

Curriculum Vitae

Bjoern Kiefer

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PERSONAL:

Date/Place of Birth: November 29, 1974/ Neviges (now Velbert),
Germany
Additional Information: Married, 2 daughters.

EDUCATION:

Ph.D. Aerospace Engineering (GPA 4.0/4.0, scale: 4.0-0.0, 4.0 best)
2002-present, Expected graduation date: December 2006,
Texas A&M University, College Station, TX, USA
Advisor: Dr. Dimitris C. Lagoudas
Dissertation: A Phenomenological Constitutive Model for Magnetic Shape Memory Alloys

Diplom (MS) Mechanical Engineering/Applied Mechanics

1996-2001 Ruhr-Universität Bochum, Germany
Grade: Very Good (Top 5% in GPA and graduation time)
Advisor: Prof. Dr.-Ing. Otto T. Bruhns
Thesis: Revisit and Characterization of a Thermomechanically Coupled Constitutive Law for the
Description of Polycrystalline Shape Memory Alloys

Abitur (High School Diploma)

1985-1995 Städtisches Gymnasium Wuppertal-Vohwinkel, Wuppertal, Germany
Salutatorian of Graduating Class (GPA 1.1, scale: 1.0-6.0, 1.0 best)

Foreign Exchanges

1999 Texas A&M University, College Station, TX, USA
1991-1992 Don Antonio Lugo High School, Chino, CA, USA
1988, 1989, 1990 Biannual two week exchanges with high schools in South Tyneside, UK

PROFESSIONAL EXPERIENCE:

- **Graduate Assistant Research, Aerospace Engineering Department, Texas A&M University, 2002-present**
 - Development of a thermodynamically-consistent phenomenological constitutive model for magnetic shape memory alloys under complex magnetomechanical loading
- **Student Research Assistant, Institute of Mechanics, Ruhr-Universität Bochum, Germany, 1997-2001**
- **Visiting Scholar, Centre des Matériaux, Ecole des Mines de Paris, Evry Cedex, France, November 2000-February 2001**
- **Internships/Co-ops:**
 - Siemens AG (KWU), Mülheim a.d.R., Germany 1999
 - FAG OEM und Handel AG, Wuppertal, Germany, 1998
 - Stocko Fasteners GmbH, Wuppertal, Germany, 1997

HONORS AND AWARDS:

- Nomination for the Distinguished Graduate Student Award for Excellence in Research, Texas A&M University, 2006.
- 1st Place 2006 SPIE/ASME Best Student Paper Presentation Contest
- Induction into the Pinnacle Honor Society, Texas A&M University Chapter, 2006
- 4th Place Student Research Week, Texas A&M University, 2006
- Runner-up 2005 SPIE/ASME Best Student Paper Presentation Contest
- Induction into the Honor Society of Phi Kappa Phi, Texas A&M University Chapter, 2003
- DAAD (German Academic Exchange Service) Scholarship for Foreign Studies, 1999
- Nomination for the German National Academic Foundation (Studienstiftung des Deutschen Volkes), Städtisches Gymnasium Wuppertal-Vohwinkel, Wuppertal, Germany, 1995
- Presidential Academic Excellence Award, Don Antonio Lugo High School, 1992

PUBLICATIONS:

Books:

1. Lagoudas, D.C. (Editor), Entchev, P.B., Popov, P.A., Kiefer, B., Machado, L.G., Kumar, P.H. and Hartl, D.J. *Introduction to Modeling and Engineering Applications of Shape Memory Alloys*, Springer Verlag, New York, to appear 2007.

Refereed Journal Publications:

1. Kiefer, B. and Lagoudas, D.C., 2005. *Magnetic Field-Induced Martensitic Variant Reorientation in Magnetic Shape Memory Alloys*. Philosophical Magazine Special Issue: Recent Advances in Theoretical Mechanics, in Honor of SES 2003 A.C. Eringen Medalist G.A. Maugin, **85**(33-35), 4289-4329.
2. Kiefer, B., Karaca, H.E. , Lagoudas, D.C. and Karaman, I., 2006. *Characterization and Modeling of the Magnetic Field-Induced Strain and Work Output in Ni₂MnGa Magnetic Shape Memory Alloys*. Submitted to Journal of Magnetism and Magnetic Materials, 2006.

Papers in Conference Proceedings:

1. Kiefer, B. and Lagoudas, D.C., 2004. *Phenomenological Modeling of Ferromagnetic Shape Memory Alloys*. Proceedings of SPIE, Smart Structures and Materials: Active Materials: Behavior and Mechanics, San Diego, CA, 14-18 March 2004, Vol. 5387, 164-176.
2. Kiefer, B. and Lagoudas, D.C., 2005. *Modeling of the Magnetic Field-Induced Martensitic Variant Reorientation and the Associated Magnetic Shape Memory Effect in MSMAs*. Proceedings of SPIE, Smart Structures and Materials: Active Materials: Behavior and Mechanics, San Diego, CA, 6-10 March 2005, Vol. 5761, 454-465.
3. Kiefer, B. and Lagoudas, D.C., 2006. *Application of a Magnetic SMA Constitutive Model in the Analysis of Magnetomechanical Boundary Value Problems*. To be published in the proceedings of SPIE, Smart Structures and Materials: Active Materials: Behavior and Mechanics, San Diego, CA, 26 February-2 March 2006, Vol. 6170, 330-341.
4. Kiefer, B. and Lagoudas, D.C., 2006. *Modeling of the Stress- and Magnetic Field-Induced Variant Reorientation in MSMAs*. Proceedings of AIAA, paper 1766, 1-15.
5. Kiefer, B. and Lagoudas, D.C., 2006. *Modeling of the Variant Reorientation in Magnetic Shape Memory Alloys under Complex Magnetomechanical Loading*. Proceedings of ESOMAT 2006, to be published in Material Science & Engineering A.

Presentations:

- 17 Conference Presentations (ASME, SES, SPIE, ICCES, MRS, AIAA/SDM and others):
7 Presenter, 8 Co-Author, 2 Posters (List of presentation available upon request).
- 5 Invited Presentations

RESEARCH INTERESTS:

Nonlinear Continuum Mechanics
Constitutive Modeling
Active and Multifunctional Materials, (Magnetic) Shape Memory Alloys
Multi-field Coupling Phenomena
Multi-scaling, Micromechanics
Computational Mechanics, Finite Elements

GRADUATE LEVEL COURSEWORK:Texas A&M University:

Calculus of Variations
Dynamics and Modeling of Mechatronic Systems
Fundamentals of Engineering Fracture Mechanics
Intermediate Heat Transfer
Introduction to the Finite Element Method
Material Science in Engineering
Mathematical Foundations of Continuum Mechanics
Mechanics of Active Materials
Methods of Applied Mathematics II
Micromechanics
Nonlinear Finite Element Methods in Structural Mechanics
Plasticity Theory
Principles of Fluid Motion

Spacecraft Dynamics and Control
Texture and Anisotropy in Materials
Theory of Elasticity

Ruhr-Universität Bochum:

Advanced Fluid Mechanics
Advanced Structural Mechanics
Continuum Mechanics
Fundamentals of Fluid Flow Machines
Fundamentals of Measurement Technology and Control Engineering
Industrial Engineering
Machine Dynamics
Turbomachinery
Measurement Technology Laboratory
Applied Mechanics Laboratory

SELECTED STUDENT RESEARCH AND CLASS RELATED PROJECTS:

1. *Design of a Vertical Lift Platform*. Student Research Project (AERO 685). Department of Aerospace Engineering, Texas A&M University, December 1999.
2. *Implementation and Verification of a SMA Material Law into an Object-Oriented FE code*. Student Research Project (Studienarbeit). Lehrstuhl für Technische Mechanik der Ruhr-Universität Bochum, Bochum, Germany and Centre des Matériaux, Ecole des Mines de Paris, Evry Cedex, France, June 2001.
3. *The Nonlinear Coupling of the Transient Heat Transfer Problem to the Phase Transformation in a Polycrystalline Shape Memory Alloy Bar*. Class project MEMA 626, Texas A&M University, Spring 2004.
4. *Prediction of Effective Elastic Properties of a Polycrystalline Material with Known Single Crystal Behavior Based on the Mori-Tanaka Method*. Class Project MEMA 625 (with Parikshith Kumar), Texas A&M University, Spring 2003.

PROFESSIONAL MEMBERSHIPS:

- American Institute of Aeronautics and Astronautics (AIAA)
- American Society of Mechanical Engineers (ASME)
- Verein Deutscher Ingenieure (Society of German Engineers, VDI)
- German Scholars Organization (GSO)

TEACHING EXPERIENCE:

- Tutoring of high school students (Math, Science, English, German, Latin)
- Teaching Assistant, Statics, Ruhr-Universität Bochum, Fall 2001
- Teaching Assistant, Continuum Mechanics, Texas A&M University, Fall 2003
- Teaching Assistant, Multifunctional Materials, Texas A&M University, Fall 2005

LEADERSHIP POSITIONS:

- Senior Ph.D. Student Shape Memory Alloy Research Team (SMART), Department of Aerospace Engineering, Texas A&M University, 2004-present
- Supervisor for undergraduate and master level research assistants, Department of Aerospace Engineering, Texas A&M University, 2005-present
- Senior Student Research Assistant, Institute of Mechanics, Ruhr-Universität Bochum, Germany, 2000-2001

LANGUAGES:

German (native), English (near native), French (basic), Latin (certified proficiency)

COMPUTER SKILLS:

Operating Systems: DOS, Windows, UNIX, LINUX

Languages: FORTRAN, PASCAL, C++, HTML

Scientific Computing: Maple, Mathematica, Matlab

FEM Software: ABAQUS, COMSOL Multiphysics (FEMLAB), Zebulon

Software: MS Office, LaTeX, Xfig

VOLUNTEER SERVICE:

- Tutoring of German exchange students at the Department of Mechanical Engineering, Texas A&M University, 2002-present
- Judge Undergraduate Summer Research Grants (USRG) Program, Texas A&M University

HOBBIES:

- Sports (active and spectator): Volleyball, Basketball, Soccer, Golf
- Reading
- Painting, Art
- My Family

REFERENCE:

- Letters of support are available upon request