Science and Technology, SURF program, D. ARMENTROUT PI, \$13,800, June 2006 – September 2006 and June 2010 – September 2010.
7. Fundamental Issues Regarding the High Temperature Failure Properties of Graphite/Polyimide Fabric Composites, D. ARMENTROUT, CO-PI, Air Force Office of Scientific Research and NASA Glenn Research Center, \$405,000, February 15, 2000 – February 14, 2004.
8. ITN Energy Systems/DARPA, "Dynamic Material Property Measurements of Thin-Film Solid State Battery on Structural Fibers for Textiles and Composites," D. ARMENTROUT PI, \$40,000 July 1, 2003 – February 20, 2004.
9. Electric Power Research Institute, "Failure Analysis of Composite High Voltage Insulators," D. ARMENTROUT CO-PI, \$523,256, July 1, 2000 - December 31, 2003.

DANIEL L. ARMENTROUT (Continued)

10. Apex Surgical, “Axial and Rotation Testing of 22 Surgical Part Pairs,” D. ARMENTROUT CO-PI, \$3,500, June 2003 – July 2003.

AWARDS

- College of Engineering Award for Excellence in Teaching, UAH, 2017.
- Faculty Pioneer Award for Scholarship and Leadership, University of Denver, 2011.
- Best Citizen Award, School of Engineering and Computer Science, 2007.
- Paul S. Helmick award for outstanding physics student, 1985.
- Third place Drake Physics Prize Test out of 2800 participants, 1981.

GRADUATE STUDENT CO-ADVISING

1. Gregory M. Odegard, “Shear-Dominated Biaxial Failure Analysis of Polymer-Matrix Composites at Room and Elevated Temperatures,” Ph.D., Department of Engineering, University of Denver, June 2000.
2. Bart Benedikt, “Analysis of Residual Stress in Graphite Fiber/PMR-15 Composites,” Ph.D., Department of Engineering, University of Denver, June 2003.
3. Mark Gentz, “Mechanical Response of Graphite/Polyimide Composites at Elevated Temperatures,” Ph.D., Department of Engineering, University of Denver, August 2004.
4. Anil Parmar, “Electrochemical Corrosion Studies of Alloy 22 Weld in aqueous KCl electrolytes,” M.S., Department of Engineering, University of Denver, March 2005.
5. Przemek Rupnowski, “Multiscale Stress and Damage Initiation Analysis of Graphite Fiber/Polyimide Composites,” Ph.D., Department of Engineering, University of Denver, November 2005.
6. Brian Burks, Ph.D., Mechanical and Materials Engineering, “The Effect of Atmospheric Aging on a Hybrid Polymer Matrix Composites’ Material Properties” University of Denver, June 2012.
7. Eva Hakansson, M.S., Mechanical and Materials Engineering, University of Denver, June 2013.

GRADUATE STUDENT ADVISING (Primary Advisor)

1. Jon Belkowitz, “Nano SiO₂ particles effect on the hydration process of Portland Cement,” M.S., Materials Science, November 2009.

PUBLICATION REVIEWER

Composite Science and Technology

TENURE REVIEWER

Candidate at Rochester Institute of Technology

PROFESSIONAL LICENSING

Licensed Professional Engineer in Colorado, #45287, June 2011.