

L. Catherine Brinson

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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:

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 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:

National Materials Advisory Board member, 2005-2008
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
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*; 1996-98
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

L. Catherine Brinson

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>)

- T. Ramanathan, S Stankovich, S.T. Nguyen, R.S. Ruoff and L.C. Brinson, *An investigation of particle size, dispersion and its influence on global properties of graphite/PMMA nanocomposites*, manuscript in preparation (2005).
- Gao, X. J., D. S. Burton, D. Brown, and L. C. Brinson, *Reorientation in Shape Memory Alloys: Multivariate Model Simulations and Neutron Diffraction Studies*, to be submitted to *Acta Materialia*, Jan. 2005.
- Gao, X. J., D. S. Burton, T. Turner and L. C. Brinson (2005), *Finite Element Simulation of Adaptive Stiffening of SMA Composite Beams*, manuscript in preparation.
- H. Liu, T. Ramanathan and L. C. Brinson, *Controlling and Modeling the Interphase in Polymer Nanocomposites*, to be submitted to *Mechanics of Materials*, 2005.
- Gao, X. J., D. S. Burton and L. C. Brinson, "Phase diagram kinetics for shape memory alloys: a robust finite element implementation." *To be submitted to Journal of Intelligent Material Systems and Structures*, 2005.
- H. Liu, T. Ramanathan and L. C. Brinson, *A Hybrid Numerical-Analytical Method for Modeling the Viscoelastic Properties of Polymer Nanocomposites*, submitted to *Journal of Applied Mechanics*, 2005.
- H. Shen, S. M. Oppenheimer, D. C. Dunand and L. C. Brinson, *Numerical Modeling of Pore Size and Distribution in Foamed Titanium*, to appear *Mechanics of Materials*, 2005.
- Liu, H; Brinson, L.C., *A Hybrid Numerical-Analytical Method for Modeling the Viscoelastic Properties of the Polymeric Nanocomposites*, submitted to *Journal of Applied Mechanics*, 2005.
- T. Ramanathan, H. Liu and L. C. Brinson, *Functionalized SWNT polymer nanocomposites for dramatic property improvement*, submitted to *J. Polymer Science: Polym. Phys.*, 2004.
- T. Ramanathan, F.T. Fisher, R.S. Ruoff, and L.C. Brinson, *Amino-functionalized Carbon Nanotubes for Binding to Polymers and Biological Systems*, in press, *Chemistry of Materials* (2004).
- X. Gao, D. Burton, L. C. Brinson, *Finite element simulation of a self-healing shape memory alloy composite*, in press, *Mechanics of Materials* (2004).
- A. Eitan, F. T. Fisher, R. Andrews, L. C. Brinson, L. S. Schadler, *Reinforcement Mechanisms in MWCNT-Filled Polycarbonate*, submitted to *Composites Science and Technology* (2004).
- Spoerke, E.D., N.G. Murray, H. Li, C.L. Brinson, D.C. Dunand and S.I. Stupp, *Organoapatite-Titanium Foam: A Bioactive Composite for Orthopedic Tissue Engineering*. Submitted to *Acta Biomaterialia*, (2004).
- Li, H., S. M. Oppenheimer, S. I. Stupp, D. C. Dunand, L. C. Brinson, *Effects of pore morphology and bone ingrowth on mechanical properties of Microporous Titanium as an Orthopaedic Implant Material*, *Jap. Materials Transactions*, Special Issue on "Frontiers of Smart Biomaterials" v. 45:4, pp.1124-1131 (2004).
- 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).
- W. Ding, A. Eitan, F.T. Fisher, X. Chen, D.A. Dikin, R. Andrews, L.C. Brinson, L.S. Schadler, and R.S. Ruoff, *Direct observation of polymer sheathing in carbon nanotube-polycarbonate composites*, *Nano Letters*, 3 (11), pp. 1593-1597 (2003).

L. Catherine Brinson

- Xu, Terry T., F. T. Fisher, L. C. Brinson, R. S. Ruoff, *Bone-shaped Nanomaterials for Nanocomposite Applications*, Nanoletters, 3 (8): pp. 1135-1139 (2003).
- Fisher, F. T., A. Eitan, R. Andrews, L. S. Schadler, and L.C. Brinson, *Spectral response and effective viscoelastic properties of MWNT-reinforced polycarbonate*, in press Advanced Composites Letters (2004).
- D. C. Lagoudas, E. Patoor, L. C. Brinson, *Review of Micromechanics Models for Shape Memory Alloys*, submitted to Mechanics of Materials (2003).
- F. L. Addessio, Q. H. Zuo, T. A. Mason and L. C. Brinson, *A Model for High Strain Rate Deformations of Uranium-Niobium Alloys*, J. Applied Physics vol. 93, pp. 9644-9654, (2003).
- 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).
- Fisher, F. T., R. D. Bradshaw, L. C. Brinson. *Effects of Nanotube Waviness on the Mechanical Properties of Nanoreinforced Polymers*. Applied Physics Letters, vol 80, no. 24, pp. 4647-4649, (2002).
- S. L. Thelen, F. Barthelat and L. C. Brinson, *Mechanics Considerations for Microporous Titanium as an orthopedic implant material*, J. Bio Mat. Res., vol. 69A(4), pp. 601-610, (2004).
- 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).
- M. Brocca, L. C. Brinson, Z. P. Bazant, *Three Dimensional Constitutive Model for Shape Memory Alloys Based on Microplane Model*, J. Mech. Physics Solids., vol. 50, pp. 1051-1077 (2002).
- 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).
- Akshantala, N. and L. C. Brinson, *A Damage Evolution Model for Aging Viscoelastic Composite Laminates*, Journal of Composite Technology and Research, vol. 23, pp. 3-14, (2001).
- X. Y. Zhang, L. C. Brinson and Q. P. Sun, *The Variant Selection Criterion in Single Crystal CuAlNi Shape Memory Alloys*”, Journal of Smart Materials and Structures, vol.9, pp. 571-581, (2000).
- Gao, X., M. Huang, and L.C. Brinson, *A Multivariant Micromechanical Model for SMAs: Part 1: Crystallographic issues for single crystal model*. Int. Journal of Plasticity, vol. 16, pp. 1345-1369 (2000).
- Huang, M.S., X. Gao, and L.C. Brinson, *A Multivariant Micromechanical Model for SMAs: Part 2: Polycrystal Model*. Int. J. Plasticity, vol. 16, pp. 1371-1399 (2000).
- Bradshaw, R. D. and L. C. Brinson, *Mechanical Response of Linear Viscoelastic Composite Laminates Incorporating Nonisothermal Physical Aging Effects*, Composite Science and Technology, vol. 59, pp. 1411-1427, (1999a).
- 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).

L. Catherine Brinson

- 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).
- Belytschko, T., A. Bayliss, C. Brinson, S. Carr, W. Kath, S. Krishnaswamy, B. Moran, J. Nosedal and M. Peshkin, *Mechanics in the Engineering First Curriculum at Northwestern University*, International Journal of Engineering Education, Vol. 13:6, (1998).
- Brinson, L. C. and W. S. Lin, *Comparison of Micromechanics Methods for Effective Properties of Multiphase Viscoelastic Composites*, Composite Structures, vol. 41, pp. 353-367, (1998).
- 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).
- 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).
- Brinson, L. C. and R. Lammering, *Finite Element Analysis of the Behavior of Shape Memory Alloys and their Applications*, International Journal of Solids & Structures, vol. 30, pp. 3261-3280, (1993).
- Brinson, L. C., *One Dimensional Constitutive Behavior of Shape Memory Alloys: thermo-mechanical derivation with non-constant material functions and redefined martensite internal variable*, Journal of Intelligent Material Systems & Structures , vol. 4, pp. 229-242, (1993).
- 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).
- Brinson, L. C. and W. G. Knauss, *Thermorheologically Complex Behavior of Multi-Phase Viscoelastic Materials*, Journal of the Mechanics & Physics of Solids, vol. 39, pp. 859-880, (1991).

L. Catherine Brinson

Books

Polymer Engineering Science and Viscoelasticity, H. F. Brinson and L. C. Brinson, in preparation.

Book Chapters

Modeling of Nanocomposites, L. C. Brinson and F. T. Fisher, Handbook of Theoretical and Computational Nanoscience, M. Rieth and W. Schommers, editors, manuscript in preparation (2005).

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 Advanced Materials and Structures, for participants in symposium on *Advanced Nanocomposite Systems*, ASME/ASCE/SES Summer Meeting, June 1-3, 2005, Baton Rouge, LA.

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 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., all manuscripts in review, 2001.

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

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.

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.

L. C. Brinson, P. J. Cornwell, R. S. Engel, D. J. Inman, *Integrating Software into the Mechanical Systems Curriculum*, MEDH Biennial Curriculum Conference, Reasons and Strategies For Major Program Changes, March 26-29, 2000, Ft. Lauderdale, Florida.

Liao, K., C. R. Schultheisz, D. L. Hunston, L. C. Brinson, *The Effect of Water on the Fatigue Behavior for a Pultruded Glass-Reinforced Composite*, Proc. ANTEC, SPE, Atlanta, April 1998.

L. Catherine Brinson

- Gates, T. S., D. R. Veazie and L. C. Brinson, *A Comparison of Tension and Compression Creep in a Polymeric Composite and the Effects of Physical Aging Effects on Creep*, NASA Technical Memorandum 110273, (1996).
- Liao, K., R. I. Altkorn, S. M. Milkovich, J. Gomez, C. R. Schultheisz, L. C. Brinson, J. M. Fildes and B. Brailsford, *Long-term Durability of Composites in Secondary Infrastructure Applications*, Proceedings 28th SAMPE Technical Conference, Nov. 4-7, pp. 1278-1289, (1996).
- Boller, C., W. Brand, L. C. Brinson and M. S. Huang, *Shape Memory Alloys and their Application*, NATO AGARD Lecture Series 205: Smart Structures and Materials: Implications for Military Aircraft of New Generation, AGARD-LS-205, pp.2.1-2.13, (1996).
- Brinson, L. C. and M. S. Huang, *A New Look at SMA Constitutive Models: Comparisons and Micromechanics*, Proceedings of ASME Summer Meeting, Los Angeles, CA, AMD-vol 206, G. Carman, Ed. pp. 129-140, (1995).
- Brinson, L. C., A. Bekker and S. Hwang, *Temperature Induced Deformation in Shape Memory Alloys*, Symposium on Active Materials and Smart Structures, D. C. Lagoudas, G. L. Anderson, Eds., Society for Engineering Science 31st Annual Technical Meeting, College Station, Texas, SPIE, pp. 234-244, (1994).
- *Gates, T. S. and L. C. Brinson, *Acceleration of Aging in Graphite/Bismaleimide and Graphite/Thermoplastic Composites*, Proceedings of the AIAA 35th Structures, Structural Dynamics, and Materials Conference, Hilton Head, South Carolina, (1994).
- Bekker, A. and L. C. Brinson, *A Macromodel of Thermo-Induced Martensite Transformation in a 1-D SMA Polycrystalline Body*, Symposium on the Mechanics of Phase Transformations and Shape Memory Alloys, ASME International Congress and Exposition, Chicago, ASME AMD-Vol. 189, L. C. Brinson, B. Moran, Eds., pp. 195-213, (1994).
- Brand, W., C. Boller, M. S. Huang and L. C. Brinson, *Introducing the Constitutive Behavior of Shape Memory Alloys into Adaptive Engineering Structures*, Symposium on the Mechanics of Phase Transformations and Shape Memory Alloys, ASME International Congress and Exposition, Chicago, ASME AMD-Vol. 189, C. Brinson, B. Moran, Eds., pp. 179-193, (1994).
- Brinson, L. C. and T. S. Gates, *Effects of Physical Aging on Long-Term Creep Behavior of Polymers and Polymer Matrix Composites*, NASA Technical Memorandum 109081, (1994).
- Boller, C., L. C. Brinson, W. Brand and M. S. Huang, *Some Basic Ideas on the Design of Adaptive Aircraft Structures using Shape Memory Alloys*, Proceedings, 4th International Conference on Adaptive Structures, Köln, Germany, November (1993).
- *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).
- 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

NSF NIRT CMS-0404291: *Interphase Design for Extraordinary Nanocomposites*, Principal Investigator, 9/1/04-8/31/08

L. Catherine Brinson

- 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 - 1/15/05
- 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.
- 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:

- 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, *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"

L. Catherine Brinson

- Los Alamos National Laboratory, 24 July 2003, *Multiaxial SMA Modeling Considering Reorientation Effects*
- 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”
- 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”

L. Catherine Brinson

- 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:

- 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, *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”

L. Catherine Brinson

- 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 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"

L. Catherine Brinson

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:

Acting Department Chair, Mechanical Engineering Department, Jan-March 2004

Associate Chair, Mechanical Engineering Department, 2002 - present

McCormick Tenure and Promotion Committee, 2004-present

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*

L. Catherine Brinson

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

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:

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

L. Catherine Brinson

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:

James Washington, *Nanoindentation and AFM for Viscoelastic Characterization of Polymer Nanocomposites*, PhD expected 2009.

Ray Qiao, *Multiscale modeling of shape memory alloys*, 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, *Nanoscale Modeling and Experiments on Nanoreinforced Polymeric Materials*, PhD expected 2006.

Huanlong Li, Mechanical Engineering, *Mechanics of Porous Titanium Foams*, PhD expected 2005.

Debbie Burton, *Continuum Level Shape Memory Alloy Modeling and Finite Element Implementation*, PhD expected 2005.

Tao Bai, Mechanical Engineering, *Impedance Spectroscopy and Mechanical Response effects of Physical and Chemical Aging of Polymers*, Ph.D. expected Jun 2005.

Frank Fisher, Mechanical Engineering, *Combined Aging and Moisture Effects in Polymers and Polymer Matrix Composites and Nanoreinforced Polymers*, Ph.D. June 2002, currently continuing as postdoc.

Xiujie Gao, Mechanical Engineering, *Micromechanical Shape Memory Behavior – Modeling and Experiments*, Ph.D. March 2002, currently continuing as postdoc.

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:

Zhu He, Mechanical Engineering, *Self-Sensing Actuation Using Shape Memory Alloys*, 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:

Hui Zhang, *Indentation Mechanics for Polymer Coatings*, 2004-

Hui Shen, *Numerical Micromechanics for Porous Metallic Materials*, 2004 -

Frank Fisher, *Viscoelastic Effects in Nanoreinforced Polymers*, 2002 - 2004

Xiujie Gao, *Micromechanical Shape Memory Behavior – Modeling and Experiments*, 2002-

T. Ramanathan, *Aging Characterization of Polymeric Wiring Insulation Materials*, 2001-

L. Catherine Brinson

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:

Jeff Schumacher, *Polymer Nanocomposites*, 2004 - 2005

Ben Levy, *Imaging and analysis of nano-inclusions in polymers*, 2003 -

Lesley Meade, *Influence of nanoparticles on polymer mechanical response*, 2002-

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.

Mentees:

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

Amy Rechenmacher, PhD 2001, currently Asst. Professor at University of Southern California.

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

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.