

# Mehrdad Negahban, Ph.D.

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## Professor

Department of Mechanical and Materials Engineering

## U.S. Director (2010-2022)

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## AREAS OF RESEARCH SPECIALIZATION

**Nonlinear Mechanics of Materials and Material Simulation:** General interest in theoretical and computational analysis and simulations, and in the experimental characterization of the thermodynamics of solids, with specific interests in constitutive modeling, nonlinear and time dependent characteristics, finite deformations, phase transformations, and in development of object oriented finite element methods. Most of this work is focused on modeling and characterization of the response of glassy and semi-crystalline polymers, with a developing interest in modeling and characterization of failure and fracture with aging, and with developing work on biological materials.

## EDUCATION

**Ph. D. (1988):** University of Michigan, Applied Mechanics

**Dissertation:** “Material Symmetry and the Evolution of Anisotropies in First Gradient Theories of Nonlinear Material Behavior; Inelasticity; Polymer Crystallization.” (Advisor: Alan S. Wineman)

**M. S. E. (1984):** University of Michigan, Applied Mechanics

**B. S. (1982):** Iowa State University of Science and Technology, Mechanical Engineering

## PROFESSIONAL EMPLOYMENT

**1983:** Teaching Assistant in the Department of Aerospace Engineering at the University of Michigan.

**1983-88:** Teaching Assistant and Instructor in the Department of Mechanical Engineering at the University of Michigan.

**1988:** Visiting Research Associate at Michigan State University, Machinery Elastodynamics and Intelligent Materials and Structures Laboratory.

**1989-95:** Assistant Professor of Engineering Mechanics, University of Nebraska-Lincoln, Lincoln, NE.

**1995-2010:** Associate Professor of Engineering Mechanics, University of Nebraska-Lincoln, Lincoln, NE.

**2010-2011:** Professor of Engineering Mechanics, University of Nebraska-Lincoln, Lincoln, NE.

**2011-:** Professor of Mechanical & Materials Engineering, University of Nebraska-Lincoln, Lincoln, NE.

## REFEREED PUBLICATIONS (“\*” = Advisee, “†” = Corresponding Author)

1. AS Wineman<sup>†</sup>, KR Rajagopal, and M Negahban, “Change in Material Symmetry Associated with Deformation: Uniaxial Extension,” *International Journal of Engineering Science*, **26**, 12, 1307-1318 (1988).
2. M Negahban<sup>†</sup>, and AS Wineman, “Material Symmetry and the Evolution of Anisotropies in a Simple Material: I. Change of Reference Configuration,” *International Journal of Nonlinear Mechanics*, **24**, 6, 521-536 (1989).

3. M Negahban<sup>†</sup>, and AS Wineman, "Material Symmetry and the Evolution of Anisotropies in a Simple Material: II. The Evolution of Symmetry," *International Journal of Nonlinear Mechanics*, **24**, 6, 537-549 (1989).
4. M Negahban<sup>†</sup>, and AS Wineman, "The Evolution of Anisotropies in the Elastic Response of an Elastic-Plastic Material," *International Journal of Plasticity*, **8**, 519-542 (1992).
5. M Negahban<sup>†</sup>, and AS Wineman, "Modeling the Mechanical Response of a Material Undergoing Continuous Isothermal Crystallization," *International Journal of Engineering Science*, **30**, 7, 953-962 (1992).
6. M Negahban<sup>†</sup>, AS Wineman, and RJ Ma\*, "Simulation of Mechanical Response in Polymer Crystallization," *International Journal of Engineering Science*, **31**, 1, 93-113 (1993).
7. M Negahban<sup>†</sup>, and MV Gandhi, "Local and Global Universal Relations for First-Gradient Materials," *Journal of Elasticity*, **33**, 67-87 (1993).
8. M Negahban<sup>†</sup>, "Simulation of Mechanical Response in Crystallizing Polymers: Crystallization Under Constant Shearing Deformations," *Mechanics of Materials*, **16**, 4, 379-399 (1993).
9. M Negahban<sup>†</sup>, and AS Wineman, "The Evolution of Material Symmetry in the Elastic Response of a Fully Strain Space Theory of Plasticity," *ASME AMD-Vol.: Anisotropy and Inhomogeneity in Elasticity and Plasticity*, **158**, 19-23 (1993).
10. JD Nielson\*, and M Negahban<sup>†</sup>, "Mathematical Modeling and Computational Simulation of Tubular Sheath Extrusion with Post-Extrusion Drawing: Application to Polymer Casing of Electronic Wire and Cable," *ASME AMD-Vol: Mechanics in Materials Processing and Manufacturing*, **194**, 41-55 (1994).
11. M Negahban<sup>†</sup>, "Theoretical Simulation of an Anomalous Response in a Torsional Oscillator," *Journal of Applied Mechanics*, **61**, 1, 124-130 (1994).
12. RJ Ma\*, and M Negahban<sup>†</sup>, "Simulation of Mechanical Response in Crystallizing Polymers: Crystallization under a Constant Shear Force," *Acta Mechanica*, **112**, 1, 59-76 (1995).
13. M Negahban<sup>†</sup>, "A Study of Thermodynamic Restrictions, Constraint Conditions, and Material Symmetry in Fully Strain-Space Theories of Plasticity," *International Journal of Plasticity*, **11**, 6, 679-724 (1995).
14. RJ Ma\*, and M Negahban<sup>†</sup>, "Simulation of Mechanical Response During Polymer Crystallization Around Rigid Inclusions and Voids: Homogeneous Crystallization," *Mechanics of Materials*, **21**, 1, 25-50 (1995).
15. RJ Ma\*, and M Negahban<sup>†</sup>, "A preliminary study of the mechanical effects of polymer crystallization around a rigid cylindrical inclusion: homogeneous crystallization under plane strain," *ASME AMD-Vol.: Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range*, **203**, 61-75 (1995).
16. M Negahban<sup>†</sup>, "A thermodynamic theory for characterizing thermo-mechanical response of polymers during crystallization," *ASME AMD-Vol.: Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range*, **203**, 45-60 (1995).
17. M Negahban<sup>†</sup>, "Preliminary results on an effort to characterize the thermo-mechanical response of amorphous polymers in the glass-transition range," *ASME MD-Vol. 68 AMD-Vol. 215: Mechanics of Plastics and Plastic Composites*, **215**, 133-152 (1995).
18. M Negahban<sup>†</sup>, "Thermodynamic Modeling of the Thermomechanical Effects of Polymer Crystallization: A General Theoretical Structure," *International Journal of Engineering Science*, **35**, 277-298 (1997).
19. M Negahban<sup>†</sup>, "Thermomechanical Effects Associated with Crystallization of Rubber Under Stretch and During Slow Extension," *Journal of Engineering Materials and Technology*, **119**, 298-304 (1997).
20. M Negahban<sup>†</sup>, "Modeling the thermomechanical effects of crystallization in natural rubber: I. The theoretical structure," *International Journal of Solids and Structures*, **37**, 2777-2789 (2000).
21. M Negahban<sup>†</sup>, "Modeling the thermomechanical effects of crystallization in natural rubber: II. Elementary thermodynamic properties," *International Journal of Solids and Structures*, **37**, 2791-2809 (2000).
22. M Negahban<sup>†</sup>, "Modeling the thermomechanical effects of crystallization in natural rubber: III. Mechanical properties," *International Journal of Solids and Structures*, **37**, 2811-2824 (2000).
23. M Negahban<sup>†</sup>, "Results of implementing a computer based mechanics readiness program in Statics," *International Journal of Engineering Education*, **16**, 5, 408-416 (2000).
24. B Eghball<sup>†</sup>, JS Schepers, M Negahban, and MR Schlemmer, "Spatial and Temporal Variability of Soil Nitrate and Corn Yield: Multifractal Analysis," *Agronomy Journal*, **95**, 339-346 (2003).

25. M Negahban<sup>†</sup>, A Goel\*, P Delabarre\*, R Feng, and A. Dimick\*, “Experimentally evaluating the equilibrium stress in shear of glassy polycarbonate,” *Journal of Engineering Materials and Technology*, **128**, 537-542 (2006).
26. M Negahban<sup>†</sup>, “Single and multiple material constraints in thermoelasticity,” *Mathematics and Mechanics of Solids*, **12**, 623-664 (2007).
27. M Negahban<sup>†</sup>, K Strabala\*, P Delabarre\*, A Goel\*, R Feng, and J Grenet, “Temperature dependence of the back-stress in shear for glassy polycarbonate,” *Macromolecular Symposia*, **258**, 142-151 (2007).
28. O Lima, L Tan<sup>†</sup>, A Goel\*, M Negahban, and Z Li, “Creating micro- and nanostructures on tubular and spherical surfaces,” *Journal of Vacuum Science and Technology B*, **25**, 2412-2418 (2007).
29. J-M Saiter, M Negahban<sup>†</sup>, P dos Santos Claro\*, P Delabarre\*, and M-R Garda, “Quantitative and Transient DSC Measurements I. Heat Capacity and Glass Transition,” *Journal of Materials Education*, **30**, 51-95 (2008).
30. M Negahban<sup>†</sup>, A Goel\*, and L Zhang\*, “Evaluating the development of elastic anisotropy with plastic flow,” *Acta Mechanica*, **208**, 259-267 (2009).
31. M Negahban<sup>†</sup>, A Goel\*, P Marchon\*, and A Azizinamini, “Geometrically Exact Nonlinear Extended-Reissner/Mindlin Shells: Fundamentals, Finite Element Formulation, Elasticity,” *International Journal for Computational Methods in Engineering Science and Mechanics*, **10**, 430-449 (2009).
32. L Delbreilh<sup>†</sup>, M Negahban, M Benzohra, C Lacabanne, and J-M Saiter, “Glass transition investigated by a combined protocol using thermostimulated depolarization currents and differential scanning calorimetry,” *Journal of Thermal Analysis and Calorimetry*, **96**, 865-871 (2009).
33. A Goel\*, K Strabala\*, M Negahban<sup>†</sup>, and JA Turner, “Modeling the development of elastic anisotropy with plastic flow for glassy polycarbonate,” *Polymer Engineering and Science*, **49**, 1951-1959 (2009).
34. A Goel\*, K Strabala\*, M Negahban<sup>†</sup>, and R Feng, “Experimentally evaluating equilibrium stress in uniaxial tests,” *Experimental Mechanics*, **50**, 709-716 (2010).
35. A Goel\*, M Negahban<sup>†</sup>, and L Zhang\*, “Modeling nonlinear thermo-elastic response for glassy polycarbonate using ultrasonic results under compression in a confined cell,” *Mechanics of Materials*, **43**, 119-126 (2011).
36. A Goel\*, Y Wen\*, J Hein\*, M Negahban<sup>†</sup>, and JA Turner, “Measuring the influence of temperature on the development of the elastic anisotropy with compressive plastic flow for glassy polycarbonate,” *Journal of Engineering Materials and Technology*, **133**, 7 pages (2011).
37. A Goel\*, A Sherafati\*, M Negahban<sup>†</sup>, A Azizinamini, and Y Wang\*, “A finite deformation nonlinear thermo-elastic model that mimics plasticity during monotonic loading,” *International Journal of Solids and Structures*, **48**, 2977-2986 (2011).
38. L Zhang\*, and M Negahban<sup>†</sup>, “Propagation of infinitesimal thermo-mechanical waves during the finite-deformation loading of a viscoelastic material: General theory,” *Zeitschrift für angewandte Mathematik und Physik*, **63**, 1143-1176 (2012).
39. G Gao, Z Li<sup>†</sup>, and M Negahban, “Dynamic fracture analysis of aged glassy polycarbonate by the method of caustics,” *Acta Mechanica Solida Sinica*, **26**, 5, 448-457 (2012).
40. JF Cepeda, C Weller<sup>†</sup>, H Thippareddi, M Negahban, and J Subbia, “Modeling Cooling of Ready-to-Eat Meats by 3D Finite Element analysis: Validation in Meat Processing Facilities,” *Journal of Food Engineering*, **116**, 450-461 (2013).
41. JF Cepeda, C Weller<sup>†</sup>, M Negahban, J Subbia, and H Thippareddi, “Heat and Mass Transfer Modeling for Microbial Food Safety Applications in the Meat Industry: A Review,” *Food Engineering Reviews*, **5**, 57-76 (2013).
42. K Strabala\*, S Meagher\*, C Landais\*, L Delbreilh, M Negahban<sup>†</sup>, J-M Saiter, JA Turner, A Ingram, and R Golovchak, “Anisotropic loss of toughness with physical aging of work toughened polycarbonate,” *Polymer Engineering and Science*, **54**, 794-804 (2014).
43. J Chen, K Pitchai, S Birla, M Negahban, D Jones, and J Subbia, “Heat and Mass Transport during Microwave Heating of Mashed Potato in Domestic Oven-Model Development, Validation, and Sensitivity Analysis,” *Journal of Food Science*, **79**, 1991-2004 (2014).
44. A Jadwai\*, J-M Saiter, F Barbe<sup>†</sup>, and M Negahban, “Porous biodegradable starch based polymer : effects of plasticizers on the physical properties,” *Macromolecular Symposia*, **340**, 65-72 (2014).
45. G Gao, Z Li<sup>†</sup>, and M Negahban, “Dynamic fracture analysis of polycarbonate by the optical method of caustics,” *Procedia Materials Science*, **3**, 165-176 (2014).
46. L Zhang\*, J Jasa\*, G Gazonas, A Jérusalem, and M Negahban<sup>†</sup>, “Extracting continuum-like deformation and stress from molecular dynamics simulations,” *Computer Methods in Applied Mechanics and Engineering*, **283**, 1010-1031 (2015).

47. Z Chen\*, and M Negahban†, “Avoiding Negative Elastic Moduli when using Lagrange Interpolation for Material Grading in Finite Element Analysis,” *Acta Mechanica*, **227**, 693-706 (2015).
48. W Li\*, EN Brown, PJ Rao, G Gazonas, and M Negahban†, “Mechanical Characterization and Preliminary Modeling of PEEK,” *Mechanics of Composite and Multi-functional Materials*, **7**, 209-218 (2016).
49. J Chen, K Pitchai, S Birla, D Jones, M Negahban, and J Subbia†, “Modeling heat and mass transport during microwave heating of frozen food rotating on a turntable,” *Food and Bioproducts Processing*, **99**, 116-127 (2016).
50. L Buterfield\*, E Bobo\*, W Li\*, S Henning, N Delpouve†, L Tan, J-M Saiter, and M Negahban, “Morphology and Thermomechanical Properties in Epoxy Acrylate Interpenetrated Networks,” *Macromolecular Symposia*, **365**, 59-66 (2016).
51. W Li\*, F Bateux\*, S Araujo\*, N Delpouve, J-M Saiter, and M Negahban†, “Measurement of Beer-Lambert Attenuation Coefficient and Curing Kinetics Power Order: A Method Based on Rapid-Scan FTIR During Laser Curing on an ATR,” *Macromolecular Symposia*, **365**, 173-179 (2016).
52. W Li\*, M Bakhtiary-Noodeh\*, N Delpouve, J-M Saiter, L Tan, and M Negahban†, “Printing Continuously Graded Interpenetrating Polymer Networks of Acrylate/Epoxy by Manipulating Cationic Network Formation during Stereolithography,” *eXPRESS Polymer Letters*, **10**, 12, 1003-1015 (2016).
53. Z Zhang\*, L Zhang\*, J Jasa\*, W Li\*, G Gazonas, and M Negahban†, “High fidelity computational characterization of the mechanical response of thermally aged polycarbonate,” *Modelling and Simulation in Materials Science and Engineering*, **25**, 26 pages (2017).
54. Z Chen\*, and M Negahban†, “Functional grading of IPN parts: Plates with single and multiple cracks,” *Acta Mechanica*, **228**, 11, 3847-3865 (2017).
55. L Zhang\*†, Z Zhang\*, J Jasa\*, D Li, RO Cleveland, M Negahban, and A Jérusalem†, “Molecular dynamics simulations of heterogeneous cell membranes in response to uniaxial membrane stretches at high loading rates,” *Scientific Reports*, **7**, 8316 (2017).
56. Y Liu, J Yi, Z Li†, X Su, W Li\*, and M Negahban, “Dissipative elastic metamaterial with a low-frequency passband,” *AIP Advances*, **7**, 6, 65215 (2017).
57. Z Chen\*, W Li\*, M Negahban†, J-M Saiter, N Delpouve, L Tan, and Z Li, “Approaching the upper bound of load capacity: Functional grading with interpenetrating polymer networks,” *Journal of Materials and Design*, **137**, 152-163 (2018).
58. S Araujo\*, F Bateux\*, W Li\*, L Buterfield\*, N Delpouve†, A Esposito, L Tan, J-M Saiter, and M Negahban, “A structural interpretation of the two components governing the kinetic fragility from the example of interpenetrated polymer networks,” *Journal of Polymer Science Part B: Polymer Physics*, **56**, 20, 1393-1403 (2018).
59. W Li\*, G Gazonas, EN Brown, PJ Rao, and M Negahban†, “Thermomechanical model for monotonic and cyclic loading of PEEK,” *Mechanics of Materials*, **129**, 113-138 (2019).
60. L Zhang\*, Z Zhang\*, M Negahban, and A Jérusalem†, “Molecular dynamics simulation of cell membrane pore sealing,” *Extreme Mechanics Letters*, **27**, 83-93 (2019).
61. W Li, N Delpouve, S Araujo, F Bateux, E Bobo, J-M Saiter, L Tan, and M Negahban†, “Controlling properties of acrylate/epoxy interpenetrating polymer networks by premature termination of radical polymerization of acrylate,” *Polymer Engineering and Science*, 10 pages (2019).
62. Z Chen\*, S Shao, M Negahban†, and Z Li†, “Tunable metasurface for acoustic wave redirection, focusing and source illusion,” *Journal of Physics D: Applied Physics*, **52**, 39, 395503 (2019).
63. Z Zhang\*, Y Hong, B Hou, Z Zhang, M Negahban, and J Zhang†, “Accelerated discoveries of mechanical properties of graphene using machine learning and high-throughput computation,” *Carbon*, **148**, 115-123 (2019).
64. H Hadidi, B Mailand, T Sundermann, E Johnson, G Madireddy, M Negahban, L Delbreilh, and M Sealy†, “Low velocity impact of ABS after shot peening predefined layers during additive manufacturing,” *Procedia Manufacturing*, **34**, 594-602 (2019).
65. J Yi, M Negahban, Z Li†, X Su, and R Xia, “Conditionally extraordinary transmission in periodic parity-time symmetric phononic crystals,” *International Journal of Mechanical Sciences*, **163**, 13 pages (2019).
66. Z Chen\*†, M Negahban†, Z Li†, and J Zhu, “Tunable Exceptional Point and Unidirectional Zero Reflection of a Metabeam Using Shunted Piezos,” *Journal of Physics D: Applied Physics*, **52**, 9, 95503 (2019).
67. H Eudier†, S Ben-Harb, J-P Lorand, M Negahban, J-M Saiter, and M Chan-Huot, “Properties Of An Analogue Cheese Obtained From Raw Peanut,” *Peanut Science*, **47**, 2, 81-88 (2020).

68. Z Chen, F Yan<sup>†</sup>, M Negahban<sup>†</sup>, and Z Li, “Resonator-based reflective metasurface for low-frequency underwater acoustic waves,” *Journal of Applied Physics*, **128**, 5, 55305 (2020).
69. L Chen, J Jung, BD Chaves, D Jones, M Negahban, Y Zhao, and J Subbia<sup>†</sup>, “Challenges of dry hazelnut shell surface for radio frequency pasteurization of inshell hazelnuts,” *Food Control*, **125**, 107948 (2021).
70. Z Chen, F Yan<sup>†</sup>, M Negahban<sup>†</sup>, and Z Li, “Extremely thin reflective metasurface for low-frequency underwater acoustic waves: Sharp focusing, self-bending, and carpet cloaking,” *Journal of Applied Physics*, **130**, 125304 (2021).
71. J Yi, Z Li<sup>†</sup>, M Negahban, R Xia, and J Zhu, “Asymmetric viscoelastic metamaterials for broad bandgap design and unidirectional zero reflection,” *Mechanical Systems and Signal Processing*, **162**, 108101 (2022).
72. Z Zhang\*, L Zhang\*, J Jasa\*, M Negahban<sup>†</sup>, and G Gazonas, “Molecular sources of ratcheting in poly-dispersed polycarbonate,” *International Journal of Fatigue*, **154**, 106567 (2022).
73. J Yi, Z Ma, R Xia, M Negahban, C Chen, and Z Li<sup>†</sup>, “Structural periodicity dependent scattering behavior in parity-time symmetric elastic metamaterials,” *Physical Review B*, **106**, 1, 14303 (2022).
74. L Song, Z Chen<sup>†</sup>, M Negahban, L Liang, Z Li, and Z Wu, “Ultrathin coding metasurface for underwater wave focusing, branching and self-bending generation with one single actuator,” *Applied Physics Letters*, **36**, 21, 2250091 (2022).
75. R Xia, S Shao, J Yi, K Zheng, M Negahban, and Z Li<sup>†</sup>, “Tunable asymmetric transmission of Lamb waves in piezoelectric bimorph plates by electric boundary design,” *Composite Structures*, **300**, 116111 (2022).

#### PUBLICATIONS IN PREPARATION (“\*” = Student)

1. J. Vogeler\*, R. Feng, A. Goel\*, M. Negahban, “Using a torsional Kolsky bar to characterizing the normal stress induced by rapid shear in glassy Polycarbonate,” (in preparation).
2. A. Goel\*, M. Negahban, “Modeling of the anisotropic nonlinear thermoelastic response of Polycarbonate resulting from plastic flow,” (in preparation).

#### VOLUME EDITOR

1. M. Negahban, “Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range,” ASME-Applied Mechanics Division publication, vol. 203, 1995.
2. L. Tan, M. Negahban, “Special Issue: POLYCHAR 23 World Forum on Advanced Materials,” Macromolecular Symposia, Vol. 365, Pages 1-267, 2016.

#### BOOKS

1. M. Negahban, “The Mechanical and Thermodynamical Theory of Plasticity,” CRC Press, Taylor & Francis, Boca Raton, 2012.

#### OTHER PUBLICATIONS

1. M. Negahban, A.S. Wineman, “The Many Faces of Isotropy: Characteristics of Describing Material Symmetry,” *Proceedings of the Twelfth Canadian Congress of Applied Mechanics*, Ottawa, Ontario, 1989, pages 838-839.
2. M. Negahban, A.S. Wineman, “Following the Mechanical Response in Phase Transitions: Elastic Solid to Elastic Solid Transitions,” *Proceedings of the Twelfth Canadian Congress of Applied Mechanics*, Ottawa, Ontario, 1989, pages 840-841.
3. M. Negahban, M. V. Gandhi, “Universal Relations and Solutions for First-Gradient Materials,” *28th Annual Meeting of the Society of Engineering Science*, Gainesville, Florida, 1991, 9 pages, ESP28.91003.
4. M. Negahban, “Constitutive Modeling of Phase Transition in Smart Materials,” *Proceedings of the ADPA, AIAA, ASME, SPIE international symposia on Active Material and Adaptive Structures*, Alexandria, Virginia, November 4-8, 1991, pages 211-216.
5. M. Negahban, “Thermo-Mechanical Modeling of Plastic Flow and Shape Recovery in Amorphous Polymers,” *Proceedings of the International Symposium on Plasticity and Its Current Applications*, Baltimore, MD, July 19-23, 1993 (4 pages, accepted but volume was not published).
6. M. Negahban, “Results of implementing a mechanics readiness program in statics,” *Workshop on Reform of Undergraduate Mechanics Education*, Penn State, August 16-18, 1998.
7. M. Negahban, “Modeling Fusion And Crystallization In Polyethylene With Application To Rotational Molding,” *Fourth International Conference on Constitutive Laws for Engineering Materials*, Rensselaer Polytechnic Institute in Troy, NY from July 27-30, 1999.
8. L.Zhang, T. Boulet, J. Hein, M. Arnoult, M. Negahban, “Material characterization and modeling of head for dynamic simulations,” *Proceedings of the ICCES’10*, Los Vegas, NV, March 28-April 1, 2010.

9. W. Li, E. N. Brown, P. J. Rae, G. Gazonas, M. Negahban, "Mechanical Characterization and Preliminary Modeling of PEEK," Experimental Mechanics Annual 2015, Costa Mesa, CA June 811, 2015.

#### CONFERENCE PRESENTATIONS ("\*" = Student)

1. "A Framework for Studying the Mechanical Response in Isothermal Solid Polymer Crystallization," M. Negahban, A.S. Wineman, 60th Annual Meeting of the Society of Rheology, Gainesville, Florida, February 1989.
2. "The Many Faces of Isotropy: Characteristics of Describing Material Symmetry," M. Negahban, A.S. Wineman, Twelfth Canadian Congress of Applied Mechanics, Ottawa, Ontario, May 1989.
3. "Following the Mechanical Response in Phase Transitions: Elastic Solid to Elastic Solid Transitions," M. Negahban, A.S. Wineman, Twelfth Canadian Congress of Applied Mechanics, Ottawa, Ontario, May 1989.
4. "On Fully Strain Space Plasticity and the Evolution of Anisotropies in One Such Theory," M. Negahban, A.S. Wineman, Society of Engineering Science Meeting, Ann Arbor, Michigan, September 1989.
5. "Development of Anisotropy in Isotropic Nonlinear Elastic Solids Due to Deformation Induced Microstructural Changes," A.S. Wineman, M. Negahban, ASME Winter Annual Meeting, San Francisco, California, December 1989.
6. "Evolution of Material Symmetry in Simple Materials," Thirty-fourth Meeting of the Society for Natural Philosophy, Lincoln, Nebraska, April 1990 (**invited**).
7. "The Effect of Continuous Phase Transition on a Torsional Oscillator," M. Negahban, 62nd Annual Meeting of the Society of Rheology, Santa Fe, New Mexico, October 1990.
8. "Universal Relations and Solutions for First-Gradient Materials," M. Negahban, M. V. Gandhi, 28th Annual Meeting of the Society of Engineering Science, Gainesville, Florida, November 1991.
9. "Mechanics of Polymer Crystallization: Theoretical Modeling," M. Negahban, 22nd Midwestern Mechanics Conference, Rolla, Missouri, October 1991 (**invited**).
10. "Constitutive Modeling of Phase Transition in Smart Materials," M. Negahban, ADPA/AIAA/ASME/SPIE Conference on Active Materials and Adaptive Structures, Alexandria, Virginia, November 1991.
11. "Post Yield Shape Recovery in Glassy Polymers," 29th Annual Technical Meeting of the Society of Engineering Science, La Jolla, California, September 1992.
12. "The Evolution of Material Symmetry in the Elastic Response of a Fully Strain Space Theory of Plasticity," M. Negahban, A. S. Wineman, Special Symposium on Anisotropy and Inhomogeneity in Elasticity and Plasticity, MEET'N'93, Joint ASCE-ASME-SES Meeting, Charlottesville, Virginia, June 6-9, 1993.
13. "Mathematical Simulation of the Mechanical Effects of Crystallization Under Shear in Polymers," M. Negahban, R. J. Ma\*, Special Symposium on the Nonlinear Mechanics of Solid Polymers, MEET'N'93, Joint ASCE-ASME-SES Meeting, Charlottesville, Virginia, June 6-9, 1993 (**invited**).
14. "Thermo-Mechanical Modeling of Plastic Flow and Shape Recovery in Amorphous Polymers," M. Negahban, International Symposium on Plasticity and Its Current Applications, Baltimore, Maryland, July 19-23, 1993 (**invited**).
15. "Shape Recovery in Glassy Polymers," M. Negahban, Twenty-Third Midwestern Mechanics Conference, Lincoln, Nebraska, October 10-13, 1993 (**invited**).
16. "Mechanical Effects of Shear During Crystallization of Polymers," M. Negahban, R.J. Ma\*, Twenty-Third Midwestern Mechanics Conference, Lincoln, Nebraska, October 10-13, 1993.
17. "A Study of the Influence of Polymer Crystallization on the Distribution of Stress and Mechanical Properties Around Rigid Inclusions and Voids," R.J. Ma\*, M. Negahban, Twenty-Third Midwestern Mechanics Conference, Lincoln, Nebraska, October 10-13, 1993.
18. "Modeling of Plastic Flow and Shape Recovery in Solid Polymers," M. Negahban, 66th Annual Meeting of the Society of Rheology, Philadelphia, Pennsylvania, October 2-6, 1994.
19. "A Study of the Influence of Polymer Crystallization on the Distribution of Stress and Mechanical Properties Around Rigid Inclusions and Voids," R.J. Ma\*, M. Negahban, 31st Annual Technical Meeting of the Society of Engineering Science, Texas A&M University, College Station, Texas, October 10-12, 1994.
20. "Mathematical Modeling and Computational Simulation of Tubular Sheath Extrusion with Post-Extrusion Drawing: Application to Polymer Casing of Electronic Wire and Cable," J. Nielson\*, M. Negahban, the Symposium on Mechanics of Materials Processing and Manufacturing, As part of the 1994 ASME International Mechanical Engineering Congress and Exhibition, Chicago, Illinois, November 6-11, 1994 (**invited**).
21. "Modeling the Mechanical Response of Amorphous Polymers in the Glass- Transition Range Based on the Observed Flow and Recovery," M. Negahban, Society of Experimental Mechanics, Grand Rapids, Michigan, June 12-14, 1995.

22. "A preliminary study of the mechanical effects of polymer crystallization around a rigid cylindrical inclusion: homogeneous crystallization under plane strain," R. Ma\* and M. Negahban, Symposium on Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range, ASME/AMD-MD '95, June 28-30, 1995.
23. "A thermodynamic theory for characterizing thermo-mechanical response of polymers during crystallization," M. Negahban, Symposium on Current Research in the Thermo-Mechanics of Polymers in the Rubbery- Glassy Range, ASME/AMD-MD '95, June 28-30, 1995.
24. M. Negahban, "Preliminary results on an effort to characterize the thermo-mechanical response of amorphous polymers in the glass-transition range," Symposium on the Mechanics of Plastics and Plastic Composites, As part of the 1995 ASME International Mechanical Engineering Congress and Exhibition, San Francisco, California, November 12-17, 1995 (**invited**).
25. M. Negahban, "Modeling the mechanics of amorphous polymers in the glass transition," M. Negahban, International Conferences on Polymer Characterization (POLYCHAR-4), University of Northern Texas, Denton, Texas, January 10-12, 1996.
26. M. Negahban, "A Thermodynamic Model for the Mechanical Response of Natural Rubber During and After Crystallization," ASME Mechanics and Materials Conference, Johns Hopkins University, Baltimore, Maryland, June 12-14, 1996.
27. M. Negahban, "Modeling the behavior of a cross-linked PMMA around its glass-transition," 33rd Annual Technical Meeting, Society of Engineering Science, Arizona State University, Tempe, Arizona, October 20-23, 1996.
28. M. Negahban, "Thermomechanical effects associated with crystallization of rubber under stretch and during slow extension" presented at McNU97, Evanston, Illinois, June 29-July 2, 1997.
29. M. Negahban, "Modeling the Shear Behavior of Cross-Linked PMMA Around its Glass Transition," 25th Midwestern Mechanics Conference, Rapid City, South Dakota, September 21-24, 1997.
30. M. Negahban, "Thermomechanical Modeling of Crystallization in Polyethylene for Use in Simulation of Rotational Molding," 35th Annual Technical Meeting of the Society of Engineering Science, Pullman, Washington, September 27-30, 1998.
31. M. Negahban, "Modeling The Thermomechanical Behavior Of A Cross-Linked PMMA," PLASTICITY'99, Cancun, Mexico, January 5-14, 1999 (**invited**).
32. M. Negahban, "The Bell Constraint As A Possible Yield Function In Plasticity," PLASTICITY'99, Cancun, Mexico, January 5-14, 1999 (**invited lecture**).
33. M. Negahban, "Modeling Fusion And Crystallization In Polyethylene With Application To Rotational Molding," Fourth International Conference on Constitutive Laws for Engineering Materials, Rensselaer Polytechnic Institute in Troy, NY from July 27-30, 1999 (**invited**).
34. M. Negahban, Nicole Denise Buffington, "Thermodynamic Modeling of Crystallization and Fusion in Polyethylene, International Conference on Polymer Characterization," University of North Texas, Denton, Texas, January 11-14, 2000.
35. M. Negahban, "The Anatomy of Plasticity: A Case Study," 14th U.S. National Congress of Theoretical and Applied Mechanics, Virginia Tech, Blacksburg, VA, June 24-28, 2002 (**invited**).
36. M. Negahban, "Using the Formal Structure of Plasticity at Finite Strains to Model the Thermomechanical Behavior of Amorphous Polymers Around Their Glass Transition," 14th U.S. National Congress of Theoretical and Applied Mechanics, Virginia Tech, Blacksburg, VA, June 24-28, 2002 (**invited**).
37. M. Negahban, "Thermomechanical characterization of crystallization in polymers," IMECE2003, American Society of Mechanical Engineers, Washington DC, November 15-21, 2003.
38. M. Negahban, "A study of rate independent and rate dependent thermoplasticity at large strains: Examples," PLASTICITY 2003, Quebec City, July 7-11, 2003.
39. M. Negahban, Jean-Marc Saiter and Philippe Dos Santos Claro\*, "Thermomechanical characterization of crystallization in PET," SES2003, Society of Engineering Science, Ann Arbor, Michigan, October 12-15 2003.
40. M. Negahban, "The central role of the shape-memory effect and rejuvenation in characterizing the response of amorphous polymers around the glass-transition temperature," SES2004, Society of Engineering Science, Lincoln, Nebraska, October 10-13, 2004.
41. M. Negahban, "Four parameter elastic solid models with applications in characterization of glassy polymers," SES2004, Society of Engineering Science, Lincoln, Nebraska, October 10-13, 2004.
42. M. Negahban, "A study of statistical mechanics of long-chain molecules and its role in the determination of the characteristics of crystallizing polymers," SES2004, Society of Engineering Science, Lincoln, Nebraska, October 10-13, 2004.
43. M. Negahban, R. Feng, P. Delabarre\*, A. Goel\*, X. Shen\*, A. Dimick\*, A. Waters\*, "Shape memory as concept in characterizing the monotonic and non-monotonic thermomechanical response of glassy polycarbonate at small and large deformations, IMECE2005, ASME Congress International Congress, Orlando, November 9-11, 2005.

44. M. Negahban, "Universal Relations and Solutions for First-Gradient Materials," Symposium in memory of Ronald S. Rivlin, 43rd Technical Meeting of the Society of Engineering Science, Penn State University, University Park, Pennsylvania, August 13-16, 2006.
45. M. Negahban, P. DelaBarre\*, A. Goel\*, R. Feng, J. Grenet, "Mapping Equilibrium Stress and Plastic Strain Rate in Glassy Polymers," 43rd Technical Meeting of the Society of Engineering Science, Penn State University, University Park, Pennsylvania, August 13-16, 2006.
46. X. Shen\*, P. DelaBarre\*, R. Feng, M. Negahban, "Dynamic shear response of polycarbonate," IMECE2006, ASME International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November 5-10, 2006.
47. M. Negahban, A. Goel\*, P. DelaBarre\*, R. Feng, J. Grenet, "Characterizing the nonlinear elastic response of polycarbonate," IMECE2006, ASME International Mechanical Engineering Congress and Exposition, Chicago, Illinois, November 5-10, 2006.
48. M. Negahban, A. Goel\*, K. Strabala\*, J. Vogeler\*, R. Feng, P. Delabarre\*, J. Grenet, "Characterizing polycarbonate under large strains and rapid loading," 15th World Forum on Advanced Materials (PolyChar 15), Bozios, Brazil, April 16-20, 2007.
49. M. Negahban, A. Goel\*, K. Strabala\*, R. Feng, "Characterizing the development of anisotropy in Polycarbonate," 17th US Army Symposium on Solid Mechanics (Theme: Blast Mitigation), Baltimore, MD, April 2-5, 2007.
50. M. Negahban, A. Goel\*, K. Strabala\*, J. Vogeler\*, R. Feng, J. Grenet, "Modeling polycarbonate under large strains and rapid loads," Applied Mechanics and Materials Conference ASME Applied Mechanics and Materials Conference (McMat 2007), University of Texas at Austin, Austin, Texas 3-7, 2007.
51. J. G. Vogeler\*, X. Shen\*, R. Feng, and M. Negahban, "Dynamic compression and shear testing of polycarbonate," Applied Mechanics and Materials Conference ASME Applied Mechanics and Materials Conference (McMat 2007), University of Texas at Austin, Austin, Texas, June 3-7, 2007.
52. M. Negahban, A. Goel\*, J. Vogeler\*, K. Strabala\*, R. Feng, P. Delabarre\*, J. Grenet, "Normal Stress, Back Stress, and Plastic Flow in Shear for Polycarbonate," Shear-07, Nancy, France, September 4-7, 2007.
53. M. Negahban, A. Goel\*, K. Strabala\*, J. Vogeler\*, R. Feng, "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," Mechanics of Time-Dependant Materials Conference of 2008 (MTDM 2008), in Monterey, California, March 30-April 4, 2008.
54. M. Negahban, A. Goel\*, K. Strabala\*, J. Vogeler\*, R. Feng, "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," Third International Conference on Polymer Behavior, Marrakech, Morocco, November 3-7, 2008.
55. A. Goel\*, K. Strabala\*, N. Medeiros\*, J. Hein\*, M. Negahban, R. Feng, "Large deformation constitutive model for back stress of glassy polycarbonate," 45th Annual Technical Meeting of the Society of Engineering Science, University of Illinois, Urbana-Champaign, Illinois, October 12-15, 2008.
56. M. Negahban, A. Goel\*, K. Strabala\*, J. Vogeler\*, R. Feng, "Experimental characterization and constitutive modeling of polycarbonate under change of temperature, strain and strain rate," 17th World Forum on Advanced Materials (PolyChar 17), Rouen, France, April 20-24, 2009.
57. K. Strabala\*, L. Delbreilh\*, J.-M. Saiter, M. Negahban "Effects of compression and aging on the fracture, mechanical, and thermal properties of glassy polycarbonate," 17th World Forum on Advanced Materials (PolyChar 17), Rouen, France, April 20-24, 2009.
58. L. Zhang\*, T. Boulet\*, J. Hein\*, M. Negahban, "Material Characterization and Modeling of Head for Dynamic Simulations," International Conference on Computational & Experimental Engineering and Sciences, ICCEES'10, Las Vegas, USA, March 28-April 1, 2010.
59. M. Negahban, A. Goel, L. Zhang\*, K. Strabala\*, Q. Fichot\*, F. Souza, S. Meagher\*, J. A. Turner, D. Allen, et L. Delbreilh, "Characterization, Modeling, and Consequences of the Development During Plastic Flow of Large Anisotropy in the Wave-Speeds and Fracture," in New Models and Hydrocodes for Shock Wave Processes, Paris, France, 24-28 May, 2010.
60. M. Negahban, A. Goel, L. Zhang\*, K. Strabala\*, Q. Fichot\*, F. Souza, S. Meagher\*, J. A. Turner, D. Allen, J.-M. Saiter, L. Delbreilh, "Plasticity-like modeling of nonlinear viscoelastic response and its application to glassy polymers and biological tissue," Composites and Infrastructures Workshop, Verese, Italy, May, 2010.
61. M. Negahban, A. Goel, K. Strabala\*, "The role of evolving anisotropy in modeling the small and large deformation thermodynamic viscoelastic and viscoplastic response of glassy polymers," 7th International Conference on Mechanics of Time-Dependent Materials, Portoroz, Slovenia, September 5-11, 2010.
62. S. Meagher\*, K. Strabala\*, C. Landais\*, L. Delbreilh, M. Negahban, J. Turner, "Anomalous Loss of Toughness with Physical Aging of Work Toughened Polycarbonate," 47th Annual Technical Meeting of Society of Engineering Science, Iowa State University, Ames, IA, 3-6 October, 2010.



63. L. Zhang\*, M. Negahban “Wave prorogations in pre-deformed nonlinear viscoelastic materials,” 47th Annual Technical Meeting of Society of Engineering Science, Iowa State University, Ames, IA, 3-6 October, 2010.
64. J. Hein\*, B. McMichen\*, A. Stibbe\*, M. Negahban, D. Cullen, J. Turner, M. Akhter “Mapping tibial surface strains using 3D stereo optical system,” 47th Annual Technical Meeting of Society of Engineering Science, Iowa State University, Ames, IA, 3-6 October, 2010.
65. J. Hein\*, B. McMichen\*, A. Stibbe\*, M. Negahban, D. Cullen, J. Turner, M. Akhter, “Mapping tibial surface strains using 3D stereo optical system,” (poster) ASBMR 2010 Annual Meeting, Toronto, Canada, October 16-18, 2010.
66. M. Negahban, S. Meagher\*, K. Strabala\*, L. Delbreilh, J.-M. Saiter, C. Landais\*, Z. Li, “The role of evolving anisotropy and physical aging in deformation and fracture of glassy polycarbonate,” PolyChar 19, Kathmandu, Nepal, March 20-25, 2011.
67. M. Negahban, A. Goel\*, S. Meagher\*, L. Delbreilh, J.-M. Saiter, Z. Li, “Effects of Plastic Flow and Thermal Aging on the Developing Anisotropic Elastic and Toughening Response of Glassy Polycarbonate,” US National Congress on Computational Mechanics, Minneapolis, Minnesota, July 25-29, 2011.
68. J. F Cepeda, C. L. Weller, M. Negahban, H. Thippareddi, J. Subbiah, “Modeling Heat Transfer during Cooling of Cooked Ready-to-Eat Meats using Three-Dimensional Finite Element Analysis,” American Society of Agricultural and Biological Engineering Annual International Meeting, Louisville, Kentucky, August 7-10, 2011.
69. L. Zhang\*, M. Negahban, “Characterization of nonlinear viscoelastic materials by wave propagation properties,” 48th Annual Technical Meeting of Society of Engineering Science, Northwestern University, Evanston, Illinois, October 12-14, 2011.
70. Zheng Li, Guiyun Gao, Mehrdad Negahban, “Dynamic fracture analysis of physical aged polycarbonate by the optical method of caustics,” The 13th International Conference on Fracture, Beijing, China, June 16 - 21, 2013 (**Keynote presentation**).
71. Zheng Li, Guiyun Gao, Mehrdad Negahban, “The dynamic fracture analysis of aged Polycarbonate by optical method of caustics,” icOPEN2013 (International Conference on Optics in Precision Engineering and Nanotechnology), Singapore, 9 - 11 April, 2013 (**Invited presentation**).
72. L. Zhang, J. Jasa, M. Negahban, L Delbreilh, J.-M. Saiter, “Multiscale characterization of glassy polycarbonate (PC) under various thermal aging,” Rouen Symposium on Advanced Materials (ROSAM), Rouen, France, June 5-7, 2013 (**Invited presentation**).
73. M. Negahban, W. Li, L. Delbreilh, J.-M. Saiter, Z. Li, “Characterization of teh nonlinear response of PEEK and polycarbonate: Large plastic flow, anisotropy of wave speeds, work toughening, and thermal aging,” PolyChar 22 World Forum on Advanced Materials, Stellenbosch, South Africa, 7-11 April, 2014 (**Invited keynote presentation**).
74. M. Negahban, L. Delbreilh, Z. Li, W. Li, J.-M. Saiter, “Anisotropic effects of aging in work toughened polymers: Directionality in the time to reach the embitterment transition,” 20th European Conference on Fracture, Trondheim, Norway, 30th June-04th July, 2014.
75. M. Negahban, “Modeling and simulation of the effects of crystallization on the thermo-mechanical response of rubbers during large deformation,” 6th International Conference on Polymer Behavior, Vienna, Austria, September 22-26, 2014 (**Invited presentation**).
76. N. Delpouve, S. Araujo, W. Li, F. Batteux, L. Tan, M. Negahban, J.-M.Saiter, “Coupling approaches for the investigation of the alpha relaxation dynamics in interacting networks,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015.
77. E. Schwahn, W. Li, M. Negahban, N. Delpouve, J.-M. Saiter, S. Araujo, F. Batteux, “Controlled curing of acrylate: System modeling and application in stereolithography,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (poster).
78. W. Li, M. Negahban, N.s Delpouve, J.-M. Saiter, F. Batteux, S. Araujo, “Characterization of the influence of depth in photo curing of acrylate: A method based on rapid-scan FTIR during laser curing on an ATR,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (poster).
79. J. Jasa, L. Zhang, G. Gazonas, A. Jrusalem, Z. Zhang, M. Negahban, “Using molecular dynamics simulations for characterizing macroscopic response in polycarbonate,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (poster).
80. Z. Chen, M. Negahban, “Optimization of the distribution of properties: Using acrylate/epoxy mixtures in the extension of an FGM plate with a hole,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (poster).
81. M. Bakhtiary Noodeh, W. Li, S. Araujo, N. Delpouve, J.-M. Saiter, M. Negahban, “Using curing kinetics to control the mechanical properties of simultaneous acrylate/epoxy IPNs during photo curing of graded materials,” PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (poster).

82. J.-M. Saiter, M. Negahban, "Physical aging and cooperative relaxation in glassy polymers," PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015 (**Keynote**).
83. W. Li, E. N. Brown, P. J. Rae, G. A. Gazonas, M. Negahban, "Characterization of strain-induced elastic anisotropy, equilibrium stress, and modeling of thermo-mechanical response of PEEK," PolyChar 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, USA, May 11-15, 2015.
84. M. Negahban, J.-M. Saiter, N. Delpouve, L. Tan, W. Li, Z. Chen, M. Bakhtiary, E. Schwahn, F. Batteux, S. Araujo, "Kinetics-Based Control of Grading in IPN Systems," PolyChar 24, 24<sup>th</sup> World Forum on Advanced Materials, Poznan, Poland, May 9-13, 2016 (**Plenary**).
85. M. Negahban, W. Li, L. Delbreilh, E. Brown, P. J. Rae, G. Gazonas, Z. Li, J.-M. Saiter, "Characterization and Modeling of Glassy Polycarbonate and PEEK: The Role of Equilibrium Stress, Elastic Anisotropy, and Aging, Mechanics of Time Dependent Materials, Pars, France, May 16-20, 2016.
86. W. Li, E.N. Brown, P.J. Rae, G. Gazonas, M. Negahban, "Back Stress in Modeling the Response of PEEK and PC, Society of Experimental Mechanics," Orlando, Florida, USA, June 6-9, 2016.
87. W. Li, G. Gazonas, E.N. Brown, P.J. Rae, M. Negahban, "Characterization and modeling of PEEK in histories with reverse loading," Society of Experimental Mechanics. Indianapolis, Indiana, USA, June 12-14, 2017.
88. W. Li, Z. Zhang, M. Negahban, G. Gazonas, E. N. Brown, Z. Li, "THE ROLE OF SHEAR IN BETTER UNDERSTANDING THE THERMO-MECHANICAL RESPONSE OF PEEK AND PC," The 11th International Conference on the Mechanics of Time Dependent Materials, Milano, Italy, September 4-7, 2018.
89. Z. Zhang, M. Negahban, G. Gazonas, "Better evaluating the response of Polycarbonate: Molecular dynamics (MD) as an additional tool to model, verify and understand mechanical response," 55th Annual Technical Meeting of the Society of Engineering Science, Leganes, Madrid, Spain, October 10-12, 2018.
90. W. Li, G. Gazonas, E. N. Brown, M. Negahban, "Thermo-mechanical response of PEEK and PC in nonlinear cyclic shearing," 13th Annual European Society of Rheology Conference, Portoroz, Slovenia, April 8-11, 2019.
91. W. Li, Z. Zhang, M. Negahban, and G. Gazonas, E. N. Brown, "Thermodynamics response of thermoplastics in the glassy state: Evaluating internal heating during monotonic and cyclic deformation," 16th Pan-American Congress of Applied Mechanics, University of Michigan, Ann Arbor, Michigan, May 19-23, 2019.
92. M. Negahban, W. Li, N. Delpouve, J.-M. Saiter, L. Tan, Z. Chen, S. Araujo, F. Batteux, E. Bobo, "Kinetics-Based Control of Grading in IPN Systems: Analysis, Modeling and Printing," Poly-Char 2019, Katmandu, Nepal, May 19-23, 2019.

## OTHER INVITED PRESENTATIONS

1. "Mechanical Modeling of Isothermal Solid Polymer Crystallization," M. Negahban, Department of Mechanical Engineering, Cornell University, Ithaca, New York, May 1988.
2. "Mechanical Modeling of Isothermal Solid Polymer Crystallization," M. Negahban, Department of Engineering Mechanics, University of Kentucky, Lexington, Kentucky, July 1988.
3. "Mechanical Modeling of Isothermal Solid Polymer Crystallization," M. Negahban, Department of Engineering Mechanics, University of Nebraska, Lincoln, Nebraska, November 1988.
4. "Mechanical Modeling of Isothermal Solid Polymer Crystallization," M. Negahban, Department of Mechanical Engineering, Florida State University, Tallahassee, Florida, March 1989.
5. "Mechanics of Polymers in the Glassy-Rubbery Range: Crystallization and Shape Recovery," M. Negahban, Dow Chemical Company, Freeport, Texas, September 1994.
6. "A Thermodynamic Theory for Characterizing Thermo-Mechanical Response of Polymers During Crystallization," M. Negahban, Ford Motor Company, June 7, 1995.
7. "Using the formal structure of plasticity at finite strains to model the thermomechanical behavior of amorphous polymers around their glass transition," University of Maryland Baltimore County, May 2, 1997.
8. "Shape memory in polymers: Using the formal structure of plasticity at finite strains to model the thermomechanical behavior of amorphous polymers around their glass transition," University of Iowa, October 30th, 2003.
9. "Shape memory in polymers: Using the formal structure of plasticity at finite strains to model the thermomechanical behavior of amorphous polymers around their glass transition," M. Negahban, University of Rouen, France, February 6, 2004.
10. "Thermomechanical Characterization of Crystallization in Solid Polymers," M. Negahban, Georgia Tech, Atlanta, December 5, 2005.
11. "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," M. Negahban, Peking University, Beijing, China, May 22, 2008.

12. "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," M. Negahban, Xi'an Jiaotong University, Xi'an, China, May 25, 2008.
13. "Direct development of linear and nonlinear finite elements of shells," M. Negahban, Zhejiang University, Hangzhou, China, May 30, 2008.
14. "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," M. Negahban, University of Science and Technology, Beijing, China, June 2, 2008.
15. "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," M. Negahban, Beijing Jiaotong University, Beijing, China, June 4, 2008.
16. "Experimental characterization and constitutive modeling of polycarbonate under large strains and rapid loads," M. Negahban, Georgia Tech, Atlanta, March 3, 2009.
17. "A life with endless starts riding upon your changing dreams," M. Negahban, **Graduate Commencement Speaker**, University of Nebraska-Lincoln, Lincoln, Nebraska, August 14, 2009.
18. "Partnership with AMME: A Journey Through the Mechanics and Thermodynamics of Solids," M. Negahban, Honorary Doctorate (**docteur Honoris Causa**), University of Rouen, France, April 22, 2016.
19. "Lectures on the applications of continuum mechanics: Continuum thermodynamics of solids, the theory of shells, optimal atom to continuum transformations," Peking University, Beijing, China, December 2018.

## TEACHING EXPERIENCE

**University of Michigan:** Teaching Assistant for Strength of Materials (Mechanical Engineering) and Intermediate Strength of Materials (Aerospace Engineering), and Instructor for Dynamics (Mechanical Engineering).

**University of Nebraska:** Courses taught are Statics, Dynamics, Strength of Materials, Advanced Dynamics, Numerical Methods, Introduction to the Finite Element Method, Fundamentals of Finite Element Analysis, Continuum Mechanics, Nonlinear Continuum Mechanics, Viscoelasticity, Theory of Plasticity, Large Deformation Plasticity.

**Peking University:** Nonlinear Finite Element Methods, Viscoelasticity.

## ON-LINE NOTES AND APPLICATIONS

**Mathematics for Mechanics:** Notes developed to introduce students to the mathematics needed for mechanics and for preparation in taking the Mechanics Readiness Test.  
(<http://emweb.unl.edu/Math/mathweb/mathtoc.html>)

**Engineering Statics:** Class notes for statics.  
(<http://emweb.unl.edu/NEGAHBAN/EM223/Intro.htm>)

**Mechanics of Materials:** Class notes for strength of materials.  
(<http://emweb.unl.edu/NEGAHBAN/Em325/intro.html>)

**Engineering Dynamics:** Class notes for engineering dynamics.  
(<http://emweb.unl.edu/NEGAHBAN/EM373/Intro.htm>)

**C# Programing:** A set of notes to learn the C# programing language focused for more engineering applications.  
(<http://emweb.unl.edu/negahban/CSharp-VisualStudioTutorial/CSharp-VisualStudio-Overview.htm>)

**EducationSystem:** An application to deliver web-based notes and computer generated exams and homework on the internet.  
(<http://emweb.unl.edu/>)

## GRADUATE STUDENTS

- Jefferey D. Nielson, "Determining Elongated Extrudate Profiles Through Mathematical Modeling," MS, Engineering Mechanics, University of Nebraska-Lincoln, August, 1991.
- Daniel J. Wolterman, "Delamination Strength of Filament Wound Curved Composite Members Subjected to Bending," MS, Engineering Mechanics, University of Nebraska-Lincoln, May, 1992.
- Ruojuan Ma, "The Study of the Influence of Uniform Crystallization on the Mechanical Response of Polymers and Polymer-Matrix Composites," PhD, Engineering Mechanics, University of Nebraska-Lincoln, August, 1994.
- Juliette Dauphin (with Jean-Marc Saiter), Master M2, Materials Engineering (CEMPI), "The characterization of the thermal and mechanical effects of isothermal and non-isothermal crystallization of PET by DSC and DMTA studies," University of Rouen, Rouen, France, September, 2001.
- Philippe Dos Santos Claro (with Jean-Marc Saiter), Master M2, Materials Engineering (CEMPI), "The characterization of the transient thermal kinetics of crystallization of PET by DSC," University of Rouen, Rouen, France, September, 2003.

- Pierre Delabarre (with Jean-Marc Saiter), Master M2, Materials Engineering (CEMPI), “The characterization of polycarbonate by DMA and other mechanical testing,” University of Rouen, Rouen, France, September, 2004.
- Pierre Delabarre, Joint PhD with the University of Nebraska-Lincoln, USA, and the University of Rouen, France (2005-2006, did not complete program).
- Elodie Letray (with Joe Turner and Jean-Marc Saiter), Master M2, Materials Engineering (CEMPI), University of Rouen, Rouen, France, September, 2006.
- Meriem Ben Salah, “Experimental Material Characterization and Computational Modeling of Indentation with the Specific Application of Nano-Indentation in Polydimethylsiloxan(PDMS)” (with Joe Turner), Master, Civil Engineering and Geodetic Sciences, Leibniz University of Hanover, Hanover, Germany, May 2008 (Self funded).
- Kyle Wayne Strabala, “The Effects of Combined Compression and Aging on the Properties of Glassy Polycarbonate,” MS, Engineering Mechanics, University of Nebraska-Lincoln, August, 2009, **AND** MS, Materials Engineering, University of Rouen, Rouen, France, August, 2009 (ARL, FIPSE-ATLANTIS, French-American Cultural Exchange Partner University Fund funded).
- Céline Hayot, “Viscoelastic properties of the cell walls of Arabidopsis thaliana using nanoindentation,” MS, Engineering Mechanics, University of Nebraska-Lincoln, August, 2009, **AND** MS, Materials Engineering, University of Rouen, Rouen, France, August, 2009 (European Union-ATLANTIS, French-American Cultural Exchange Partner University Fund funded).
- Ashwani Goel, “Title Thermodynamically consistent large deformation constitutive model for glassy polymers,” PhD, Engineering Mechanics, University of Nebraska-Lincoln, December, 2009 (ARL, ARO, NDoR funded).
- Shawn Meagher, “Anomalous loss of toughness of work toughened polycarbonate,” double MS, Engineering Mechanics, University of Nebraska-Lincoln, December, 2010, **AND** MS, Materials Engineering, University of Rouen, Rouen, France, December, 2010 (ARO, FIPSE-ATLANTIS, French-American Cultural Exchange Partner University Fund funded).
- Jonathan Hein, “Ultrasonic and stereo-optical characterization techniques for applications in mechanical testing,” MS, Engineering Mechanics, University of Nebraska-Lincoln, May, 2011 (ARO funded).
- Charles Landais (with Joe Turner), “Ultrasonic Methods for the Characterization of Complex Materials and Material Systems: Polymers, Structured Polymers, Soft Tissue and Bone,” double MS, Engineering Mechanics, University of Nebraska-Lincoln, Materials Engineering, University of Rouen, Rouen, France, May 2011 (European Union-ATLANTIS, French-American Cultural Exchange Partner University Fund funded).
- Quentin Fichot (with David Allen), “Characterization, modeling, and consequences of the development during plastic flow of large anisotropy in the wave-speeds,” double MS, Engineering Mechanics, University of Nebraska-Lincoln, Materials Engineering, University of Rouen, Rouen, France, August 2010 (European Union-ATLANTIS, French-American Cultural Exchange Partner University Fund funded).
- Lili Zhang, PhD, Engineering Mechanics, ”Propogation of thermo-mechanical waves in deforming non-linear viscoelastic bodies,” University of Nebraska-Lincoln, May 2013 (ARL, ARO funded).
- Thomas Boulet (with Shadi Othman), PhD, Engineering Mechanics, University of Nebraska-Lincoln, expected December 2012 (ARO funded).
- Yenan Wang, PhD, Engineering Mechanics, University of Nebraska-Lincoln, expected May 2013 (CRC-China funded).
- Ke Yu, “Generic Strategies to Implement Material Grading in Finite Element Methods for Isotropic and Anisotropic Materials,” MS, Engineering Mechanics, University of Nebraska-Lincoln, December, 2011 (NaBRO funded).
- Derek Peterson, double MS, Engineering Mechanics, University of Nebraska-Lincoln, Materials Engineering, University of Rouen, Rouen, France, expected December 2012 (Funded by US-ATLANTIS, French-American Cultural Exchange Partner University Fund, Army Research Laboratory).
- Lena Butterfield, double MS, Engineering Mechanics, University of Nebraska-Lincoln, Materials Engineering, University of Rouen, Rouen, France, expected August 2013 (Funded by US-ATLANTIS, French-American Cultural Exchange Partner University Fund, Department of Defense).
- Wenlong Li, PhD, Mechanical Engineering and Applied Mechanics, “Thermo-mechanical characterization of polyether-ether-ketone (PEEK) and polycarbonate (PC) and thermodynamic continuum modeling of glassy polymers”, University of Nebraska-Lincoln (2013-2018; Funded by Army Research Laboratory, Midwest Roadside Safety Facility).
- Ramy Farrag, PhD, Engineering Mechanics, University of Nebraska-Lincoln (funded by Army Research Laboratory; Not Completed).

- Evan Schwahn, M.S., Mechanical Engineering and Applied Mechanics, Using Controlled Curing in a Custom Stereolithography-based 3D Printing Machine to Obtain Graded Property Variations (2015).
- Zhong Chen, PhD, Materials Engineering, Optimization of material grading (2012-2016).
- Zesheng Zhang, PhD, Mechanical Engineering and Applied Mechanics, “Multiscale investigation of mechanical response and identification of molecular sources of ratcheting in polycarbonate,” University of Nebraska-Lincoln (2013-2019; Funded by Army Research Laboratory, Midwest Roadside Safety Facility).
- Marzieh Bakhtiary Noodeh, PhD, Materials Engineering, Material grading in 3D printing (2014-Not Completed),

## UNDERGRADUATE STUDENTS

- Rob Gray, Construction of a testing machine and thermal chamber for large extension (1989-1991).
- Mark Fleming, Characterization of PMMA in shear ( 1991-1992).
- Farrell Calcaterra, Modeling shape memory in amorphous polymers ( 1991-1993).
- Jeff Lundy, Computational characterization of shape recover ( 1993-1994).
- Todd Leathers, Computational characterization of shape recovery ( 1994-1995).
- Steve Carroll, Shear response in glassy and rubbery PMMA (1996-1997).
- Nick Hiser, Analysis of PMMA results around its glass transition (1996).
- Russell Froehlich, Mechanics Readiness Program (1996-1998).
- Nicole Denise Buffington, REU student, Characterization of crystallization in PE (1999).
- Adam L Waters, Characterization of phase transition and mechanical properties in polymers (UNL Undergraduate Research Experience (UCare), 2004-2005).
- Amy Dimick, Characterizing the Mechanical Effects of Shape Recovery in Amorphous Polymers (UNL Undergraduate Research Experience (UCare), 2005-2006).
- Hong Wei Tan (with Jean-Marc Saiter), Characterization of aging in polycarbonate (2007).
- Kyle Strabala, Ultrasonic characterization of polycarbonate (2007).
- Nathan Medeiros Barreto Oliveira, High temperature ultrasonics in compressed polycarbonate (2007-paper under review).
- Karteek Narumanchi, from IIT Kharackpoor, High temperature ultrasonics in compressed polycarbonate (2007-summer intern).
- Brian McMichen, Stereo optical characterization of effects of osteoporosis in mouse bone models (UNL Undergraduate Research Experience (UCare), 2009-10).
- James Dalton (with Joe Turner), Micro-stereo optical measurements using the ARAMIS system (UNL Undergraduate Research Experience (UCare), 2009).
- John Davidson, Characterization of failure in soft materials (2009-10).
- Evan Schwahn, Rapid prototyping graded systems (2011-12).
- David Bailey, Dynamic testing on human tissue (2011).
- John Jasa, Molecular dynamics simulation of glassy polymers (2012-2015).
- Matt Lutomski, Rapid prototyping of grades systems (2013-14).
- Jacob Reher, Aging of mechanical properties of polycarbonate (2013-14).
- Walker Dimon, Graded interpenetrating polymer networks (IPNs) for mechanical and capacitance applications (2016-2017).
- Michael Elsbernd, Characterization of temperature during deformation (2017-2018);

## PROFESSIONAL ACTIVITIES

1. Conference Organization:
  - Organizing Chair, POLYCHAR 23, 23<sup>rd</sup> World Forum on Advanced Materials, Lincoln, Nebraska, May 11-15, 2015.
2. Conference Symposium Organization:
  - Co-organizer with Alan S. Wineman of “Symposium on nonlinear mechanics of polymers,” 23<sup>rd</sup> Midwestern Mechanics Conference, Lincoln, Nebraska, October 10-13, 1993.

- Organizer of a symposium on Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range for the Joint Applied Mechanics and Materials Summer Meeting of the American Society of Mechanical Engineers, Los Angeles, California, June 28-30, 1995.
  - Organized a symposium on the Thermo-Mechanics of Solid Polymers for the 1996 Mechanics & Materials Conference of the American Society of Mechanical Engineers, The Johns Hopkins University, Baltimore, MD, June 12-14, 1996.
  - Co-Organized with Said Ahzi a symposium titled Mechanics and Materials Issues for Polymers to be held during 35<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science, Pullman, Washington, September 27-30, 1998.
  - Co-Organizer with J.-M. Saiter of a symposium on polymers at the 2004 SES meeting, Lincoln, Nebraska.
  - Co-Organizer with G. McKenna of a symposium in honor of Alan Winemans at the 2004 SES meeting, Lincoln, Nebraska.
  - Co-Organizer with A. Segall Thermoelasticity and Thermal Shock at the 2004 SES meeting, Lincoln, Nebraska.
  - Co-Organizer with Zheng Li and Jean Grenet of a symposium on mechanical effect in polymers at PolyChar 17, Rouen, France, April 20-24, 2009.
  - Co-Organizer with Jim Caruthers of the symposium on Modeling and Thermodynamics of Nonlinear Viscoelastic and Viscoplastic Materials, 7th International Conference on Mechanics of Time-Dependent Materials, Portoroz, Slovenia, September 5-11, 2010.
3. Scientific Committee Membership:
- Member of the International Scientific Advisory Committee for the International Workshop on New Approaches to Hi-Tech Materials 97, Nondestructive Testing and Computer Simulations in Materials Science and Engineering, 9-12 June 1997, St. Petersburg, Russia.
  - Member of the International Scientific Committee for the 35th Annual Technical Meeting of the Society of Engineering Science, Pullman, Washington, September 27-30, 1998.
  - Member of Scientific Committee of PolyChar World Forum on Advanced Materials (2007-).
  - Member of Scientific Committee of International Conference on Polymer Behavior (2007-).
4. Editor and Editorial Board Membership:
- Editor of an Applied Mechanics Division of ASME volume containing the full length papers of the presentations in the symposium on Current Research in the Thermo-Mechanics of Polymers in the Rubbery-Glassy Range to be held as part of the Joint Applied Mechanics and Materials Summer Meeting of the ASME, Los Angeles, California, June 28-30, 1995.
  - Member of Editorial Board of The Mechanics of Time-Dependent Materials Journal (2008-).
5. US-Director of the Advanced Mechanics and Materials Engineering international laboratory (AMME-International) between University of Nebraska-Lincoln and University of Rouen in France (2010-).
6. Present or previous member of: American Academy of Mechanics; American Society of Mechanical Engineers; Elasticity Committee of the Applied Mechanics Division of ASME; Society of Engineering Science; Society for Natural Philosophy; Society of Plastics Engineers; Society of Rheology;
7. **Reviewer for:**
- Advances in Mechanical Engineering;
  - Acta Mechanica Solida Sinica;
  - Applied Mechanics Reviews;
  - ASME Journal of Applied Mechanics;
  - ASME Journal of Biomechanical Engineering;
  - ASME Journal of Engineering Materials and Technology;
  - ASME Pressure Vessels and Piping Division Conference;
  - Composites and Structures;
  - Geomechanics and Engineering;
  - International Conferences on Polymer Characterization;
  - International Journal of Fracture;
  - International Journal of Impact Engineering;
  - International Journal of Nonlinear Mechanics;
  - International Journal of Solids and Structures;
  - International Journal of Plasticity;
  - IRWIN publishing;
  - Journal of Biomechanics and Modeling in Mechanobiology;
  - Journal of Continuum Mechanics and Thermodynamics;
  - Journal of Dynamic Behavior of Materials;
  - Journal of Elasticity;

- Journal of Experimental Mechanics;
- Journal of Molecular Graphics and Modeling;
- Journal of Optics and Lasers in Engineering;
- Journal of Polymer Engineering and Science;
- Journal of Polymer Research;
- Journal of Polymer Science Part B: Polymer Physics;
- Journal of Sound and Vibration;
- Journal of the Mathematics and Mechanics of Solids;
- Journal of the Mechanics of Time-Dependent Materials;
- Journal of Vibration and Acoustics;
- Langmuir Journal;
- Macromolecule;
- Mathematics and Mechanics of Solids;
- Materials;
- Mechanics of Materials Journal;
- Modelling and Simulation in Materials Science and Engineering;
- National Science Foundation;
- Nondestructive Testing and Evaluation;
- Optics and Lasers in Engineering;
- Polymer Testing Journal;
- Thermochimica Acta Journal.

## AWARDS AND HONORS

- UNL Parents Association and Teaching Council Recognition Award, UNL, January 1990.
- UNL Parents Association and Teaching Council Recognition Award, UNL, January 1992.
- Department of Engineering Mechanics Teaching Award, UNL, 1998.
- Department of Engineering Mechanics Teaching Award, UNL, 1999.
- UNL Parents Association and Teaching Council Recognition Award, January 2000.
- Department of Engineering Mechanics Teaching Award, UNL, 2001.
- Holling Family Distinguished Senior Faculty Teaching Award, College of Engineering and Technology, UNL, April 2003.
- Holling Family Distinguished Senior Faculty Teaching Award, College of Engineering and Technology, UNL, April 2009.
- UNL Parents Association and Teaching Council Recognition Award, UNL, January 2010.
- UNL Parents Association and Teaching Council Recognition Award, UNL, January 2012.
- Holling Family Master Teacher Award/University-Wide Teaching Award, College of Engineering, UNL, April 2014.
- UNL College Distinguished Teaching Awards, UNL, April 2014.
- Holling Family Distinguished Teaching/Advising/Mentoring Award, College of Engineering, UNL, April 2015.
- Honorary Doctorate (docteur Honoris Causa), University of Rouen, France, April 2016.
- UNL Parents Association and Teaching Council Recognition Award, UNL, January 2017.
- Pierre-Gilles de Gennes Award, in recognition of outstanding contribution in macromolecular science and polymer characterization, Poly-Char 2019, Katmandu, Nepal.

## FUNDING

- M. Negahban, "Experimental Evaluation of the Nonlinear Mechanical Response of Polymers," (UNL Center for Materials Research and Analysis: \$3,000, 10/1/1990 - 6/30/1991).
- M. Negahban, Thermo-Mechanical Testing of Polymers, (UNL Research Council Grant-In-Aid: \$2,500, 5/1/1990 - 4/30/1991).
- M. Negahban, Investigation of Mechanical Response During Phase Transition in Polymers, (Engineering Foundation (for AFOSR) Engineering Research Initiation Grants: \$20,000, 9/1/1990 - 8/31/1991).
- M. Negahban (PI), R. Alberts (Co-PI), M. Wu (Co-PI), W. Martin (Co-PI), "Engineering Research Equipment Grant: Workstation Laboratory," (NSF: \$87,649, College of Engineering: \$22,000, UNL Research Council: \$22,000, 9/1/1991 - 2/28/1993)

- M. Negahban, “Preliminary Experiments to Characterize Shape Recovery in Plastically Formed Polymers,” (UNL Center for Nontraditional Manufacturing: \$800 8/20/1992 - 12/30/1992)
- M. Negahban (PI) “REU Supplement to Engineering Research Equipment Grant: Workstation Laboratory,” (NSF: \$10,000 9/1/1991 - 2/28/1994)
- M. Negahban, “Thermo-Mechanical Effects of Crystallization in Polymers,” (UNL Research Council Grant-in-Aid: \$2,500, 1/1/1993 - 12/31/1993)
- M. Negahban, “Preliminary Experiments to Characterize Shape Recovery in Plastically Formed Polymers,” (UNL Center for Nontraditional Manufacturing: \$780 12/10/1993 - 5/1/1994)
- M. Negahban, “Analysis of PMMA results around its glass transition,” Center for Materials Research and Analysis, UNL, \$1,000 (1996).
- Dzenis (PI/PD), Murphy, Negahban, Rhode, Tong, “Engineering Research Equipment: Equipment for High Temperature Durability Studies of Advanced Materials” (NSF-Equipment: \$60,000, 7/15/96-6/30/97)
- Dzenis (PI/PD), Negahban, Rohde, Timm, “Acquisition of System for Advanced Thermo-Mechanical Studies of Polymers, Composites, and Coatings” (NSF-Equipment: \$75,000, 7/1/96-6/30/97)
- Dzenis (PI/PD), Mark Beatty, Dillon, Ianno, Murphy, Negahban, Rohde, Stezowski, Timm, Weins, Williams, “Acquisition of Scanning Acoustic Microscope” (NSF-Equipment: \$235,000, 10/1/96-9/30/97)
- M. Negahban (PI), J. Turner, J. Yang., “Development of Statics Readiness Program,” (UNL Teaching Council: \$6,000 , College of Engineering and Technology: \$3,800 CET, Deptment of Engineering Mechanics: \$3,800, 1999-2001)
- M. Negahban (PI-50%) and R. Feng (Co-PI-50%) “Characterization of the dynamic thermomechanical response of Polycarbonate,” (U.S. Army Research Laboratory (ARL) under the RMAC-RTP Cooperative Agreement No. W911NF-04-2-0011. (David Allen PI): \$300,191, 6/25/2004 - 5/10/2008)
- A. Azizinamini (PI-75%), M. Negahban (Co-PI-25%), “Development of Field Data for Effective Implementation of the Mechanistic Empirical Pavement Design Procedure” (Nebraska Department of Roads: \$315,252, 07/01/2006 - 06/30/2010)
- M. Negahban (US-PI-50%), J.-M. Saiter (French PI-50%), “Simultaneous Double Master Program in Mechanics and Materials” (French-American Cultural Exchange Partner University Fund (FACE-PUF): \$125,000, 07/03/2007 - 07/02/2010)
- M. Negahban (PI), A. Azizinamini, Y. Dzenis, R. Feng, L. Tan, “System for full-field 3D displacement, velocity and strain measurement: ARAMIS 3D HR” (College of Engineering Research Infrastructure Enhancement: \$75,000, Department of Engineering Mechanics \$12,950, 2007)
- D. Allen (PI-15%US), M. Negahban (PD-60%US), Namas Chandra (Co-PI-25%US), J.-M. Saiter (French PI-50%EU), J. Varna (Swedish PI-50%EU) “EMME: US-EU Transatlantic Degree Program in Engineering Mechanics and Materials Engineering” (DoEducation-FIPSE:\$407,999, European Union: 407,999 Euro, 09/01/2007 - 08/31/2011)
- M. Negahban (PI), J. Turner (Co-PI), “Material Characterization and Modeling of Head and Helmet Materials” (Army-UNL Center for Trauma Mechanics, Army Research Office contract number W911NF-08-1-0483 (N. Chandra PI); Negahban: \$143,325 (+\$50,000 equipment), 10/1/2008 - 9/30/2010); Army-UNL Center for Trauma Mechanics, Army Research Office contract number W911NF-08-1-0483 (N. Chandra PI); Negahban: \$50,730 (+\$198,000 equipment), 10/1/2008 - 9/30/2010)
- M. Negahban (PI), “Skin and dura characterization” (Army-UNL Center for Trauma Mechanics, ARO contract number is: W911NF-11-1-0033 (N. Chandra PI); Negahban: \$101,761, 11/22/2010-11/21/2012);
- M. Negahban (PI), L. Tan (Co-PI), “Polymer Parts with Tailored Microstructure Distributions Optimized for an Application,” contract number: HQ0147-12-C-6013, \$837,504, 11/21/2011-5/20/2015.
- M. Negahban (PI), “Development of a dynamic internal state variable constitutive and failure model for glassy polymers,” Battelle Scientific Services Program, DOD-Army Research Office, contract number: TCN-11109, \$134,912, 10/12/2011-03/31/2013.
- F. Bobaru (PI), M. Negahban (Co-PI), “Validation of Peridynamic Models of Glassy Polymer Networks,” High Performance Technologies Inc., DoD-Army Research Laboratory, award number HPTi-PETTT-NEBRASKA, \$173,135, 10/06/2011-08/31/2012.
- M. Negahban (Sub-Award PI), “Integration of MultiMech with ABAQUS,” MultiMech R & D LLC, sub-award from Nebraska Department of Economic Development, \$50,290, 8/1/14-7/31/15.
- M. Negahban (Lead PI), “Conference and Workshop Proposal: Student and Young Investigator Grants for PolyChar 23 at the University of Nebraska-Lincoln,” National Science Foundation, \$15,000, 02/15/2015-01/31/2016.



- J. Subbiah (PI), M. Negahban, D. Jones, A. Guru, “Title: Water Physics Model for a Heterogeneous Meal System in a Rotating Pattern Tray with a Lid Stock Seal.” ConAgra, \$59,971, 01/01/2015-12/31/2015.
- Z. Li (PI), X. Su (Co-I), M. Negahban (Co-I), “The study and design of sensors based on piezoelectric metamaterials,” National Natural Science Foundation of China, 1,020,000 RMB, 01/01/2017-12/31/2020.