KEN GALL
Professor
School of Materials Science and Engineering
Woodruff School of Mechanical Engineering
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SUMMARY

Professor Gall's research combines polymer chemistry, materials science, bioengineering, and mechanical engineering in order to synthesize and characterize new materials for use in emerging technologies. His specific interests include metallic and polymer biomaterials, mechanically active materials, and nanometer scale materials and characterization. He has published over 125 journal articles, which have been cited over 2,200 times and he has given over 185 professional talks. Over the past seven years, his research, consulting, and entrepreneurial activities have been supported by over $14M. He has provided extensive consulting on materials and engineering for law firms, industry, national labs, and the United States military. His research on shape memory alloys and polymers was the basis for founding MedShape Solutions, a company developing shape memory material based orthopedic devices that has already received FDA clearance for the first shape memory polymer based medical device.

EDUCATION

Ph.D.	1998	Mechanical Engineering	University of Illinois at Urbana-Champaign
M.S.	1996	Mechanical Engineering	University of Illinois at Urbana-Champaign
B.S.	1995	Mechanical Engineering	University of Illinois at Urbana-Champaign

REPRESENTATIVE HONORS

2008 TMS Robert Lansing Hardy Award
2006 Modern Marvels: Invent Now Competition Top 100 Inventions
2005 ASM Bradley Stoughton Award for Young Teachers
2004 ASME Pi Tau Sigma Gold Medal
2001 Presidential Early Career Award for Scientists and Engineers (PECASE)
2000 Sullivan-Carlson Innovation in Teaching Award

REPRESENTATIVE PUBLICATIONS

(1) K. Gall (2009) Understanding, predicting and preventing failure of Ti-Ni shape memory alloys used in medical implants. *Shape Memory Alloys for Biomedical Applications*, Chapter 7, CRC Press, Woodhead Publishing Limited.

(2) C. Yakacki, R. Shandas, D. Safranski, A. M. Ortega, K. Sassaman, and K. Gall (2008) Strong, Tailored, and Biocompatible Shape Memory Polymer Networks. *Advanced Functional Materials*. Vol. 18, pp. 1-8.

(3) C. M. Yakacki, R. Shandas, C. Lanning, B. Rech, A. Eckstein, and K. Gall (2007) Unconstrained Recovery Characterization of shape-memory polymer networks for cardiovascular applications. *Biomaterials*, vol. 28, pp. 2255-2263.

(4) C. P. Frick, K. Spark, T. Lang, and K. Gall (2006) Stress-Induced Martensitic Transformations and Shape Memory at Nanometer Scales. *Acta Materialia,* vol. 54, pp. 2223-2234.

(5) J. Diao, K. Gall and M. L. Dunn (2003) Surface-Stress-Induced Phase Transformation in Metal Nanowires. *Nature Materials*, vol. 2, no. 10, pp. 656-660.

(6) K. Gall and H. Sehitoglu (1999) The Role of Texture in Tension-Compression Asymmetry in Polycrystalline NiTi. *International Journal of Plasticity*, vol. 15, no. 1, pp. 69-92.

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Ph.D.	1998	Mechanical Engineering	University of Illinois at Urbana-Champaign
M.S.	1996	Mechanical Engineering	University of Illinois at Urbana-Champaign
B.S.	1995	Mechanical Engineering	University of Illinois at Urbana-Champaign

APPOINTMENTS

2/07 - Present	*Professor*, School of Materials Science and Engineering Georgia Institute of Technology, Atlanta, GA
2/07 - Present	*Professor*, George Woodruff School of Mechanical Engineering Georgia Institute of Technology, Atlanta, GA
3/06 - Present	*Faculty*, Interdisciplinary Bioengineering Graduate Program Georgia Institute of Technology, Atlanta, GA
6/05 - Present	*Chief Technology Officer and Co-Founder* MedShape Solutions, Inc, Atlanta, GA
6/05 - 2/07	*Associate Professor*, School of Materials Science and Engineering Georgia Institute of Technology, Atlanta, GA
6/05 - 2/07	*Associate Professor*, George Woodruff School of Mechanical Engineering Georgia Institute of Technology, Atlanta, GA
1/04 - 1/06	*Consulting Member*, Defense Science Study Group Institute for Defense Analysis (IDA), Washington, DC
8/04 - 6/05	*Graduate Program Chair*, Department of Mechanical Engineering University of Colorado, Boulder, CO
8/03 - 6/05	*Associate Professor*, Department of Mechanical Engineering University of Colorado, Boulder, CO
1/01 - 6/05	*Senior Consulting Engineer* Ponderosa Associates, Ltd., Lafayette, CO
8/99 - 8/03	*Assistant Professor*, Department of Mechanical Engineering

University of Colorado, Boulder, CO

8/98 - 8/99 *Adjunct Professor*, Department of Mechanical Engineering
University of Colorado, Boulder, CO

8/98 - 8/99 *Postdoctoral Research Appointee*, Science Based Materials Modeling Department
Sandia National Laboratory, Livermore, CA

5/98 - 8/98 *Postdoctoral Associate*, Department of Mechanical Engineering
University of Illinois, Urbana, IL

1/95 - 5/98 *Graduate Research Assistant*, Department of Mechanical Engineering
University of Illinois, Urbana, IL

8/94 - 1/95 *Undergraduate Research Assistant*, Department of Mechanical Engineering
University of Illinois, Urbana, IL

5/93 - 8/93 *Mechanical Engineer*, D0 Detector Group
Fermi National Laboratory, Batavia, IL

AWARDS AND HONORS

2008 Faculty Mentoring Award
Georgia Institute of Technology Business Plan Competition

2008 Robert Lansing Hardy Award
National award from TMS for a young scientist with exceptional research promise

2006 Modern Marvels: Invent Now Competition Top 100 Inventions
International award from the History Channel for a shape memory polymer device

2006 Gordon Research Conference
Invited Speaker for the Composites Program

2005 Mechanical Engineering Senior's Choice Award
Department-wide award from CU senior's for advising and mentoring

2005 Mechanical Engineering Professor of the Year
Department-wide award from CU undergraduates for excellence in teaching

2005 Bradley Stoughton Award for Young Teachers
International award from ASM International

2004 Pi Tau Sigma Gold Medal
National award from ASME for outstanding achievement within 10 years of graduation

2004 Faculty Appreciation Award
College-wide award from CU students in the Multicultural Engineering Program (MEP)

2004 Teacher Recognition Award
University-wide award from the CU Student Alumni Association

2004 Ralph R. Teetor Educational Fellow
International award from the Society of Automotive Engineers (SAE)

2003 Subaru Educator Spotlight Award
University-wide award from Subaru of America for excellence in teaching and research

2002 Boulder Faculty Assembly (BFA) Award for Excellence in Teaching
University-wide award given by the CU Chancellor

2001 Presidential Early Career Award for Scientists and Engineers (PECASE)
National award given by the President of the United States

2001 Early Career Scientist and Engineer Award
National award from the US National Nuclear Security Defense Program

2001 Junior Faculty Development Award (JFDA)
University-wide award from the CU Graduate School

2000 Sullivan-Carlson Innovation in Teaching Award
College-wide award from students in the CU College of Engineering

1998 Graduate Research Travel Award
University-wide award given by the University of Illinois Graduate School

1998 Alwin Schaller Graduate Student Paper Presentation Grant
Department-wide award given by the University of Illinois

1997 Alwin Schaller Graduate Student Paper Presentation Grant
Department-wide award given by the University of Illinois

1997 Teaching Incentive Grant
College-wide award given by the General Electric Corporation

1997 Hershede Engineering Fellowship
National award given by the Sigma Chi Foundation

1996 Hershede Engineering Fellowship
National award given by the Sigma Chi Foundation

1994 Fred Eggers Undergraduate Award
University-wide award given to an outstanding undergraduate student

1992 NCAA Division III Academic All-American
National award given to an outstanding college level scholar-athlete

BOOK CHAPTERS

1. Understanding, predicting and preventing failure of Ti-Ni shape memory alloys used in medical implants. *Shape Memory Alloys for Biomedical Applications*, Chapter 7, CRC Press, Woodhead Publishing Limited (2009).

JOURNAL PUBLICATIONS (OVER 2,200 CITATIONS, JULY 2009)

1. L. Ferranti, K. Gall, and N. N. Thadhani (2009) Microstructure and Mechanical Properties of Particle-Filled Aluminum-Hematite Epoxy Composites. *In Review.*

2. K. Smith, S. Sawicki, M. Hyjek, S. Downey, and K. Gall (2009) Enhancing Toughness of Photopolymerizable (Meth)Acrylate Networks Under Hydrated Conditions. *In Review.*

3. S. Kasprzak, B. Wester, T. Raj, M. Allen, and K. Gall (2009) Photopatterning of Thiol-ene/acrylate Copolymers. *In Review.*

4. M. A. DiPrima, K. Gall, D. L. McDowell, R. Guldberg, A. Lin, T. Sanderson, D. Campbell, and S. Arzberger (2009) Deformation of Epoxy Shape Memory Polymer Foams: Part I Experimental and Macroscale Modeling. *In Review.*

5. M. A. DiPrima, K. Gall, D. L. McDowell, R. Guldberg, A. Lin, T. Sanderson, D. Campbell, and S. Arzberger (2009) Deformation of Epoxy Shape Memory Polymer Foams: Part II Mesoscale Simulation and Modeling. *In Review.*

6. E. Wornyo, G. S. May, and K. Gall (2009) Modeling the Deposition of Shape Memory Polymers for Information Storage. *In Review*.

7. C. M. Yakacki and K. Gall (2009) A Review of Shape-Memory Polymers for Biomedical Applications. *In Press Advances in Polymer Sciences.*

8. C. M. Yakacki, H. Khalil, K. Gall, and D. J. Pacaccio (2009) Compression Forces of Internal and External Ankle Fixation Devices with Simulated Bone Resorption. *In Press Foot and Ankle International.*

9. K. Smith, J. Temenoff, and K. Gall (2009) On the Toughness of Photopolymerizable Acrylate Networks for Biomedical Applications. *In Press Journal of Applied Polymer Science.*

10. T. Keim and K. Gall (2009) Synthesis, Characterization, and Cyclic Stress-Influenced Degradation of a Poly(ethylene)glycol based Poly(beta-amino ester). *In press Journal of Biomedical Materials Research.*

11. C. M. Yakacki, J, Griffis, M. Poukalova, and K. Gall (2009) Bearing Area: A New Indication for Suture Anchor Pullout Strength? *Journal of Orthopedic Research*, Vol. xx, pp. 1-7.

12. M. Lucas, E. Riedo, K. Gall (2009) Tip size effects on Atomic Force Microscopy Nanoindentation of a gold single crystal. *Journal of Applied Physics*, vol. 104, no. 11, art. 113515.

13. C. M. Yakacki, N. Satarkar, K. Gall, R. Likos, and Z. Hilt (2009) Shape-Memory Polymer Networks with Fe_3O_4 Nanoparticles for Remote Activation. *Journal of Applied Polymer Science,* vol. 112, pp. 3166-3176.

14. A. Sharp, A. M. Ortega, D. Restrepo, D. Curran-Everett, and K. Gall (2009) In Vivo Penetration Mechanics and Mechanical Properties of Mouse Brain Tissue at Micrometer Scales. *IEEE Transactions on Biomedical Engineering*, vol. 56, no. 1, pp. 45-53.

15. B. Lin, K. Gall, H. J. Maier, and R. Waldron (2009) Structure and Thermomechanical Behavior of NiTiPt Shape Memory Alloy Wires. *Acta Biomaterilia,* vol. 5, pp. 257-267.

16. D. Safranski and K. Gall (2008) Effect of Chemical Structure and Crosslinking Density on the Thermo-Mechanical Properties and Toughness of (Meth)Acrylate Shape Memory Polymer Networks. *Polymer.* Vol. 49, pp. 4446-4455.

17. J. Diani, A. M. Ortega, K. Gall, S. Kasprzak, and A. R. Greenberg (2008) On the Relevance of a 8-Chain Model and a Full Network Model For the Deformation and Failure of Networks Formed Through Photopolymerization of Multifunctional Acrylates. *Journal of Polymer Science Part B: Polymer Physics,* Vol. 46, no. 12, pp. 1226-1234.

18. M. D. Allendorf, R. J. Houk, L. Andruszkiewicz, A. A. Talin, J. Pikarsky, A. Choudhury, K. Gall, and P. J. Hesketh (2008) Stress-Induced Chemical Detection Using Flexible Metal-Organic Frameworks. *J. Am. Chem. Soc*., vol. 130, no. 44, pp. 14404-14405.

19. M. T. McDowell, A. M. Leach, and K. Gall (2008) On The Elastic Modulus of Metallic Nanowires. *Nanoletters*, vol. 8, No. 11, pp. 3613-3618.

20. A. M. Ortega, S. Kasprzak, C. M. Yakacki, J. Diani, A. R. Greenberg, and K. Gall (2008) Structure-Property Relationships in Photopolymerizable Polymer Networks: Effect of Composition on the Crosslinked Structure and Resulting Thermomechanical Properties of a (Meth)Acrylate System. *Journal of Applied Polymer Science,* vol. 110, pp. 1559-1572.

21. A. Creuzinger, L. J. Bartol, K. Gall, and W. C. Crone (2008) Fracture in Single Crystal NiTi. *Journal of The Mechanics and Physics of Solids*, vol. 56, pp. 2896-2905.

22. C. Yakacki, R. Shandas, D. Safranski, A. M. Ortega, K. Sassaman, and K. Gall (2008) Strong, Tailored, and Biocompatible Shape Memory Polymer Networks. *Advanced Functional Materials*. Vol. 18, pp. 1-8.

23. M. Lucas, A. M. Leach, M. T. McDowell, S. E. Hunyadi, K. Gall, C. J. Murphy, and E. Riedo (2008) Plastic Deformation of pentagonal silver nanowires: Comparison between AFM nanoindentation and atomistic simulations. *Physical Review B*, #245429.

24. M. T. McDowell, A. M. Leach, and K. Gall (2008) Bending and Tensile Deformation of Metallic Nanowires. *Modeling and Simulation in Materials Science and Engineering.* Vol. 16, #045003.

25. K. Gall, J. Tyber, G. Wilkesanders, S. Robertson, R. O. Ritchie, and H. J. Maier (2008) Effect of Microstructure on the Fatigue of NiTi Shape Memory Alloys. *Materials Science and Engineering A.* Vol. 486, pp. 389-403.

26. F. Yang, W. P. King, E. Wornyo, and K. Gall (2008) Thermomechanical Formation and Recovery of Nanoindents in a Shape Memory Polymer Studied Using a Heated Tip. *Scanning.* Vol. 30, pp. 197-202.

27. C. M. Yakacki, S. Willis, C. Luders, and K. Gall (2008) Deformation Limits in Shape Memory Polymers. *Advanced Engineering Materials*, vol. 10, no. 1-2, pp. 112-119.

28. C. M. Yakacki, M. B. Lyons, B. Rech, K. Gall, and R. Shandas (2008) Cytotoxicity and Thermomechanical Behavior of Biomedical Shape-Memory Polymer Networks Post-Sterilization. *Biomedical Materials*, vol. 3, no. 015010.

29. T. Zhu, J. Li, A. Samanta, A. Leach, and K. Gall (2008) Temperature and Strain-Rate Dependence of Surface Dislocation Nucleation. *Physical Review Letters*, vol. 100, 025502.

30. M. A. DiPrima, M. Lesniewski, K. Gall, D. L. McDowell, T. Sanderson, D. Campbell (2007) Thermo-Mechanical Behavior of Epoxy Shape Memory Polymer Foams. *Smart Materials and Structures,* vol. 16, pp. 2330-2340.

31. J. McCormick, J. Tyber, R. DesRoches, K. Gall, and H. J. Maier, (2007) Structural Engineering with NiTi. Part II: Mechanical and Scaling. *Journal of Engineering Mechanics*, vol. 133, no. 9, pp. 1019-1029.

32. J. Tyber, J. McCormick, K. Gall, R. DesRoches, H. J. Maier, and A. E. A. Maksoud (2007) Structural Engineering with NiTi. Part I: Basic Materials Characterization. *Journal of Engineering Mechanics,* vol. 133, no. 9, pp. 1009-1018.

33. J. Diani and K. Gall (2007) Molecular Dynamics Simulations of the Shape Memory Behavior of Polyisoprene. *Smart Materials and Structures,* vol. 16, pp. 1575-1583.

34. D. C. Miller, B. L. Boyce, M. T. Dugger, T. E. Buchheit, and K. Gall (2007) Characteristics of a Commercially Available Silicon-on-Insulator MEMS Material. *Sensors and Actuators A*, vol. 138, pp. 130-144.

35. R. L. Bartz, K. Mossoni, J. Tyber, J. Tokish, K. Gall, and P. N. Siparsky (2007) A Biomechanical Comparison of Initial Fixation Strength of Three Different Methods of Anterior Cruciate Ligament Soft Tissue Graft Tibial Fixation: Resistance to Monotonic and Cyclic Loading. *American Journal of Sports Medicine*, vol. 35, no. 6, pp. 949 - 954.

36. F. Yang, E. Wornyo, K. Gall, and W. P. King (2007) Nanoscale Indent Formation in Shape Memory Polymers Using a Heated Probe Tip. *Nanotechnology*, vol. 18, 285302.

37. E. Wornyo, K. Gall, F. Yang, W. P. King (2007) Nanoindentation of Shape Memory Polymer Networks. *Polymer*, vol. 48, pp. 3213-3225.

38. D. C. Miller, B. L. Boyce, K. Gall, and C. R. Stoldt (2007) Galvanic Corrosion Induced Degradation of Tensile Properties in Micromachined Polycrystalline Silicon. *Applied Physics Letters*, vol. 90, 191902-191904.

39. C. M. Yakacki, R. Shandas, C. Lanning, B. Rech, A. Eckstein, and K. Gall (2007) Unconstrained Recovery Characterization of shape-memory polymer networks for cardiovascular applications. *Biomaterials*, vol. 28, pp. 2255-2263.

40. D. C. Miller, W. L. Hughes, Z. L. Wang, K. Gall, and C. R. Stoldt (2007) Mechanical Effects of Galvanic Corrosion on Structural Polysilicon. *Journal of MicroElectroMechanical Systems,* vol. 16, no. 1, pp. 87- 101.

41. D. Miller, C. F. Hermann, H. J. Maier, S. M. George, C. Stoldt, and K. Gall (2007) Thermo-Mechanical Stability of Thin Film Multilayers: Part II Microstructure Evolution. *Thin Solid Films*. Vol. 515, pp. 3224-3240.

42. D. Miller, C. F. Hermann, H. J. Maier, S. M. George, C. Stoldt, and K. Gall (2007) Thermo-Mechanical Stability of Thin Film Multilayers: Part I Mechanical Behavior of Au/Cr/Si Microcantilevers. *Thin Solid Films*. Vol. 515, pp. 3208-3223.

43. A. Leach, M. McDowell, and K. Gall (2007) Deformation of Top-Down and Bottom-Up Silver Nanowires. *Advanced Functional Materials.* Vol. 17, pp. 43-53.

44. D. C. Miller, M. Talmage, and K. Gall (2006) Incipient Yielding Behavior During Indentation for Gold Thin Films Before and After Annealing. *Journal of Materials Research*, vol. 21, no. 10, pp. 2480-2492.

45. A. Sharp, H. V. Panchawagh, A. Ortega, R. Artale, S. Richardson-Burns, D. S. Finch, K. Gall, R. L. Mahajan and D. Restrepo (2006) Towards a Self-Deploying Shape Memory Polymer Neuronal Electrode. *Journal of Neural Engineering,* vol. 3, pp. L23-L30.

46. M. K. Tripp, C. Stampfer, D. C. Miller, T. Helbling, C. F. Herrmann, C. Hierold, K. Gall, S. M. George and V. M. Bright (2006) The mechanical properties of atomic layer deposited alumina for use in micro- and nano-electromechanical systems. *Sensors and Actuators A*, vol. 130, pp. 419-429.

47. M. Haftel and K. Gall (2006) Density Functional Theory Investigation of Surface-Stress Induced Phase Transformations in FCC Metal Nanowires. *Physical Review B*, vol. 74, no. 3, art. 035420.

48. P. Gramenz, P. Siparsky, K. Gall, R. D'Ambrosia, and R.L. Bartz (2006) Bioabsorbable Polymers Used in Knee Arthroscopy, Part 2: Clinical Results. *Techniques in Knee Surgery,* vol. 5, no. 3, pp. 199-204.

49. P. Siparsky, P. Gramenz, K. Gall, R. D'Ambrosia, and R.L. Bartz (2006) Bioabsorbable Polymers Used in Knee Arthroscopy, Part 1: Basic Science and Application. *Techniques in Knee Surgery*, vol. 5, no. 3, pp. 193-198.

50. H. S. Park, K. Gall, and J. A. Zimmerman (2006) Deformation of FCC Nanowires by Twinning and Slip. *Journal of The Mechanics and Physics of Solids,* vol. 54, pp. 1862-1881.

51. C. P. Frick, K. Spark, T. Lang, and K. Gall (2006) Stress-Induced Martensitic Transformations and Shape Memory at Nanometer Scales. *Acta Materialia,* vol. 54, pp. 2223-2234.

52. K. Gall, Y. Liu, D. Finch, and D. Routkevitch (2006) Instrumented Microindentation of Nanoporous Alumina Films, *Journal of Engineering Materials and Technology,* vol. 128, pp. 225-233.

53. J. Diani, Y. Liu, and K. Gall (2006) Finite Strain Thermo-Viscoelastic Constitutive Model for Shape Memory Polymers. *Polymer Engineering and Science,* vol. 46, pp. 486-492.

54. J. Diao, K. Gall, M. L. Dunn, and J. A. Zimmerman (2006) Atomistic Simulations of the Yielding of Gold Nanowires. *Acta Materialia*, vol. 54, pp. 643-653.

55. Y. Liu, K. Gall, M. L. Dunn, A. R. Greenberg, and J. Diani (2006) Thermomechanics of Shape Memory Polymers: Uniaxial Experiments and Constitutive Model. *International Journal of Plasticty*, vol. 22, pp. 279-313.

56. K. Gall, J. Tyber, V. Brice, C. P. Frick, H. J. Maier, and N. Morgan (2005) Tensile Deformation of NiTi Wires. *Journal of Biomedical Materials Research*, vol. 75A, pp. 810-823.

57. H. S. Park, K. Gall, and J. A. Zimmerman (2005) Shape Memory and Pseudoelasticity in Metal Nanowires. *Physical Review Letters*, vol. 95, 255504. (Republished in Virtual Journal of Nanoscale Science & Technology, vol. 11, no. 12, 2005).

58. K. Gall, J. Diao, M. L. Dunn, M. Haftel, N. Bernstein, and M. J. Mehl (2005) Tetragonal Phase Transformation in Gold Nanowires, *Journal of Engineering Materials and Technology*, vol. 127, pp. 417-422.

59. C. P. Frick, K. Gall, A. M. Ortega, J. Tyber, H. J. Maier, A. El. M. Maksoud, and Y. Liu (2005) Thermal Processing of Polycrystalline NiTi Shape Memory Alloys. *Materials Science and Engineering A,* vol. 405, pp. 34-49.

60. A. M. Ortega, C. P. Frick, K. Gall, J. Tyber, and H. J. Maier (2005) Cast NiTi Shape Memory Alloys. *Advanced Engineering Materials*, vol. 7, no. 6, pp. 492-507.

61. D. C. Miller, K. Gall, and C. R. Stoldt (2005) Galvanic Corrosion of Miniaturized Polysilicon Structures: Morphological, Electrical, and Mechanical Effects. *Electrochemical and Solid State Letters*, vol. 8, no. 9, pp. G223-G226.

62. K. Gall, C. Yakacki, Y. Liu, R. Shandas, N. Willett, and K. S. Anseth (2005) Thermomechanics of the Shape Memory Effect in Polymers for Biomedical Applications. *Journal of Biomedical Materials Research A*, vol. 73, no 3, pp. 339-348.

63. K. Gall, G. Biallas, H. J. Maier, M. F. Horstemeyer, and D. L. McDowell (2005) Environmentally Influenced Microstructurally Small Fatigue Crack Growth in Cast Magnesium. *Materials Science and Engineering A*, vol. 396, pp. 143-154.

64. B. A. Nelson, K. Gall, and W. P. King (2005) Shape Recovery of Nanoscale Imprints in a Thermoset Shape Memory Polymer. *Applied Physics Letters*, vol. 86, no. 103108, pp. 1-3. (Republished in Virtual Journal of Nanoscale Science & Technology, vol. 11, no. 10, 2005).

65. D. Miller, C. F. Hermann, H. J. Maier, S. M. George, C. Stoldt, and K. Gall (2005) Intrinsic Stress Development and Microstructure Evolution of Au/Cr/Si Multilayer Thin Films Subject to Annealing. *Scripta Materialia*, vol. 52, no. 9, pp. 873-879.

66. K. Gall, J. Diao, and M. L. Dunn (2004) The Strength of Gold Nanowires. *Nanoletters*, vol. 4, no. 12, pp. 2431-2436.

67. J. Diao, K. Gall, and M. L. Dunn (2004) Yield Strength Asymmetry in Metal Nanowires. *Nanoletters*, vol. 4, no. 10, pp. 1863-1867.

68. J. Diao, K. Gall and M. L. Dunn (2004) Surface Stress Driven Reorientation of Gold Nanowires. *Physical Review B*, vol. 70, 075413.

69. J. Diao, K. Gall and M. L. Dunn (2004) Atomistic Simulation of the Structure and Elastic Properties of Gold Nanowires. *Journal of the Mechanics and Physics of Solids*, vol. 52, no. 9, pp. 1935-1962.

70. G. Biallas, H. J. Maier, M. Essert, and K. Gall (2004) In-Situ Studies of Short Crack Growth Behavior in Cast AM60B Magnesium. *Materialprüfung (Materials Testing),* vol. 46, no. 7-8, pp. 384-388

71. K. Gall, G. Stefanic, D. Balzar, M. L. Dunn, and Y. Liu (2004) Internal Stress Storage in Shape Memory Polymer Nanocomposites. *Applied Physics Letters,* vol. 85, no. 2, pp. 290-292.

72. C. P. Frick, A. M. Ortega, J. Tyber, K. Gall, and H. J. Maier (2004) Multi-Scale Structure and Properties of Cast and Deformation Processed Polycrystalline NiTi Shape Memory Alloys. *Metallurgical and Materials Transactions A*, vol. 35A, pp. 2013-2025 (Nominated for the TMS/ASM Marcus Grossman Young Author Award)

73. Y. Zhang, M. L. Dunn, K. Gall, J. W. Elam, and S. M. George (2004) Suppression of Inelastic Deformation of Nanocoated Thin Film Microstructures. *Journal of Applied Physics*, vol. 95, no. 12, pp. 8216-8225.

74. K. Gall, P. Kreiner, D. Turner, and M. Hulse (2004) Shape Memory Polymers for MicroElectroMechanical Systems. *Journal of MicroElectroMechanical Systems,* vol. 13, no. 3, pp. 472-483.

75. Y. Liu, K. Gall, M. L. Dunn, and P. McCluskey (2004) Thermomechanics of Shape Memory Polymer Nanocomposites. *Mechanics of Materials,* vol. 36, pp. 929-940. (One of the top 5 most downloaded papers in Mechanics of Materials in 2004).

76. H. Shelton, J. Sullivan, and K. Gall (2004) Analysis of the Fatigue Failure of a Mountain Bike Front Shock. *Engineering Failure Analysis,* vol. 11, pp. 375-386.

77. K. Gall, N. West, K. Spark, M. L. Dunn, and D. Finch (2004) Creep of Thin Film Au on Au/Si Microcantilevers. *Acta Materialia*, vol. 52, no. 8, pp. 2133-2146.

78. M. F. Horstemeyer, N. Yang, K. Gall, D. L. McDowell, J. Fan, and P. Gullet (2004) High Cycle Fatigue of a Die Cast AZ91E-T4 Magnesium Alloy. *Acta Materialia,* vol. 52, no. 5, pp. 1327-1336.

79. P. Towashiraporn, K. Gall, G. Subbarayan, B. McIlvanie, B. C. Hunter, D. Love, and B. Sullivan (2004) Power Cycling Thermal Fatigue of Sn-Pb Solder Joints on a Chip Scale package. *International Journal of Fatigue*, vol. 26, no. 5, pp. 497-510.

80. K. Gall, G. Biallas, H. J. Maier, P. Gullet, M. F. Horstemeyer, and D. L. McDowell (2004) In-Situ Observations of Low-Cycle Fatigue Damage in Cast AM60B Magnesium in an Environmental Scanning Electron Microscope. *Metallurgical and Materials Transactions A*, vol. 35, no. 1, pp. 321-331.

81. K. Gall, G. Biallas, H. J. Maier, P. Gullet, M. F. Horstemeyer, D. L. McDowell, and J. Fan (2004) In-Situ Observations of High Cycle Fatigue Mechanisms in Cast AM60B Magnesium in Vacuum and Water Vapor Environments. *International Journal of Fatigue*, vol. 26, no. 1, pp. 59-70.

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111. K. Gall and M. F. Horstemeyer (2000) Integration of Basic Materials Research Into the Design of Cast Components by a Multi-Scale Methodology. *Journal of Engineering Materials and Technology*, vol. 122, no. 3, pp. 355-362.

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116. K. Gall and H. Sehitoglu (1999) The Role of Texture in Tension-Compression Asymmetry in Polycrystalline NiTi. *International Journal of Plasticity*, vol. 15, no. 1, pp. 69-92.

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121. K. Gall, H. Sehitoglu, Y. I. Chumlyakov, Y. L. Zuev, and I. Karaman (1998) The Role of Coherent Precipitates in Martensitic Transformations in Single Crystal and Polycrystalline Ti-50.8at%Ni. *Scripta Materialia*, vol. 39, no. 6, pp. 699-705.

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124. K. Gall, H. Sehitoglu, and Y. Kadioglu (1997) A Methodology for Predicting Variability in Microstructurally Short Fatigue Crack Growth Rates. *Journal of Engineering Materials and Technology*, vol. 119, no. 2, pp. 171-179.

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126. K. Gall, H. Sehitoglu, and Y. Kadioglu (1996) Plastic Zones and Fatigue-Crack Closure Under Plane-Strain Double Slip. *Metallurgical and Materials Transactions A*, vol. 27, no. 11, pp. 3491-3502.

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PRESENTATIONS AND LECTURES

2008

1. Characterization of Toughness in Photopolymerizable Acrylate Networks for Biomedical Applications. MRS Conference, Boston, MA.

2. Thermomechanical Characterization of (Qua)ternary Thiol-ene/Acrylate Polymers for Photolithography and Shape Memory Applications. MRS Conference, Boston, MA.

3. Characterization of the Damage Mechanisms in Epoxy Shape Memory Polymer Foam during Cyclic Deformation. MRS Conference, Boston, MA.

4. Shape Memory Polymers for Soft Tissue Fixation, Society for Biomaterials, Atlanta, GA.

5. The Chemistry and Mechanics of Shape Memory Polymers for Biomedical Applications, University of Illinois, Urbana, IL.

6. *Keynote Lecture:* The Chemistry and Mechanics of Shape Memory Polymers for Biomedical Applications, GEARS Conference, University of Colorado, Boulder, CO.

7. Influence of Crosslinking on Network Properties of Photopolymerizable Polymer Networks, GEARS Conference, University of Colorado, Boulder, CO.

2007

8. Effect of Chemistry on the Thermo-Mechanical Shape-Memory Properties of Acrylate Networks, MRS Conference, Boston, MA.

9. Design of Shape Memory Polymers for Biomedical Applications, MRS conference, Boston, MA.

10. Shape Memory Polymers and Their Biomedical Applications, Kimberly-Clark, Atlanta, GA.

11. Atomistic Characterization of the Elastic Bending Behavior of Metallic Nanowires, Society of Engineering Science (SES), College Station, TX.

12. Deformation Limits of Shape Memory Polymers, Society of Engineering Science (SES), College Station, TX.

13. Characterization Epoxy Shape Memory Polymer Foams, Society of Engineering Science (SES), College Station, TX.

14. Nanoindentation of Shape Memory Polymer Networks, Society of Engineering Science (SES), College Station, TX.

15. Shape Memory Polymer Networks for Biomedical Applications, Society of Engineering Science (SES), College Station, TX.

16. Shape Memory Polymers for Biomedical Applications, University of Southern Mississippi, Hattiesburg, MS.

17. NiTi and NiTiPt Shape Memory Alloys, Abbot Labs, Santa Clara, CA.

18. Deformation and Shape Recovery in Polymer Networks, School of Polymers, Textiles and Fiber Engineering, Georgia Institute of Technology, Atlanta, GA.

19. Shape Memory Polymers, ASM/AIAA Meeting, Georgia Institute of Technology, Atlanta, GA.

20. Thermal Properties of an Open Cell Epoxy Shape memory Polymer Foam, SAMPE, 2007.

21. Thermo-mechanical Behavior of Adaptive Foam, SAMPE, 2007.

22. Effect of Crosslink Density on the Deformation of Shape Memory Polymer Networks. Photopolymerization Summer 2007 Meeting, Breckenridge, CO.

23. Tailored Recovery of Biocompatible Shape Memory Polymer Networks. Photopolymerization Summer 2007 Meeting, Breckenridge, CO.

24. Deformation and Stability of Metallic Nanowires, MatModel2007, Hamburg, Germany.

25. High-resolution Prototyping of Polymer Based Chronic Electrodes. Society for Neuroscience Annual Meeting, San Diego, CA.

26. Deformation and Shape Recovery in Photopolymerized Networks. Photopolymerization Summer 2007 Meeting, Breckenridge, CO.

27. Deformation of Top-Down and Bottom-Up Nanowires. Materials Research Society (MRS), San Francisco, CA.

28. Shape memory Polymers for Biomedical Applications. Materials Research Society (MRS), San Francisco, CA.

29. Structure-Property Relationships in Photo-Polymerizable Polymer Networks Demonstrating Shape-Memory Behavior. Materials Research Society (MRS), San Francisco, CA.

30. Deformation Mechanism of Silver Nanowires. APS Meeting, Denver, CO.

31. Effect of Crosslinking Structure on the Shape Recovery of Shape Memory Polymer Networks, SPIE Meeting, San Diego, CA.

32. Etch-Induced Nanoscale Flaws Influence the Strength of Several Silicon Microfabrication Technologies, 2007 Annual TMS Meeting, Orlando, FL.

2006

33. Strain Rate, Temperature, and Size Dependence of Surface Dislocation Nucleation in Nanopillars Materials Research Society (MRS), Boston, MA.

34. Shape Memory Materials in Orthopaedic Surgery: Future of Fixation? Foot and Ankle Institute of Virginia, 4th Annual Surgical Skills Workshop, Las Vegas, NV.

35. Mechanics of Neuronal Probe Insertion at Micrometer Scales, NIH Neural Interfaces Workshop, Bethesda, MD.

36. Phase Transformations at Small Scales, Georgia Tech and Nancy Workshop, Metz, France.

37. Shape Memory Capacitors for Next Generation Embedded Actives, 2006 Electronic Components and Technology Conference, San Diego, CA.

38. Mechanical Properties of Mouse Brain Tissue at Micrometer Scales, Society for Neuroscience 36th Annual Meeting.

39. Thermo-Mechanical Modeling of Shape Memory Polymers, MRS Spring Meeting, San Francisco, CA.

40. Shape Memory and Pseudoelasticity in Metal Nanowires, MRS Spring Meeting, San Francisco, CA.

41. Exploring the Mechanical Properties of Ag Nanowires and Au Thin Films, MRS Spring Meeting, San Francisco, CA.

42. In-Vivo Penetration Mechanics and Mechanical Properties of Mouse Brain Tissue at Micrometer Scales, Society of Engineering Sciences, SES 2006, University Park, PA.

43. Shape Memory and Pseudoelasticity in Metal Nanowires, Society of Engineering Sciences, SES 2006, University Park, PA.

44. MEMS Enabled Mechanical Testing of Nano-Scale Gold and Zinc-Oxide Specimens, Society of Engineering Sciences, SES 2006, University Park, PA.

45. Simulating the Deformation of Silver Nanowires, Society of Engineering Sciences, SES 2006, University Park, PA.

46. Shape-Memory Effect in Polymer Networks: Influence of the Glass Transition Temperature and Crosslink Density, Society of Engineering Sciences, SES 2006, University Park, PA.

47. Thermo-Mechanical Finite Deformation Behavior of Shape Memory Polymers, Society of Engineering Sciences, SES 2006, University Park, PA.

48. In-vitro Recovery of Shape Memory Polymer Stents, BIO2006, ASME Summer Bioengineering Conference, Amelia Island, FL

49. Self-Deploying Shape Memory Polymer Neuronal Electrode Arrays, BIO2006, ASME Summer Bioengineering Conference, Amelia Island, FL.

50. Shape Memory Polymers and Their Composites, Gordon Research Conference, Ventura CA.

51. Tensile Deformation of NiTi Wires, The International Conference on Shape Memory and Superelastic Technologies, Pacific Grove, CA.

52. Shape Memory and Pseudoelasticity in FCC Metal Nanowires, The International Conference on Shape Memory and Superelastic Technologies, Pacific Grove, CA.

53. Stress-Induced Martensitic Transformations and Shape Memory at Nanometer Scales. The International Conference on Shape Memory and Superelastic Technologies, Pacific Grove, CA.

54. Micromechanical Finite Element Simulations of High Strain Rate Effects on Void Growth and Coalescence, 7th World Congress on Computational Mechanics, Los Angeles, CA.

55. *Keynote Lecture:* Computations of Nanowire Stability and Deformation, 7th World Congress on Computational Mechanics, Los Angeles, CA.

56. Deformation of FCC Nanowires by Twinning and Slip, 7th World Congress on Computational Mechanics, Los Angeles, CA.

57. Shape Memory and Pseudoelasticity in Metal Nanowires, 7th World Congress on Computational Mechanics, Los Angeles, CA.

58. *Plenary Lecture:* Shape Memory and Pseudoelasticity at Nanometer Scales, ESOMAT, Bochum, Germany.

59. Mechanical- and Materials- Aspects of Polysilicon Subjected to Galvanic Corrosion, 2006 TMS Annual Meeting and Exhibition.

60. Galvanic Corrosion: A Microsystems Device Integrity and Reliability Concern, SPIE MOEMS-MEMS Micro & Nanofabrication 2006 Conference.

61. Deformation and Cyclic Loading of Metallic Nanowires, International Conference on Fatigue, Atlanta, GA.

62. Influence of humid environment on fatigue behaviour of cast AM60B magnesium, International Conference on Fatigue, Atlanta, GA.

63. Effect of Material Structure on the Fatigue of NiTi Shape Memory Alloys, International Conference on Fatigue, Atlanta, GA.

64. In-Situ Observations of Fatigue Crack Growth in Cast Mg Cycled in an Environmental SEM, International Conference on Fatigue, Atlanta, GA.

65. Getting Grants and Fellowships, AIESEC, Georgia Institute of Technology, Atlanta, GA.

66. Stability and Deformation of Metallic Nanowires, Brown University, Providence, RI.

67. Stability and Deformation of Metallic Nanowires, University of Illinois at Chicago, Chicago, IL.

68. Structure and Properties of Shape Memory Alloys at Multiple Length Scales, Guidant Corporation, Santa Clara, CA.

69. Shape Memory Polymer Stents, Prescient Medical, Doylestown, PA.

70. Advanced Biomaterials: Choices and Challenges, Prescient Medical, Doylestown, PA.

71. Structure and Properties of Shape Memory Alloys at Multiple Length Scales, Prescient Medical, Doylestown, PA.

72. Shape Memory Polymers, SURE Program, Georgia Institute of Technology, Atlanta, GA.

73. Structure-Property Characterization and Modeling of Shape Memory Polymer Foams, Raytheon, Tucson, AZ.

74. Orthopedic Fixation with Shape Memory Materials, MedVestors, Boning Up on the Orthopedic and Spine Market, Morris Plains, NJ.

75. MedShape Solutions Shape Memory Polymer ACL Fixation, University of Colorado, Boulder, CO.

2005

76. Slow Deployment of Shape Memory Polymer Neuronal Probes, Society for Neuroscience 35th Annual Meeting, Washington, DC.

77. Nanoindentation of NiTi Shape Memory Alloys, 3rd Annual HPPT Meeting, Knoxville, TN.

78. Shape Memory Polymer Networks and Their Biomedical Applications, MRS Fall Meeting, Boston, MA.

79. Nanoindentation of NiTi Shape Memory Alloys, MRS Fall Meeting, Boston, MA.

80. Shape Memory Polymers: Experiments and Modeling Studies. NSF-sponsored 2005 China/USA/Japan Joint Chemical Engineering Conference, Beijing, China.

81. Shape Memory Polymers, Materials Science & Technology 2005, Pittsburgh, PA.

82. Correlation of Morphology and Microstructure Evolution Nanometer Grain-Sized Au/Cr Films Subject to Annealing, Materials Science & Technology 2005, Pittsburgh, PA.

83. Shape Memory Polymers for Biomedical Applications, First International Conference on Mechanics of Biomaterials and Tissues, Waikoloa, HI.

84. Optimized Thermomechanics of a Shape Memory Polymer Stent to Recover at Body Temperature, 2005 ASME Summer Bioengineering Conference, Vail, CO (2nd Place PhD student competition).

85. Martensitic Phase Transitions in Metallic Nanowires, APS March Meeting, Los Angeles, CA.

86. The Strength of Gold Nanowires, ASME/ASCE/SES Conference on Mechanics and Materials, Baton Rouge, LA.

87. Nanoindentation of NiTi Shape Memory Alloys, ASME/ASCE/SES Conference on Mechanics and Materials, Baton Rouge, LA.

88. Correlation of Morphology and Microstructure Evolution for Annealed Au/Cr/Si Thin Films, ASME/ASCE/SES Conference on Mechanics and Materials, Baton Rouge, LA.

89. Optimizing the Thermomechanics of Shape-Memory Polymers for Biomedical Applications, ASME/ASCE/SES Conference on Mechanics and Materials, Baton Rouge, LA.

90. Yield of Gold Nanowires, Mechanical Behavior of Thin Films and Small Structures, TMS2005, San Francisco, CA.

91. Phase Transformation and Reorientation in Gold Nanowires, Mechanical Behavior of Thin Films and Small Structures, TMS2005, San Francisco, CA.

92. Thermomechanics of Thin Film Au for Micro/Nano Scale Engineering, Mechanical Behavior of Thin Films and Small Structures, TMS2005, San Francisco, CA.

93. Atomistic Modeling of Metal Nanowires, Sandia National Laboratory, Albuquerque, NM.

94. Computational and Experimental Nanomechanics. Oak Ridge National Laboratory, Nanoscience Conference, Knoxville, TN.

95. Shape Memory Materials, Georgia Institute of Technology, MSE Umbrella Society, Atlanta, GA 30332.

96. Mechanics of Materials at Small Scales, Georgia Institute of Technology, Materials Council, Atlanta, GA 30332.

97. Atomistic Modeling of Metal Nanowires, University of South Carolina, Department of Chemistry, Columbia, SC.

98. Biomedical Applications of Shape Memory Polymers, Composite Technology Development, Lafayette, CO.

99. Atomistic Modeling of Metal Nanowires, Stanford University, Department of Materials Science and Engineering, Palo Alto, CA.

100. Atomistic Modeling of Metal Nanowires, Naval Research Laboratory, Washington, DC.

101. Recent Advances in Shape Memory Materials, University of Wyoming, Department of Mechanical Engineering, Laramie, WY.

102. Recent Advances in Shape Memory Materials, University of Michigan, Department of Aerospace Engineering, Ann Arbor, MI.

103. Shape Memory Polymers, Massachusetts Institute of Technology, Program for Polymer Science and Technology, Boston, MA.

104. Atomistic Modeling of Metal Nanowires, Los Alamos National Laboratory, Albuquerque, NM.

105. Shape Memory Polymers, University of Nebraska, Mechanical Engineering, Lincoln, NE.

2004

106. Microstructure-Property Relationships in Polycrystalline NiTi Shape Memory Alloys. Shape Memory and Superelastic Technologies (SMST), Baden-Baden, Germany.

107. Galvanic Cell Formation During MEMS Release Processes: Implications for Sub-Micron Device Fabrication, ASME International Mechanical Engineering Congress & Exposition, Anaheim, CA.

108. Stability and Structural Transition of Gold Nanowires Under Surface Stresses, Materials Research Society (MRS), Boston, MA.

109. Thermal Processing of Polycrystalline NiTi Shape Memory Alloys, Materials Research Society (MRS), Boston, MA.

110. Cast NiTi Shape Memory Alloys, Materials Research Society (MRS), Boston, MA.

111. The Yield of Atomic and Nanometer Scale Metal Wires, Materials Research Society (MRS), Boston, MA.

112. Shape Memory Polymers for Biomedical Applications, Materials Research Society (MRS), Boston, MA.

113. Morphology and Microstructure Evolution of Multilayer Au/Cr/Si Thin Films Subject to Annealing, Materials Research Society (MRS), Boston, MA.

114. Thermomechanics of the Shape Memory Effect in Polymers, Materials Research Society (MRS), Boston, MA.

115. Multi-Scale Structure and Properties of Commercial NiTi Shape Memory Alloys (Lead Presentation), ASM Materials & Processes for Medical Devices Conference (MPMD), St. Paul, MN.

116. Effect of Material Composition and Insertion Rate on the Biocompatibility of Chronically Implanted Microelectrodes, Society for Neuroscience 34th Annual Meeting, San Diego, CA.

117. Thermal Processing of Polycrystalline NiTi Shape Memory Alloys, Society of Engineering Sciences, Lincoln, NE.

118. Thermomechanics of the Shape Memory Effect in Polymers for Biomedical Applications, Society of Engineering Sciences, Lincoln, NE.

119. Heat Treating of Commercial Ni-rich NiTi Shape Memory Alloys for Manufacturability, Society of Engineering Sciences, Lincoln, NE.

120. Thermomechanical Behavior and Reliability of Au/Si MEMS Structures, Society of Engineering Sciences, Lincoln, NE.

121. Cast NiTi Shape Memory Alloys, Society of Engineering Sciences, Lincoln, NE.

122. Stability of Nanowires Under Their Own Surface Stress, Society of Engineering Sciences, Lincoln, NE.

123. Shape Memory Polymers for MicroElectroMechanical Systems, Society of Engineering Sciences, Lincoln, NE.

124. A One-dimensional Constitutive Model for the Thermomechanical Behavior of Shape Memory Polymers, Society of Engineering Sciences, Lincoln, NE.

125. Thermal Processing of Polycrystalline NiTi Shape Memory Alloys, Society of Experimental Mechanics Meeting, Costa-Mesa, CA.

126. Creep and Stress Relaxation in Bilayer Au/Si Microcantilevers, Reliability, Testing, and Characterization of MEMS/MOEMS III, San Jose, CA.

127. Stresses in Shape Memory Polymer Matrix Composites for Biomedical Applications, Denver X-ray Conference, Denver, CO.

128. Atomistic Modeling of Metal Nanowires, University of Colorado, Mechanical Engineering, Boulder, CO.

129. Atomistic Modeling of Metal Nanowires, University of Minnesota, Chemical Engineering and Materials Science, St. Paul, MN.

130. Atomistic Modeling of Metal Nanowires, Georgia Institute of Technology, Materials Science and Engineering, Atlanta, GA.

131. Processing-Structure-Property Relationships in Commercial NiTi Shape Memory Alloys for Biomedical Applications, Boston Scientific, St. Paul, MN.

132. Atomistic Modeling of The Deformation of Gold Nanowires, Northwestern University, Department of Theoretical and Applied Mechanics, Chicago, IL.

133. Shape Memory Polymers, North Carolina State University, Department of Mechanical & Aerospace Engineering, Raleigh, NC.

134. Atomistic Modeling of the Deformation of Metal Nanowires, Mississippi State University, Department of Mechanical Engineering, Mississippi State, MS.

135. Recent Advances in Shape Memory Materials, Sandia National Laboratory, Albuquerque, NM.

136. Mechanical Behavior of NiTi Single Crystals and Related Polycrystalline Phenomenon, Ruhr-Universitat, Intitute fur Werkstoffe, Bochum, Germany.

137. Mechanical Behavior of NiTi Single Crystals and Related Polycrystalline Phenomenon, University of Paderborn, Paderborn, Germany.

138. Recent Advances in Shape Memory Materials, University of Wisconsin, Department of Mechanical Engineering, Madison, WI.

139. Some New Directions in Mechanics/Materials Research, Georgia Institute of Technology, GWW School of Mechanical Engineering, Atlanta, GA.

140. Thermomechanics of Emerging Materials at Small Scales. University of Virginia, Department of Civil Engineering, Charlottesville, VA.

141. Thermomechanics and MEMS/Biomedical Applications of TEMBO Elastic Memory Composite Resins, Composite Technology Development, Lafayette, CO.

142. Some New Directions in Mechanics/Materials Research, Sandia National Laboratory, Livermore, CA.

143. Some New Directions in Mechanics/Materials Research, Nitinol Devices and Components (NDC), Fremont, CA.

2003

144. Shape Memory Behavior of NiTi Castings, Society of Engineering Sciences, Ann Arbor, MI.

145. Linking Standard Processing Practice to Structure and Properties in NiTi Shape Memory Alloys, Society of Engineering Sciences, Ann Arbor, MI.

146. Shape Memory Polymers – Thermomechanics and Applications, Society of Engineering Sciences, Ann Arbor, MI.

147. Surface Stress Induced Phase Transformation in Metal Nanowires, Society of Engineering Sciences, Ann Arbor, MI.

148. Fatigue and Asymmetric Deformation of Nitinol Shape Memory Alloys (Lead Presentation), ASM Materials & Processes for Medical Devices Conference, Anaheim, CA.

149. Shape Memory Polymers for Medical Applications, ASM Materials & Processes for Medical Devices Conference, Anaheim, CA.

150. Effect of Texture on the Behavior of NiTi Shape Memory Alloys, European Symposium on Martensitic Transformations (ESOMAT), Cirencester, England

151. Effect of Al2O3 Nanocoatings on the Thermo-Mechanical Behavior of Au/Si MEMS Structures, IEEE International Reliability Physics Symposium, Dallas, TX.

152. Atomistic Simulation of Metallic Nanowires, Cornell University, Distinguished Lecture Series on Computational Materials and Engineering, Ithaca, NY.

153. Getting Good Grades From Your Students, University of Colorado, Graduate School, Graduate Teacher Program (GTP), Boulder, CO.

154. Deformation of Au/Si Bilayers for MEMS and Atomistic Modeling of Au Nanowires, University of Illinois, Department of Mechanical and Industrial Engineering, Urbana, IL.

155. Thermo-Mechanical Behavior of Nanostructured Materials for MEMS: Coated Au/Si Beams and Shape Memory Polymer Based Composites, Harvard University, Division of Engineering and Applied Sciences, Cambridge, MA.

156. Some Materials Reliability Issues in MEMS, Rocky Mountain IMAPS, Boulder, CO.

2002

157. Multi-Scale Analysis of Au/Si MEMS Structures, Fourteenth U.S. National Congress of Theoretical and Applied Mechanics, Blacksburg, VA.

158. Fatigue of NiTi Shape Memory Alloys, Fourteenth U.S. National Congress of Theoretical and Applied Mechanics, Blacksburg, VA.

159. Shape Memory Polymer Based Nano-Reinforced Composites, Fourteenth U.S. National Congress of Theoretical and Applied Mechanics, Blacksburg, VA.

160. Micro and Macro Issues in NiTi Shape Memory Alloys, International Conference on Plasticity, Aruba, Netherlands Antilles.

161. Atomistic Modeling of Gold, International Conference on Plasticity, Aruba, Netherlands Antilles.

162. Deformation of bi-layer Au/Si MEMS Structures, International Conference on Plasticity, Aruba, Netherlands Antilles.

163. Overview of Shape Memory Single Crystals, NATO Conference, Metz, France.

164. Deformation and Stability of Multi-Layer Au/Si MEMS Structures, Texas A&M University, Department of Mechanical Engineering, College Station, TX.

165. NiTi Shape Memory Alloys: Microstructure, Properties, and Applications, Colorado School of Mines, Golden, CO.

2001

166. Multi-Scale Fatigue of As-Cast lightweight Structural Metals, International Conference on Fracture, Honolulu, HI.

167. Fatigue and Fracture in NiTi Shape Memory Alloys, International Conference on Fracture, Honolulu, HI.

168. Modeling the Deformation of Bi-Layer Thin Films for MEMS, Sixth US National Congress on Computational Mechanics, Dearborn, MI.

169. Thermal Cycling Response of Layered Gold/Polysilicon MEMS Structures, ASME Mechanics and Materials Conference, San Diego, CA.

170. Vickers Micro-Indentation of NiTi Shape Memory Alloys, ASME Mechanics and Materials Conference, San Diego, CA.

171. Micro-Mechanisms of Deformation in Fiber Reinforced Polymer Matrix Elastic Memory Composites, 42nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Seattle, WA.

172. The Deformation of Single Crystal NiTi and Related Modeling Issues, University of California at Berkeley, Department of Mechanical Engineering, Berkeley, CA.

173. Shape Memory Alloys in Medical Devices and Micro-Electro-Mechanical Systems (MEMS), Colorado Med-Tech, Boulder, CO.

174. Shape Memory Alloys for Bio-Medical Applications, University of Colorado, Bio-Medical Engineering Society, Boulder, CO.

2000

175. NiTi Experiments Versus Modeling: Where do we Stand?, SPIE Smart Structures and Materials, Newport Beach, CA.

176. Micro and Macro Deformation of NiTi Single Crystals, ASME Adaptive Structures and Materials, Orlando, FL.

177. Microstructure-Based Modeling of High Cycle Fatigue Mechanisms in Heterogeneous Materials, Cornell University, Department of Civil Engineering, Ithaca, NY.

178. Engineering Aspects of Ceramics, University of Colorado, Department of Fine Arts, Boulder, CO.

179. Single Crystal NiTi Shape Memory Alloys and Related Polycrystalline Phenomenon, Georgia Institute of Technology, GWW School of Mechanical Engineering, Atlanta, GA.

1999

180. Finite Element Study of the Debonding and Fracture Characteristics of Si Particle Clusters in Cast Al-Si Alloys, ASME Summer Meeting, Blacksburg, VA.

181. Relationship Between Fatigue Crack Paths and Second Phase Inclusions in a Premium Cast A356 Al Alloy, 1999, ASME Summer Meeting, Blacksburg, VA.

182. Monotonic and Cyclic Stress-Strain Response of Aged Single Crystal NiTi Shape Memory Alloys, ASME Summer Meeting, Blacksburg, VA.

183. Systems Approach to Materials Selection and Microstructure Design for Discontinuously Reinforced Materials, ASME Winter Meeting, Nashville, TN.

184. Intergranular Constraint in NiTi Shape Memory Alloys, ASME Winter Meeting, Nashville, TN.

185. The Effect of Precipitates on Martensitic Transformations in Single Crystal NiTi Shape Memory Alloys, International Conference on Plasticity, Cancun, Mexico.

186. Engineering Aspects of Ceramics, University of Colorado, Department of Fine Arts, Boulder, CO.

187. Deformation of Precipitated NiTi Single Crystals, Northwestern University, Department of Mechanical Engineering, Evanston, IL.

1998

188. Shape Memory Alloys: Introduction and Current Research Thrusts, University of Illinois, Department of Mechanical and Industrial Engineering, Urbana, IL.

189. Linking Material Length Scales in the Deformation of NiTi Shape Memory Alloys, Southwest Research Institute, Materials Engineering Department, San Antonio, TX.

1997

190. Crack Closure and Microstructurally Short Fatigue Crack Growth Rates, International Conference on Fracture, Sidney, Australia.

GRANTS AND CAPITAL

2009-2010 Expandable Shape-Memory Polymers for Suture Anchors, $839,860, National Institute of Health (NIH), SBIR Phase II, Consultant.

2008-2010 Fabrication and Characterization of NiTi Shape Memory Alloy Nanowires, $350,000, National Science Foundation (NSF), Co-PI.

2008-2009 Injectable and Biodegradable Polymer Scaffold for Aneurysm Repair. $75,000, Johnson and Johnson and Georgia Tech Healthcare innovation award, Co-PI.

2008-2010 Series B Private Placement Investment, $3,000,000, MedShape Solutions, Co-Founder.

2008-2010 Chemo-Mechanics of Fracture in Small Volume Materials, $300,000, National Science Foundation (NSF), Co-PI.

2008-2009 Strategic Partner Investment, $500,000, MedShape Solutions, Co-Founder.

2008-2009 Shape Memory Polymer Based Orthopedic Fixation Devices, $500,000, National Science Foundation (NSF), SBIR Phase II, Consultant.

2008-2008 Multi-Activated Shape-Memory Polymers for Cast Immobilization, $100,000, National Science Foundation (NSF), SBIR Phase I, Consultant.

2008-2008 Expandable Shape-Memory Polymers for Suture Anchors, $100,000, National Institute of Health (NIH), SBIR Phase I, Consultant.

2007-2008 Strategic Partner Investment, $250,000, MedShape Solutions, Co-Founder.

2007-2009 Soft Tissue Orthopedic Fixation with Shape Memory Polymers, $378,940, National Institute of Health (NIH), PI.

2007-2009 Adaptive Materials for Morphing Aircraft Skins, $250,000, Air Force Office of Scientific Research (AFOSR), STTR Phase II, Co-PI.

2007-2007 Prototype Shape Memory Polymers Orthopedic Casting, $75,000, VentureLab Phase II, Georgia Research Alliance, PI.

2007-2010 NIRT: Novel Manufacturing and Modeling Approaches for Multi-Scale Hybrid Magnetic Shape Memory Alloy Nanostructures. $231,631, National Science Foundation (NSF), Co-PI.

2007-2007 Shape Memory Polymer Based Orthopedic Fixation Devices, $50,000, National Science Foundation (NSF), SBIR Phase Ib, Consultant.

2007-2008 Shape Memory Polymer Orthopedic Castings, $200,000, Georgia Research Alliance (GRA) and MedShape Solutions, PI.

2007-2009 Stress-Induced Chemical Detection Using Flexible Nanoporous Coordination Polymers, $150,000, Sandia National Laboratories, Co-PI.

2007-2007 Strategic Partner Investment, $750,000, MedShape Solutions, Co-Founder.

2007-2007 Thermo-Mechanical Testing Equipment, $60,000, Georgia Research Alliance (GRA), PI.

2007-2007 Shape Memory Polymer Based Orthopedic Fixation Devices, $100,000, National Science Foundation (NSF), SBIR Phase I, Consultant.

2006-2007 Properties and Structure of Radio-Opaque NiTi, $50,000, Abbott Labs, PI.

2006-2007 In-Vivo Testing and FDA Clearance Initiation for Shape Memory Orthopedic Devices, $100,000, VentureLab Phase II, Georgia Research Alliance, PI.

2006-2007 Shape Memory Polymer Foams, $50,000, Raytheon University Research Grant, PI.

2006-2006 Series A Private Placement Investment, $800,000, MedShape Solutions, Co-Founder.

2006-2007 Adaptive Materials for Morphing Aircraft Skins, $100,000, Air Force Office of Scientific Research (AFOSR), STTR Phase I, Co-PI.

2006-2007 TEMBO Foam for Morphing Wing Applications, $100,000, Air Force Office of Scientific Research (AFOSR), STTR Phase I, Co-PI.

2006-2006 The Difficult Airway Tube (DAT) a Novel Endotracheal Tube, $10,000, University of Colorado, Technology Transfer Office, Co-PI.

2006-2006 Development of a Cardiovascular Shape-Memory Polymer Stent-Graft for Treatment of Abdominal Aortic Aneurysm (AAA), $20,000, University of Colorado, Technology Transfer Office, Co-PI.

2006-2006 Development of a Shape Memory Polymer ACL Fixation Device, $100,000, University of Colorado, Technology Transfer Office, Co-PI.

2006-2008 R21: Multifunctional Polymer Neuronal Probes, $409,170, National Institute of Health (NIH). PI.

2006-2006 Thermo-Mechanics of Shape Memory Polymer Foams, $34,340, Raytheon, PI.

2006-2006 Development of Prototype Shape Memory Orthopedic Fixation Devices, $25,000, VentureLab Phase I, Georgia Research Alliance, PI.

2006-2009 F31: Biodegradable Shape-Memory Polymer Networks for Orthopedic Fixation Devices, $175,000, National Institute of Health (NIH), Ruth L. Kirschstein National Research Service Award, Individual Fellowship for Alicia M. Ortega, Faculty Sponsor.

2006-2006 Development of A Cardiovascular Shape Memory Polymer Stent, $10,000, University of Colorado, Technology Transfer Office, Co-PI.

2005-2005 Shape Memory Polymers for Aerospace Applications, $10,000, Raytheon, PI.

2005-2008 Optical Windows from Nanostructured Ceramic Composites, $600,000, SBIR Phase II, Department of Defense (DOD), Consultant.

2005-2007 Nanomechanics of Mechanically Active Polymers, $214,000, National Science Foundation (NSF). Co-PI.

2005-2009 NIRT/GOALI: Fundamental Study of Bulk Magnesium Matrix Nanocomposites Fabricated by Ultrasonic Cavitation Based Solidification Processing, $1,270,000, National Science Foundation (NSF). Co-PI.

2005-2007 R21: Development of Shape Memory Polymers for Cardiovascular Use, $388,790, National Institute of Health (NIH). Co-I.

2005-2006 Micro-Mechanics-on-a-Chip: A Universal Testbed for Evaluating Mechanical Reliability of Micro- and Nanostructures, Microsystems and Engineering Sciences Applications (MESA) Project, $100,000, Sandia National Laboratory, PI.

2005-2005 Hybrid Brain Machine Interface (HBMI): A Proposal for a Proof-of-Concept HBMI (Development of Micrometer Scale Polymer Neuronal Probes), $100,000, Coleman Institute. Co-PI.

2005-2008 Internal Startup Funding, $640,000, Georgia Institute of Technology. PI.

2004-2006 Engineered Ceramic Composite Insulators for High Field Magnet Applications, $635,817, SBIR Phase II, Department of Energy (DOE). Consultant.

2004-2005 Nickel Titanium Bone Plate, $15,000, Coleman Institute. Co-PI.

2004-2005 Graft Fixation Devices – An In Vitro Study in Calf Tibia, $12,500, Arthrotek, University of Colorado Health Sciences Center subcontract. PI.

2004-2004 Optical Windows from Nanostructured Ceramic Composites, $100,000, SBIR Phase I, Department of Defense (DOD), Consultant.

2004-2006 NUE: Integration of Nanoscale Research/Technology into a Mechanical Engineering Curriculum, $99,985, National Science Foundation (NSF). Co-PI.

2003-2008 T32: Graduate Training in Cardiovascular Biomechanics and Imaging, $1,050,000, National Institute of Health (NIH). Co-I.

2003-2004 Acquisition of a Nanoindentor System for Micro/Nanosystems Research and Education Efforts, $500,000, National Science Foundation (NSF). Co-PI.

2003-2005 REU Supplement: Shape Memory Polymer Based Nano-Composites for MEMS, $6,000, National Science Foundation (NSF). PI.

2002-2005 Shape Memory Polymer Based Nano-Composites for MEMS, $265,524, National Science Foundation (NSF). PI.

2001-2006 PECASE: Nano/micro Scale Deformation and Damage of Emerging Materials for Defense Applications, $250,000, DOE/Sandia National Laboratories. PI.

2001-2002 Measurement of Micro-scale Material Properties by Indentation, $5,000, University of Colorado, Council for Research and Creative Work, Junior Faculty Development Award. PI.

2001-2001 Advanced Materials in the Sporting Industry: Module Development and Course Supplementation, $10,000, University of Colorado, Engineering Excellence Fund. PI.

2001-2001 Elastic Memory Composites for Deployable Space Structures, $15,000, NASA, Co-PI.

2000-2003 Mechanism Based Multiscale Modeling and Critical Experiments for Lifecycle Engineering of MEMS, $376,448, NSF/Sandia National Laboratories. Co-PI.

1999-2002 Internal Startup Funding, $120,000, University of Colorado. PI.

PHD STUDENTS

Maeling Tapp	PhD, Current	Mechanics and Biology of Polymer Network Scaffolds for ACL Reconstruction.
David Safranski	PhD, Current	Structure and Mechanical Properties of Injectable and Biodegradable Polymers for Biomedical Applications.
Kathryn Smith	PhD, Current	Tailoring the Toughness and Biological Properties of Polymer Networks for Spinal Implant Applications.
Walter Voit	PhD, Current	Large Strain and High Force Shape Memory Polymers.
Alicia Ortega	PhD, Current	Biodegradable and Non-Biodegradable Shape Memory Polymer Networks.
Scott Kasprzak	PhD, 2009	Small-Scale Polymer Structures Enabled by Thiol-Ene Copolymer Systems.
Matthew DiPrima	PhD, 2009	Thermo-Mechanical and Micro-Structural Characterization of Shape memory Polymer Foams.
Edem Wornyo	PhD, 2008	Nanomechanics of Shape Memory Polymers.
Austin Leach	PhD, 2007	Atomistic Modeling of the Mechanical Behavior of Nanometer Scale Metals.
Chris Yakacki	PhD, 2007	Shape-Memory Polymers for Biomedical Applications: An Investigation into Thermomechanics, Recovery Characteristics, and Cytocompatibility.
David Miller	PhD, 2007	Galvanic Corrosion-Induced Damage of Miniaturized Silicon Structures.
Carl Frick	PhD, 2005	Processing, Structure, and Property Relationships in NiTi Shape Memory Alloys at Multiple Length Scales.
Yiping Liu	PhD, 2004	Thermomechancis of Shape Memory Polymers.
Jiankuai Diao	PhD, 2004	Atomistic and Continuum Modeling of the Structure and Mechanical Properties of Metal Nanowires.

MS STUDENTS

Greg Vialle	MS, 2009	Inductive Activation of Magnetite Filled Shape Memory Polymers
Brian Lin	MS, 2009	Structure and Thermomechanical Behavior of NiTiPt Shape Memory Alloy Wires.
David Safranski	MS, 2008	Effect of Chemical Structure and Crosslinking Density on the Thermo-Mechanical Properties and Toughness of (Meth)Acrylate Shape Memory Polymer Networks.

Terra Keim	MS, 2007	Synthesis, Characterization, and Cyclic Stress-Influenced Degradation of a Poly(ethylene)glycol based Poly(beta-amino ester)
Jeff Tyber	MS, 2005	Mechanical Behavior of Materials for Reconstructive Bioengineering Applications.
Alicia Ortega	MS, 2004	Cast NiTi Shape Memory Alloys.
Neil West	MS, 2003	Factors Affecting Creep in Gold on Polysilicon Bi-layer Cantilevered MEMS Beams.
Kevin Juntunen	MS, 2001	Effects of Precipitate Size and Surface Normal Orientation on Micro-Indentation and Compressive Fatigue of NiTi Shape Memory Alloys.
Brian Corff	MS, 2000	High Strain Rate Damage in Ductile Metals.

COURSE INSTRUCTION

Georgia Institute of Technology, 2005-Present

Students provide individual Course Instructor Opinion Surveys online at the end of a course. The maximum score on a question is 5.0 (Strongly Agree) and the minimum is 1.0 (Strongly Disagree), and interpolated medial values are presented. C1, C2, and C3 are cluster scores for "preparation and presentation", "interaction with students", and "assessment of student performance", respectively.

Undergraduate Courses

Year	Term	Course Title	Enrolled Responded	Instructor Effectiveness	C1	C2	C3
2007	Spring	MSE 2001B Engineering Materials	112 39	4.8	4.9	4.6	4.7
2007	Spring	MSE 2001C Engineering Materials	117 49	4.9	4.9	4.7	4.7
2006	Spring	MSE 2001 Engineering Materials	88 31	4.9	4.8	4.8	4.7
2006	Spring	MSE 4403 *(team taught)* Nanomaterials	14 2	4.5	4.2	4.2	3.3

Graduate Courses

Year	Term	Course Title	Enrolled Responded	Instructor Effectiveness	C1	C2	C3
2006	Spring	MSE 8803 *(team taught)* Nanomaterials	12 7	4.3	4.1	4.5	3.8

University of Colorado, 1999-2005

Students provide individual course and instructor Faculty Course Questionnaire (FCQ) ratings anonymously. The cited course and instructor *overall quality* ratings are computed from the average of individual student rankings from a range of 0.0 (very poor) to 4.0 (very good).

Year	Term	Course Title	Enrollment	Instructor	Course	Percentile
2004	Fall	Failure of Materials (U/G)	120	3.96 (A+)	3.85 (A)	99th
2004	Spring	Material Science (U)	174	3.96 (A+)	3.89 (A+)	99th
2003	Fall	Failure of Materials (U/G)	93	3.95 (A+)	3.84 (A)	99th
2003	Spring	Freshman Projects (U)	32	3.85 (A)	3.85 (A)	90th
2002	Fall	Failure of Materials (U/G)	77	3.97 (A+)	3.87 (A)	99th
2002	Spring	Freshman Projects (U)	33	3.88 (A+)	3.85 (A)	95th
2001	Fall	Failure of Materials (U/G)	60	3.90 (A+)	3.83 (A)	95th
2001	Fall	Materials Science I (G)	19	3.78 (A)	3.67 (A)	90th
2001	Spring	Freshman Projects (U)	19	3.93 (A+)	4.00 (A+)	95th
2000	Fall	Failure of Materials (U/G)	33	4.00 (A+)	3.96 (A+)	99th
2000	Spring	Freshman Projects (U)	30	3.96 (A+)	3.75 (A)	95th
1999	Fall	Materials Science I (G)	19	3.89 (A+)	3.67 (A)	95th