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EDUCATION:

Ph.D., Applied Mechanics, June 1990

California Institute of Technology

Thesis Advisor: Professor Wolfgang G. Knauss

Thesis Title: "Time-Temperature Characterization of Solids Containing Multiple Viscoelastic Phases by Numerical Analysis"

MS., Applied Mechanics, June 1986

California Institute of Technology

BS., Engineering Science and Mechanics, June 1985

Summa Cum Laude

Virginia Polytechnic Institute and State University

PROFESSIONAL EXPERIENCE:

Department Chair, Mechanical Engineering, *Northwestern University*, 2007 - present

Visiting Professor, *Helmut Schmidt Universität* and *Technische Universität Hamburg-Harburg*, Hamburg, Germany, September 2006-Aug 2007

Jerome B. Cohen Professor of Engineering, *Northwestern University*, Jan 2004 – present

Full Professor, Mechanical Engineering Dept., *Northwestern University*, Sept. 2003 – present

Secondary Appointment, Materials Science & Eng., *Northwestern University*, June 2003- present

Associate Department Chair, Mechanical Engineering, *Northwestern University*, 2002 - 2006

Associate Professor, Mechanical Engineering Dept., *Northwestern University*, Sept 1998-Aug 2003

Visiting Professor, *Universität der Bundeswehr*, Hamburg, Germany, October 2000-Aug 2001

Assistant Professor, Mechanical Engineering Dept., *Northwestern University*, Oct. 1992 - 1998

Guest Scientist, *DLR-German Air & Space Agency*, Göttingen, Germany, April 1991 - Aug. 1992

Visiting Scientist, *Institut für Fertigungstechnik*, Erlangen, Germany, Aug. 1990 - Nov. 1990

Research Assistant, *California Institute of Technology*, Pasadena, CA, July 1986 - June 1990

Teaching Assistant, *California Institute of Technology*, Pasadena, CA, Sept. 1987-June 1988

Engineer, *Hercules Aerospace*, Salt Lake City, UT, Summer 1985

Research Assistant, Experimental Mechanics Laboratory, *Virginia Tech*, Blacksburg, VA, 1982-85

Engineering Technician, *Naval Research Laboratory*, Washington, D.C., Summers 1982, 1983

HONORS, AWARDS, EDITORSHIPS:

Fellow, *Society for Engineering Science*, 2007

Friedrich Wilhelm Bessel Prize, Alexander von Humboldt Foundation, 2006-07

National Materials Advisory Board member, Jan. 2005 - Dec. 2007

Editorial board, *Mechanics of Advanced Materials and Structures*, 2004 - present

ASME Special Achievement Award for Young Investigators, Applied Mechanics Division, 2003.

Alexander von Humboldt Research Fellowship, 2000-2001

President of the *Society of Engineering Science*, 1999; Vice-President, 1998

DSSG - Defense Science Study Group, Institute for Defense Analysis, 1998-2000

Associate Editor, *ASME Journal of Engineering Materials & Technology*, 1997-2003

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Board of Directors, *Institute for Mechanics and Materials Young Investigators*, 1997
Associate Editor, *Journal of Intelligent Material Systems and Structures*, 1996-2002
Honorable Mention, *McCormick Teacher of the Year Award*, Northwestern Univ. 1997
Board of Directors, *Society for Engineering Science*; 1996-00
Honored in *Celebration of Women Leaders at Virginia Tech*, March 1996
Northwestern Associated Student Government *Faculty Honor Roll* 1996
NSF CAREER Award, 1995-99
ASEE New Mechanics Educator, 1995
ASEE Summer Faculty Fellowship, NASA-Langley, 1993
June and Donald Brewer Junior Professor, endowed chair, Northwestern University, 1992-94
AAUW (American Association of University Women Educational Foundation) Postdoctoral Fellowship, July 1991-July 1992
Special Language Scholarship for Ph.D.'s, *Deutscher Akademischer Austausch-Dienst*, Summer 1990
Caltech Special Institute Fellowship, 1985-86
ESM Departmental Scholarship, Virginia Tech, 1984-85
Finalist, *Woman of the Year Award*, Virginia Tech, 1984-85
T. Marshal Hahn Freshman Engineering Scholarship, Virginia Tech, 1981-82
Member of *Phi Kappa Phi* and *Tau Beta Pi* (National and Engineering Honor Societies)

PUBLICATIONS:

Refereed Journal Articles (for pdf files see <http://www.mech.northwestern.edu/fac/brinson/reference.html>)

- K. Putz, M. Palmeri, L. C. Brinson, *Interplay of Crosslink Density and Nanoparticle Reinforcement in Polymers*, to be submitted to Polymer, Feb 2008.
- A. B. Schoch, K. R. Shull, and L. C. Brinson, *Junction-Controlled Elasticity of Single-Walled Carbon Nanotube Dispersions in Acrylic Copolymer Gels and Solutions*, submitted to Macromolecules, 2008.
- R. Qiao and L. C. Brinson, *Interphase percolation and gradients in polymer nanocomposites*, submitted to Composite Science and Technology, 2008.
- X. Chen, I. Beyerlein and L. C. Brinson, *Curved-Fiber Pull-out Model for Nanocomposites, Part 1: Bonded Stage Formulation*, submitted to Mechanics of Materials, 2008.
- X. Chen, I. Beyerlein and L. C. Brinson, *Curved-Fiber Pull-out Model for Nanocomposites, Part 1: Interfacial Debonding and Sliding*, submitted to Mechanics of Materials, 2008.
- L. M. Hamming, XW Fan, PB Messersmith, LC Brinson, *Mimicking mussel adhesion to improve interfacial properties in composites*, to appear Composite Science and Technology, 2008.
- Wakabayashi K, Pierre C, Dikin D, Ruoff R, Ramanathan T, Brinson LC, Torkelson JM, *Polymer-Graphite Nanocomposites: Effective Dispersion and Major Property Enhancement via Solid-State Shear Pulverization*, Macromolecules, to appear 2007
- Schadler LS, Brinson LC, Sawyer WG, *Polymer nanocomposites: A small part of the story*, Journal of Materials, 59 (3): 53-60 MAR 2007
- H. Liu, T. Ramanathan and L. C. Brinson, *Controlling and Modeling the Interphase in Polymer Nanocomposites*, to be submitted to Mechanics of Materials, 2007.
- T. Ramanathan, A. A. Abdala, S. Stankovich, D. A. Dikin, M. Herrera-Alonso, R. D. Piner, D. H. Adamson, J. Liu, R. S. Ruoff, S. T. Nguyen, I. Ihan A. Aksay, R. K. Prud'homme, L. C. Brinson *Beyond Carbon Nanotubes: TEGO Nanoplates for Polymer Nanocomposites*, submitted to Nature:Nanotechnology, December, (2007).

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- Gao, X. J., D. S. Burton, D. Brown, and L. C. Brinson, *Reorientation in Shape Memory Alloys: Multivariant Model Simulations and Neutron Diffraction Studies*, to be submitted to Acta Materialia, (2007).
- H. Liu and L. C. Brinson, *Reinforcing efficiency of nanoparticles: a simple comparison for polymer nanocomposites*, in press, Composites Science and Technology, 2007.
- H. Shen, H. Li, , L. C. Brinson, *Effect of Microstructural Configurations on the Mechanical Responses of Porous Titanium: A Numerical Design of Experiment Analysis for Orthopedic Applications*, J. Eng. Mater. Tech., in press, 2008.
- M. Panico, L. C. Brinson, *A three-dimensional phenomenological model for martensite reorientation in shape memory alloys*, Journal of the Mechanics and Physics of Solids, v. 55, 2491-2511, (2007).
- Gao, X. J., R. Qiao, D. S. Burton and L. C. Brinson, "Phase diagram kinetics for shape memory alloys: a robust finite element implementation." in press, Journal of Intelligent Material Systems and Structures, (2007).
- Erik D. Spoerke, Naomi G. D. Murray, Huanlong Li, L. Catherine Brinson, David C. Dunand, and Samuel I. Stupp, *Titanium with Aligned, Elongated Pores for Orthopedic Tissue Engineering Applications*, Journal of Biomedical Materials Research, Vol. 84A (2): 402-412 (2008).
- T. Ramanathan, S Stankovich, H. Liu, H. Shen, S.T. Nguyen, and L.C. Brinson, *Graphitic nanofillers in PMMA nanocomposites—An investigation of particle size and dispersion and their influence on nanocomposite properties*, J. Polymer Science: Polym. Phys v. 45:15: 2097-2112 (2007).
- M. E. Kassner, S. Nemat-Nasser, Z. Suo, G. Bao, J. C. Barbour, C. Brinson, H. Espinosa, H. Gao, S. Granick, P. Gumbsch, K. S. Kim, W. Knauss, L. Kubin, J. Langer, B. C. Larson, L. Mahadevan, A. Majumdar, S. Torquato, F. van Swol, *New Directions in Mechanics*, Mechanics of Materials, 37 (2-3): 231-259 (2006).
- H. Shen and L. C. Brinson. *Finite element modeling of titanium foam*. International Journal of Solids and Structures, 44 (1): 320-335, (2007).
- H. Shen and L. C. Brinson, *A numerical investigation of the effect of boundary conditions and representative volume element size for porous titanium*, J. Mech. Matls. Struct., 1 (7): 1179-1205, (2007).
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- Z. He. K. R. Gall and L. C. Brinson, *Use of Electrical Resistance Testing to Redefine the Transformation Kinetics and Phase Diagram for SMAs*, Metall. Mater. Trans. A, 37A (3): 579-587 (2006).
- H. Shen, S. M. Oppenheimer, D. C. Dunand and L. C. Brinson, *Numerical Modeling of Pore Size and Distribution in Foamed Titanium*, Mechanics of Materials, 38 (8-10): 933-944 (2006).
- A. Eitan, F. T. Fisher, R. Andrews, L. C. Brinson, L. S. Schadler, *Reinforcement Mechanisms in MWCNT-Filled Polycarbonate*, Composites Science and Technology, v. 66, pp 1162-1173, (2006).
- McVeigh, C., F. Vernerey, W. K. Liu and L. C. Brinson, *Multiresolution analysis for material design*, Comput. Methods Appl. Mech. Engrg., 195 (37-40): 5053-5076 (2006).
- Liu, H; Brinson, L.C., *A Hybrid Numerical-Analytical Method for Modeling the Viscoelastic Properties of the Polymeric Nanocomposites*, Journal of Applied Mechanics, vol. 73 (5) pp. 758-768 (2006).

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- D. Burton, X. Gao, L. C. Brinson, *Finite element simulation of a self-healing shape memory alloy composite*, Mechanics of Materials vol. 38, pp. 525-537 (2006).
- E. Patoor, D.C. Lagoudas, P.B. Entchev, L.C. Brinson, X. Gao, *Shape memory alloys, Part I: General properties and modeling of single crystals*, Mechanics of Materials vol 38, pp. 391-429 (2006).
- E. Patoor, D.C. Lagoudas, P.B. Entchev, L.C. Brinson, X. Gao, *Shape memory alloys, Part II: Modeling of polycrystals*, Mechanics of Materials vol 38, pp. 430-462 (2006).
- T. Ramanathan, H. Liu and L. C. Brinson, *Functionalized SWNT polymer nanocomposites for dramatic property improvement*, J. Poly. Sci.: Polym. Phys., v. 43, pp. 2269-2279 (2005).
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- L. C. Brinson, I. Schmidt, R. Lammering, *Micro and Macromechanical Investigations of Transformation Behavior of a Polycrystalline NiTi Shape Memory Alloy Using in situ Optical Microscopy*, J. Mech. Physics of Solids, vol. 52:7, pp. 1549-1571 (2004).
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- Fisher, F. T., R. D. Bradshaw, L. C. Brinson. *Fiber Waviness in Nanotube-Reinforced Polymer Composites: I. Modulus predictions using effective nanotube properties*, Composites Science and Technology, 63 (11): pp. 1689-1703 (2003).
- R. D. Bradshaw, Fisher, F. T., L. C. Brinson. *Fiber Waviness in Nanotube-Reinforced Polymer Composites: II. Modeling Via Numerical Approximation of the Dilute Strain Concentration Tensor*, Composites Science and Technology, 63 (11): pp. 1705-1722 (2003).
- Akshantala, N. and L. C. Brinson, *Experimental Study of Viscoelastic Effects and Aging on Elevated Temperature Damage and Failure in Polymer Composites*, Mechanics of Time Dependent Materials, vol 7, pp. 1-19 (2003).
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- X. Gao and L. C. Brinson, *A Simplified Multivariant SMA Model Based on the Invariant Plane Nature of Martensitic Transformation*, J. Intell. Matl Syst. Struct., 13 (12): pp. 795-810 (2002).
- L. C. Brinson, I. Schmidt, R. Lammering, *Micro and Macromechanical Investigations of CuAlNi Single Crystal and CuAlMnZn Polycrystalline Shape Memory Alloys*, Journal of Intelligent Material Systems & Structures, 13 (12): pp. 761-772 (2002).
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- F. Fisher and L. C. Brinson, *Viscoelastic Interphases in Polymer Matrix Composites: Theoretical Models and Finite Element Analysis*, Composite Science and Technology, vol 61, pp. 731-748, (2001).
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- Bradshaw, R. D. and L. C. Brinson, *A Continuous Test Data Method to Determine a Reference Curve and Shift Rate for Isothermal Physical Aging*, Polymer Engineering & Science, vol. 39, pp. 211-235, (1999b).
- Bekker, A., L. C. Brinson, K. Issen, *Localized and Diffuse Thermoinduced Phase Transformation in 1D Shape Memory Alloys*, Journal of Intelligent Material Systems & Structures, vol.9, pp. 355-365, (1998).
- Bekker, A. and L. C. Brinson, *Phase Diagram Based Description of the Hysteresis Behavior of Shape Memory Alloys*, Acta Materialia, vol. 46, pp. 3649-3665, (1998).
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- Huang, M. and L. C. Brinson, *A Multivariant Model for Shape Memory Alloys*, Journal of the Mechanics & Physics of Solids, vol. 46:8, pp. 1379-1409, (1998).
- Bekker, A. and L. C. Brinson, *Temperature Induced Phase Transformation in a Shape Memory Alloy: Phase Diagram Kinetics Approach*, Journal of the Mechanics & Physics of Solids, vol. 45, pp. 949-988, (1997).
- Bradshaw, R. D. and L. C. Brinson, *A Sign Control Method for Fitting and Interconverting Material Functions for Linear Viscoelastic Solids*, Mechanics of Time-Dependent Materials, vol. 1, pp. 85-108, (1997a).

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- Bradshaw, R. D. and L. C. Brinson, *Recovering Continuous Shift Factors from Nonisothermal Physical Aging Test Data: Theory and Experimental Results*, Journal of Engineering Materials & Technology, vol. 119, pp. 233-241(1997b).
- Liao K., Altkorn R.I., Milkovich S.M., Fildes J.M., Gomez J., Schultheisz C.R., Hunston D.L., Brinson L.C., *Long-term durability of glass-fiber reinforced composites in infrastructure applications*, J. Advanced Materials vol. 28 (3), pp. 54-63 (1997).
- Brinson, L. C., T. Belytschko, B. Moran and T. Black, *Design and Computational Methods in Basic Mechanics Courses*, Journal of Engineering Education, April, pp. 159-166, (1997).
- Gates, T. S., D. R. Veazie and L. C. Brinson, *Creep and Physical Aging in a Polymeric Composite: Comparison Between Tension and Compression*, Journal of Composite Materials, Vol. 31, pp. 2478-2498, (1997).
- Bradshaw, R. D. and L. C. Brinson, *Physical Aging in Composites: An Analysis and Method for Time-Aging Time Superposition*, Polymer Engineering & Science, vol. 37, pp. 31-44, (1997).
- Brinson, L. C., M. S. Huang, C. Boller and W. Brand, *Analysis of Controlled Beam Deflections using SMA Wires*, Journal of Intelligent Material Systems & Structures, vol. 8, pp. 12-25, (1997).
- Brinson, L. C. and M. S. Huang, *Simplifications and Comparisons of Shape Memory Alloy Constitutive Models*, Journal of Intelligent Material Systems & Structures , vol. 7, pp. 108-114, (1996).
- Brinson, L. C., S. Hwang and A. Bekker, *Deformation of Shape Memory Alloys Due to Thermo-Induced Transformation*, Journal of Intelligent Material Systems & Structures, vol. 7, pp. 97-107, (1996).
- Brinson, L. C. and T. S. Gates, *Effects of Physical Aging on Long-Term Creep Behavior of Polymers and Polymer Matrix Composites*, International Journal of Solids & Structures, vol. 32, pp. 827-846, (1995).
- Monaghan M. R., L. C. Brinson and R. D. Bradshaw, *Analysis of Variable Stress History on Polymeric Composite Materials with Physical Aging*, Composites Engineering, vol. 4, pp. 1023-1032, (1994).
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- Brinson, L. C. and W. G. Knauss, *Finite Element Analysis of Multi-Phase Viscoelastic Solids*, Journal of Applied Mechanics, vol. 59, pp. 730-737, (1992).
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Books

Polymer Engineering Science and Viscoelasticity, H. F. Brinson and L. C. Brinson, Springer, (2008).

Book Chapters

Balancing Professional and Personal Life, S. E. Randolph, L. C. Brinson, V. A. Cornish and L. S. Schadler, Success Strategies for Women in Science, Peggy A. Pritchard, ed., Elsevier Academic Press, (2006).

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Nanomechanics of Nanoreinforced Polymers F. T. Fisher and L. C. Brinson, in Volume 8 of Handbook of Theoretical and Computational Nanoscience, M. Rieth and W. Schommers, editors, American Scientific Publishers, pp. 253-360 (2006).

Viscoelasticity and Aging of Polymer Matrix Composites, L. C. Brinson and T. S. Gates, Comprehensive Composite Materials: Volume 2: Polymer and Elastomer Matrix Composites, Edited by Ramesh Talreja, Elsevier Science, pp. 333-368,(2000).

Gates, T. S., L. C. Brinson, K. S. Whitley, T. Bai, *Aging During Elevated Temperature Stress Relaxation of IM7/K3B Composite*, ASTM STP 1357: Time-Dependent and Nonlinear Effects in Polymers and Composites, C. T. Sun and R. A. Schapery, Eds., pp. 141-159, (2000).

Editorships

Special Issue of Mechanics of Time Dependent Materials, to honor the career and retirement of Professor H. F. Brinson, L. C. Brinson and D. A. Dillard, Eds., vol. 7, no. 1 (2003).

Special Issue of Journal of Intelligent Material Systems and Structures, for participants in symposium on *Physics, Mechanics and Modeling of Phase Transformations*, Joint ASME/ASCE/SES Summer Meeting, 27 June - 29 June 2001, San Diego CA, L. C. Brinson, S. Govindjee, D. C. Lagoudas, Eds., vol. 13, no. 12, (2002).

Special Volume of ASME Journal of Engineering Materials and Technology for participants in Symposium *Characterization and Modeling of Polymeric Material Systems*, Joint ASME/ASCE/SES Summer Meeting, McNU'97, L. C. Brinson, E. M. Arruda, Eds., Vol. 119, (1997).

Proceedings of the Symposium on the Mechanics of Phase Transformations and Shape Memory Alloys, L. C. Brinson, B. Moran, Eds., *ASME International Congress and Exposition*, Chicago, ASME AMD-Vol. 189, 215 pp., (1994)

Conference Proceedings (* peer-reviewed), Technical Reports

X. Gao, T.L. Turner and L.C. Brinson, "Finite element analysis of adaptive-stiffening and shape-control SMA hybrid composites," Proceedings of SPIE, Smart Structures and Materials 2005: Active Materials: Behavior and Mechanics, W.D. Armstrong ed., 5761, Paper No. 84.

X. Gao, D.W. Brown and L.C. Brinson, "SMA texture & reorientation: Simulations & neutron diffraction studies," Proceedings of SPIE, Smart Structures and Materials 2005: Smart Structures and Integrated Systems, A.B. Flatau ed., 5764, Paper No. 84.

Frank Fisher, Ramanathan Thillaiyan, Lesley Meade, Benjamin Levy, Rod Ruoff, and L. Cate Brinson, *The impact of chemical functionalization on nanoparticle-reinforced polymers: Nanoscale characterization and effective mechanical properties*, American Society for Composites 18th Meeting, October 19-22, 2003.

K. R. Shull, L. C. Brinson, F. N. Nunalee, T. Bai, T. O. Mason, S. H. Carr, *Aging Characterization of Polymeric Insulation in Aircraft Wiring Via Impedance Spectroscopy*, Proceedings of the 5th Joint Conference on Aging Aircraft, Orlando, Florida, 10-13 September (2001).

K. A. Issen, B. Kinsey, L. C. Brinson, L. J. Broadbelt, *Preparing Future Engineering Faculty: A Professional Development Series*, American Society of Engineering Education, 2001.

S. Thelen and L. C. Brinson, *Titanium foam for use in bone implants: Microstructure effects on mechanical properties*, Proceedings of the International Congress for Theoretical and Applied Mechanics, September 2000.

L. C. Brinson, P. J. Cornwell, R. S. Engel, D. J. Inman, *Integrating Software into the Mechanical Systems Curriculum*, 2000.

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- X. Gao, X. Zhang and L. C. Brinson, *SMA Single Crystal Experiments and Micromechanical Modeling for Complex Thermomechanical Loading*, Proceedings SPIE: Active Materials: Behavior and Mechanics, volume 3992, Newport Beach, 6-9 March 2000, pp. 516-523.
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- *Brinson, L. C. and R. Lammering, *Development and Application of One-Dimensional Truss Finite Elements for Shape Memory Alloys*, Adaptive Structures and Material Systems, AD-Vol. 35, G. P. Carman and E. Garcia, Eds. ASME Winter Annual Meeting, New Orleans, November 28-December 3, pp. 1-10, (1993).

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- Brinson, L. C., *Constitutive Behavior of Shape Memory Alloys: one dimensional thermomechanical derivation with non-constant material functions and redefined martensite internal variable*, Conference on Recent Advances in Adaptive and Sensory Materials and their Applications, Virginia Tech, Blacksburg, VA, April 27 - 29, Technomic Publishing Co., C. A. Rogers and R. C. Rogers, Eds., pp. 729-742, (1992).
- Knauss, W. G., G. U. Losi and L. C. Brinson, *Research Report on Fundamental Studies Related to Failure of Adhesively Bonded Structures*, California Institute of Technology, GALCIT SM Report 88-15, 75 pp., August (1988).
- Brinson, L. C. and W. G. Knauss, *Finite Element Procedure for Determination of the Frequency Dependent Properties of Multi-Phase Viscoelastic Materials*, California Institute of Technology, GALCIT SM Report 90-7, 33 pp., May (1990).
- Brinson, L. C. and W. G. Knauss, *Obtaining and Smoothing Viscoelastic Moduli Relaxation Spectra*, California Institute of Technology, GALCIT SM Report 86-37, (1986).

SPONSORED RESEARCH

- Argonne, *Synchrotron X-ray and Computational Studies of Strains in Animal Bones*, co-PI, 9/1/2007 – 8/31/2011
- NIH, *Biomimetic Interfacial Control in Polymer Nanocomposites*, co-PI, 4/1/07-3/31/10
- Ford-Boeing, *Carbon Nano-reinforced Thermoset Polymers*, Principal Investigator, 6/1/2006 – 5/31/2008
- ONR, *Enhancing the Penetration and Fragmentation Behavior of Metallic/Elastomer Composites*, co-PI, 1/4/06 – 1/3/09.
- DOE, *Natural Fiber Nanocomposites*, co-PI, 10/1/2006 – 1/31/08
- Goodrich BRITE award, *Processing, Modeling and Characterization of Nanoreinforced Polymer Composites*, co-PI, 1/1/2006 – 12/31/2007.
- NSF Materials Science and Research Center Interdisciplinary Research Group, *Novel Processing Routes to Nanostructured Polymer Blends and Composites*, co-PI, 9/1/2005 – 8/31/2010
- NSF, *Mechanically- and Biologically-Active Nickel-Titanium Foam as Biomimetic Material for Skeletal Repair*, co-PI, 6/1/2005 – 5/31/2008
- NSF NIRT CMS-0404291: *Interphase Design for Extraordinary Nanocomposites*, Principal Investigator, 9/1/04-8/31/08
- FAA, *Aging of Polymeric Insulation in Aircraft Wiring: Mechanical and Electrical Property Characterization and Correlation*, Principal Investigator, 9/1/03 – 8/31/06
- NASA-Langley URETI, *Bioinspired Design and Processing of Multifunctional Nanocomposites*, Co-Principal Investigator, 7/1/02 – 6/30/07
- NASA-Langley, *Micromechanics – Continuum – Numerical Modeling of Shape Memory Alloys*, Principal Investigator, 1/16/02 - 1/15/06
- NSF Award DMR-0108342, *Organoapatite-Coated Titanium Foam: A Biohybrid for Skeletal Repair*, Co-Principal Investigator, 8/1/01 – 4/30/05
- NASA-Langley, *Nano-, Micro- and Macro-mechanics of Nanoreinforced Polymeric Materials*, Principal Investigator, 10/1/00 – 9/30/03.
- NSF Award POWRE CMS-0074921, *Bone Cell Growth and Strength Characteristics of Microporous Titanium*, Principal Investigator, 9/1/00 – 8/31/01.
- NSF Award CMS 0089977, *Self-Sensing Actuation and Control with SMAs*, 9/1/00 – 9/1/03.
- Los Alamos National Lab, *Development of Physically Based Models for U-6Nb Alloys*, Principal Investigator, 6/1/00 – 6/1/03.

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- FAA, *Aging Characterization and Lifetime Assessment of Polymeric Insulation in Aircraft Wiring*, Principal Investigator, 6/1/00 – 7/31/03.
- NSF-SGER Grant, CMS-9908368, *Micromechanical Testing and Multivariant Model Correlation for Shape Memory Alloys*, Principal Investigator, 6/1/99-6/1/00
- NASA-Langley Research Grant, NCC1-271, *Synergistic Effects of Physical Aging and Damage on Long-term Behavior of Polymer Matrix Composites*, Principal Investigator, 11/1/97-11/1/99
- 3M Nontenured Faculty Grant, *Mechanics of Polymeric and Smart Materials*, Principal Investigator, 12/1/96-12/1/98
- NSF CAREER Award, CMS-9501792, *Characterization and Modeling of Multidimensional SMA Behavior and Coupled Effects of Temperature, Aging Time and Moisture in Polymer Composite Systems*, Principal Investigator, 9/1/95-3/15/00
- NASA-Langley Research Grant, *Effects of Chemical and Physical Aging on Long-Term Behavior of Polymer Matrix Composites*, Principal Investigator, 1/1/95-1/1/98
- NSF-Research Initiation Award, MSS-9308937, *Constitutive and Finite Element Modeling of Shape Memory Alloys*, Principal Investigator, 9/15/93-9/15/96
- Northwestern University Research Grants Committee Award, *Characterization of Multi-Dimensional Shape Memory Alloy Behavior*, Principal Investigator, 6/1/93-6/1/94

INVITED SEMINARS:

- Keynote Speaker, Smart Structure System Technologies Workshop, Prague, Czech Republic, *Porous Shape Memory Materials – Robust Modeling and Characterization*, May 4-7, 2008.
- Southern California Mechanics Tour, Lectures at UCSD, UCLA, USC, Caltech, *Inside Polymer Nanocomposites - interphases and percolation*, March 3-7, 2008
- Keynote speaker at Mechanics of Time Dependent Materials Conference, March 30- April 4, 2008
Gordon Conference, Ventura, CA. *Designer Polymer Nanocomposites*, January 13-18, 2008
- Domain Dinner Speaker for Energy Efficient Transportation, Northwestern University, 3 December 2007
- Keynote speaker at Composites at Lake Louise, Lake Louise, Canada, “*Polymer Nanocomposites - Controlling the Interphase and its Impact*”, Oct 28 – Nov 2, 2007
- US- China NSF Workshop and Summer Institute (UCWSI2007) on Bio- and Nano- Mechanics and Applications, *Polymer Nanocomposites: Mechanics, Modeling and Biomimetics*, August 31 - September 4, 2007, Beijing, China.
- Helmut Schmidt University, Hamburg Germany, *Nanocomposites: Polymers Made Durable and the Vision for Materials Informatics*, 29 June 2007.
- National Research Council, Integrated Computational Materials Engineering Workshop, *Materials Informatics: What, How and Why: Analogy to Bioinformatics*, Irvine NAS Beckman Center, 30 May 2007.
- University of Hamburg, Applied Math Department, *Polymer Nanocomposites: Percolating Interphases*, 3 May 2007.
- TMS Annual Meeting, *Micro to Macro Strain Mapping and Reorientation Based Modeling in Shape Memory Alloys*, San Antonio, TX, Feb 25-28, 2007.
- DSRC Workshop on Reliable Polymers, *Time, Temperature and Aging in Polymers: the Nanocomposite Solution*, Chicago, 8 Feb. 2007
- Technical Universität Hamburg-Harburg, 25 Jan 2007, *Percolated Interphases in Polymer Nanocomposites*.

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- Materials Science and Technology Conference (MS&T) 2006, *Materials Informatics*, 15-19 October 2006.
- TMS Annual Meeting, *Interphase Design in Nanocomposites*, San Antonio, TX, March 12-16, 2006.
- Materials Science Colloquium, Northwestern University, 7 Feb. 2006, *Polymer Nanocomposites and the Interphase*.
- International Institute for Nanotechnology Kick-off Symposium, *Designing Polymer Nanocomposites*, Nov 5-6, 2005.
- Keynote Panel at Materials Science and Technology Conference (MS&T), *Moving Materials Informatics Forward*, Pittsburgh, PA, Sept 25-28, 2005.
- Carbon Nanotube Polymer Composites International Conference, Hamburg, Germany, September 5-7, 2005, *Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- Summer Institute for Nanomechanics, Nanoscale Mechanics, Bio-inspired Hierarchical Structures, and Potential Applications, *Bioinspired Polymer Nanocomposites and Engineered Self-healing Materials*, June 2005.
- International Shape Memory and Damping Conference, Metz France, 10-11 May 2005, *SMA Constitutive Modeling: Applications to Adaptive Control, Self-Healing Composites and Foams*, Princeton University, 15 April 2005, *Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- University of Southern California, 28 March 2005, *Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- Winter Neutron School, Los Alamos National Lab, 7-11 March 2005, *Crystallography of Martensite*.
- Symposium for W. G. Knauss' 70th Birthday, Pasadena CA, Nov. 15-16, 2004, *Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- American Vacuum Society, AVS 51st International Symposium, Anaheim, CA, November 14 - 19, 2004, invited lecture for Nanotube Processing and Composite Materials symposium.
- ICTAM – International Congress on Theoretical and Applied Mechanics, *SMA Hybrid Composites: Self-healing, Self-stiffening and Shape Control Simulations*, Warsaw, Poland, 15-19 Aug 2004.
- Summer Institute for Nanomechanics, Multiscale Modeling and Simulation of Nano Mechanics and Materials, *Polymer Nanocomposites: Challenges of Theory and Experiment*, June 2004
- ASME Department Head Meeting, *Bioengineering and the Neural Engineering Initiative in Mechanical Engineering at Northwestern University*, Clearwater FL, 6-9 March 2004.
- GALCIT 75th Anniversary Symposium, Caltech, 14 Nov 2003, *Scaling Issues in Polymer Nanocomposites*.
- US-Swiss Nanoforum, Basel Switzerland, 13-14 Oct 2003, *Polymer Carbon Nanotube Composites*
- Mechanics of Time-Dependent Materials Conference: Special Symposium honoring Max Williams, Lake Placid, NY, Oct 7-10, 2003, *Geometry and Interphase Effects in Nano-Reinforced Polymer Composites*.
- Workshop on New Directions in Mechanics, DOE, *Nanomechanics to Design Materials of the Future*, Washington, DC, Sept. 2003.
- Michigan Tech, 2 September 2003, "Why Nanocomposites?: Mechanics Issues"
- Los Alamos National Laboratory, 24 July 2003, *Multiaxial SMA Modeling Considering Reorientation Effects*

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- TMS/ASM Spring Symposium: Frontiers in Materials Development: Computation, Nanomaterials, and Alternative Energy, Schenectady, NY, GE, May, 12 2003, *Geometry and Interphase Effects in Nanotube Reinforced Polymer Composites*.
- Texas A&M University, 17 April 2003, “Why Nanocomposites?: Mechanics Issues”
- Duke University, 6 March 2003, “Why Nanocomposites?: Mechanics Issues”
- TMS Meeting, *Modeling and In Situ Observations of Stress Induced Transformation in Shape Memory Alloys*, Keynote speaker for “Martensitic Transformations in Low Symmetry Materials” Symposium. San Diego, CA, 3-6 March 2003.
- Oregon State University, 14 May 2002, “Micromechanics Characterization of Shape Memory Alloys”
- Los Alamos National Laboratory, 12 October 2001, “Micromechanical Modeling and Experiments for Shape Memory Alloys”
- University of Michigan, Distinguished Lecture Series, 27 September 2001, “Micromechanical Modeling and Experiments for Shape Memory Alloys”
- International Workshop Shape Memory Alloys – Experimental Verification and Numerical Modeling, Karlsruhe Germany, 9-11 July 2001, “Micromechanical Modeling and Experiments for Shape Memory Alloys”
- University of Karlsruhe, 23 January 2001, “Micromechanical Modeling of Shape Memory Alloys”
- NASA-Langley, 8-9 January 2001, “Effect of Nanotube Waviness on Nanoreinforced Polymers”
- Universität der Bundeswehr, Hamburg Germany, 18 October 2000, “SMA Modeling: A Multivariant Approach and a Microplane Model”
- Alexander von Humboldt Foundation, Introductory Meeting for 2000-01 Fellows/Awardees, Göttingen Germany, 8-11 October 2000, “Shape Memory Alloy Modeling and Experiments”
- Conference Honoring Retirement of Prof. H. F. Brinson, Virginia Tech, 22-24 September 2000, “Micromechanical Issues in SMA Behavior and Modeling”
- Los Alamos National Laboratory, 9-11 August 2000, Martensite Workshop, “SMA Modeling: A Multivariant Approach and a Microplane Model”
- Hong Kong University of Science and Technology, 24 February 2000, “The Power of Materials and Mechanics - from smart materials to biomaterials”
- Los Alamos National Laboratory, 27 September 1999, “Micromechanical Issues in SMA Behavior and Modeling”
- Texas A&M University, 29 April 1999, “SMA Constitutive Modeling”, and “Updating Undergraduate Engineering Curricula”
- University of Massachusetts - Amherst, 25 February 1999, “Aging and Damage in Viscoelastic Composites”
- The Boeing Company, High Speed Research Workshop, 15 September 1998, “Physical Aging and Damage in Polymer Composites”
- Hong Kong University of Science and Technology, 25 March 1998, “Micromechanical Modeling of Shape Memory Alloys via the Multivariant Approach”
- Gordon Conference, Santa Barbara, CA, 5-9 January 1998, “Aging in Polymeric Composites”
- Northwestern University, 30 October 1997, Tenure Talk: “Mechanics of Shape Memory Alloys”
- NASA-Langley, 11 September 1997, “Characterization and Modeling of Viscoelastic Composites with Nonisothermal Physical Aging”
- Lawrence Livermore National Laboratory, CA, 5-6 December 1996, “Mechanics Modeling of Shape Memory Alloys”

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- 3M - St Paul, MN, 4 November 1996, “Mechanics of Polymeric and Smart Materials”
- NASA-Langley, 17 September 1996, “Aging, Time and Temperature”
- University of Illinois - Urbana-Champaign, 7 December 1995, “Physical Aging in Polymers and Polymer Composites – aging in anisotropic materials under general variable thermomechanical loading”
- NASA-Langley, 17 August 1995, “Physical Aging in Polymers and Polymer Composites – aging in anisotropic materials under general variable thermomechanical loading”
- Michigan State University, 6 December 1994, “Finite Element and Micromechanics Models of Viscoelastic Composites”
- 1993 ASEE Summer Faculty Fellowship Program Final Presentations (selected from other summer fellows in division to present final presentation), Hampton VA, 11-12 August 1993, “Effects of Physical Aging on Long-Term Behavior of Composites”
- NASA-Langley, Hampton, VA, 22 March 1993, “Thermorheologically Complex Behavior of Multiphase Viscoelastic Materials”
- National Institute of Standards and Technology, Gaithersburg, MD, 19 March 1993, “Thermorheologically Complex Behavior of Multiphase Viscoelastic Materials”
- Katholieke Universiteit Leuven, Belgium, 23 September 1992, “Constitutive and Finite Element Modeling of Shape Memory Alloys”
- University of Poitiers, France, 18 September 1992, “Thermorheologically Complex Behavior of Multiphase Viscoelastic Materials” and “Constitutive and Finite Element Modeling of Shape Memory Alloys”
- Free University of Brussels, Belgium, 22 May 1992, “One Dimensional Constitutive Behavior of Shape Memory Alloys”
- Free University of Brussels, Belgium, 21 March 1991, “Finite Element Analysis of Multiphase Viscoelastic Solids”

CONFERENCE PRESENTATIONS:

- Society for Engineering Science, 42nd Technical Meeting, College Station, TX, Oct, 21-25, 2007. *SMA Constitutive Modeling Incorporating Reorientation Effects and Application to Porous Materials*, and *A Numerical Study of Interphase Percolation Effects in the Polymeric Nanocomposites*
- ECCOMAS Thematic Conference on Modelling of Heterogeneous Materials, Prague, Czech Republic, 25-27 June 2007, *The Influence of Nanotube Geometry on Polymer Composite Properties*.
- US National Congress on Computational Mechanics (USNCCM 9), San Francisco, July 23-26, 2007, *SMA Constitutive Modeling Incorporating Reorientation Effects and Application to Porous Materials*.
- American Chemical Society Meeting, Chicago, IL, 25-29 March 2007, *Improved Interfacial Adhesion Between NiTi and PMMA Utilizing a Biomimetic Initiator*.
- ASME IMECE, Nov 2006, Chicago, IL, *Nanoparticle composites utilizing a biomimetic initiator for bone implants; A three dimensional phenomenological model for reorientation in shape memory alloys; Enthalpy relaxation in carbon nanotube polymer composites; Structure, Mechanical and Electrical Properties of model polymer gel nanotube composites; Implementation of shape memory alloy constitutive model in ABAQUS; Graphite nanocomposites: strategies to superior properties; Modeling the creep behavior of polymer*

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- nanocomposites; Curved fiber pullout model for nanocomposites; Effect of bone filling on response of porous Ti as potential new orthopedic implant material.*
- Materials Science and Technology Conference (MS&T) 2006, *Interphases and Aging in Polymer Nanocomposites*, 15-19 October 2006.
- Gordon Conference on Composites, 15-20 Jan 2006, Ventura, CA, Discussion Leader for *New Developments in Experimental Mechanics*, Poster on *Interphase Design in Nanocomposites*.
- Society of Rheology, 77th Annual Meeting, 17-20 Oct 2005, Vancouver, British Columbia, Canada, *Graphene Nanocomposites*.
- Society for Experimental Mechanics, Portland, OR, June 7-9, 2005, *Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- ASME IMECE, 15-19 November 2004, Anaheim, CA, *SMA Hybrid Composites: Self-healing, Self-stiffening and Shape Control Simulations* and *A Hybrid Numerical-Analytical Method for Modeling the Viscoelastic Properties of the Polymeric Nanocomposites*.
- NASA BIMat Workshop, *Interphase effects of nanofillers in polymers*, May 25-26, 2006, Santa Barbara, CA.
- NASA BIMat Workshop, *Polymer Nanocomposites: strength at the interphase*, Jan 31, 2006, Hampton, VA.
- APS Meeting 2006, *Structure and Mechanical Properties of Model Nanotube Composites*.
- NSF NIRT Review presentation, Dec 13, 2005.
- NASA BIMat Workshop, *Polymer Nanocomposites: strength at the interphase*, Oct 7-8, 2004, Hampton, VA.
- Society for Engineering Science 41st Technical Meeting, Lincoln, NE, 11-13 Oct 2004, *Electrical Resistance in SMAs and Controlling and Modeling the Interphase in Polymer Nanocomposites*.
- ASME IMECE, 17-20 Nov 2003, *SMA Hybrid Composites: Self-healing, Self-stiffening and Shape Control Simulations* and *Reorientation in Shape Memory Alloys: Micromechanics and Continuum Modeling*.
- Society for Engineering Science 40th Technical Meeting, *Representing SMA Multivariant Model Simulation Results Using Peak Intensity and Pole Figures* and *SMA Continuum Model with Martensite Reorientation Effects*, Ann Arbor, MI, 12-15 Oct 2003.
- Frank Fisher, Ramanathan Thillaiyan, Lesley Meade, Benjamin Levy, Rod Ruoff, and L. Cate Brinson, *The impact of chemical functionalization on nanoparticle-reinforced polymers: Nanoscale characterization and effective mechanical properties*, American Society for Composites 18th Meeting, October 19-22, 2003.
- 44th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, 7-11 April 2003, Norfolk, VA, "Macroscale Experimental Evidence of a Reduced-Mobility Non-bulk Polymer Phase in Nanotube-reinforced Polymers"
- 39th Annual SES Conference, Penn State University, 13-16 October 2002, "SMA Kinetics Characterization: Micromechanics to Continuum"
- Mini-Conference on Mechanics Innovations, 13-14 September 2002, San Antonio, TX, "Mechanics in Engineering First at Northwestern"
- National Congress for Theoretical and Applied Mechanics, Va Tech, 23-28 June 2002, "Viscoelastic and Nano-geometry Effects in carbon nanotube-reinforced polymers", "A 3-D Two-tier Multivariant Model Based on Hierarchical Structural Characteristic of SMA Martensites"
- SEM Conference, Milwaukee, WI, 10 -12 June 2002, "Viscoelasticity and Physical Aging of Carbon Nanotube-Reinforced Polymers"

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- TMS Conference, Indianapolis, IN, 4-7 November 2001, "Effects of nanotube waviness on the properties of nano-reinforced polymers"
- Sixth U.S. National Congress on Computational Mechanics, Dearborn, Michigan, 1-3 August 2001, "Mechanical response of carbon nanotube-reinforced polymers"
- Joint ASME/ASCE/SES Summer Meeting, 27 June - 29 June 2001, San Diego CA, "Studies of SMA response to cyclic loading: strain rate and cycle dependence with microstructural observations" and "In situ SEM & EBSD Observation of Variant Formation, Detwinning and Reorientation in CuAlNi Single Crystals" and "Effects of curvature on the elastic modulus of carbon nanotube-reinforced polymers"
- Society for Engineering Science 36th Technical Meeting, 21-25 October 2000, Columbia, SC, "Scaling Issues in SMA Modeling and Experiments"
- International Congress for Theoretical and Applied Mechanics, 27 August - 2 September 2000, Chicago IL, "Simplified multivariant model and SEM/EBSD verification of variant formation and switching", "Titanium foam for use in bone implants: Microstructure effects on mechanical properties", and "Three dimensional constitutive model for shape memory alloys based on microplane model"
- SPIE's 7th Annual International Symposium on Smart Structures and Materials, 5-9 March 2000, Newport Beach, CA, "SMA Single Crystal Experiments and Micromechanical Modeling for Complex Thermomechanical Loading"
- Society for Engineering Science 35th Technical Meeting, 24-27 October 1999, Austin, TX, "Micromechanics Issues for SMA Constitutive Modeling"
- ASME Summer Meeting, 26-30 June 1999, Va Tech, "Synergistic Effects of Aging and Damage in Viscoelastic Composites"
- International Plasticity'99 Conference, 5-13 January 1999, Cancun Mexico, "Micromechanics Based Polycrystalline Model for SMAs"
- Society for Engineering Science 34th Technical Meeting, 27-30 September 1998, Pullman, WA, "A Micromechanics Damage Model for Viscoelastic Composites"
- Workshop on Reform of Undergraduate Mechanics Education, Penn State University, 16-18 August 1998, "The Engineering First Curriculum at Northwestern University"
- ASTM Conference, Atlanta, 4 May 1998, "Aging During Elevated Temperature Stress Relaxation of IM7/K3B Composite"
- Mechanics of Time Dependent Materials Conference, Pasadena CA, 3 March 1998, "Physical Aging in Polymers and Composites: A New Analysis Method for Isothermal and Nonisothermal Aging"
- ASME IMECE'97, Dallas, TX, "Two-Phase Zone and Single Interface Solutions for SMAs" and "Combined Aging and Moisture Effects in Polymers and Polymer Matrix Composites"
- Joint ASME/ASCE/SES Summer Meeting, McNU'97, 29 June - 2 July 1997, Evanston IL, "A Multivariant SMA Model" and "A Unified Theory for Macro-scale SMA Kinetic Laws and Phase Diagrams" and "Nonisothermal Physical Aging" and "Mechanics in the Engineering First Curriculum"
- ASEE Annual Meeting, 15-18 June 1997, Milwaukee WI, "Mechanics in the Engineering First Curriculum"
- Society for Engineering Science 33rd Technical Meeting, 20-23 Oct. 1996, Tempe, AZ, "Modeling and behavior of SMAs under multiaxial loading" and "Aging, Time and Temperature"
- ASME Summer Meeting, 12-14 June 1996, Johns Hopkins, "Physical Aging in Polymers and Polymer Composites: Aging in Anisotropic Materials Under General Thermomechanical

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- Loading” and “Toward the Integration of Mechanics, Mathematics and Computational Methods in an Undergraduate Engineering Curriculum”
- Society for Engineering Science 32nd Technical Meeting, 28 Oct. - 1 Nov. 1995, New Orleans, “Thermo-Induced Transformation in Prestressed 1-D SMA Body - Model and Numerical Simulation”
- ASME Summer Meeting, 28-30 June 1995, Los Angeles, “A New Look at SMA Constitutive Models: Comparisons and Micromechanics”
- ASEE Annual Meeting, 25-28 June 1995, Anaheim, “Introducing Basic Finite Elements into Sophomore Mechanics of Materials”
- ASME International Congress and Exposition, 6-11 Nov. 1994, Chicago, “A Macromodel of Thermo-induced Martensite Transformation in a 1-D SMA Polycrystalline Body”
- Society for Engineering Science 31st Technical Meeting, 10-12 Oct. 1994, College Station, TX, “Deformation Wave in 1-D SMA Rod Due to Martensitic Phase Transition Induced by Cooling of the Boundary”
- International Conference on Composites Engineering, 28-31 Aug. 1994, New Orleans, LA, “Analysis of Variable Stress History on Polymeric Composite Materials with Physical Aging”
- Symposium for the 60th Birthday of Wolfgang Knauss, 1-2 February 1994, Pasadena, CA, “Effects of Physical Aging on Long-Term Creep Behavior of Polymers and Polymer Matrix Composites”
- ASME Winter Annual Meeting, 28 November - 3 December 1993, New Orleans, “Development and Application of One-Dimensional Truss Finite Elements for Shape Memory Alloys”
- ASME Winter Annual Meeting, 8-13 November 1992, Anaheim, CA, “Finite Element Analysis of Multiphase Viscoelastic Solids”
- Recent Advances in Adaptive and Sensory Materials and their Applications, 27-29 April 1992, Blacksburg, VA, “Constitutive Behavior of Shape Memory Alloys”

MEMBERSHIP IN TECHNICAL SOCIETIES:

- SES (Society for Engineering Science), 1994- present
Board of Directors, 1995-2000; Vice-President, 1998; President, 1999
- TMS (The Minerals Metals and Materials Society), 2001-present
- SEM (Society for Experimental Mechanics), 1986-present
- ASME (American Society of Mechanical Engineers), 1986-present
Computational Mechanics Committee, 1996-present
- ASEE (American Society for Engineering Education), 1992-present
Director at-large for *Women in Engineering Division*, 1996-98
- American Academy of Mechanics, 1992-present
- AAUW (American Association of University Women), 1994-present

NU ADMINISTRATIVE DUTIES:

- Department Chair, Mechanical Engineering Department, 2007 - present
- Northwestern Honorary Degree Committee, 2007 - present
- Associate Department Chair, Mechanical Engineering Department, 2002 - 2006
- Chair, Search Committee for joint ME-BME faculty line in nanobiomaterials/mechanics, 2005-06
- Acting Department Chair, Mechanical Engineering Department, Jan-March 2004
- McCormick Tenure and Promotion Committee, 2004-2006
- Northwestern Program Review Committee for Athletics and Recreation, 2005

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UFRPTPAD (University tenure/promotion appeal committee), 2003-04
Research Systems Planning Advisory Committee, 2003
Dean Search Committee, Engineering School, 2003
Internal Review Committee, Program Review for Chemistry Department, 2002
Graduate Student Admission Officer, ME Department, 1997 - 2000
Graduate Studies Committee for ME Dept., November 1993 - 2000
Chair of committee, September 1997 - 2000
Coordinator for Mechanics courses Teaching Assistants, 1995-97
Committee on ME Office Efficiency, December 1993 - June 1996
Organizer of Mechanics Colloquia Seminar Series, 1993-95
Committee on Excellence (October 1992-October 1994), including Subcommittees “Hiring, Tenure and Post-Tenure Decisions” and “Selection of Graduate Students”

REVIEWING:

Texts: Mechanics of Solids by Bickford; Mechanical Response of Polymers by Wineman and Rajagopal
Actively review papers for many Journals, including: *Acta Materialia*, *Advanced Materials*, *ASME Journal of Applied Mechanics*, *International Journal of Solids and Structures*, *Journal of the Mechanics and Physics of Solids*, *Journal of Intelligent Material Systems and Structures*, *Journal of Polymer Science*, *Composites Science and Technology*, *Mechanics of Composite Materials and Structures*, *Mechanics of Materials*
NSF Review Panel for Graduate Fellowships, February 15-18, 2004.
NSF Review Panels for Division of Civil and Mechanical Systems (previously Mechanical and Structural Systems), numerous from 1993 - present
Review proposals for AFOSR, ONR, NSF on an ongoing basis.

CONFERENCE ORGANIZATION:

Co-Organizer of symposium on *Advanced Nanocomposite Systems*, ASME/ASCE/SES Summer Meeting, Baton Rouge, LA, June 1-3, 2005.
Co-Organizer of symposium on *Constitutive Relations of Advanced Materials*, ASME IMECE, Washington DC, Nov 15-21, 2003.
Co-Organizer of symposium on *Shape Memory Materials*, SES, Univ. Michigan, Oct. 12-15, 2003.
Co-Organizer of symposium on *Time Dependent Failure Phenomena*, The 14th U.S. Congress of Theoretical and Applied Mechanics, 23-28 June 2002, Blacksburg VA
Co-Organizer of symposium on *Physics, Mechanics and Modeling of Phase Transformations*, Joint ASME/ASCE/SES Summer Meeting, 27 June - 29 June 2001, San Diego CA
Co-Organizer of symposium on Active Materials, SPIE, 2000
Co-Organizer of symposium *Functionally Graded and Shape Memory Materials*, ASME IMECE, Dallas, TX, November 1997.
Co-Organizer of symposium on *Characterization and Modeling of Polymeric Material Systems*, Joint ASME/ASCE/SES Summer Meeting, Northwestern University, June 1997.
Program Co-Chair for McNU'97, Joint ASME/ASCE/SES Summer Meeting, Northwestern University, June 1997.
Co-Organizer for “Engineering Technology Forum”, a short course for integrating design, multi-media and Working Model software into the basic mechanics curriculum, Northwestern University, 4 March 1995

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Co-Organizer of *Symposium on Phase Transformations and Shape Memory Alloys*, ASME IMECE, Chicago, November 1994

Session Developer for Composite Durability; Chair of Session on “Aging, Creep and Durability of Composites I”, International Conference on Composites Engineering, New Orleans, LA, August 28-31, 1994

OTHER PROFESSIONAL ACTIVITIES:

Executive Education Course, Business for Scientists and Engineers, Kellogg Business School, 2008.

Invited review panelist for Deutsche Forschungsgemeinschaft (DFG) in materials science and engineering for new “German Excellence Initiative”, 21-22 June 2007 and 28-30 June 2006.

Invited review panelist for Methusalem Project, Leuven Belgium, 17-19 May 2007.

Thesis committee member, Andrey Vishnevsky, Helmut Schmidt University, Hamburg Germany, May 11, 2007.

Committee Benchmarking US Competitiveness in Mechanical Engineering, National Research Council, 2006

Chair, *Extreme Composites Committee*, National Materials Advisory Board of the National Academy of Engineering, 2004.

Panelist for New Directions in Mechanics Workshop, DOE, Washington DC, September 2003.

Co-author of web-based text for freshman course Dynamics of Systems 1998-02; coordination of asynchronous learning tools for course 2001-02 (<http://othello.mech.nwu.edu/ea3/>).

Structural and Multifunctional Materials Panel for National Materials Advisory Board of the *National Academy of Sciences*, Materials Research for the Defense After Next, Jan. 2001 – Jan 2002.

Advisor and Founder of *Preparing Future Engineering Faculty*, professional development group for Northwestern engineering graduate students, 1999-present

Co-developer of new core undergraduate “Engineering First Curriculum” at Northwestern, 1996-02
Faculty Associate for the Women’s Residential College at NU, 1999-2000

Moderator for the Mechanics Curriculum sessions at the Workshop on Reform of Undergraduate Mechanics Education, Penn State University, 16-18 August 1998

Organized SWE students at NU as coaches for Science Olympiad teams from a local middle school, 1998.

Attended IMM Workshops for Young Investigators (Seattle, October 1996; Albany, August 1997).

MEAS Speaker for NU Admissions Office Forum, 1 June 1997

Resident Associate, Ayers CCI Dormitory on Northwestern Campus, 1995 -1996.

Keynote speaker for “Women in Engineering – the Challenge of the 21st Century” a career workshop for women students and their parents at Northwestern University, 14 May 1994

Speaker at Northwestern SWE student chapter meetings

Panelist for “Women in Science” session of the 1994 *Women in Leadership* conference at Northwestern University

MEAS Academic Panelist for NU Admissions Office Open House, 29 August 1993

GRADUATE STUDENTS AND POSTDOCS

Ph. D. Students:

Fang Yuan, Materials Science and Engineering, *Bone Mechanics Modeling*, PhD expected 2011.

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Sankar Narayanan, Mechanical Engineering, *Molecular Dynamics and Multiscale Modeling of Polymer Nanocomposites*, PhD expected 2011.

Marc Palmeri, Materials Science and Engineering, *Toughening Mechanisms in Nanocomposites*, PhD Expected 2010.

Lesley Meade Hamming, Materials Science and Engineering, *Self-healing polymer nanocomposites utilizing a biomimetic initiator*, PhD expected 2009

Supinda Watcharone, Mechanical Engineering, *Dispersion of nanoparticles in nanocomposites: quantification*, PhD expected 2009.

Michele Panico, Mechanical Engineering, *Multiscale modeling of shape memory alloys*, PhD expected 2008

Grace Chen, Mechanical Engineering, *Fracture Mechanics for Nanoreinforced Polymers*, PhD expected 2007

Andy Schoch, Materials Science and Engineering, *Morphology Control in Polymer Nanocomposites*, PhD expected 2009.

Ray Qiao, Mechanical Engineering, *Percolation in Polymer Nanocomposites*, PhD expected 2009.

Keith Gall, Mechanical Engineering, *Microstructural Measurements of Phase Transformation and Relation to Macroscopic Properties for Shape Memory Alloys*, PhD expected 2008.

Hua Liu, Mechanical Engineering, *Characterization and Modeling of Viscoelastic Behavior of Carbon Nanotube Reinforced Polymers: The Influence of Interphase and Nanotube Morphology*, PhD September 2007. Currently research scientist at Dow Corning.

Huanlong Li, Mechanical Engineering, *Modeling and Simulation of Microporous Titanium: Effects of Morphology with Application to Orthopaedic Implants*, PhD June 2006.

Debbie Burton, Theoretical and Applied Mechanics, *Continuum Models for Shape Memory Alloys for Simulations*, PhD June 2005.

Tao Bai, Mechanical Engineering, *Impedance Spectroscopy and Mechanical Response effects of Physical and Chemical Aging of Polymers*, Ph.D. expected 2006.

Frank Fisher, Mechanical Engineering, MS Thesis: *Combined Aging and Moisture Effects in Polymers and Polymer Matrix Composites*; PhD Thesis: *Nanomechanics and the viscoelastic behavior of carbon nanotube-reinforced polymers*, Ph.D. June 2002, currently Asst. Prof. at Stevens Institute of Technology.

Xiujie Gao, Mechanical Engineering, *Multivariant Modeling and Characterization of SMAs Based on Hierarchical Characteristics of Martensite Crystallography*, Ph.D. March 2002, currently at GM.

Alex Bekker, Applied Math, *Mathematical Modeling of One-Dimensional Shape Memory Alloy Behavior: Phase Diagram Kinetics and Temperature Induced Transformation*, Ph.D. Fall 1997, currently in computer industry in Silicon Valley (exact whereabouts unknown)

MiinShiou Huang, Mechanical Engineering, *A Multivariant Shape Memory Alloy Model*, Ph.D. Fall 1997, Research Associate, Univ. Tenn. 1998, currently at Ford Company.

Roger Bradshaw, Mechanical Engineering, *Nonisothermal Physical Aging in Polymer Composite Materials*, Ph.D. Summer 1997, currently Assistant Professor at University of Louisville.

M. S. Students:

Keith Gall, *Digital Image Correlation Analysis of Shape Memory Alloys*

Ray Qiao, *Numerical Modeling of Shape Memory Alloys and Interfacial Effects in Self-Healing Composites*, MS Feb 2006.

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- James Washington, Mechanical Engineering, *Multi-scale Measurements of Viscoelastic Properties of Polymeric Materials by Tensile and Indentation Deformations*, MS Feb 2006.
- Zhu He, Mechanical Engineering, *Use of Electrical Resistance Testing to Redefine the Transformation Kinetics and Phase Diagram for SMAs*, MS Dec 2004.
- Sarah Thelen, Mechanical Engineering, *Mechanics of Ti- Foam Implant Materials*, MS June 2000.
- Frank Fisher, Mechanical Engineering, *Viscoelastic Behavior of Polymer Matrix Composites with Interphase Effects: Theoretical Models and Finite Element Analysis*, M.S., Fall 1998.
- Richard Hansen, Mechanical Engineering, *Multiviscoelastic Materials in a Single Constrained Layer*, M.S. Spring 1997.
- WenSheng Lin, Mechanical Engineering, *Micromechanics Studies of Multiphase Viscoelastic Composites*, M.S. Winter 1996.
- Shiyi Hwang, Mechanical Engineering, *Behavior of One-Dimensional Shape Memory Alloy Wires with Heat Transfer Effects*, M.S. Winter 1994.

Postdoctoral Fellows:

- Karl Putz, *Thermosetting Nanocomposite Systems and Effects of Nanoparticle Geometry on Interphase and Mobility*, 2006 – present.
- Anny Flory, *Aging and Structural Relaxation in Nanocomposites*, 2005-07, now research scientist at Dow Corning.
- Hui Zhang, *Indentation Mechanics for Polymer Coatings*, 2004-2005
- Hui Shen, *Numerical Micromechanics for Porous Metallic Materials*, 2004 – 2006, currently professor at Ohio Northern University
- Frank Fisher, *Viscoelastic Effects in Nanoreinforced Polymers*, 2002 – 2004, currently professor at Stevens Institute of Technology
- Xiujie Gao, *Micromechanical Shape Memory Behavior – Modeling and Experiments*, 2002-2005, currently at GM
- T. Ramanathan, *Aging Characterization of Polymeric Wiring Insulation Materials and Design and Characterization of Polymer Nanocomposites*, 2001-
- Xiangyang Zhang, *SEM Identification of SMA Variants During Loading*, 1999
- Nagendra Akshantala, *Physical Aging and Damage Mechanics in Composites*, 1997-99, currently at Goodyear Co.
- Martin Monahan, *Physical Aging in Composites – Use of Reduced Time in Viscoelastic Constitutive Equations for Long Term Response*, 1993-94, currently at Baxter Corporation.

Undergraduate Students working on research:

- Rachel Cohn, *Effect of Crosslink Density on Interphase Creation in Polymer Nanocomposites*, summer 2007.
- Angela Alexander, *Polymer Nanocomposites: Carbon Nanotubes and Beyond*, summer 2007.
- Laura Jamison, *Buckyballs in Nanocomposites*, summer 2006
- Jeff Schumacher, *Polymer Nanocomposites*, 2004 - 2005
- Ben Levy, *Imaging and analysis of nano-inclusions in polymers*, 2003 - 2004
- Lesley Meade, *Influence of nanoparticles on polymer mechanical response*, 2002-2005
- Ben Mangrich, *Thermomechanical Testing of SMA wires*, 2003- 2004
- Peter Golovin, *Micromechanical modeling programming*, 2002 - 2003
- Werner Brand, *SMA wire characterization and beam control modeling*, 1994
- Craig Balanos, *Chemical Aging of Polymer Films and Impedance Spectroscopy Testing*, high school teacher summer intern, 2000.

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Mentees:

Kathleen Issen, PhD 2000, currently Assoc. Professor at Clarkson University.

Amy Rechenmacher, PhD 2001, currently Asst. Professor at University of Southern California, received CAREER Award, 2007.

COURSES TAUGHT

Engineering Analysis III: Dynamics of Systems, ENG-205, spring 97-98, spring 98-99, spring 99-00, spring 01-02, spring 02-03, spring 03-04

Mechanics of Materials, CE-216, winter 92-93, spring 92-93, spring 93-94, winter 96-97

Computer Enhanced Mechanics of Materials, CE-216, pilot section, winter 94-95, winter 95-96

Mechanics, CE 212, fall 93-94, fall 94-95

Theory of Elasticity, CE-415, winter 93-94, winter 94-95, fall 95-96, fall 96-97, fall 97-98, fall 2005-06

Mechanics of Advanced Materials, ME-495 (now ME 456), new graduate course, spring 96-97, spring 98-99, fall 01-02, fall 03-04, winter 04-05, winter 07-08.