

H. Jerry Qi

Associate Professor

George W. Woodruff School of Mechanical Engineering

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Prof. H. Jerry Qi is an associate professor at Georgia Institute of Technology. He received his bachelor degrees (dual degree), master and PhD degree from Tsinghua University (Beijing, China) and a ScD degree from Massachusetts Institute of Technology (Boston, MA, USA). After one year postdoc at MIT, he joined University of Colorado Boulder as an assistant professor in 2004, and was promoted to associate professor with tenure in 2010. He joined Georgia Tech in 2014 as an associate professor with tenure. Prof. Qi's research is in the broad field of nonlinear mechanics of soft materials and focuses on developing fundamental understanding of multi-field properties of soft active materials through experimentation and constitutive modeling then applying these understandings to application designs. He and his collaborators have been working on a range of soft active materials, including shape memory polymers, shape memory elastomeric composites, light activated polymers, covalent adaptable network polymers, for their interesting behaviors such as shape memory, light actuation, surface patterning, surface welding, healing, and reprocessing. Recently, he and his collaborators pioneered the 4D printing concept. Prof. Qi is a recipient of NSF CAREER award (2007). He is the founding chair of Mechanics of Soft Materials technical committee of Applied Mechanics division in ASME. He is a member of Board of Directors and the treasurer for the Society of Engineering Science.

EDUCATION

Massachusetts Institute of Technology Cambridge, MA
Sc.D. in Mechanics of Materials (08/99~08/03)
Advisor: Professor Mary C. Boyce, Mechanical Engineering Department
Thesis: Mechanics of Abrasive Wear of Elastomeric Materials

Tsinghua University Beijing, China
Ph.D. in Computational Mechanics (09/94~06/99)
Advisors: Professor Zhenhan Yao, Engineering Mechanics Department
Professor Daining Fang, Engineering Mechanics Department
Thesis: Geometrically Nonlinear FEM Analysis of Shell and Three Dimensional
Elasto-Dynamic Time Domain Direct Integral BEM

Tsinghua University Beijing, China
M.Sc. in Solid Mechanics (09/94~06/99)
Advisors: Professor Zhenhan Yao, Engineering Mechanics Department
Professor Daining Fang, Engineering Mechanics Department
Thesis: Geometrically Nonlinear Analysis of Laminate Composite Shell and
Electromechanical Analysis of Smart Materials

Kyoto University Kyoto, Japan
International Visiting Student (03/97~04/98)
Advisors: Professor Shaoyichi Kobayashi, Civil Engineering Department
Professor Naoshi Nishimura, Civil Engineering Department

Tsinghua University Beijing, China
B.Eng. with honors in Engineering Mechanics (09/89~06/94)
B.Eng. in Machine Design

PROFESSIONAL APPOINTMENTS

Georgia Institute of Technology Atlanta, GA
Associate Professor, School of Mechanical Engineering (01/14-present)

University of Colorado Boulder, CO
Associate Professor, Department of Mechanical Engineering (08/10~present)

University of Colorado Boulder, CO
Assistant Professor, Department of Mechanical Engineering (08/04~08/10)

Massachusetts Institute of Technology Cambridge, MA
Post-doctoral Associate, MIT Army Institute of Soldier Nanotechnology (09/03~08/04)
Advisors: Professor Christine Ortiz, Professor Mary C. Boyce

AWARDS

J. T. Oden Faculty Fellowship, UT Austin, (2012)
AFRL summer faculty fellowship (2010-2012)

Mechanical Engineering Outstanding Research Award (2009)
Mechanical Engineering Chair Faculty Fellow (2008)
NSF Career Award (2007)
Woodward Outstanding Mechanical Engineering Faculty (2006-2007)
University of Colorado Graduate School Junior Faculty Development Award (2005)

GRANTS

External Total \$6,003,456. (\$4,995,848 as PI, and \$957,609 as Co-PI, \$50,000 as Senior Investigator, total share: \$3,857,184)

NSF CMMI: Healing and Reprocessing of Epoxy with Dynamic Covalent Bonds and Composites, co-PI: Wei Zhang, 09/01/2013-08/31/2016, \$362,771 (my share: ~\$200,000)

NSF CMMI: DMREF Collaborative: Laminated Elastomeric Composites with Anisotropic and Chiral Elasticity and Shape Memory, 09/01/2013-08/21/2016, \$241,234.

AFOSR: 3D Printed Composites for Topology-Transforming Multifunctional Devices, as PI, co-PI: Kurt Maute, Martin Dunn, 04/01/2013-03/30/2016, \$420,000 (my share: ~\$350,000).

NSF-EFRI: ODISSEI: Photo-Origami, as PI. Co-PIs: Kurt Maute, Robert Mcleod, Elisabeth “Beth” Stade, Patrick Mather (Syracuse University). 08/01/2012-07/31/2016. \$1,999,377 (my share, \$469,215)

NSF-SBIR: Monolithic Ceramic Pressure Sensor (Phase I). Subtract from InReDox, LLC., CU PI: Qi, 01/01/2012-05/30/2012. \$44,218.

NSF-EFRI: SEED-Living Wall Materials and Systems for Automatic Building Thermo-Regulation, as Co-PI. PI: John Zhai, Co-PI: Yifu Ding, Kurt Maute, Fred Andreas, Jerry Qi. 09/01/2010-08/31/2014. \$1.9M (my share, \$430,000).

NSF CMMI: Instabilities in Patterned Polymer Surfaces, as Co-PI (40%). PI: Yifu Ding. 09/01/2010-08/31/2013. \$309,720.

NSF CMMI: Mechanics of Cell Alignment due to Contact Guidance by Substrate Surface Patterns, as PI (75%). Co-PI: Yifu Ding and Martin Dunn. 09/01/2009-08/31/2012. \$320,000.

AFOSR: Reversible Shape Memory Polymers and Composites: Synthesis, Modeling and Design, as CU PI (100%), PI: Patrick Mather (Syracuse University), co-PI: Martin Dunn. 03/01/2009-12/31/2011 CU fund: \$366,147.

DARPA STTR: Adaptive Skin-Stiffener Interconnects for Shape-Changing Vehicles (Phase II), CU PI (100%), subcontract through Cornerstone Research Group (CRG), 12/31/2007-11/30/2009, \$300,000.

NSF Career: Integrative Research and Education on Multiphysical Behaviors of Soft Functional Materials, as PI (100%), 03/01/2007-02/28/2012, \$400,000.

Sandia National Laboratories (SNL): LDRD: Novel Active Polymer Composites for Temperature and Light Detection. Subcontract to SNL, as PI at CU (100%), 11/27/2006-09/30/2007, \$30,000.

NSF-Sandia Initiative: Thermo- and Photo- Mechanical Constitutive Modeling of Shape Memory Polymers, as PI (100%), 10/01/2006-09/30/2009, \$290,000.

DARPA STTR: Adaptive Skin-Stiffener Interconnects for Shape-Changing Vehicles (Phase I), subcontract through Cornerstone Research Group (CRG), as PI (75%), with Martin L. Dunn and Kurt Maute (Co-PIs), 08/01/2006-07/30/2007, \$40,000.

NSF CMMI: A Multiscale Modeling Approach for Large Deformation Behavior of Erythrocyte Membrane, as PI (75%), with Meredith Betterton as Co-PI, 09/07/2005~08/31/2007, \$182,100.

NIH-NIBIB: R21 Development of SMP's for cardiovascular application, as Senior Investigator, with Robin Shandas as PI, 07/2005 – 07/2008, \$391,808 (~\$50,000 to Qi)

AFOSR: High Fidelity In-Situ Nanomechanical Characterization System, as Co-PI (75%), with Martin L. Dunn as PI, Kurt Maute as Co-PI, 05/01/2005~04/30/2006, \$247,889.

Internal (Total \$11,997 as PI)

Seed Grant: The effects of pulsed electromagnetic fields (PEMFs) on osteoblast-like cell growth on scaffolds, as PI (100%), \$7,000. 07/01/2006-06/30/2007.

CRCW: Molecular Modeling of Hydrogel Degradation in Biomedical Applications, University of Colorado CRCW Junior Faculty Development Award, 07/01/2005~06/30/2006, \$4,997 (100%).

RESEARCH INTERESTS

Mechanical behavior of soft active materials
Mechanical behavior of biomolecules and soft tissues
Advanced manufacturing for active materials

TEACHING INTERESTS

Solid Mechanics
Finite Element Methods and Computational Mechanics
Mechanics of Soft Matter
Mechanical Behavior of Materials

PUBLICATIONS – BOOK CHAPTERS

1. Yu, K., Qi, H.J., 2016. “Chapter 7. Viscoelasticity Based Models for Thermally Activated Systems”, in “Shape Memory Polymers for Aerospace Applications: Novel Activation, Modeling, Characterization and Design”, Ed. G.P. Tandon, A.J.Q. McClung, J.W. Baur, DEStech Publications. (The book will be published in the summer of 2015, carrying a 2016 copyright).
2. Dunn, M., Qi, H.J., 2016. “Chapter 18. Active Origami”, in “Shape Memory Polymers for Aerospace Applications: Novel Activation, Modeling, Characterization and Design”, Ed. G.P. Tandon, A.J.Q. McClung, J.W. Baur, DEStech Publications. (The book will be published in the summer of 2015, carrying a 2016 copyright).
3. Qi, H.J., Dunn, M.L., 2010. “Chapter 3. Thermomechanical Behavior and Modeling Approaches” in “*Shape-Memory Polymers and Multifunctional Composites*”, Ed. JS Leng, SY Du, CRC Press, pp65-90.
4. Qi, H.J., Bruet, B.J.F., Palmer, J.S., Ortiz, C., Boyce, M.C., 2006. Micromechanics and macromechanics of the tensile deformation of nacre, in *Mechanics of Biological Tissue*, Springer, Berlin Heidelberg, pp189-203.

PUBLICATIONS – ACHIEVED JOURNALS

1. Yin, H., Qi, H.J., Fan, F., Zhu, T., Wang, B., Wei, Y., 2014. On the Griffith criterion for brittle

fracture in grapheme, Nano Letter, accepted.

2. Mu, X., Sowan, N., Tumbic, J.A., Bowman, C.N., Mather, P.T., Qi, H.J., 2014. Photo-Induced Bending in a Light-Activated Polymer Laminated Composite, *Soft Matter*, available online.
3. Yu, K., Ritchie, A., Mao, Y., Dunn, M.L., Qi, H.J., 2014. Controlled Sequential Shape Changing Components by 3D Printing of Shape Memory Polymer Multimaterials, *Procedia IUTAM*, in press.
4. Yu, K., Qi, H., 2014, Temperature Memory Effect in Amorphous Shape Memory Polymers, *Soft Matter*, 10(47), 9423-9432.
5. Yu, K., Taynton, P., Zhang, W., Dunn, M.L., Qi, H.J., Influence of Stoichiometry on the Glass Transition and Bond Exchange Reactions in Epoxy Thermoset Polymers, *RSC Adv.*, 4(89), 48682-48690.
6. Yu, K., Ge, Q., Qi, H.J., 2014. Effects of stretch induced softening on the free recovery behavior of shape memory polymer composites, *Polymer*, 55(23), 5938-5947.
7. Yang, W.G., Lu, H., Huang, W.M., Qi, H.J., Wu, X.L., Sun, K.Y., 2014. Advanced Shape Memory Technology to Reshape Product Design, Manufacturing and Recycling. *Polymers* 6 (8), 2287-2308.
8. Ge, Q., Dunn, C., Qi, H.J., Dunn, M.L., 2014. Active Origami by 4D Printing, *Smart Materials and Structures*, 23, 094007-15.
9. Ma, J., Mu, X., Bowman, C.N., Sun, Y., Dunn, M.L., Qi, H.J., Fang, D.N., 2014. A Photoviscoplastic Model for Photo Activated Covalent Adaptive Networks. *J. Mech. Phys. Solids.*, 70, 84-103.
10. Yu, K., Philips, D.M., Baur, J.W., Qi, H.J., 2014. Analysis of Shape Memory Polymer Composites with Embedded Microvascular System for Fast Thermal Response, *Journal of Composite Materials*, in press.
11. Taynton, P., Yu, K., Shoemaker, R., Jin, Y., Qi, H.J., Zhang, W., 2014. Heat or water driven self-healing in a highly-recyclable covalent network polymer, *Advanced Materials*, v26, 23:3938-3942.
12. Hall, R.B., Rao, I.J., Qi, H.J., 2014. Thermodynamics and Thermal Decomposition for Shape Memory Effects with Crystallization Based on Dissipation and Logarithmic Strain. *Mechanics of Time Dependent Materials*, 18(2), 437-452.
13. Yu, K., Taynton, P., Zhang, W., Dunn, M.L., Qi, H.J., 2014, Reprocessing and Recycling of Thermosetting Polymers based on Bond Exchange Reactions, *RSC Adv.*, 2014, 4 (20), 10108 - 10117.
14. Ge, Q., Luo, X., Iversen, C.B., Mather, P.T., Dunn, M.L., Qi, H.J., 2014, A Finite Deformation Thermomechanical Constitutive Model for Triple Shape Polymeric Composites Based on Dual Thermal Transitions, *International Journal of Solid and Structures*, 51, 2777-2790.
15. Yu, K., Ge, Q., Qi, H.J., 2014, Reduced Time as a Unified Parameter Determining Fixity and Free Recovery of Shape Memory Polymers, *Nature Communication*, 5:3066.
16. Yu, K., McClung, A.J., Tandon, G.P., Baur, J.W., Qi, H.J., 2014, A Thermomechanical Constitutive Model for an Epoxy Based Shape Memory Polymer and its Parameter Identifications, *Mechanics of Time-Dependent Materials*, 18(2) 453-474.

17. Ge, Q., Qi, H.J., Dunn, M.L., 2013, Active Materials by 4D Printing, *Applied Physics Letter*, **103**, 131901. (Reported by National Public Radio)
18. Long, R., Qi, H. J., Dunn, M.L., 2013, Thermodynamics and Mechanics of Photochemically Reacting Polymers, *J. Mech. Phys. Solids.*, 61: 2212-2239.
19. Wang, X., Sliker, L.J., Qi, H.J., Rentschler, M.E., 2013. A Quasi-Static Model of Wheel-Tissue Interaction for Surgical Robotics, *Medical Engineering & Physics*, 35,9, 1368-1376.
20. Ge, Q., Westbrook, K.K., Mather, P.T., Dunn, M.L., Qi, H.J., 2013. Thermomechanical Behavior of a Two-Way Shape Memory Composite Actuator, *Smart Material and Structures*, 22, 055009.
21. Long, R., Qi, H. J., Dunn, M.L., 2013, Modeling the mechanics of covalently-adaptable polymer networks with temperature-dependent bond exchange reactions, *Soft Matter*, 9 (15), 4083 - 4096.
22. Ge, Q., Yu, K., Dunn, M.L., Qi, H.J., 2013. Shape Memory Polymers: Mechanisms and Constitutive Models. *Int. J. Aerospace and Lightweight Structures*, accepted.
23. Yu, K., Westbrook, K.K., Kao, P.H., Leng, J., Qi, H.J., 2013. Design Considerations for Shape Memory Polymer Composites with Magnetic Particles, *J. Comp. Mat.*, 47:51-63.
24. Ge, Q., Luo, X., Iversen, C.B., Mather, P., Dunn, M., Qi, H.J., 2013. Mechanisms of Triple-Shape Polymeric Composites Featuring Dual Thermal Transitions, *Soft Matter*, 9, 2212-2223.
25. Ge, Q., Yu, K., Ding, Y., Qi, H.J., 2012. Prediction of Temperature Dependent Free Recovery Behaviors of Shape Memory Polymers, *Soft Matter*, 8, 11098–11105.
26. Yu, K., Tao Xie, T., Leng, J., Ding, Y., Qi, H.J., 2012. Mechanisms of Multi-Shape Memory Effects and Associated Energy Release in Shape Memory Polymers, *Soft Matter*, v8, 5687 - 5695.
27. Tian, L., Lammers, S.R., Kao, P.H., Albiets, J.A., Stenmark, K.R., Qi, H.J., Robin Shandas, R., Hunter, K.S., 2012. Impact of Residual Stretch and Remodeling on Collagen Engagement in Healthy and Pulmonary Hypertensive Calf Pulmonary Arteries at Physiological Pressures, *Annals of Biomedical Engineering*, 40: 1419-1433.
28. Jennie Ryu, J., D'Amato, M., Cui, X., Long, K.N., Qi, H.J., Dunn, M.L., 2012. Photo-Origami-Bending and folding polymers with light, *Applied Physics Letter*, 100, 161908. (Feature Story for May 10, 2012 at [phys.org](http://phys.org/news/2012-05-origami.html) (<http://phys.org/news/2012-05-origami.html>); It is also featured as one of the APL's 50th Anniversary Collection: Editor's Picks of Most Recent Publications.)
29. Ge, Q., Luo, X., Rodriguez, E.D., Zhang, X., Mather, P., Dunn, M.L., Qi, H.J., 2012, Thermo-mechanical Behaviors of Shape Memory Elastomer Composites, *J. Mech. Phys. Solids.*, v60, 67-83.
30. Westbrook, K.K., Kao, P.H., Castro, F., Ding, Y., Qi, H.J., 2011. A 3D Finite Deformation Constitutive Model for Amorphous Shape Memory Polymers: A Multi-Branch Modeling Approach for Nonequilibrium Relaxation Processes. *Mechanics of Materials*, v43: 853-869.
31. Tian, L., Lammers, S.R., Kao, P.H., Albiets, J.A., Stenmark, K.R., Qi, H.J., Robin Shandas, R., Hunter, K.S., 2011 Linked opening angle and histological and mechanical aspects of the proximal pulmonary arteries of healthy and pulmonary hypertensive rats

- and calves, *American J. Physiology-Heart and Circulatory Physiology*, 301:(5) H1810-H1818.
32. Wang, A., Hansen, C, Ge, Q., Maruf, S. H., Ahn, D. U., Qi, H.J., and Ding, Y., 2011, Programmable, Pattern-Memorizing Polymer Surface, *Advanced Materials*, 23:3669-3673.
 33. Westbrook, K.K., Patrick T. Mather, Vikas Parakh, Martin L. Dunn, Qi Ge, Brendan M. Lee, H. Jerry Qi, 2011, Two-Way Reversible Shape Memory Effects in a Free-Standing Polymer Composite, *Smart Material and Structures*, 20, 065010 (9 pages).
 34. Long, K.N., Dunn, M.L., Qi, H.J., 2011, Photo-Induced Deformation of Active Polymer Films: Single Spot Irradiation, *Int. J. Solids and Struc.*, v48: 2089-2101.
 35. Castro, F., Westbrook, K.K., Hermiller, J., Ahn, D.U., Ding, Y., Qi, H.J., 2011. Time and Temperature Dependent Recovery of Epoxy-Based Shape Memory Polymers, *ASME Journal of Engineering Materials and Technology*, v133, n 2, 021025 (9 pages).
 36. Kao, P.H., Lammers, S., Tian, L., Qi, H.J., Hunter, K., Stenmark, K.R., Shandas, R., 2011. A Microstructurally-Driven Model for Pulmonary Artery Tissue, *ASME Journal of Biomechanical Engineering*, 051002-1-12 (12 pages).
 37. Ding, Y., Qi, H.J., Alvine, K.J., Ro, H.W., Ahn, D.U., Lin-Gibson, S., Douglas, J.F., Soles, C.L., 2010. Stability and Surface Topography Evolution in Nanoimprinted Polymer Patterns under a Thermal Gradient. *Macromolecules*, 43: 8191-8201.
 38. Hunter, K.S., Albiets, J.A, Lee, P.F., Lanning, C.J., Lammers, S.R., Hofmeister, S.H., Kao, P.H., Qi, H.J., Stenmark, K.R., Shandas, R., 2010. In-vivo measurement of proximal pulmonary artery elastic modulus in the neonatal calf model of pulmonary hypertension: development and ex vivo validation. *J. Appl. Physiol.*, 108: 968-975.
 39. Long, K.N., Dunn, M.L., Scott, T.F., Turpin, L.P., Qi, H.J., 2010. Light-Induced Stress Relief to Improve Flaw Tolerance in Network Polymers, *Journal of Applied Physics*, 107, 053519.
 40. Long, K.N., Dunn, M.L., Qi, H.J., 2010. "Mechanics of Soft Active Materials with Phases Evolution", *International Journal of Plasticity*, 26, 603-616.
 41. Westbrook, K.K., Castro, F., Long, K., Slifka, A., Qi, H.J., 2010. Improved Testing System for Thermomechanical Experiments on Polymers Using Uniaxial Compression Equipment, *Polymer Testing*, 29, 503-512.
 42. Westbrook, K.K., Parakh, V., Mather, P.T., Wan, L. C., Dunn, M.L., H.J. Qi, 2010, Constitutive Modeling of Shape Memory Effects in Semicrystalline Polymers with Stretch Induced Crystallization. *ASME Journal of Engineering Materials and Technology*, 312:041010-1-9.
 43. Roy, S., Qi, H.J., Miao, F., 2010. Cell Crawling Assisted by Contractile Stress Induced Retraction. *ASME Journal of Biomechanical Engineering*, v132, 061005.
 44. Kao, P.H., Lammers, S., Hunter, K., Stenmark, K.R., Shandas, R., Qi, H.J., 2010, Constitutive Modeling of Anisotropic Finite Deformation Hyperelastic Behaviors of Soft Materials Reinforced by Tortuous Fibers. *International Journal of Structural Changes in Solids*, 2, 19-29.
 45. Roy, S., Qi, H.J., 2010. A Computational Biomimetic Study of Cell Crawling. *Journal of Biomechanics and Modeling in Mechanobiology*, 9: 573-581.
 46. Long, K.N., Dunn, M.L., Scott, T.F., Qi, H. J., 2010, Photo-Induced Creep of Network

Polymers. *International Journal of Structural Changes in Solids*, 2, 41-52.

47. Castro, F., Westbrook, K.K, Long, K.N., Shandas, R., Qi, H.J., 2010. "Effects of Thermal Rates on the Thermomechanical Behaviors of Amorphous Shape Memory Polymers", *Journal of Mechanics of Time Dependent Materials*, 14:219-241.
48. Long, K. N., Scott, T. F., Qi, H. J., Bowman, C. N., and Dunn., M. L., 2009. Photomechanics of Light-Activated Polymers, *J. Mech. Phys. Solids*, 57:1103-1121.
49. S. Lammers, P. Kao, H.J. Qi, K. Hunter, C. Lanning, J. Albietz, S. Hofmeister, R. Mecham, K.R. Stenmark, R. Shandas, 2008. Changes in the structure-function relationship of elastin and its impact on the proximal pulmonary arterial mechanics of hypertensive calves. *Am J Physiol Heart Circ Physiol*, 295(4):H1451-1459.
50. S. Roy, H. J. Qi, 2008. Micro-mechanical Model for Elasticity of the Cell Cytoskeleton. *Physical Review E*, 77, 061916. Also in July 1, 2008 issue of Virtual Journal of Biological Physics Research.
51. W. Tan, D. Scott, D. Belchenko, H. J. Qi, L. Xiao, 2008. Development and Evaluation of Microdevices For Studying Anisotropic Biaxial Cyclic Stretch on Cells, *Biomed Microdevices*, 10(6), pp. 869-882.
52. T. D. Nguyen, H. J. Qi, F. Castro, K.N. Long, 2008. A thermoviscoelastic model for amorphous shape memory polymers: Incorporating structural and stress relaxation, *J. Mech. Phys. Solids*, 56:2792-2814. (#4 most cited paper in JMPS since 2007 as of June, 2012)
53. H.J. Qi, T.D. Nguyen, F. Castro, C. Yakacki, R. Shandas, 2008. Finite Deformation Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers, *J. Mech. Phys. Solids*, 56:1730-1751. (#3 most cited paper in JMPS since 2007 as of June, 2012)
54. K.K. Westbrook, H.J. Qi, 2008. Novel Actuator Designs Using Environmentally Responsive Hydrogels, *J. Intelligent Material Sys. Struct.*, 19:597-607.
55. C.F. Martino, D. Belchenko, V. Ferguson, S. Nielsen-Preiss, H.J. Qi, 2008, The Effects of Pulsed Electromagnetic Fields on the Cellular Activity of SaOS-2 Cells, *Bioelectromagnetics*, 29:125-132.
56. M. Arslan, M. C. Boyce, H. J. Qi, and C. Ortiz, 2008. Constitutive Modeling of the Stress-Stretch Behavior of Two-Dimensional Triangulated Macromolecular Networks Containing Folded Domains. *J. Applied Mechanics*, 75:011020.
57. H.J. Qi, C. Ortiz, M.C. Boyce, 2006. Mechanics of biomacromolecular networks containing folded domains. *ASME Journal of Engineering Material and Technology*, 128:509-518.
58. K. Tai, H. J. Qi, C. Ortiz, 2005. Effect of mineral content on the nanoindentation properties and nanoscale deformation mechanisms of bovin tibial cortical bone. *J. Materials Science: Materials in Medicine*, 16:947-959.
59. B.J.F. Bruet, H.J. Qi, M.C. Boyce, R. Panas, Tai, K., Ortiz, C., 2005. Nanoscale morphology and indentation of individual nacre tablets from the gastropod mollusc *Trochus Niloticus*. *J. Material Research*. 20: 2400-2419.
60. H.J. Qi, M.C. Boyce, 2005. Stress-strain behavior of thermoplastic polyurethanes, *Mech. Mater.*, 36:817-839. (As of October 2010, this paper is top 10 cited paper in Mech. Mater. in the past five years)
61. H.J. Qi, M.C. Boyce, 2004. Constitutive model for stretch-induced softening of stress

- strain behavior of elastomeric material, *J. Mech. Phys. Solids*, November, 52:2187-2205.
62. H.J. Qi, K.B.K. Teo, K.K.S. Lau, M.C. Boyce, W.I. Milne, J. Robertson, K.K. Gleason, 2003. Determination of mechanical properties of carbon nanotubes and vertically aligned carbon nanotube forests using nanoindentation, *J. Mech. Phys. Solids*, 51:2213-2237.
 63. H.J. Qi, K. Joyce, M.C. Boyce, 2003. Relationship between durometer hardness and the stress-strain behavior of elastomeric and elastomeric-like materials, *Rubber Chem. Tech.*, 76:419-435.
 64. H. Qi, D. Fang, Z. Yao, 2001. Analysis of electric boundary condition effects on crack propagation in piezoelectric ceramics, *ACTA Mech. Sinica*, 17:59-70.
 65. D. Fang, H. Qi, Z. Yao, 1998. Numerical analysis of crack propagation in piezoelectric ceramics. *Fatigue, Frac. Eng. Mater. Struc.* 21:1371-1380.
 66. H. Qi, D. Fang, Z. Yao, 1997. FEM analysis of electro-mechanical coupling effect of piezoelectric materials, *Compu. Mater. Sci.*, 8:283-290.
 67. D. Fang, H. Qi, T. Liu, 1997. Optimization of micro structures to elastoplastic properties in fiber reinforced composite materials, *Tsinghua Sci. Tech.*, 2:539-544.
 68. Z. Yao, H. Qi, M. Fu, J. Yao, 1997. A kind of super-parametric finite element for geometric nonlinear analysis of plates and shells, *Tsinghua Sci. Tech.*, 2:707-712.
 69. Z. Yao, H. Qi, M. Fu, J. Yao, 1997. Geometric nonlinear finite element analysis of sandwich plates and shells, *Chinese J. Compu. Mech.*, 14:173-176. (in Chinese)
 70. D. Fang, H. Qi, S. Tu, 1996. Elastic and plastic properties of metal-matrix composites: geometrical effects of particles, *Comput Mater. Sci.*, 6:303-309.
 71. D. Fang, H. Qi, 1996. Numerical study of effective properties of particulate reinforced composite materials, *ACTA Mechanica Sinica*, 28:475-482. (in Chinese)

PUBLICATIONS – ACHIEVED JOURNALS (Submitted)

1. Steinmetz, N. J., Aisenbrey, E.A., Westbrook, K.K., Qi, H.J., Bryant, S. J., 2014. Mechanical Loading Regulates Human MSC Differentiation in a Multilayer Hydrogel for Osteochondral Tissue Engineering, submitted in 12/2014.
2. Zhai, Q., Qi, H.J., Xie, T., 2014. Recent Progress in Shape Memory Polymer: New Behaviors, Enabling Materials, and Mechanistic Understanding, submitted in 08/2014.
3. Yang, H., Yu, K., Mu X., Shi, X., Wei, Y., Guo, Y. Qi, H.J., 2014. A molecular dynamics study of bond exchange reactions in covalent adaptable networks. Submitted in 11/2014.

PUBLICATIONS -- CONFERENCE PROCEEDINGS

1. Philip Kao, Kristofer Westbrook, H. Jerry Qi, Design Considerations for Shape Memory Polymer Composites with Magneto-sensitive Particles, 18th International Conference on Composite Materials (ICCM-18), Jeju Island, S. Korea, August, 2011.
2. H. Jerry Qi, Kristofer K. Westbrook, Philip H. Kao, Francisco Castro, Yifu Ding, A 3D Finite Deformation Thermomechanical Constitutive Model for Amorphous Shape Memory Polymers, NSF CMMI Grantee Conference, Atlanta, GA, Jan. 4-7, 2011.
3. H. Jerry Qi, Roy Sitikantha, Feng Miao, A Computational Modeling Approach for Cell-

- Substrate Interaction and Cell Crawling. NSF CMMI Grantee Conference, Atlanta, GA, Jan. 4-7, 2011.
4. Kristofer Westbrook, Francisco Castro, H. Jerry Qi, Temperature dependent recovery of shape memory polymers, SAMPE Conference, Salt Lake City, Oct 11-14, 2010.
 5. Long, K.N., Dunn, M., Qi, H.J., 2009. "Constitutive model for photo-mechanical behaviors of photo-induced shape memory polymers", in Proceedings of SAMPE'09, Baltimore, MD, May 18-21, 2009.
 6. Qi, H.J., Castro, F., 2009. "Time dependent thermo-mechanical behavior of thermally induced shape memory polymers", in Proceedings of SAMPE'09, Baltimore, MD, May 18-21, 2009.
 7. Hermiller, J.M., Cable, K.M., Hemmelgarn, C.D., Qi, H.J., and Castro, F., 2008. "Thermal Design Methodology for Attaching Morphing Components", Proc. of SPIE..
 8. Castro, F., Qi, H.J., Hermiller, J.M., Havens, E., 2009, "Time Dependent Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers", Proc. of SPIE.
 9. Long, K. N., Scott, T. F., Qi, H. J., Bowman, C. N., and Dunn, M. L., 2008, "Photomechanics of Light-Activated Shape Memory Polymers," in *Proceedings of the ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems*.
 10. H. J. Qi, L. Xiao, 2008, Micromechanical Modeling of Large Deformation Behavior of Red Blood Cell Membranes, in Proceedings of NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
 11. H. J. Qi, F. Castro, K. N. Long, Finite Element Simulations of Thermally Induced Shape Memory Polymers Based Applications, in Proceedings of NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
 12. W.H. Francis, M.S. Lake, M.R. Schultz, D. Campbell, M. Dunn and H.J. Qi, 2007. Elastic Memory Composite Microbuckling Mechanics: Closed-Form Model with Empirical Correlation. 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, 23 - 26 April 2007, Honolulu, Hawaii, AIAA 2007-2164.
 13. H.J. Qi, M.L. Dunn, K. Long, F. Castro, R. Shandas, 2007. Thermomechanical Indentation of Shape Memory Polymers, in Behavior and Mechanics of Multifunctional and Composite Materials 2007, edited by M.J. Dapino, Proc. of SPIE v.6526, 652615.
 14. H.J. Qi, C. Ortiz, Boyce, M.C., 2005. Protein forced unfolding and its effects on the finite deformation stress-strain behavior of biomacromolecular solids. Mater. Res. Soc. Symp. Proc. Vol. 874. L4.3.1
 15. H. J. Qi, B. F. J. Bruet, J. S. Palmer, C. Ortiz, and M. C. Boyce. 2004. Micromechanics and macromechanics of the tensile deformation of nacre, in *Mechanics of Biological Tissues, Proceeding of IUTAM*, G. Holzapfel and R. W. Ogden, eds. Graz, Austria, 2005, Springer Verlag, p189-203.
 16. H. Qi, N. Nishimura, Z. Yao, S.Kobayashi, 1998. Application of 3D time domain direct integral BEM to crack and inverse problem, In: *Theory and Application of Boundary Element Methods, Proc. of the 8th Chinese-Japan Symposium on Boundary Element Methods*, Beijing, China, May, 1998, International Academic Publishers, p105-112.
 17. H. Qi, D. Fang, Z. Yao, N. Nishimura, S. Kobayashi, 1998. FEM analysis of crack problem with different crack surface electric boundary conditions in piezoelectric

materials. In: *Mechanical Properties of Advanced Engineering Materials, Proc. of the Third International Symposium on Microstructures and Mechanical Properties of New Engineering Materials*, Tsu, Japan, August 1997, Mie University Press, p315-322.

18. D.Fang, H. Qi. 1996. An investigation of 3-D simulations for predicting elastic and plastic properties of particulate-reinforced metal-matrix composites. Wang T.C., Chou T. W. eds., *Progress in advanced materials and mechanics, ICAm'96*, 1996, 2 , p96-101.

INVITED TALKS

1. Active Composites by 4D Printing, Southwest Jiaotong University, Chengdu, China, 10/17/2014.
2. Active Composites by 4D Printing, Institute of Electronic and Nanotechnology, Georgia Tech, Atlanta, GA, 9/18/2014.
3. Mechanics of Soft Active Materials with Bond Exchange Reactions, Workshop on Chemomechanical Coupling, Xi'an, China, August 24-25.
4. Mechanics and Physics of Shape Memory Polymers, A-Star, Singapore, July 29, 2014.
5. Active Composites by 4D Printing, Colorado School of Mines, Golden, CO, 2/4/2014.
6. Mechanics and Physics of Shape Memory Polymers, Hunan University, Changsha, China June 21, 2013.
7. Mechanics of Phase Evolution in Soft Active Materials, Beijing Jiaotong University, Beijing, China, June 18, 2013.
8. Photo-mechanics of Polymer Structural Alteration Due to Light Irradiation, NSF-NIST Workshop on Service-Life Prediction of Polymeric Materials: Vision for the Future, Monterey, CA, March 3-8, 2013.
9. Multiphysical Behaviors of Shape Memory Polymers, Xi'an Jiaotong University, Xi'an, Shaanxi, China, August 29, 2012.
10. Shape Memory Behaviors in Soft Materials, Workshop on Mechanics of Soft Materials, Lhasa, China, July 29-August 4, 2012
11. Multiphysical Behaviors of Shape Memory Polymers, University of Texas, Austin, TX, April 17, 2012.
12. Multiphysical Behaviors of Shape Memory Polymers, Harbin Institute of Technology, Harbin, China, 12/23/2011.
13. Multiphysical Behaviors of Shape Memory Polymers, Beijing Jiaotong University, Beijing, China, 12/2/2011.
14. Physics and Mechanics of Shape Memory Polymers, Hong Kong PolyTechnic University, July 28, 2010.
15. Physics and Mechanics of Shape Memory Polymers, Fudan University, August 3, 2010.
16. Shape memory polymers: Physics and Mechanics, Beijing University, Beijing, China, December, 2009.
17. Mechanics of Cytoskeleton and Cell Crawling, Tsinghua University, Beijing, China, December, 2009.
18. Shape memory polymers: Physics and Mechanics, TAPS symposium, Boulder, CO, August, 2009.
19. Constitutive Models for Active Materials with Phase Evolution. ARFL/RXB, Wright-Patterson AFB, OH, April, 2009.
20. Soft Active Materials: The Smart Elastigirl, Theoretical and Applied Mechanics Council, Northwestern University January 22, 2009.
21. Soft Active Materials: The Smart Elastigirl, Sandia National Laboratories, Albuquerque, NM, October, 2008.
22. Modeling of Multiphysical Behaviors of Active Soft Materials, Liquid Crystal Material

- Research Center, University of Colorado, Boulder, CO, March 2008.
23. Smart Polymers: The Elastigirl. Tsinghua University, Beijing, June, 2007.
 24. Smart Polymers: The Elastigirl. Xi'an Jiaotong University, Xian, Shannxi Provice, June, 2007.
 25. Experiments and Constitutive Modeling on the Thermo-Mechanical Behaviors of Shape Memory Polymers, Cornerstone Research Group and Air Force Research Lab, Dayton, OH, January, 2007.
 26. Soft Active Polymers: The Elastigirl. Sandia National Laboratories, Livermore, CA, November, 2006.
 27. Smart Polymers: The Elastigirl. Civil and Environmental Engineering Department Seminar, Louisiana State University, Baton Rouge, LA, March, 2006.
 28. Biological Mechanism of Mechanical Behavior of Nacre. Sandia National Laboratories, February, 2005.
 29. Biological Mechanism of Mechanical Behavior of Nacre. Dept. Mechanical Engineering, Ohio State University, May, 2005.

PRESENTATIONS/POSTERS IN CONFERENCES

2014

1. Qi, H.J., Maute, K., Dunn, M.L., 4D Printed Composites for Topology Transforming Devices, The 3rd Multifunctional Materials for Defense Workshop, August 18-22, Arlington, VA.
2. Qi Ge, Conner Dunn, Kai Yu, H. Jerry Qi, Martin L. Dunn, Active Composites by 4D Printing, MRS Spring 2014, Symposium XX: Shape Programmable Materials, San Francisco, CA, April 22, 2014.
3. (Invitation only), Qi Ge, Martin L. Dunn, H. Jerry Qi, Active Composites by 4D Printing, IUTAM Symposium on Mechanics of Soft Active Materials, Haifa, Israel, 5/12/2014-5/15/2014.
4. Kai Yu, Philip Taynton, Wei Zhang, Martin L. Dunn, H. Jerry Qi (2014). Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reaction. Society of Experimental Mechanics Annual Technical Conference. Greenville, SC, 06/01/14-06/05/14.
5. Yu, K., Ge, Q., Qi, H.J., A Unified Approach to Predict Shape Fixity and Recovery of Amorphous Shape Memory Polymers by Using Reduced Time, The 9th International Conference on the Mechanics of Time Dependent Materials, Montreal, QC, Canada, 5/27/2014-5/30/2014.
6. Kai Yu, Philip Taynton, Wei Zhang, Martin L. Dunn, H. Jerry Qi (2014). Reprocessing and Recycling of Thermoset Polymers based on Bond Exchange Reaction. Mechanics of Time-Dependent Materials Conference. Montreal, QC, Canada, 5/27/2014-5/30/2014.

2013

1. (Keynote) Philip Kao, H. Jerry Qi, Michael Sacks, Anisotropic Mechanical Behaviors and Growth of Pulmonary Artery Tissues, 13th International Conference on Fracture June 16-21, 2013.
2. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Thermomechanical Behaviors of Anisotropic Shape Memory Elastomer Composites, 13th International Conference on Fracture June 16-21, 2013.
3. Kai Yu, H. Jerry Qi, Jeffrey W. Baur, David M. Philips, Design Considerations for Thermally Responsive SMP Composites with Internal Heating, 13th International

- Conference on Fracture June 16-21, 2013.
4. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Thermomechanical Behaviors of Anisotropic Shape Memory Elastomer Composites, SEM Annual Conference, Lombard, IL, June 3-5, 2013.
 5. Kai Yu, H. Jerry Qi, Jeffrey W. Baur, David M. Philips, Design Considerations for Thermally Responsive SMP Composites with Internal Heating, PACAM XIII, Houston, TX, May 22-24, 2013.
 6. Kai Yu, Qi Ge, and H. Jerry Qi, Predicting Shape Fixity and Recovery of Shape Memory Polymers, PACAM XIII, Houston, TX, May 22-24, 2013.
 7. Qi Ge, Conner Dunn, H. Jerry Qi, Martin L. Dunn, Active Composites by 4D Printing, ASME IMECE, San Diego, CA, November 15-21, 2013.

2012

1. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, SEM XII International Congress & Exposition on Experimental and Applied Mechanics, Costa Mesa, CA, June 11-14, 2012.
2. Kai Yu, Ge (Kevin) Qi, Philip Kao, Kristofer Westbrook, H. Jerry Qi, Time Dependent Recovery of Shape Memory Polymer Composites with Magnetic Particles, SEM XII International Congress & Exposition on Experimental and Applied Mechanics, Costa Mesa, CA, June 11-14, 2012.
3. Feng Miao, Yifu Ding, H. Jerry Qi, Mechanics of Cell Alignment due to Contact Guidance by Substrate Surface Patterns (Poster), NSF Grantee Conference, Boston, MA, July 9-11, 2012.
4. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, 8th International Conference on Mechanics of Time-Dependent Materials (MTDM 2012), Kanazawa, Japan, September 24 -26, 2012.
5. Qi Ge, Binglian Wang, Martin Dunn, H. Jerry Qi, Time-Temperature Dependent Behaviors of Shape Memory Elastomer Composites, 8th International Conference on Mechanics of Time-Dependent Materials (MTDM 2012), Kanazawa, Japan, September 24 -26, 2012.
6. M. D'Amato, J. Ryu, X. Cui, M. Dunn, H. Jerry Qi, Mechanics and Applications of Light-Activated Polymers, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
7. Kai Yu, H. Jerry Qi, Design Considerations for Shape Memory Polymer Composites Containing Magnetic Particles, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
8. Qi Ge, Xiaofan Luo, Erika D. Rodriguez, Patrick Mather, Martin Dunn, H. Jerry Qi, Thermomechanical Constitutive Modeling for Triple Shape Polymeric Composites, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
9. Binglian Wang, Qi (Kevin) Ge, H. Jerry Qi, Finite Element Analysis of Shape Memory Elastomeric Composite, ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
10. H. Jerry Qi, Bahar Fata, Michael Sacks, A Forward Incremental Approach for Determining the Unloaded Configuration of the Growing Pulmonary Artery (Poster), Atlanta, GA, October 24-27, 2012.

2011

1. Qi Ge, Xiaofan Luo, Patrick Mather, Martin Dunn, H. Jerry Qi, Thermomechanical Constitutive Modeling of Shape Memory Elastomeric Composites, 2011 SEM conference, Uncasville, CT, June 13-16, 2011.

2. Kristofer Westbrook, Qi Ge, H. Jerry Qi, Time-dependent Recovery of Shape Memory Polymers, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
3. Feng Miao, Xiaodong Cui, and H. Jerry Qi, Computational Study of Cell Adhesion on Substrate with Surface Patterns, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
4. Gregory Pelkie, Philip Kao, H. Jerry Qi, Characterization of Viscoelastic Behaviors of Pulmonary Arterial Tissues, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
5. Philip Kao, H. Jerry Qi, A Microstructure-based Model for Pulmonary Artery Tissues, SES 2011 Annual Conference, Evanston, IL, October, 12-14, 2011.
6. Feng Miao, Xiaodong Cui, H. Jerry Qi, Simulation of cell adhesive contact on a grooved rigid substrate, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.
7. Binglian Wang, Qi Ge, Kevin Long, H. Jerry Qi, A General 3D Thermal-mechanical Constitutive Model for Soft Active Materials with Phase Evolution, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.
8. Qi Ge, Martin Dunn, H. Jerry Qi, Thermo-mechanical Behaviors of Shape Memory Elastomer Composites, 2011 IMECE, Denver, CO., Nov. 14-17, 2011.

2010

1. Kao, P., Pelkie, G., Qi, H.J., Lammers, S., Hunter, K., Stenmark, K., Shandas, R., "A Microstructure-based Model for Pulmonary Artery Tissue", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
2. Pelkie, G., Kao, P., Sokol, S., Qi, H.J., "Characterization of Viscoelastic Behaviors of Pulmonary Arterial Tissues", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
3. Westbrook, K., Kao, P., Castro, F., Qi, H.J., "Temperature Dependent Recovery of Shape Memory Polymers", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
4. Qi, G., Dunn, M., Qi, H.J., "Constitutive Model of Shape Memory Elastomeric Composites (SMECs)", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
5. Long, K., Dunn, M., Qi, H.J., "Photo-Patterning with Light Activated Polymers", ASME 2010 IMECE, Vancouver, BC, CA, November 2010.
6. Westbrook, K., Castro, F., Qi, H., "Time Dependent Recovery of Shape Memory Polymers", SAMPE Fall Technique Conference, Salt Lake City, UT, October, 2010.
7. Qi, H.J., Ge, Q., Dunn, M., Mather, P., "Constitutive Model of Shape Memory Elastomeric Composites (SMECs)", The 7th International Conference on MTDM, Portoroz, Slovenia, September, 2010
8. Qi, H.J., Westbrook, K., Long, K., Dunn, M., Mather, P., "Shape Memory Behaviors in Semicrystalline Polymers with Stretch Induced Crystallization", The 7th International Conference on MTDM, Portoroz, Slovenia, September, 2010
9. Roy, S., Qi, H.J., "Micromechanical Modeling of Affine-Nonaffine Deformation in Cytoskeleton Mechanics", SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, May 2010.
10. Roy, S., Qi, H.J., "Micromechanical Modeling of Cytoskeleton, ASME NEMB Conference", Houston, TX, Feb. 2010.
11. Roy, S., Miao, F., Qi, H.J., "Computational Study of Cell Crawling by Contractile Stress Induced Retraction", ASME NEMB Conference, Houston, TX, Feb. 2010.

2009

1. Qi, H.J., Long, K.N., Dunn, M., 2009. "Mechanics of Soft Active Materials with Phase

- Evolution”, ASME IMECE 2009, Orlando, FL, November, 2009.
2. Long, K.N., Dunn, M., Qi, H.J., 2009. “Photo-Mechanical Modeling of Photo-Activated Polymers”, ASME IMECE 2009, Orlando, FL, November, 2009.
 3. Qi, H.J., Castro, F., Westbrook, Hermiller, J, Havens, E., 2009. “Investigation of Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers, SEM Conference”, Albuquerque, NM, June, 2009.
 4. Long, K.N., Dunn, M., Qi, H.J., 2009. “Photo-Mechanical Modeling of Photo-Activated Polymers”, SMN 2009 Conference, Weihai, China, July, 2009
 5. Qi, H.J., Westbrook, K., Castro, F., 2009. “A Thermo-Viscoelastic Model for Amorphous Shape Memory Polymers”. SMN 2009 Conference, Weihai, China, July, 2009.
 6. Qi, H.J, Castro, F., Hermiller, J., Havens, E. “Investigation of Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers”, SEM Conference, Albuquerque, NM, June, 2009
 7. Long, K.N., Dunn, M., Qi, H.J, 2009. “Constitutive model for photo-mechanical behaviors of photo-induced shape memory polymers”, in SAMPE’09, Baltimore, MD, May, 2009.
 8. Qi, H.J., Castro, F., 2009. “Time dependent thermo-mechanical behavior of thermally induced shape memory polymers”, in SAMPE’09, Baltimore, MD, May, 2009.
 9. Hermiller, J.M., Cable, K.M., Hemmelgarn, C.D., Qi, H.J., and Castro, F., 2008. “Thermal Design Methodology for Attaching Morphing Components”, in SPIE Conference on Smart Structures, San Diego, CA, March, 2009.
 10. Castro, F., Qi, H.J., Hermiller, J.M., Havens, E., 2009, “Time Dependent Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers”, in SPIE Conference on Smart Structures, San Diego, CA, March, 2009.

2008

1. H. J. Qi, L. Xiao, 2008, A Multiscale Modeling Approach for Large Deformation Behavior of Erythrocyte Membrane (poster), NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
2. H. J. Qi, F. Castro, K. Long, K. Westbrook, 2008, CAREER: Integrative Research and Education on Multiphysical Behaviors of Soft functional Materials (poster), NSF CMMI Grantee Conference, Knoxville, TN, January, 2008.
3. Francisco Castro, H. Jerry Qi, Thermal Rates Effects to the Shape Change of Thermally Induced Shape Memory Polymers, MTDM’08, Monterey, CA , April, 2008.
4. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, IMECE, Boston, MA, November, 2009.
5. Sitikantha Roy and H. Jerry Qi, Micromechanical Modeling of Cytoskeleton, SES’08, Urbana-Champaign, IL, October, 2008.
6. Francisco Castro, H. Jerry Qi, Robin Shandas-, Thermo-Mechanical Behavior of Thermally Induced Shape Memory Polymers, SES’08, Urbana-Champaign, IL, October, 2008.
7. Kristofer Westbrook, H. Jerry Qi, Modeling the Coupled Diffusion and Swelling Deformation of Hydrogels, SES’08, Urbana-Champaign, IL, October, 2008.
8. Philip H. Kao, Steven R. Lammers, H. Jerry Qi, Robin Shandas, A constitutive model considering the orthotropy of the elastic and collagen fiber networks, SES’08, Urbana-Champaign, IL, October, 2008.
9. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, SES’08, Urbana-Champaign, IL, October, 2008.

10. Kevin Long, Timothy Scott, H. Jerry Qi, Chris Bowman, Martin L. Dunn, Modeling the Photomechanics of Light-Activated Polymers, SMASIS, Ellicott City, MD, October, 2008.
11. Sitikantha Roy and H. Jerry Qi, Constitutive Modeling of Cell Cytoskeleton, MRS Fall conference, Boston, MA, November, 2008.

2007

1. H. J. Qi, F. Castro, J. M. Hermiller, D. E. Havens, On the Development of Constitutive Models of Finite Deformation Behavior of Shape Memory Polymers, SAMPE, SAMPE Fall Technical Conference and Exhibition Cincinnati, OH, Oct 29-Nov. 31, 2007.
2. P. Kao, H. Jerry Qi, Mechanical Properties of Fresh Artery Tissues and Elastin-Network, SES 2007, College Park, TX, October, 2007.
3. F. Castro, H. J. Qi, Thermo-mechanical Behaviors of Shape Memory Polymers, SES 2007, College Park, TX, October, 2007.
4. K. Long, M. Dunn, H. J. Qi, Shape Memory Effect of Shape Memory Polymers due to Nano-/Micro- Indentation, SES 2007, College Park, TX, October, 2007.
5. L. Xiao, H. J. Qi, A structural micromechanical approach for modeling large deformation behavior of red blood cells, SES 2007, College Park, TX, October, 2007.
6. H.J. Qi, Thermo-Mechanical Behaviors of Shape Memory Polymers, (**Keynote**), McMat 2007, Austin, TX, June, 2007.
7. L. Xiao, H.J. Qi, A Structural Micromechanical Approach for Modeling Large Deformation Behaviors of Red Blood Cells, McMat 2007, Austin, TX, June, 2007.
8. K. Westbrook, H.J. Qi, Design of Environmentally Responsive Hydrogel Based Sensors and Actuators, McMat 2007, Austin, TX, June, 2007.
9. P. Kao, H.J. Qi, A Comparative Study of Mechanical Properties of Fresh Artery Tissues and Elastin-Network, McMat 2007, Austin, TX, June, 2007.
10. L. Xiao, H.J. Qi, A Structural Micromechanical Approach for Modeling Large Deformation Behaviors of Red Blood Cells, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
11. K. Westbrook, H.J. Qi, Design of Environmentally Responsive Hydrogel Based Sensors and Actuators, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
12. H.J. Qi, F. Castro, Constitutive Modeling of Finite Deformation Behavior of Shape Memory Polymers, The 5th International Conference on Nonlinear Mechanics, Shanghai, China, June, 2007.
13. M. Dunn, K. Long, F. Castro, H. J. Qi Instrumented Indentation of Shape Memory Polymers, SPIE Conference on Smart Structures, San Diego, CA, March, 2007.

2006

1. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Thermo-Mechanical Modeling of Shape Memory Polymers. MRS Spring Conference, San Francisco, CA, April, 2006.
2. K. Westbrook, H.J. Qi, Constitutive Modeling of Large Deformation Behavior of Thermo-Responsive Hydrogels. MRS Spring Conference, San Francisco, CA, April, 2006.
3. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Constitutive Modeling of Thermo-Mechanical Behavior of Shape Memory Polymers. U.S. National Congress of Theoretical and Applied Mechanics 2006 Conference, Boulder, CO, June, 2006.
4. K. Westbrook, H.J. Qi, Large Deformation Behavior of Thermo-Responsive Hydrogels, SES 2006, State College, PA, August, 2006.

5. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Thermo-Mechanical Finite Deformation Behavior of Shape Memory Polymers. SES 2006, State College, PA, August, 2006.
6. M.L. Dunn, H.J. Qi, Shape Memory Effect of Shape Memory Polymers due to Nano-/Micro- Indentation, ASME IMECE 2006, Chicago, November, 2006.
7. H.J. Qi, C. Yakacki, R. Shandas, K. Gall, Constitutive Modeling of Shape Memory Polymers and its Application to Shape Changing Biomedical Device Design. MRS Fall Conference, Boston, MA, 2006.
8. L. Xiao, H.J. Qi, Modeling of Large Deformation Behavior of Red Blood Cells, MRS Fall Conference, Boston, MA, 2006.
9. K. Westbrook, H.J. Qi, Photo-patterned Environmentally Responsive Composite Hydrogel Actuators. MRS Fall Conference, Boston, MA, 2006.

2005

1. H.J. Qi, C. Ortiz, M.C. Boyce, Protein forced unfolding and its effects on the finite deformation stress-strain behavior of biomacromolecular solids. MRS Spring Conference, San Francisco, CA, April, 2005.
2. H.J. Qi, C. Ortiz, M.C. Boyce, Biological Mechanism of Mechanical Behavior of Nacre. (Poster). MRS Spring Conference, San Francisco, CA, April, 2005.
3. H.J. Qi, C. Ortiz, M.C. Boyce, Biological Mechanism of Mechanical Behavior of Nacre. McMat 2005, Baton Rouge, LA, June, 2005.
4. H.J. Qi, M.C. Boyce, Stress-Strain Behavior of Thermoplastic Polyurethane Elastomer and Its Application to the Traction of Elastomers. McMat 2005, Baton Rouge, LA, June, 2005.
5. H.J. Qi, C. Ortiz, M.C. Boyce, Protein Forced Unfolding and Its Effects to the Finite Deformation Stress-Strain Behavior of Biomacromolecular Membrane and Solids. McMat 2005, Baton Rouge, LA, June, 2005.
6. H.J. Qi, C. Ortiz, M.C. Boyce, Protein Forced Unfolding and Its Effects to the Finite Deformation Stress-Strain Behavior of Biomacromolecular Membrane and Solids Summer Bioengineering Conference, Vail, CO, June, 2005
7. H.J. Qi, M.C. Boyce, Large Strain Rate Dependent Stress-Strain Behavior of Thermoplastic Polyurethane Elastomers. IMECE 2005, Orlando, FL, November, 2005.
8. H.J. Qi, C. Ying, S. Hsu, Nano-scale Mechanistic Study of Tribological Behavior of Silicon (Poster). CU-NIST Symposium, November, 2005.

2004

1. H.J. Qi, M.C. Boyce, C. Ortiz, Protein unfolding and mechanics of nacre, in Workshop on Reliability Issues in Nanomaterials (invited only), Boulder, CO, August 16-18, 2004.
2. B. Bruet, H.J. Qi, K.L. Frick, C. Ortiz, M.C. Boyce. Nanomechanical properties of individual nacre plates from *Trochus Niloticus* (poster), MRS Spring Meeting, San Francisco, CA, April, 2004.

2003 and before

1. H.J. Qi, K. Teo, K. Lau, J. Lao, M.C. Boyce, J. Robertson, W. Milne, Z. Ren, K.K. Gleason, Nanoindentation of Vertically Aligned Carbon Nanotubes, PMMA Coated Nanotubes, and ZnO Nanofibers, MRS Fall Meeting, Boston, MA, December, 2003.
2. H.J. Qi, M.C. Boyce, Influence of time dependence and cyclic softening on surface traction of elastomers, 40th Annual Technical Meeting, Society of Engineering Science,

- Detroit, MI, October, 2003.
3. H.J. Qi, M.C. Boyce, Topography studies of thermoplastic polyurethane upon cyclic micro scratching tests, 40th Annual Technical Meeting, Society of Engineering Science, Detroit, MI, October, 2003.
 4. H.J. Qi, M.C. Boyce, FEM simulations of micro indentation/scratching tests on elastomeric materials, 2003 ASME Mechanics and Materials Conference, Scottsdale, AZ, June, 2003.
 5. H. Qi, K. Teo, K. Lau, M.C. Boyce, J. Robertson, W. Milne, K.K. Gleason, On determining the mechanical properties of carbon nanotubes and vertically aligned carbon nanotube forests using nanoindentations, MRS Spring Meeting, San Francisco, CA, April, 2003.
 6. H. Qi, K. Lau, M.C. Boyce, K.K. Gleason, K. Teo, J. Robertson, W. Milne, Effects of processing conditions and dimensions on the mechanical properties of vertically aligned carbon nanotube forests, Annual APS March Meeting 2003, Austin, TX, March, 2003.
 7. H. Qi, M.C. Boyce, Micro in-situ SEM study of abrasive wear of elastomeric materials (poster), presented at 2001 Gordon Research Conference on Elastomers, Networks and Gels, Colby-Sawyer College, New London, NH, August, 2001.
 8. H. Qi, M.C. Boyce, Micro in-situ SEM study of abrasive wear of elastomeric materials, presented at the Symposium on the Durability of Elastomeric Material Systems, part of the national 2001 Mechanics and Materials Conference, San Diego, CA, June, 2001.

SERVICES

Department

1. 09/2012-05/2013, mechanical engineering faculty search committee chair
2. 09/2010-05/2011, faculty search committee chair
3. 09/2009-05/2010, member of faculty search committee
4. 04/2009, leader for Math topic in prelim exams in 2009
5. 09/2007-05/2008, member of faculty search committee
6. 09/2005-05/2007, member of graduate committee
7. 09/2005-05/2007, faculty member responsible for ME graduate seminars
8. 04/2005-04/2007, leader for Applied Mechanics topic in prelim exams in 2005-2007.
9. 09/2005-05/2006, member of ad hoc committee on “implementing matlab into ME curriculum”
10. 09/2004-05/2005, member of faculty search committee

College

1. 05/2006, judge for undergraduate DLC Apprenticeship Competition

Campus

1. 09-2012-, executive committee member of material science and engineering program.
2. 09/2012-05/2013, material science and engineering faculty search committee chair
3. 03/2005-05/2007, member of Task Force on International Graduate Education
4. 03/2007, reviewer for CU-NREL seed grants applications

Society

1. 01/2015-, treasurer, member of Board of Directors, Society of Engineering Science
2. 06/2012-05/2014, chair of time-dependent material technical committee of SEM (Society of Experimental Mechanics)
3. 11/2009-12/2009, chair of mechanics of soft material technical committee of ASME Applied Mechanics Division (AMD).
4. 06/2009-06/2011, vice chair of time-dependent material technical committee of SEM.
5. 11/2007-10/2009, recording secretary of ASME AMD executive committee.

PROFESSIONAL SOCIETIES

Member of ASME
 Member of MRS
 Member of SPIE
 Member of SAMPE
 Member of SEM

PROFESSIONAL ACTIVITIES

Guest Editors for Journal Special Issues

H.J., Qi, T.D. Nguyen, 2009. Special Issue on Mechanics of Soft Materials, International Journal of Structural Changes in Solids -Mechanics and Applications, in progress.

R.B. Hall, H.B. Lu, H.J. Qi, 2009. Special Issue on 6th international conference on mechanics of time-dependent materials, Journal of Time Dependent Behavior of Materials, Volume 13, Issue2.

R.B. Hall, H.J. Qi, 2006. Special Issue on Time Dependent Behavior in Polymeric Composites and Their Matrices, Journal Engineering Materials and Technology, Vol. 128, October, (As a guest editor)

Conferences and Symposia

Organizer and co-organizer, (with Richard Hall, Hongbing Lu, G. P. Tandon, B. R. Antoun, Y.C. Lu), *Symposium on Time Dependent Constitutive Behavior of Materials*, In 2011-2014 SEM Annual Conference & Exposition.

Organizer (with Richard Hall, Hongbing Lu, G. P. Tandon, B. R. Antoun, Y.C. Lu), *Symposium on Time Dependent Constitutive Behavior and Failure/Fracture Processes*, In 2010 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Indianapolis, IN.

Co-Organizer (with S. Li and G. Bao), Bio-physics and bio-mechanics of cells, in ASEM 2010 First Global Congress on NanoEngineering for Medicine and Biology, Houston, TX.

Co-Organizer (with Richard Hall, Hongbing Lu, G. P. Tandon), *Symposium on Time Dependent Constitutive Behavior and Failure/Fracture Processes*, In 2009 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, Albuquerque, NM.

Conference Co-Chair (with Richard B. Hall and Hongbin Lu), *6th International Conference on Mechanics of Time-Dependent Materials 2008*, Monterey, CA.

Co-Organizer (with Thao Nguyen, Rebecca Dupaux, Jorgen Bergstrom, Thao Nguyen), the 4rd *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2008, Urbana, IL.

Organizer (with Rebecca Dupaix, Jorgen Bergstrom, Thao Nguyen), the 3rd *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2007, College Station, TX.

Co-Organizer (with Philip LuDec, and Gang Bao) the *Symposia on Mechanics in Biomedicine* in AMD McMat 2007, Austin, TX.

Co-Organizer (with Hongbin Lu and Richard B. Hall) the *Symposium on Time Dependent Behaviors of Polymer* in AMD McMat 2007, Austin, TX.

Co-Organizer (with Sanjeev Khanna), the *Symposium of Characterization of Nanomaterials for Biomedical Applications* in ASME 2006, Chicago, IL.

Organizer (with Jeff E. Bischoff, Jorgen Bergstrom), the 2nd *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in SES 2006 (22 presentations), State College, PA.

Organizer (with Jeff E. Bischoff, Jorgen Bergstrom), the *Symposium of Mechanics of Soft Materials and Soft Biological Tissues* in McMat 2005, Baton Rouge, LO.

Co-Organizer (with Sanjeev Khanna), the *Symposium of Characterization of Nanomaterials for Biomedical Applications* in ASME 2005, Orlando, FL.

Co-Organizer (With Richard B. Hall), the *2nd Symposium on Time Dependent Behaviors of Polymer* in ASME 2005, Orlando, FL.

STUDENTS AND POSTDOC ADVISED

Doctoral Students Graduated

Qi Ge, 08/2009-12/2012, CU, “Thermal-Mechanics of Shape Memory Polymers and Composites”, co-advise with Martin Dunn.

Binglian Wang, 08/2010-12/2012, CU, “Micromechanics and constitutive models for soft active materials with phase evolution”.

Feng Miao, 08/2008, 12/2012, CU, “Mechanics of Interaction between Cell Membrane and a Rigid Substrate”.

Xin Wang, 08/2008-08/2012, CU, “Contact Mechanics in Wheel-Tissue Interactions for Medical Robotic Devices”, co-advise with Mark Rentschler.

Steven Lammers, 08/2004-08/2009. Co-advise with Robin Shandas, “The Role of Elastin in Pulmonary Hypertensive Conduit Artery Stiffening”, August, 2009. Currently as a postdoc at CUHSC.

Francisco Castro, 09/2005-11/2009. “Thermo-Mechanical Behavior of Shape Memory Polymers”, November, 2009. Lecturer in ME Department at CU-Boulder.

Kristofer Westbrook, 08/2005 – 07/2010, CU, “Finite Deformation Constitutive Modeling of Soft Active Materials, Thermally Responsive Polymers”, currently as a senior engineering at Boston Scientific, Ltd.

Philips Kao, 08/2006 – 07/2010, CU, “Biaxial mechanical characterization and microstructure-driven modeling of elastic pulmonary artery walls of large mammals under hypertensive conditions”. Co-Advise with Robin Shandas, currently as a postdoc.

Kevin Long, 08/2006 – 06/2010, CU, “Mechanics of Light Activated Network Polymers”. Co-Advise with Martin Dunn, currently as a technical staff at Sandia National Laboratories.

Lian Tian, 08/2006-11/2010, CU, “Bioengineering Investigations of Pulmonary Vascular Function in Pulmonary Hypertension: in vivo, in vitro and Model Studies”, co-advise with Kendall Hunter, Robin Shandas.

Postdoctoral Research Associate

Xiaodong Cui, 01/2011-08/2012, CU.

Philips Kao, 01/2011- 08/2011.

Sitikantha Roy, 10/2007 – 11/2009, CU, “Computational Mechanics of Cells”. Currently as a postdoc at Johns Hopkins University.

Doctoral Students

Xiaoming Mu, 08/2012-present, CU.

Kai Yu, 01/2011-present, CU, “Themomechanical behaviors of shape memory polymers”.

Master Students

Jennie Ryu, 01/2011-present, CU, “Controlled Deformation of Light Activated Polymers”, co-advise with Martin Dunn

Gregory Pelkie, 08/2009-present, CU “Mechanical Behaviors of Arterial Tissues”.

Long Xiao, 08/2005 – 05/2008, CU, “Micromechanical Modeling of Large Deformation Behavior of Red Blood Cells”.

Will Francis, 08/2005 – 05/2007, CU, “Micromechanical Modeling of Fiber Reinforced Shape Memory Elastic Materials”. Co-advise with Martin Dunn

Y. Ge, 08/2004 – 05/2005, CU, “Micro Mechanics of Cytoskeleton of Red Blood Cell.”. Transferred to Purdue University without finishing.

K. Tai (Co-advise with C. Ortiz), 09/2003 – 08/2004, MIT, “Micro- and nano- mechanics of cortical bone tissue”.

Undergraduate Students

Stacey Sokol, 08/2009-present, “Thermo-Mechanical Testing of Shape Memory Polymers”

Lucas Turpin, 09/2008-present, “Light-activated polymers”.

Elizabeth Jones, 09/2008-05/2009, DLC apprentice, CU, “SMP Characterization”

Steven Szabados, 09/2008-05/2009, DLC apprentice, CU, “Hydrogel beads”

Erik Schmidt, 09/2008-05/2009, DLC apprentice, CU, “SMP Characterization”

Kevin Fiedler, 09/2007-05/2009, DLC apprentice, CU, “Hydrogel actuators”

Jennifer Miller, 09/2007-05/2008, CU, “Multiphysical behaviors of SMPs”

Christine Renes, 09/2007-05/2008, CU, “Multiphysical behaviors of SMPs”

Trenton Lynch, 05/2005 – 07/2007, CU, DLC apprentice (09/2006-05/2007), “Nanomechanical properties of diatoms”.

K. Gredvig, 08/2004 – 08/2006. CU, “Surface mechanical properties of thermoplastic polyurethane”.

K. Mcneilly, 08/2004 – 08/2005. CU, “Nanoindentation on thermoplastic polyurethane”.

K. Joyce, (Co-advised with M.C. Boyce), 02/2002 – 06/2002. MIT, S.B. Thesis, “FEM simulations of Durometer Hardness”.

G.F. Ebeling (Co-advised with M.C. Boyce), 02/2004 – 06/2004. MIT, S.B. Thesis, “Macro Scale Physical Model of Nanoindentation on Vertically Aligned Carbon Nanotube Forests”.