

# **Alan R. Kallmeyer, Ph.D.**

Associate Professor and Interim Chair  
Department of Mechanical Engineering and Applied Mechanics  
North Dakota State University

## **Office Address**

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## **Education**

- Ph.D. Mechanical Engineering, University of Iowa, Iowa City, IA, 1995  
Thesis Title: *Time-Dependent Behavior of Bolted Joints in a Polymer Matrix Composite Laminate at Ambient and Elevated Temperatures*  
Advisor: Prof. Ralph I. Stephens
- M.S. Mechanical Engineering, University of Iowa, Iowa City, IA, 1992  
Thesis Title: *Low Cycle Fatigue Behavior and Variable Amplitude Fatigue Life Calculations for an SRIM Polymer Matrix Composite*  
Advisor: Prof. Ralph I. Stephens
- B.S. Mechanical Engineering, University of Utah, Salt Lake City, UT, 1990  
Minor: Mathematics  
Graduated magna cum laude

## **Professional Experience**

- 2005 – present Interim Chair, Department of Mechanical Engineering and Applied Mechanics, North Dakota State University, Fargo, ND
- 2001 – present Associate Professor, Department of Mechanical Engineering and Applied Mechanics, North Dakota State University, Fargo, ND
- 1998 Visiting Scientist, Materials Research Laboratory, AFRL Wright-Patterson Air Force Base, Dayton, OH
- 1995 – 2001 Assistant Professor, Department of Mechanical Engineering and Applied Mechanics, North Dakota State University, Fargo, ND
- 1990 – 1995 Graduate Research Assistant, Department of Mechanical Engineering and the Center for Computer Aided Design, University of Iowa, Iowa City, IA

## **Administrative Experience**

**Interim Chair** Department of Mechanical Engineering and Applied Mechanics, NDSU,  
July 2005 – present

### ***General Responsibilities***

- Development of course teaching schedules, including identifying, interviewing, and hiring adjunct faculty as needed.
- Managing department personnel, including 15 faculty members, 4 staff members, over 400 students, and several adjunct faculty members.
- Conducting annual reviews of all faculty and staff.
- Managing budgets and overseeing expenditures.
- Submission of departmental reports in accordance with university guidelines, including the Departmental Assessment Reports and the Annual Reports.
- Resolving conflicts among students, faculty and staff.
- Recruiting of undergraduate and graduate students through attendance at University recruiting events such as Discover NDSU and the National Collegiate Recruiting Fair in Minneapolis, MN.
- Meeting with employers, alumni, and friends of the department.
- Conducting semi-annual meetings of the MEAM Department Industrial Advisory Board.
- Overseeing the collection and analysis of program assessment data from faculty, students, alumni, and employers.
- Conducting exit-interviews of all graduating seniors in the program.

### ***Major Accomplishments***

- Guided the MEAM Department through a successful re-accreditation review by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET). This process included the submission of a Self-Study report in June 2006, followed by the on-site review in October 2006. No program weaknesses or deficiencies were reported in the Final Statement issued by ABET.
- Established a Strategic Planning Committee for the MEAM Department, which developed the first Strategic Plan for the department in recent history. This plan has defined ambitious but attainable objectives for the department in the areas of education, research, and service.
- Reactivated and expanded the MEAM Industrial Advisory Board. The IAB, which had not held a formal meeting in approximately 2 years prior to my appointment as Interim Chair, has met semi-annually since the fall of 2005. The involvement of IAB members in Department planning and assessment has been strengthened.
- Assisted the MEAM Department faculty and staff in the development of a plan for renovating and upgrading the educational laboratories and equipment, beginning in 2006 with the Materials Characterization Laboratory. These upgrades are being funded primarily through the use of program fees.

- Increased the level of communication between the administration, faculty and students in the MEAM Department by establishing monthly open forums with undergraduate students. These forums have allowed an open dialogue between students and faculty on topics such as the use of program (student) fees, curriculum and laboratory improvements, the advising process, the assessment and accreditation process, and graduate school opportunities at NDSU. Students in the program have reacted very favorably towards the scheduling of these forums.
- Reduced teaching loads among most research-active faculty members to 3 courses per year, enabling the faculty to devote more time to the development of research programs.
- Facilitated an atmosphere of collegiality and cooperation in the MEAM Department, which has allowed the faculty and staff to advance along an ambitious agenda of curriculum and facilities improvement and growth in research productivity.

## **Teaching & Advising Experience**

### ***Courses Taught***

A broad variety of undergraduate and graduate level courses in mechanics and design at NDSU, including: Statics, Dynamics, Mechanics of Materials, Mechanics of Machinery, Vibrations, Machine Design, Capstone Design, Design with Plastics, Fatigue and Fracture of Metals, Composite Materials, Finite Element Analysis, and Advanced Engineering Analysis (Numerical Methods).

### ***Capstone Design Projects***

Mentored over 25 capstone (senior) design group projects, including externally sponsored projects with Case Corporation, Caterpillar, Global Electric Motorcars, Webb Enterprises, Amity Technology, MKM Automation, Cedarapids, Inc., Enstrom Helicopter Company, Gremada Industries, and Bobcat, and national design competitions including Formula SAE and SAE Mini Baja.

### ***Teaching Awards***

- Carnot Award for Excellence in Teaching in Mechanical Engineering, awarded by the NDSU Chapter of Pi Tau Sigma: 1996, 1997, 1998, 1999, 2001, 2002, 2005, 2007.
- Teacher of the Year, College of Engineering and Architecture, NDSU, 1999.
- Preferred Professor, NDSU Mortar Board Society, 2004.
- Nominated for the Carnegie US Professor of the Year Award at NDSU, 2005.

### ***Professional & Curriculum Development***

- Attended Effective Teaching Workshop in 2000, conducted at NDSU by Dr. Richard Felder and Rebecca Brent from North Carolina State University.

- Received an Instructional Development Grant in *Advanced Composite Materials and Engineering Design of Plastics* from the NDSU Faculty Development Committee, in the amount of \$3000 (Dr. Uday Vaidya, PI, and Dr. Alan Kallmeyer, Co-PI), 2000.
- Introduced a new elective course in the mechanical engineering curriculum at NDSU in 2004: ME 472/672, Fatigue and Fracture of Metals.
- Invited Presenter for the NDSU Teaching Workshop organized by the Associate Vice President for Academic Affairs, August 2005.
- Developed PowerPoint Slides for the textbook *Engineering Mechanics: Dynamics* by R.C. Hibbeler (2000 – 2002). These slides are marketed by Prentice Hall as an instructor supplement for the textbook.
- Chair of MEAM Graduate Committee (1998 – present). During this time, the committee developed and revised the curriculum requirements for the newly-established PhD degree in Mechanical Engineering, and revised the curriculum requirements for the MS degree in Mechanical Engineering. In addition, a new Graduate Seminar series was introduced in the MEAM Department.
- Chair of MEAM Assessment Committee (2002 – present). During this time, the committee developed and implemented a new Assessment Plan for the MEAM Department, which has resulted in the continuing reaccreditation of the program by ABET.

### *Advising*

- Academic advisor to 30 – 50 undergraduate students per semester in the mechanical engineering program at NDSU, 1995 – present.
- Faculty advisor, NDSU student chapter of the Society of Automotive Engineers, 1997 – present (chapter founded in 1997).
- Faculty advisor, NDSU Formula SAE Team, 1997 – present. NDSU has participated in four competitions since 2000.
- Faculty advisor, NDSU SAE Mini-Baja Team, 2000 – present. NDSU has participated in four competitions since 2000.
- Faculty advisor, NDSU Cycling Club, 1996 – 2004.

## **Research Interests and Experience**

### *Research Interests*

Theoretical, computational, and experimental aspects of deformation, fatigue, and fracture of engineering materials, with interests in both monolithic and composite materials. Specific interests include material characterization, fatigue and fracture behavior, multiaxial fatigue model development, cumulative damage studies, time-dependent behavior, temperature effects, elastic-plastic and elastic-viscoplastic constitutive modeling, and finite element applications.

## ***Publications***

### Refereed Journal Articles

Peterson, E. C., Patil, R. R., **Kallmeyer, A. R.**, and Kellogg, K. G., “A Micromechanical Damage Model for Carbon Fiber Composites at Reduced Temperatures,” in review, submitted to the *Journal of Composite Materials*, September 2007.

Erickson, M., **Kallmeyer, A. R.**, Van Stone, R., and Kurath, P., “Development of a Multiaxial Fatigue Damage Model for High Strength Alloys using a Critical Plane Methodology,” under proprietary review by General Electric Company (submitted August 2007), for submission to the *ASME Journal of Engineering Materials and Technology*.

Naik, R. A., Lanning, D. B., Nicholas, T., and **Kallmeyer, A. R.**, “A Critical Plane Gradient Approach for the Prediction of Notched HCF Life,” *International Journal of Fatigue*, Vol. 27, 2005, pp. 481 – 492.

Erickson, M. D., **Kallmeyer, A. R.**, and Kellogg, K. G., “Effect of Temperature on the Low Velocity Impact Behavior of Composite Sandwich Panels,” *Journal of Sandwich Structures and Materials*, Vol. 7, No. 3, May 2005, pp. 245 – 264.

Kellogg, K. G., Patil, R., Dutta, P. K., and **Kallmeyer, A. R.**, “Effect of Load Rate on Notch Toughness of Glass FRP Subjected to Moisture and Low Temperature,” *International Journal of Offshore and Polar Engineering*, Vol. 15, No. 1, March 2005, pp. 54 – 61.

Kellogg, K. G., **Kallmeyer, A. R.**, and Dutta, P., “Influence of Moisture and Reduced Temperature Thermal Cycles on the Izod Notch Toughness of a Pultruded Glass Fiber Composite,” *International Journal of Offshore and Polar Engineering*, Vol. 13, No. 3, September 2003, pp. 232-239.

**Kallmeyer, A. R.**, Krgo, A., and Kurath, P., “Evaluation of Multiaxial Fatigue Life Prediction Methodologies for Ti-6Al-4V,” *ASME Journal of Engineering Materials and Technology*, Vol. 124, No. 2, April 2002, pp. 229-237.

**Kallmeyer, A. R.** and Stephens, R. I., “A Finite Element Model for Predicting Time-Dependent Deformations and Damage Accumulation in Laminated Composite Bolted Joints,” *Journal of Composite Materials*, Vol. 33, No. 9, 1999, pp. 794-826.

**Kallmeyer, A. R.** and Stephens, R. I., “Creep Elongation of Bolt Holes Subjected to Bearing Loads in a Polymer Matrix Composite Laminate,” *Composite Materials: Fatigue and Fracture (Sixth Volume)*, ASTM STP 1285, E. A. Armanios, Ed., American Society for Testing and Materials, 1997, pp. 452-467.

**Kallmeyer, A. R.** and Stephens, R. I., "Constant and Variable Amplitude Fatigue Behavior and Modeling of an SRIM Polymer Matrix Composite," *Journal of Composite Materials*, Vol. 29, No. 12, 1995, pp. 1621-1648.

**Kallmeyer, A. R.** and Stephens, R. I., "Low Cycle Fatigue Behavior and Variable Amplitude Fatigue Life Calculations for an SRIM Polymer Matrix Composite," SAE Paper No. 930405, *Journal of Materials and Manufacturing (SAE Transactions)*, Vol. 102, Section 5, 1993, pp. 485-495.

#### Book Chapters/Appendices

**Kallmeyer, A.**, "Estimation of HCF Threshold Stress Levels in Notched Components," Appendix E in *High Cycle Fatigue: A Mechanics of Materials Perspective* by Theodore Nicholas, Elsevier Science, 2006.

#### Conference Proceedings

Joneson, A., **Kallmeyer, A.**, Yazdani, S., and Mallick, K., "Fatigue Induced Microcracking in Composite Tank Laminates," *Proceedings of the 9<sup>th</sup> International Fatigue Congress*, Atlanta, GA, May 2006.

Erickson, M., **Kallmeyer, A.**, Goodin, E., Torkelson, E., and Kurath, P., "An Evaluation of Multiaxial Fatigue Data from Ti-6Al-4V using a Critical Plane Methodology," *Proceedings of the 9<sup>th</sup> International Fatigue Congress*, Atlanta, GA, May 2006.

Ryan, K., Cronin, J., Arzberger, S., Mallick, K., Munshi, N., Yazdani, F., **Kallmeyer, A.**, Arritt, B., and Welsh, J., "Prediction of Pressure Cycle Induced Microcrack Damage in Linerless Composite Tanks," *Proceedings of the 47<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA 2006-2201, Newport, Rhode Island, May 2006.

Okeson, M., Kellogg, K., and **Kallmeyer, A.**, "Impact Damage Growth in Fiberglass/Epoxy Laminates Subjected to Moisture and Low Temperature Thermal Cycling," *Proceedings of the Sixteenth International Offshore and Polar Engineering Conference*, San Francisco, CA, May 2006.

**Kallmeyer, A.**, Goodin, E., and Kurath, P., "Load Path Dependence on the HCF/LCF Interaction Effect under Multiaxial Loadings," *Proceedings of the 10<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, New Orleans, March 2005 (abstract).

Kellogg, K. G., Patil, R., Dutta, P. K., and **Kallmeyer, A. R.**, "Moisture and Low Temperature Effects on Hopkinson Bar Notch Toughness in Glass FRPs," *Proceedings of the Fourteenth International Offshore and Polar Engineering Conference*, Toulon, France, May 2004.

Goodin, E., **Kallmeyer, A.**, and Kurath, P., "Evaluation of Nonlinear Cumulative Damage Models for Assessing HCF/LCF Interactions in Multiaxial Loadings," *Proceedings of the 9<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, North Carolina, March 2004.

Goodin, E., **Kallmeyer, A.**, and Kurath, P. "Cyclic Event Identification and Fatigue Damage Assessment for Multiaxial Mission Loadings," *Proceedings of the 8<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, California, April 2003.

Goodin, E., **Kallmeyer, A.**, and Kurath, P. "Multiaxial Fatigue Evaluation of Ti-6Al-4V under Simulated Mission Histories," *Proceedings of the 7<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Florida, May 2002.

**Kallmeyer, A. R.**, Krgo, A., and Kurath, P., "Multiaxial Fatigue Life Prediction Methods for Notched Bars of Ti-6Al-4V," *Proceedings of the 6<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Florida, 2001.

Kellogg, K. G., **Kallmeyer, A. R.**, and Dutta, P. K., "Effects of Low Temperature Thermal Cycling and Moisture on Izod Notch Toughness of a Glass FRP," *Proceedings of the Tenth International Offshore and Polar Engineering Conference*, Seattle, 2000.

Krgo, A., **Kallmeyer, A. R.**, and Kurath, P., "Evaluation of HCF Multiaxial Fatigue Life Prediction Methodologies for Ti-6Al-4V," *Proceedings of the 5<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Arizona, 2000.

Kellogg, K. G., **Kallmeyer, A. R.**, Chinman, R. B., and Dutta, P. K., "Influence of Moisture and Low Temperature on Notched Izod Impact Toughness in a Pultruded Reinforced Composite," *Proceedings of the Ninth International Offshore and Polar Engineering Conference*, Brest, France, 1999.

**Kallmeyer, A. R.** and Stephens, R. I., "Creep of Bolted Joints in a Polymer Matrix Composite Laminate," *Proceedings of the Fourth Annual Iowa Space Conference*, Iowa City, Iowa, November, 1994, pp. 413-422.

### ***Funded Grants and Contracts***

Title: Lightweight Composite Solutions for the Spartan SCOUT  
PIs: Chad Ulven (PI), **Alan Kallmeyer (Co-PI)**, Ghodrat Karami (Co-PI)  
Sponsor: SpaceAge Synthetics, Inc./US Navy  
Funding: \$225,281  
Duration: September 2007 – December 2008

Title: Development of a Nonlinear Cumulative Fatigue Damage Methodology for Aircraft Engine Components under Multiaxial Loadings  
PIs: **Alan Kallmeyer (PI)**  
Sponsor: Air Force Office of Scientific Research  
Funding: \$307,856  
Duration: April 2007 – November 2009

Title: Evaluation of Multiaxial Fatigue Parameters for Aircraft Engine Materials  
PIs: **Alan Kallmeyer (PI)**  
Sponsor: General Electric Aviation (Aircraft Engine Division)  
Funding: \$180,000 (total amount awarded through annual renewals)  
Duration: June 2003 – December 2007

Title: Application of Cumulative Damage Theories to Multiaxial Loadings  
PIs: **Alan Kallmeyer (PI)**  
Sponsor: Aerospace Testing Alliance/Sverdrup Technology, Arnold Engineering Development Center, Arnold Air Force Base  
Funding: \$118,000 (total amount awarded through annual renewals)  
Duration: May 2003 – September 2007

Title: Hydrogen Conversion of an Agricultural Row Crop Tractor  
PIs: **Alan Kallmeyer (PI)**, Robert Pieri (Co-PI), Mike Stewart (Co-PI), Vern Hofman (Co-PI)  
Sponsor: Basin Electric Power Cooperative  
Funding: \$20,000  
Duration: June 2006 – December 2007

Title: Testing of Thermoplastic Composite Material Concepts for Military Equipment Transportation Container Design  
PIs: Chad Ulven (PI), Jing Shi (Co-PI), Mohammad Mahinfalah (Co-PI), **Alan Kallmeyer (Co-PI)**, Reuben Tschritter (Co-PI)  
Sponsor: Sioux Manufacturing  
Funding: \$10,000  
Duration: April 2006 – August 2006

Title: Development of Fatigue Damage Assessment Methods Considering LCF/HCF Interactions  
PIs: **Alan Kallmeyer (PI)**, Peter Kurath (Co-PI)  
Sponsor: Air Force Research Laboratory  
Funding: \$84,000  
Duration: February 2004 – February 2006

Title: Alternative Aerial Target Launcher, Rotational Energy Concept: Final Design  
PIs: **Alan Kallmeyer (PI)**, Jack Johnson (Co-PI)  
Sponsor: Analytical Services, Inc.  
Funding: \$35,000  
Duration: July 2004 – December 2004

Title: Fatigue Behavior of Microcrack Resistant Composite Materials  
PIs: Frank Yazdani (PI), **Alan Kallmeyer (Co-PI)**  
Sponsor: Composite Technology Development, Inc.  
Funding: \$6,000  
Duration: June 2004 – September 2004

Title: Advanced Chemical Iodine Lasers  
PIs: Frank Yazdani (PI), **Alan Kallmeyer (Co-PI)**  
Sponsor: Composite Technology Development, Inc.  
Funding: \$21,000  
Duration: September 2003 – June 2004

Title: Target Launcher Design and Coating Study  
PIs: Jack Johnson (PI), **Alan Kallmeyer (Co-PI)**  
Sponsor: Applied Resources, Inc.  
Funding: \$42,000  
Duration: August 2003 – May 2004

Title: Target Launcher Study, Phase I: Development of Rotational Energy System  
PIs: Jack Johnson (PI), **Alan Kallmeyer (Co-PI)**, David Wells, (Co-PI)  
Sponsor: Applied Resources, Inc.  
Funding: \$49,000  
Duration: August 2003 – June 2004

Title: Durability of Graphite Fiber Composites Subjected to Reduced Temperature Thermal Fatigue  
PIs: Ken Kellogg (PI), **Alan Kallmeyer (Co-PI)**  
Sponsor: Army Research Office  
Funding: \$193,000 (\$289,000 project total)  
Duration: June 2000 – June 2004

Title: Multiaxial Fatigue Life Prediction Methodologies for Advanced Metallic Materials  
PIs: **Alan Kallmeyer (PI)**  
Sponsor: University of Dayton Research Institute/Air Force Office of Scientific Research  
Funding: \$151,000 (total amount awarded through annual renewals)  
Duration: June 1999 – August 2003

Title: Affordable Processing and Dynamic Characterization of Sandwich Composite Structures  
PIs: Uday Vaidya (PI), **Alan Kallmeyer (Co-PI)**, Mohammad Mahinfalah (Co-PI), Ken Kellogg (Co-PI)  
Sponsor: National Science Foundation  
Funding: \$203,000  
Duration: January 2001 – November 2003

Title: Acquisition of High-Rate Loading and Damage Characterization Equipment for Advanced Materials Research and Education  
PIs: **Alan Kallmeyer (PI)**, Ken Kellogg (Co-PI), Robert Pieri (Co-PI), Mohammad Alimi (Co-PI)  
Sponsor: National Science Foundation  
Funding: \$82,000  
Duration: June 2002

Title: Acquisition of Instrumented High/Low Velocity Impact Test System for Advanced Materials Research and Education  
PIs: **Alan Kallmeyer (PI)**, Ken Kellogg (Co-PI), Mohammad Alimi (Co-PI)  
Sponsor: ND EPSCoR Infrastructure Improvement Program  
Funding: \$84,000  
Duration: June 2002

Title: Durability of Polymer Composites Subjected to Low Temperature Thermal Cycling

PIs: Ken Kellogg (PI), **Alan Kallmeyer (Co-PI)**

Sponsor: NDSU Research and consulting Committee

Funding: \$5,800

Duration: May 1999 – June 2000

Title: Instructional Development in Advanced Composite Materials and Engineering Design of Plastics

PIs: Uday Vaidya (PI), **Alan Kallmeyer (Co-PI)**

Sponsor: NDSU Faculty Development Committee

Funding: \$3,000

Duration: January 2000 – May 2000

Title: Environmental Chamber for MTS Load Frame

PIs: **Alan Kallmeyer (PI)**, Ken Kellogg (Co-PI)

Sponsor: NDSU Contingency Fund

Funding: \$4,100

Duration: May 1998

Title: Cooperative Investigation in Research and Development of New and Existing Products

PIs: **Alan Kallmeyer (PI)**

Sponsor: Webb Enterprises, Inc.

Funding: \$6,000

Duration: January 1997 – August 1997

Title: Equipment for Undergraduate Vibration Analysis Laboratory

PIs: **Alan Kallmeyer (PI)**, Robert Rizza (Co-PI), Mohammad Mahinfalah (Co-PI), Sudhir Mehta (Co-PI)

Sponsor: 3M Company

Funding: \$5,000

Duration: January 1996 – May 1996

### ***Presentations***

“Development of a Nonlinear Cumulative Fatigue Damage Methodology for Aircraft Engine Components under Multiaxial Loadings,” *2007 AFOSR T&E Program Review*, Herndon, VA, September 2007 (*presenter*).

“LCF-HCF Interactions under Multiaxial Loadings,” *US-UK HCF Technology Forum*, Dayton, OH, June 2006, (Invited speaker).

“Fatigue Induced Microcracking in Composite Tank Laminates,” *9<sup>th</sup> International Fatigue Congress*, Atlanta, GA, May 2006.

“Progress on Multiaxial Fatigue Modeling of Aircraft Engine Materials,” *General Electric Aircraft Engines Division*, Cincinnati, Ohio, December 2005.

“AMT Considerations: Influence of Small Cycles, LCF/HCF Interactions, and Nonlinear Damage Accumulation,” *Aerospace Testing Alliance*, Arnold Air Force Base, TN, December 2005.

“Load Path Dependence on the HCF/LCF Interaction Effect under Multiaxial Loadings,” *10<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, New Orleans, March 2005.

“NDSU/Midwest Brake Alternative Target Launcher: Final Design Review,” *US Army Targets Management Office Engineers and DoD Target Management Initiative Program Manager*, Detroit, MI, September, 2004.

“Evaluation of Multiaxial Fatigue Models for Aircraft Engine Materials,” *General Electric Aircraft Engines Division*, Cincinnati, Ohio, July 2004.

“Evaluation of Nonlinear Cumulative Damage Models for Assessing HCF/LCF Interactions in Multiaxial Loadings,” *9<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Pinehurst, North Carolina, March 2004.

“Cyclic Event Identification and Fatigue Damage Assessment for Multiaxial Mission Loadings,” *8<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Monterey, California, April 2003.

“Influence of Reduced-Temperature Environments on the Durability of Fiber-Reinforced Polymer Matrix Composites,” *Army Research Laboratory*, Aberdeen Proving Grounds, Maryland, September, 2002.

“Multiaxial Fatigue Modeling of Aircraft Engine Materials: Recent Developments,” *Materials Directorate, Air Force Research Laboratory*, Wright-Patterson Air Force Base, Dayton, Ohio, June 2002.

“Multiaxial Fatigue Evaluation of Ti-6Al-4V under Simulated Mission Histories,” *7<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, West Palm Beach, Florida, May 2002.

“Effect of Frequency and Mean Stress on the Fatigue Behavior of Glass-Reinforced Nylon,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Dearborn, Michigan, April 2002.

“Multiaxial Fatigue Life Prediction Methods for Notched Bars of Ti-6Al-4V,” *6<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Jacksonville, Florida, March 2001.

“Multiaxial Fatigue Life Predictions for Ti-6Al-4V,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Champaign-Urbana, Illinois, October 2000.

“Evaluation of HCF Multiaxial Fatigue Life Prediction Methodologies for Ti-6Al-4V,” *5<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference*, Phoenix, Arizona, March 2000.

“Frequency and Temperature Effects on the Fatigue Behavior of Glass Fiber Composites,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Detroit, Michigan, April 1999.

“Research Activities at North Dakota State University,” *US Army Cold Regions Research and Engineering Laboratory*, Hanover, New Hampshire, April 1998.

“Time-Dependent Deformations and Damage Accumulation in Laminated Composite Bolted Joints,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Iowa City, Iowa, April 1996.

“Creep Elongation of Bolt Holes Subjected to Bearing Loads in a Polymer Matrix Composite Laminate,” *ASTM Sixth Symposium on Composite Materials: Fatigue and Fracture*, Denver, Colorado, March 1995.

“Creep of Bolted Joints in a Polymer Matrix Composite Laminate,” *The Fourth Annual Iowa Space Conference*, Iowa City, Iowa, November 1994.

“Low Cycle Fatigue Behavior and Variable Amplitude Fatigue Life Calculations for an SRIM Polymer Matrix Composite,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Blacksburg, Virginia, October 1992.

“Constant Amplitude Fatigue Behavior of an SRIM Polymer Matrix Composite,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Dubuque, Iowa, April 1992.

“Strain-Controlled Fatigue Testing of an SRIM Composite,” *Society of Automotive Engineers Fatigue Design and Evaluation Committee Meeting*, Urbana-Champaign, Illinois, October 1991.

### ***Graduate Students***

Sandip Suman, PhD, Spring 2010 (expected), *Fatigue Damage Accumulation in Metals under Multiaxial Loadings*

Eric Goodin, MS, Spring 2008 (expected), *LCF/HCF Interactions under Multiaxial Loadings*

Siegfried Feierabend, MS, Fall 2007, *A Critical Plane Approach for Modeling Multiaxial Fatigue Damage in High Strength Alloys*

Aaran Joneson, MS, Fall 2007, *Fatigue Induced Microcracking in [0/90] Composite Laminates with High Ductility Resin Systems*

Matthew Erickson, MS, Spring 2006, *Development of a Multiaxial Fatigue Model for Metals using a Critical Plane Methodology*

Mitch Okeson, MS, Spring 2005 (co-advisor), *Effects of Moisture and Low Temperature Thermal Cycling on Damage Growth in Fiberglass Laminates*

Edward Peterson, MS, Spring 2004, *The Effects of Moisture, Low Temperature, and Low-Temperature Thermal Cycling on the Strength and Stiffness of Unidirectional Carbon/Epoxy Laminates*

David Booth, MS, Spring 2004, *Design and Flow Analysis of a Water Therapy Device*

Ranjit Patil, MS, Fall 2003, *Micromechanical Stress Analysis of Carbon-Epoxy Composite at Reduced Temperatures*

Greg Finnes, MS, Spring 2003, *Interaction Between Loading Frequency and Surface Temperature on the Fatigue Behavior of a Glass Mat Thermoplastic Composite*

Ahmo Krgo, MS, Fall 2000, *Evaluation of Multiaxial Fatigue Life Prediction Methodologies for Ti-6Al-4V under High Cycle Fatigue Loading*

Served on the Supervisory Committee of over 20 additional graduate students at NDSU.

## **Professional Service Activities**

### *University Service*

- Member, University Awards Selection Committee (2006 – present)
- Member, Research Information Technology Advisory Committee (2006 – present)
- Member, NDSU RFID Steering Committee (2006 – present)
- Reviewer, NDSU Graduate School Doctoral Dissertation Scholarship Proposals and EPSCoR PhD Fellowship Proposals (2006)
- Alternate Member, Computer and Information Technology Planning and Goals Committee (2006)
- Senator (College of Engineering and Architecture), University Senate (2003 – 2006)
- Member & Chair, College of Engineering and Architecture Executive Committee (1997 – 2001)
- Coordinator, MEAM Department ABET Accreditation activities for 2000 re-accreditation review & Co-Author, MEAM Self-Study Report (1999 – 2000)
- Chair, MEAM Assessment Committee (2002 – present)
- Chair (Graduate Program Coordinator), MEAM Graduate Committee (1998 – present)
- Member, MEAM Undergraduate Committee (2000 – 2002)
- Member, MEAM Strategic Planning Committee (2006 – present)
- Member, numerous faculty search committees

### *Professional Service and Outreach*

- Game Coordinator, Bison BEST Hub, BEST Robotics Competition, (2007). This event, sponsored by BEST Robotics Inc. (Boosting Engineering, Science, and Technology), seeks to inspire high school and middle school students to pursue careers in engineering, science, technology, and math through participation in a sports-like science- and engineering-based robotics competition. NDSU hosted a hub

- site for the first time in the fall of 2007, with 16 high school and middle school teams participating
- Member, Society of Automotive Engineers Fatigue Design and Evaluation Committee (1995 – present)
  - Member & Past Officer, North Central Section of SAE (1998 – present). Program Coordinator (1998 – 1999), Secretary/Treasurer (1999 – 2000), Vice-Chair (2000 – 2001), Chair (2001 – 2002)
  - Chair, Composites Task Group, Society of Automotive Engineers Fatigue Design and Evaluation Committee (1997 – 2003)
  - External Examiner, Gbadebo Moses Owolabi's PhD Committee, University of Manitoba, (December 2004)
  - Session Chair, 10<sup>th</sup> National Turbine Engine High Cycle Fatigue Conference, New Orleans (March 2005)
  - Paper Reviewer, *Journal of Composite Materials*, *International Journal of Fatigue*, *Engineering Fracture Mechanics*, *Journal of Engineering Materials and Technology*, *Materials Science and Engineering Journal*, *Composites Journal*, *American Society for Testing and Materials Special Technical Publication 1389: Fatigue and Fracture Mechanics, Vol 31*, *Society of Automotive Engineers publications*
  - Proposal Reviewer, Air Force Office of Scientific Research, Natural Sciences and Engineering Research Council of Canada

#### ***Professional Society Memberships***

- American Society of Mechanical Engineers
- Society of Automotive Engineers
- Pi Tau Sigma, National Mechanical Engineering Honor Society
- Tau Beta Pi, National Engineering Honor Society

#### ***Consulting Activities***

- Webb Enterprises, Inc., West Fargo, ND (1997). Provided engineering assistance to the company for the design and improvement of new and existing products.
- Amity Technology, Fargo, ND (1998). Assisted the company in analyzing failures of beet harvester wheels through testing and analysis of steel samples.
- Handi-Cabinets Etc., Inc, Kindred, ND (2003 – 2004). Served as Technical Advisor on a Phase I SBIR Grant from NIH entitled "Development of a Friction Drive Inclined Platform Lift."
- Case-New Holland, Fargo, ND (2006). Assisted the company in analyzing failures of a hydraulic cylinder rod.

#### ***Public/Community Service***

- Youth Soccer Coach, Red River Soccer Association (2001 – 2007)
- Assistant Scout Leader, Pack 220, Northern Lights Council (2004 – 2005)