

# **SES 2006 Advance Program Schedule**

Updated: August 10, 2006

## Concurrent Sessions — Monday A, Aug 14, 9:15 AM – 11:20 AM

MA1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – I</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: D. Steigmann, A.P.S. Selvadurai
9:15–9:40	<i>Elasto-Dynamics of Embryonic Epidermal Wound Closure</i> , A. Sadovsky, F.Y.M. Wan	
9:40–10:05	<i>Nonlinear Modeling and Analysis for Intracranial Saccular Aneurysms</i> , D.P. Warne, P.G. Warne	
10:05–10:30	<i>The Approach of Rivlin Is Alive and Well and Needed Now More Than Ever</i> , J.C. Criscione	
10:30–10:55	<i>Comparison of Material Symmetry Approaches of Load Transformation and Coordinate Transformation</i> , C. Luo	
10:55–11:20	<i>An Experimental Study of the Inflation of Elastomeric Membranes Undergoing Thermally-Induced Chemorheological Changes</i> , A.S. Wineman, J.A. Shaw	
MA2 Boardroom-2	<i>Multiscale Materials Modeling (16) – I</i>	Organizers: J.D. Clayton, P.W. Chung Chairs: M.J. Buehler, N. Bernstein
9:15–9:40	<i>A Quasicontinuum Study of Scale Effects in Uniaxially Compressed Au Nanopillars</i> , J. Marian, J. Knap	
9:40–10:05	<i>A Surface Cauchy-Born Model for Nanoscale Materials</i> , H.S. Park, P.A. Klein, G.J. Wagner	
10:05–10:30	<i>An Atomistic-to-Continuum Framework for Finite Deformation Plasticity Based on Asymptotic Homogenization</i> , J.D. Clayton, P.W. Chung	
10:30–10:55	<i>Molecular Dynamics Study of Stress-Strain Behavior and Elastic Moduli of Carbon Nanotube Reinforced Epon 862</i> , R. Zhu, E. Pan	
10:55–11:20	<i>Microstructure-Property Relationship Study on Digitally Generated Liquid Phase Sintered Materials</i> , S. Lee, A. Rollett	
MA3 Ballroom-A	<i>Future of Mechanics Education and Research (7)</i>	Organizers: J.A. Todd, J.J. Lesko, I.K. Puri, H. Aref, R.C. Benson, M.W. Hyer, J.P. Cusumano Chair: J.A. Todd
9:15–11:20	<i>The Future of Mechanics Education and Research: A Global Mechanics Initiative</i> , J.A. Todd, J.P. Cusumano, J.J. Lesko, I.K. Puri, H. Aref, M.W. Hyer	
MA4 Boardroom-1	<i>Alan Needleman Prager Medal Symposium: Multiscale Modeling of Plastic Deformation (3) – I</i>	Organizers: H. Gao, W.A. Curtin Chair: H. Gao
9:15–9:40	<i>Rethinking Plasticity Theory for Crystalline Solids</i> , J.L. Bassani	
9:40–10:05	<i>A Discrete Theory of Dislocation Dynamics in Crystals</i> , M. Ortiz, A. Ramasubramaniam, P. Ariza	
10:05–10:30	<i>Statistical Characterization of Dislocation Ensembles</i> , A.A. El-Azab, J. Deng	
10:30–10:55	<i>Invariant Configurational Integrals for Geometrically Necessary Dislocations</i> , S. Li	
10:55–11:20	<i>An Analysis of Partial Dislocations</i> , K.J. Hsia, H. Gao	
MA5 Ballroom-B	<i>Recent Advances in Fracture and Fatigue (22) – I</i>	Organizer: T. Siegmund Chair: T. Siegmund
9:15–10:05	<b>Keynote:</b> <i>Crack Growth in Ductile Materials with Large out-of-Plane Deformation: Experiments and Simulations</i> , X. Deng, M.A. Sutton, J. Yan, Z. Wei, C.-S. Cheng	
10:05–10:30	<i>A Mechanism-Based Approach to Predict Ductile Crack Growth in Metallic Alloys</i> , X. Gao	
10:30–10:55	<i>Microstructure-Scale Modeling of Mechanical Deformation of Ti-6Al-4V Based on Computational Crystal Plasticity</i> , M. Zhang, J. Zhang, D.L. McDowell	

## Concurrent Sessions — Monday A, Aug 14, 9:15 AM – 11:20 AM

MA6 Ballroom-D	<i>Advanced Characterization of Materials for Civil Infrastructure (1) – I</i>	Organizers: G. Chehab, M. Lopez de Murphy Chair: M. Lopez de Murphy
9:15–10:05	<b>Keynote:</b> <i>Characterization and Modeling of the Interface Between Concrete and Epoxy-Bonded Repair Systems</i> , C. Coronado, M. Lopez de Murphy	
10:05–10:30	<i>Local Bond-Slip Analysis of Loaded, Environmentally Conditioned GFRP Reinforcement Bars in Concrete Beams</i> , C.E. Bakis, T.E. Boothby	
10:30–10:55	<i>Time Scaling Techniques for Predicting Long-Term Behaviors of Multi-Layered Composite Systems</i> , A.R. Nair, A.H. Muliana	
10:55–11:20	<i>Experimental Evaluation of a Hybrid FRP-Concrete Bridge Deck on Steel Girders</i> , W. Alnahhal, A.J. Aref, S. Alampalli	
MA7 Ballroom-E	<i>Instabilities in Solids and Structures (10) – I</i>	Organizers: E. Mockensturm, C. Rahn Chairs: E. Mockensturm, C. Rahn
9:15–9:40	<i>Bistability and Collapse of Single-Walled Carbon Nanotubes</i> , A. Mahdavi, E. Mockensturm	
9:40–10:05	<i>Inversion of Carbon Nanocone: A Nano-Scale Saddle-Node Bifurcation</i> , A. Mahdavi, E. Mockensturm	
10:05–10:30	<i>Effects of Non-Glide Stresses on Plastic Flow and Strain Localization</i> , V. Racherla, J.L. Bassani	
10:30–10:55	<i>Investigation of a Hexagonal Lattice Cell with Negative Stiffness Components</i> , Y.-C. Wang	
MA8 Alumni Lounge	<i>Pushing Mechanics to the Nanoscale Limit (21) – I</i>	Organizer: L.H. Friedman Chair: E. Van der Giessen
9:15–9:40	<i>Imperfect Bifurcation of Interacting Graphene Layers</i> , P. Wilber, A. Buldum, C. Clemons, D. Quinn, J. Young	
9:40–10:05	<i>Modeling of Carbon Nanotubes Using Non-Local Continuum Mechanics</i> , L. Sudak	
10:05–10:30	<i>Defects in Carbon Nanotubes: From Atomistic to Continuum Descriptions</i> , E. Ertekin, M.S. Daw, D.C. Chrzan	
10:30–10:55	<i>Large Deformation Buckling Analysis of Single-Walled Carbon Nanotubes</i> , A. Mahdavi, E. Mockensturm	
10:55–11:20	<i>Vibration Characteristics of Carbon Nanostructures Using Consistent Atomic-Scale Finite Element Method</i> , A. Mahdavi, E. Mockensturm	
MA9 Mt. Nittany	<i>Mechanical Behavior of Structural Films and Nanomaterials (11)</i>	Organizer: C.L. Muhlstein Chair: C.L. Muhlstein
9:15–9:40	<i>Electrical Current Induced Stress Analysis in Nanowires</i> , C. Basaran, M. Lin	
9:40–10:05	<i>Investigation of the Deformation Mechanics in Nanoindenter Deflected Freestanding Submicron Gold Thin Films</i> , L. Wang, B. Prorok	
10:05–10:30	<i>Young's Modulus and Tensile Strength of Gold Films</i> , W.N. Sharpe, Jr., J.S. Pulskamp, R. Polcawich	
10:30–10:55	<i>Simulating the Deformation of Silver Nanowires</i> , A.M. Leach, M. McDowell, K. Gall	

**Concurrent Sessions — Monday B, Aug 14, 12:30 PM – 2:35 PM**

MB1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – II</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: A.S. Wineman, L. Wheeler
12:30–12:55	<i>Constitutive Modeling of Shape Memory Alloys and Magnetic SMAs</i> , D.C. Lagoudas, P. Popov, B. Kiefer	
12:55–1:20	<i>Stability and Bifurcation of Elastic Cylindrical Tubes</i> , L. Dorfmann, D.M. Haughton	
1:20–1:45	<i>On the Stability of a Compressible Rivlin’s Cube Made of Transversely Isotropic Material</i> , K.P. Soldatos	
1:45–2:10	<i>Bifurcation of a Coated Elastic Cylinder with Negative Stiffness Core</i> , M. Gei, D. Bigoni	
2:10–2:35	<i>On Mechanics of Polymeric Membranes Subjected to Chemical Exposure</i> , A.P.S. Selvadurai	
MB2 Boardroom-2	<i>Multiscale Materials Modeling (16) – II</i>	Organizers: J.D. Clayton, P.W. Chung Chairs: E. Pan, H.S. Park
12:30–12:55	<i>Multi-Paradigm Modeling of Dynamical Crack Propagation in Silicon Using the ReaxFF Reactive Force Field</i> , M.J. Buehler, A. Duin, W. Goddard	
12:55–1:20	<i>Multiscale Simulations of High-Temperature Fracture in Silicon</i> , N. Bernstein	
1:20–1:45	<i>Boundary Conditions for Molecular Dynamics Simulations in Crystalline Solids</i> , X. Li, W. E	
1:45–2:10	<i>Stabilized Multiple Time Stepping Method for Coupling Multiple Time Scales in Molecular Dynamics</i> , P. Nukala, W. Shelton Jr.	
2:10–2:35	<i>Fundamental Examination of the Effects of Residual Stress, Defects, Dielectric Polarization, Electric Field and Thickness in Ferroic Thin Films</i> , J. Andzelm, J.D. Clayton, P.W. Chung, M.W. Cole, J.D. Demaree, M. Greenfield, S.G. Hirsch, W.D. Nothwang	
MB3 Ballroom-A	<i>The 2nd Symposium on Mechanics of Soft Materials and Soft Tissues (23) – I</i>	Organizers: H.J. Qi, J. Bergstrom, J.E. Bischoff Chairs: T. Nguyen, H.J. Qi
12:30–1:20	<b>Keynote:</b> <i>The Influence of Fiber Orientation Dispersion on the Mechanical Properties of Soft Tissues, with Particular Reference to Arterial Walls</i> , R.W. Ogden	
1:20–1:45	<i>An Approach to Extract Material Parameters from No-Slip Uniaxial Compression Experiments on Soft Tissue</i> , E. Roan, K. Vemaganti	
1:45–2:10	<i>Large Strain Mechanical Behavior of Poly(Methyl Methacrylate) (PMMA)</i> , R. Dupaix, G. Palm, J.M. Castro	
2:10–2:35	<i>Inertial Effects in Split Hopkinson Pressure Bar Tests on Soft Materials</i> , M. Scheidler	
MB4 Boardroom-1	<i>Alan Needleman Prager Medal Symposium: Multiscale Modeling of Plastic Deformation (3) – II</i>	Organizers: H. Gao, W.A. Curtin Chair: H. Gao
12:30–12:55	<i>Size Effects, Percolation and Criticality in Athermal Microcrystal Plasticity</i> , D.M. Dimiduk, C. Woodward, M.D. Uchic, S.I. Rao, T.A. Parthasarathy, R. LeSar	
12:55–1:20	<i>A Model of Size Effects in Nano-Indentation</i> , Y. Huang, F. Zhang, K.-C. Hwang, W.D. Nix, G.M. Pharr, G. Feng	
1:20–1:45	<i>Fracture Toughness of Materials with Dynamic and Geometric Constraints to Dislocation Motion</i> , A. Hartmaier, N.C. Broedling, H. Gao	
1:45–2:10	<i>Dislocation Dynamics Simulations of Surface Roughening During Sub-Micron Indentation</i> , E. Van der Giessen, A. Widjaja	
2:10–2:35	<i>On the Structure of Constitutive Relations in Strain-Gradient Plasticity</i> , A.A. Benzerga	

## Concurrent Sessions — Monday B, Aug 14, 12:30 PM – 2:35 PM

MB5 Ballroom-B	<i>Recent Advances in Fracture and Fatigue (22) – II</i>	Organizer: T. Siegmund Chair: X. Deng
12:30–1:20	<b>Keynote:</b> <i>Fatigue Threshold R-Curves for Reliability Predictions in Bridging Materials</i> , J.J. Kruzic, R.M. Cannon, R.O. Ritchie	
1:20–1:45	<i>Investigation of Damage Mechanisms in Composites Subjected to Spectrum Fatigue Loading</i> , N.L. Post, J. Cain, S.W. Case, J.J. Lesko	
1:45–2:10	<i>The Effect of a Static Dwell Period on Fatigue Crack Growth Rates in Rubber</i> , R. Harbour, A. Fatemi, W.V. Mars	
2:10–2:35	<i>The Effect of R-Ratio on the Fatigue Performance of Naval Composites</i> , J. Cain, N.L. Post, S.W. Case, J.J. Lesko	
MB6 Ballroom-D	<i>Advanced Characterization of Materials for Civil Infrastructure (1) – II</i>	Organizers: G. Chehab, M. Lopez de Murphy Chair: G. Chehab
12:30–1:20	<b>Keynote:</b> <i>Material Characterization Techniques for Glass Fiber Reinforced Stress Absorbing Membrane Interlayer</i> , V.S. Kale, T. Kumar, G. Chehab	
1:20–1:45	<i>Failure Analysis of PCC Overlay on Concrete Bridges</i> , Q. Xu, M. Solaimanian	
1:45–2:10	<i>Load-Induced Fatigue Simulations of Truss Bridge with Fiber Reinforced Polymer Decks</i> , M. Chiewanichakorn, A.J. Aref, S. Alampalli	
MB7 Ballroom-E	<i>Instabilities in Solids and Structures (10) – II</i>	Organizers: E. Mockensturm, C. Rahn Chairs: E. Mockensturm, C. Rahn
12:30–12:55	<i>Materials with Negative Stiffness</i> , T. Jaglinski, D.S. Stone, R.S. Lakes	
12:55–1:20	<i>Post-Buckling Life of Nonlinear Beam Vibration: Modelling, New Phenomena and Stability Criteria</i> , D.Y. Gao	
1:20–1:45	<i>Pull-In Instability and Shock Load Response of a MEMS Dual-Backplate Capacitive Microphone</i> , J. Liu, M. Sheplak, B. Mann	
1:45–2:10	<i>Stability of Elastic Films in Proximity to a Rigid Plate</i> , Y.-C. Chen, E. Fried	
MB8 Alumni Lounge	<i>Pushing Mechanics to the Nanoscale Limit (21) – II</i>	Organizer: L.H. Friedman Chair: L.H. Friedman
12:30–12:55	<i>Parametric Resonance of a Nonlinearly Coupled Micromechanical/Nanomechanical Array</i> , J. Zhu, C.Q. Ru, A. Mioduchowski	
12:55–1:20	<i>Mechanical Properties of Zinc Oxide Nanowires</i> , A.V. Desai, A. Haque	
1:20–1:45	<i>The Stress-Strain Response of Nanoscale Systems</i> , A.J. Miller, P.C. Andia, F. Costanzo, G.L. Gray	
1:45–2:10	<i>A Finite Temperature Continuum Mechanics Theory Based on the Interatomic Potentials</i> , H. Jiang, Y. Huang	
2:10–2:35	<i>Molecular Dynamics Simulations of Nano-Scale Fracture in a Single Crystal</i> , X. Deng, S. Xu	

**Concurrent Sessions — Monday B, Aug 14, 12:30 PM – 2:35 PM**

MB9 Mt. Nittany	<i>Thermo-Mechanics and Fracture of Space Shuttle External Tank Spray-On Foam Insulation (26) – I</i>	Organizer: R.M. Sullivan Chair: R.M. Sullivan
12:30–12:55	<b>Keynote:</b> <i>An Overview of Spray-On Foam Insulation Applications on the Space Shuttle's External Tank: Foam Applications and Foam Shedding Mechanisms,</i> R.M. Sullivan, B.A. Lerch, P.R. Rogers, J.S. Sparks	
12:55–1:20	<i>Structural Continuum Modeling of Space Shuttle External Tank Foam Insulation,</i> B. Steeve, S. Ayala, T.E. Purlee, P. Shaw	
1:20–1:45	<i>Nondestructive Evaluation of Foam Insulation on the Space Shuttle External Tank,</i> J. Richter, J.L. Walker	
1:45–2:10	<i>Crack Initiation and Growth in Rigid Polymeric Closed-Cell Foam Cryogenic Applications,</i> T. Sayyah, B. Steeve, D. Wells	
2:10–2:35	<i>Mechanics of TPS Foam Failure: Analysis and Experimental Investigation,</i> J.C. Thesken, B.A. Lerch, R.M. Sullivan	

## Concurrent Sessions — Monday C, Aug 14, 2:55 PM – 5:00 PM

MC1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – III</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: A.J.M. Spencer, Y.-C. Chen
2:55–3:20	<i>Formulation of Initial Value Problems in Thin Elastic Plates</i> , G.A. Rogerson	
3:20–3:45	<i>Entropic Thermoelasticity of Polymer Membranes</i> , M. Taylor, D. Steigmann	
3:45–4:10	<i>Thin-Plate/Shell Theory for Large Elastic Deformations</i> , D. Steigmann	
4:10–4:35	<i>Inflation of Strain-Stiffening Rubber-like Spherical and Cylindrical Thin Shells</i> , C.O. Horgan, L.M. Kanner	
4:35–5:00	<i>Inverse Analysis in Finitely Deforming Thin-Wall Elastic Structures</i> , J. Lu, X. Zhou	
MC2 Boardroom-2	<i>Multiscale Materials Modeling (16) – III</i>	Organizers: J.D. Clayton, P.W. Chung Chairs: J.D. Clayton, G.Z. Voyiadjis
2:55–3:20	<i>Non-Associated Plastic Flow for Textured Polycrystals</i> , H. Pan, J.L. Bassani	
3:20–3:45	<i>Cooperative Atomic Motions in Dislocation Cross Slip</i> , S. Pendurti, S. Jun, I.-H. Lee, V. Prasad	
3:45–4:10	<i>Micromechanical Finite Element Crystal Plasticity Models for Prediction of Crystallographic Texture and Its Gradients During Equi-Channel Angular Processing</i> , B.R. Donohue, S.R. Kalidindi, S. Li, I.J. Beyerleine	
4:10–4:35	<i>Effect of Strain Rate in Dynamic Hardness for Metals</i> , G.Z. Voyiadjis, A.H. Almasri	
4:35–5:00	<i>Atlas of First-Order Closures for Anisotropic Elastic-Plastic Properties of Cubic Materials</i> , M. Knezevic, S.R. Kalidindi	
MC3 Ballroom-A	<i>The 2nd Symposium on Mechanics of Soft Materials and Soft Tissues (23) – II</i>	Organizers: H.J. Qi, J. Bergstrom, J.E. Bischoff Chairs: H.J. Qi, J. Bergstrom
2:55–3:45	<b>Keynote:</b> <i>A Nonlinear Viscoelastic Model for the Tensile Behavior of Bovine Cornea</i> , T. Nguyen, R.E. Jones, B.L. Boyce	
3:45–4:10	<i>A Constitutive Model for Simple Wheat Flour Dough</i> , J.S. Bergstrom, S. Chakrabarti	
4:10–4:35	<i>Large Deformation Behavior of Thermo-Responsive Hydrogels</i> , K.K. Westbrook, H.J. Qi	
MC4 Boardroom-1	<i>Alan Needleman Prager Medal Symposium: Multiscale Modeling of Plastic Deformation (3) – III</i>	Organizers: H. Gao, W.A. Curtin Chair: H. Gao
2:55–3:20	<i>Modeling Fatigue Crack Growth with Irreversible Cohesive Zone Models</i> , T. Siegmund	
3:20–3:45	<i>An Evaluation of Cohesive Surface Implementations for the Analysis of Dynamic Fracture</i> , J. Remmers	
3:45–4:10	<i>The Coupling of Interface Decohesion and Ductile Matrix Fracture in Composites</i> , J. Segurado, S. Nogales, J. LLorca, H. Böhm	
MC5 Ballroom-B	<i>Recent Advances in Fracture and Fatigue (22) – III</i>	Organizer: T. Siegmund Chair: K. Volokh
2:55–3:45	<b>Keynote:</b> <i>Multiscale Modeling of Fracture in Fiber-Reinforced Composites</i> , C. González, J. LLorca, J. Segurado	
3:45–4:10	<i>The Uniaxial Tension of Particle-Reinforced Composite Materials with Nonlinear Interface Debonding</i> , H. Tan, Y. Huang, C. Liu, G. Ravichandran, P. Geubelle	
4:10–4:35	<i>Computational Modeling of Failure Mechanisms in EB-PVD Thermal Barrier Coatings</i> , H. Bhatnagar, S. Ghosh, M.E. Walter	
4:35–5:00	<i>Does Site-Specific Collagen Crosslinking Cause a Ductile to Brittle Transition in Fracture of Bone?</i> , T. Siegmund, D. Burr	

## Concurrent Sessions — Monday C, Aug 14, 2:55 PM – 5:00 PM

MC6 Ballroom-D	<i>Advanced Characterization of Materials for Civil Infrastructure (1) – III</i>	Organizers: G. Chehab, M. Lopez de Murphy Chair: C.E. Bakis
2:55–3:20	<i>A Theoretical and Experimental Technique to Characterize Fracture Failure in Asphaltic Pavements</i> , F.A. Freitas, D.H. Allen, Y.-R. Kim	
3:20–3:45	<i>Characterization of Asphalt Concrete Using FEM with Real Microstructure</i> , B. Zhang, Y. Wang, L. Wang	
3:45–4:10	<i>Finite Element Modeling of the Visco-Elastic Behavior of Asphalt Concrete by Considering the Mixture Microstructure</i> , S. Adhikari, Z. You, Q. Dai	
4:10–4:35	<i>Overview and Comparison of Interrelationships Between LVE Response Functions</i> , T. Kumar, G. Chehab	
MC7 Ballroom-E	<i>Instabilities in Solids and Structures (10) – III</i>	Organizers: E. Mockensturm, C. Rahn Chairs: E. Mockensturm, C. Rahn
2:55–3:20	<i>Stability of Fluid Filled Carbon Nanotubes</i> , J. Slisik, S.G. Kelly	
3:20–3:45	<i>Stabilization of Buckling Instabilities in Foams</i> , B. Moore, T. Jaglinski, D.S. Stone, R.S. Lakes	
3:45–4:10	<i>The Atomic Level Material Stability Theory and Its Applications</i> , L. Zhang, J. Lu	
4:10–4:35	<i>The 3-D Equilibrium Solution of a Rod Wrapped onto a Roller</i> , J. Guo, E. Mockensturm	
MC8 Alumni Lounge	<i>Pushing Mechanics to the Nanoscale Limit (21) – III</i>	Organizer: L.H. Friedman Chair: L.H. Friedman
2:55–3:20	<i>Comparison of Atomistic and Continuum Calculations with Experimental Measurements of Strain and Local Electronic Structure in InAs/GaAs Quantum Dots</i> , H. Johnson, J.-Q. Lu, R. Goldman, V. Dasika	
3:20–3:45	<i>Simulation of Thermal-Field Directed Self-Assembly of Epitaxial Quantum Dots</i> , C. Kumar, L.H. Friedman	
3:45–4:10	<i>Crystal Anisotropy and Order of Epitaxial Self-Assembled Quantum Dots</i> , L.H. Friedman	
4:10–5:00	<b>Keynote:</b> <i>Open Forum—Pushing Mechanics to the Nanoscale Limit</i> , L.H. Friedman	
MC9 Mt. Nittany	<i>Thermo-Mechanics and Fracture of Space Shuttle External Tank Spray-On Foam Insulation (26) – II</i>	Organizer: R.M. Sullivan Chair: R.M. Sullivan
2:55–3:20	<i>Thermal Expansion of Three Closed Cell Polymeric Foams at Cryogenic Temperatures</i> , E.H. Stokes	
3:20–3:45	<i>Thermal Expansion of Polyurethane Foam</i> , B.A. Lerch, R.M. Sullivan	
3:45–4:10	<i>Micromechanics of Spray-On Foam Insulation</i> , B.A. Bednarczyk, J. Aboudi, S.M. Arnold, R.M. Sullivan	
4:10–4:35	<i>A Micromechanics Finite Element Model for Studying the Mechanical Behavior of BX-265 Spray-On Foam Insulation</i> , L.J. Ghosn, R.M. Sullivan, B.A. Lerch	
4:35–5:00	<i>Porous Media Approach for Modeling Closed Cell Foam</i> , L.J. Ghosn, R.M. Sullivan	

**Concurrent Sessions — Tuesday A, Aug 15, 9:15 AM – 11:20 AM**

TA1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – IV</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: M. Hayes, C.O. Horgan
9:15–9:40	<i>Some Dynamical Problems in Finite Elasticity - Revisited</i> , M.F. Beatty	
9:40–10:05	<i>Peridynamic View of Crack Initiation</i> , S.A. Silling, E. Askari	
10:05–10:30	<i>Fully Explicit Agmon Condition for an Incompressible Neo-Hookean Body in a General State of Strain</i> , G.P. Mac Sithigh	
10:30–10:55	<i>Soft Elastic Flexure of a Nematic Elastomer</i> , T.J. Pence	
10:55–11:20	<i>A predictive model for the Mullins effect</i> , D. De Tommasi, G. Puglisi, G. Saccomandi	
TA2 Boardroom-2	<i>Multiscale Materials Modeling (16) – IV</i>	Organizers: J.D. Clayton, P.W. Chung Chairs: P.W. Chung, S.R. Kalidindi
9:15–9:40	<i>Microstructure Sensitive Design Using Second Order Homogenization Theories</i> , M. Binci, S.R. Kalidindi	
9:40–10:05	<i>Phase Field Simulation of Martensitic Microstructure</i> , D.-W. Lee, V.I. Levitas, A.V. Idesman	
10:05–10:30	<i>Process Design for Targeted Textures in Polycrystalline Metals</i> , H.K. Duvvuru, S.R. Kalidindi	
10:30–10:55	<i>Multiscale Simulations of Microphase Separated Copolymers</i> , J. Andzelm, R. Beyer, J. Snyder, P.W. Chung	
TA3 Ballroom-A	<i>The 2nd Symposium on Mechanics of Soft Materials and Soft Tissues (23) – III</i>	Organizers: H.J. Qi, J. Bergstrom, J.E. Bischoff Chairs: J. Bergstrom, H.J. Qi
9:15–10:05	<b>Keynote:</b> <i>Modelling the Viscoelastic Nature of Growing Tendon</i> , H. Narayanan, S. Calve, K. Garikipati, K. Grosh, E.M. Arruda	
10:05–10:30	<i>On the Misuse of the Laplace Law for Estimating Stress and Stiffness for Biological Vessels</i> , A.M. Thatte, J. Brasseur, F. Costanzo	
10:30–10:55	<i>Shape-Memory Effect in Polymer Networks: Influence of the Glass Transition Temperature and Crosslink Density</i> , C.M. Yakacki, R. Shandas, C. Lanning, K. Gall	
10:55–11:20	<i>Thermo-Mechanical Finite Deformation Behavior of Shape Memory Polymers</i> , H.J. Qi, C.M. Yakacki, R. Shandas, K. Gall	
TA4 Boardroom-1	<i>Alan Needleman Prager Medal Symposium: Multiscale Modeling of Plastic Deformation (3) – IV</i>	Organizers: H. Gao, W.A. Curtin Chair: W.A. Curtin
9:15–9:40	<i>A Numerical and Experimental Study of High Temperature Deformation Mechanisms in Aluminum Alloys</i> , A. Bower, S. Agarwal, C. Briant, P. Krajewski, E. Taleff	
9:40–10:05	<i>Modeling of Steel Toughness</i> , L. Chuzhoy, D.H. Sherman, C. Briant	
10:05–10:30	<i>Simulations and Experiments of Dynamic Fracture in Ductile Metals</i> , R. Becker	
10:30–10:55	<i>Influence of Microstructural Morphology on Viscoplastic Flow of Two-Phase Polycrystals</i> , N. Rupin, M. Bornert, P. Gilormini, C. Pinna, A. Zaoui	
10:55–11:20	<i>Formations of Adiabatic Shear Bands in Metallic Glasses Under Impact Loading</i> , F. Zhou, K.T. Ramesh	

## Concurrent Sessions — Tuesday A, Aug 15, 9:15 AM – 11:20 AM

TA5 Ballroom-B	<i>Recent Advances in Fracture and Fatigue (22) – IV</i>	Organizer: T. Siegmund Chair: J.J. Kruzic
9:15–10:05	<b>Keynote:</b> <i>Simulated Surface Roughness of Creep Fracture Versus Fractality</i> , Y. Kaim, P. Onck, E. Van der Giessen	
10:05–10:30	<i>Numerical Modeling of Micro-Branching Cohesive Cracks</i> , P. Ganguly, K.D. Papoulia	
10:30–10:55	<i>Softening Hyperelasticity for Material Failure Modeling</i> , K. Volokh	
10:55–11:20	<i>Weakly-Singular SGBEM for Analysis of Fractures in Piezoelectric Media</i> , J. Rungamornrat	
TA6 Ballroom-D	<i>General Sessions (8) – I</i>	Organizers: G.L. Gray, F. Costanzo Chair: S.G. Kelly
9:15–9:40	<i>Dynamic Modeling of the Planar Flow Melt Spinning Process</i> , M. Davis, E. Theisen, P. Steen	
9:40–10:05	<i>Adhesion and Accumulation of Thermal Stress in Continuously Cast Aluminum Ribbon</i> , T. Ober, C. Byrne, P. Steen	
10:05–10:30	<i>Compression of Bonded Rubber Blocks Under Frictional Contact</i> , J.B. Suh, S.G. Kelly, M.E. Pottinger	
10:30–10:55	<i>A Parametric Study on Particulate Al-SiC Composite Bolted Joints</i> , S.N. Shoukry, J.C. Prucz, G.W. William	
10:55–11:20	<i>Finite Element Analysis for Saturated Porous Media Using the S-ALE Method</i> , T. Park, H. Kim, M. Tak, G.Z. Voyiadjis	
TA7 Ballroom-E	<i>Particle Systems Characterization and Modeling (20) – I</i>	Organizer: V.M. Puri Chair: V.M. Puri
9:15–9:40	<i>Complete Pharmaceutical Process Characterization: Understanding the Effect of Process Parameters on Tablet Quality</i> , S.T.S. Bukkapatnam, C. Iyyunni	
9:40–10:05	<i>Fundamental Mechanical Properties of Powder Mixtures Using Cubical Triaxial Tester</i> , H. Yi, A. Pandeya, V.M. Puri	
10:05–10:30	<i>Upward Penetration Through a Granular Medium</i> , D. Costantino, T. Scheidemantel, M.B. Stone, J. Cole, C. Conger, K. Klein, M. Lohr, W. McConville, Z. Modig, P. Schiffer	
10:30–10:55	<i>Correlation of Flowability and Percolation Segregation in Blended Fertilizers Under Varying Relative Humidity Conditions</i> , A.K. Jha, V.M. Puri	
TA8 Alumni Lounge	<i>Structural and Medical Health Monitoring with Ultrasonic Sensors (25) – I</i>	Organizers: B.R. Tittmann, P. Shull Chair: B.R. Tittmann
9:15–9:40	<i>An Innovative Piezoelectric Force Sensor to Determine the Integrity of Electrical Sockets</i> , E.A. Blickley, B.R. Tittmann	
9:40–10:05	<i>Noninvasive Sonic Pressure Sensor</i> , M.J. Guers, B.R. Tittmann	
10:05–10:30	<i>Acoustic Characterization of Laser Interaction with Materials</i> , S. Jayaraman, M. Bohenic, J. Welsch, V. Semak, B.R. Tittmann, N. Nicholas	
10:30–10:55	<i>Dynamic Magnetostriction Experiments and Applications</i> , M.M. Kropf, C. Searfass, B.R. Tittmann	

**Concurrent Sessions — Tuesday A, Aug 15, 9:15 AM – 11:20 AM**

TA9 Mt. Nittany	<i>Novel Applications of Nonlinear Homogenization (18) – I</i>	Organizer: R.P. Lipton Chair: R.P. Lipton
9:15–9:40	<i>Fiber-Reinforced Composites in Finite Elasticity</i> , G. deBotton, I. Hariton, E.A. Socolsky	
9:40–10:05	<i>Increase and Decrease of the Effective Conductivity of Two Phase Composites due to Polydispersity</i> , L. Berlyand, V. Mityushev	
10:05–10:30	<i>A Fictitious Domain Approach to Effective Properties of Two-Phase Composites</i> , A. Novikov	
10:30–10:55	<i>Dynamics of Steps Along a Phase Boundary</i> , A. Vainchtein, Y. Zhen	
10:55–11:20	<i>An Inverse Homogenization Approach to the Design of Graded Composite Structures Subject to Localstress Constraints</i> , R.P. Lipton, M. Stuebner	

## Concurrent Sessions — Tuesday B, Aug 15, 12:30 PM – 2:35 PM

TB1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – V</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: R. Fosdick, M.F. Beatty
12:30–12:55	<i>Two New Expanding Cavity Models Incorporating Strain-Hardening and Indentation Size Effects</i> , X.-L. Gao	
12:55–1:20	<i>Scale Effects in Finite Elasticity of Nonlinear Random Composites</i> , Z.F. Khisaeva, M. Ostoja-Starzewski	
1:20–1:45	<i>On Azimuthal Shear in a Transversely Isotropic Elastic Solid and Failure of Ellipticity</i> , R.W. Ogden	
1:45–2:10	<i>Elastic Deformations of Fibre-Reinforced Materials with Fibre Bending Stiffness</i> , A.J.M. Spencer, K.P. Soldatos	
2:10–2:35	<i>Complete Solutions to a Class of Nonconvex Finite Deformation Problems with Applications</i> , D.Y. Gao	
TB2 Boardroom-2	<i>Mechanics of Nano- and Biosystems (12) – I</i>	Organizers: H. Jiang, H. Gao, A. Chandra, T. Saif Chair: H. Gao
12:30–1:20	<b>Keynote:</b> <i>Listeria Monocytogenes Propelled by Actin Comet Tails: Observed Trajectories and a Dynamical Model</i> , V. Shenoy	
1:20–1:45	<i>Nanomechanics of Cartilage: Biomimetic Surfaces, Single Chondrocytes, and Intact Tissue</i> , L. Han, D. Dean, L. Ng, L.A. Daher, J. Greene, H.-H.K. Hung, A.J. Grodzinsky, C. Ortiz	
1:45–2:10	<i>Mechanics of Hierarchical Structures</i> , C. Picu, M. Soare	
2:10–2:35	<i>Mechanics of Detachment of a Rigid Solid from an Elastic Wavy Surface</i> , P.R. Guduru	
TB3 Ballroom-A	<i>The 2nd Symposium on Mechanics of Soft Materials and Soft Tissues (23) – IV</i>	Organizers: H.J. Qi, J. Bergstrom, J.E. Bischoff Chairs: H.J. Qi, T. Nguyen
12:30–1:20	<b>Keynote:</b> <i>Mechanics of a Stretchable Form of Single-Crystal Silicon for High-Performance Electronics on Elastomeric Substrates</i> , H. Jiang, D.-Y. Khang, Y. Huang, J. Rogers	
1:20–1:45	<i>Modeling and Characterization of Electrospun PCL</i> , J. Davidson, R. Dupaix, J. Johnson, J. Lannutti	
1:45–2:10	<i>Mapping Equilibrium Stress and Plastic Strain Rate in Glassy Polymers</i> , M. Negahban, P. Delabarre, A. Goel, R. Feng, J. Grenet	
2:10–2:35	<i>A New Constitutive Model Framework for Polymer Foams</i> , J.S. Bergstrom	
TB4 Boardroom-1	<i>Alan Needleman Prager Medal Symposium: Multiscale Modeling of Plastic Deformation (3) – V</i>	Organizers: H. Gao, W.A. Curtin Chair: W.A. Curtin
12:30–12:55	<i>Atomistic Simulations of Size Scale Effects on the Plasticity of Metals</i> , M.I. Baskes	
12:55–1:20	<i>A Model for Twinning Stress and Twin Size</i> , H. Sehitoglu, S. Kibey, D.D. Johnson, J.-B. Liu	
1:20–1:45	<i>An Approach to Multi-Body Interactions in a Continuum-Atomistic Context: Application to Analysis of Tension Instability in Carbon Nanotubes</i> , K. Volokh, K.T. Ramesh	
1:45–2:10	<i>Hyperelasticity Can Play a Governing Role Dynamic Fracture</i> , M.J. Buehler, H. Gao	
2:10–2:35	<i>A New Mechanism for Dynamic Strain Aging in Aluminum-Magnesium Alloys</i> , W.A. Curtin, D.L. Olmsted, L.G. Hector, Jr.	

## Concurrent Sessions — Tuesday B, Aug 15, 12:30 PM – 2:35 PM

TB5 Ballroom-B	<i>Electroactive Polymer Materials: Mechanics and Modeling (5) – I</i>	Organizer: N.C. Goulbourne Chair: N.C. Goulbourne
12:30–12:55	<i>The Refined Theory for a Transversely Isotropic Piezoelectric Body: Plane Problems</i> , Y. Gao	
12:55–1:20	<i>A Model for Conductive Polymers</i> , M. Gei, L. Magnarelli	
1:20–1:45	<i>Strain Effects on Percolation Conduction in Conductive Particle Filled Composites</i> , T.A. Godfrey	
1:45–2:10	<i>Electroactive Heterogeneous Polymers - Analysis and Simulation</i> , L. Tevet-Deree, G. deBotton	
TB6 Ballroom-D	<i>Advanced Mathematical Tools: A Frontier Between Mathematics and Engineering (2) – I</i>	Organizers: R. Ablamowicz, J. Liu Chairs: R. Ablamowicz, L. Meister
12:30–1:20	<b>Keynote:</b> <i>A Modern Geometric Approach in Electrical Engineering</i> , W.E. Baylis	
1:20–1:45	<i>Algebraic Quaternion Equations and Its Application in Engineering</i> , L. Meister	
1:45–2:10	<i>Dielectric Model of Anisotropic Mixtures Using Clifford Algebra</i> , M.A. Baswell, M.A. Abdelrahman	
2:10–2:35	<i>Free Vibration Analysis of a Bézier Cubic Composite Shell</i> , S. Douangvilay, J. Liu	
TB7 Ballroom-E	<i>Particle Systems Characterization and Modeling (20) – II</i>	Organizer: V.M. Puri Chair: V.M. Puri
12:30–12:55	<i>Flux Through a Hole from a Shaken Granular Medium</i> , K. Chen, M.B. Stone, R. Barry, M. Lohr, W. McConville, K. Klein, B. Sheu, A. Morss, T. Scheidemantel, P. Schiffer	
12:55–1:20	<i>Evaluation of Different Powder Deposition Method in Dies</i> , S. Sayyar Roudsari, V.M. Puri	
1:20–1:45	<i>Modeling of Simultaneous Deposition of Powder in Dies</i> , X. Xie, V.M. Puri	
1:45–2:10	<i>Distribution of Fines During Percolation Segregation Under Varying Coarse Particle Bed Depths</i> , J.S. Gill, A.K. Jha, V.M. Puri	
TB8 Alumni Lounge	<i>Structural and Medical Health Monitoring with Ultrasonic Sensors (25) – II</i>	Organizers: B.R. Tittmann, P. Shull Chair: B.R. Tittmann
12:30–12:55	<i>Elevated Temperature Piezoelectric Transducer</i> , D.A. Parks, B.R. Tittmann	
12:55–1:20	<i>Ion Detection Possibilities of Love Wave-Based Devices</i> , M.K. Pedrick, B.R. Tittmann	
1:20–1:45	<i>Characterization of Composite Interface Defects Using Acoustic Microscopy</i> , R.W. Pfaff, J. Du, B.R. Tittmann	
TB9 Mt. Nittany	<i>Novel Applications of Nonlinear Homogenization (18) – II</i>	Organizer: R.P. Lipton Chair: R.P. Lipton
12:30–12:55	<i>Homogenization in Acoustics of Granular Materials</i> , A. Panchenko	
12:55–1:20	<i>Percolation Thresholds and Cluster Statistics for Quiescent and Sheared Rigid-Rod Dispersions</i> , X. Zheng, M.G. Forest, R. Zhou	
1:20–1:45	<i>Homogenization of a Ginzburg-Landau model for a nematic liquid crystal with inclusions.</i> , L. Berlyand, D. Golovaty, D. Cioranescu	
1:45–2:10	<i>Numerical Integration Algorithms for Thermo-Mechanical Viscoelastic Analyses of Polymeric Based Composites</i> , K.A. Khan, A.H. Muliana	
2:10–2:35	<i>A Novel Exactly Realizable Estimate for the Transport Properties of Multiscale Random Heterogeneous Materials</i> , E. Stora, Q.-C. He, B. Bary	

## Concurrent Sessions — Tuesday C, Aug 15, 2:55 PM – 5:00 PM

TC1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – VI</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: K.N. Sawyers, T.J. Pence
2:55–3:20	<i>Some Exact Solutions for a Class of Compressible Nonlinear Elastic Materials</i> , F. Rooney	
3:20–3:45	<i>Universal Relations and Solutions for First-Gradient Materials</i> , M. Negahban	
3:45–4:10	<i>Construction of a Helmholtz Free Energy Function for an Isotropic Elastic-Viscoplastic Material</i> , J.T. Fong, B. Bernstein, L.J. Zapas	
4:10–4:35	<i>Extreme Elastic Properties of Anisotropic Crystals</i> , L. Wheeler	
4:35–5:00	<i>Unsheared Pairs in Finite Plane Strain</i> , P. Boulanger, M. Hayes	
TC2 Boardroom-2	<i>Mechanics of Nano- and Biosystems (12) – II</i>	Organizers: H. Jiang, H. Gao, A. Chandra, T. Saif Chair: H. Jiang
2:55–3:45	<b>Keynote:</b> <i>Thickness of Graphene and Single-Wall Carbon Nanotubes</i> , Y. Huang, J. Wu, K.-C. Hwang	
3:45–4:10	<i>Linking Mechanics to Biochemistry in Biology and Medicine: Understanding Molecular and Cellular Behavior with Nano-/Micro-Technology, Controls Approaches and Computational Biology</i> , P. LeDuc	
4:10–4:35	<i>Nature Designs Collagen to Resist Brittle Fracture: A Critical Length Scale for Tough Fibrils</i> , M.J. Buehler	
4:35–5:00	<i>A Cohesive Law for Carbon Nanotube/Polymer Interfaces in Nanocomposites</i> , H. Jiang, L. Jiang, Y. Huang, G. Ravichandran, H. Gao, K.-C. Hwang, B. Liu	
TC3 Ballroom-A	<i>The 2nd Symposium on Mechanics of Soft Materials and Soft Tissues (23) – V</i>	Organizers: H.J. Qi, J. Bergstrom, J.E. Bischoff Chairs: T. Nguyen, J. Bergstrom
2:55–3:45	<b>Keynote:</b> <i>Structural Constitutive Models for Engineered Tissue Scaffolds</i> , M. Sacks, T. Courtney, J. Liao, W. Wagner	
3:45–4:10	<i>In-Vivo Penetration Mechanics and Mechanical Properties of Mouse Brain Tissue at Micrometer Scales</i> , A.M. Ortega, A.A. Sharp, D. Restrepo, K. Gall	
4:10–4:35	<i>A Microstructural Approach to Characterizing the Mechanics of Liver Tissue</i> , K. Vemaganti, E. Roan	
4:35–5:00	<i>Noninvasive Prediction of Residual Stress and Elastic Property in Arteries</i> , J. Lu, X. Zhao	
TC4 Boardroom-1	<i>Multifunctional Materials and Structures (15) – I</i>	Organizers: D. Lagoudas, Z. Ounaies, A. Beskok, D. Leo Chair: Y.M. Jin
2:55–3:20	<i>On the Possibility of Apparently Piezoelectric Composites Without the Use of Piezoelectric Constituents</i> , P. Sharma	
3:20–3:45	<i>Making Thermoplastic Polyurethanes Multifunctional via Nanoreinforcement</i> , S.M. Liff, G. McKinley	
3:45–4:10	<i>Constitutive Modeling of Electrostrictive Composite Materials</i> , A.W. Richards, G.M. Odegard	
4:10–4:35	<i>Cost-Effective Self-Healing Polymers</i> , J.M. Kamphaus, J.D. Rule, S.R. White, J.S. Moore, N.R. Sottos	
4:35–5:00	<i>Multilinear Constitutive Model for Shape Memory Alloy Materials</i> , S.A. Motahari, M. Ghassemieh	

## Concurrent Sessions — Tuesday C, Aug 15, 2:55 PM – 5:00 PM

TC5 Ballroom-B	<i>Electroactive Polymer Materials: Mechanics and Modeling (5) – II</i>	Organizer: N.C. Goulbourne Chair: N.C. Goulbourne
2:55–3:20	<i>On the Constitutive Equations for Electroelastomers</i> , N.C. Goulbourne	
3:20–3:45	<i>Electromechanical Instability of Dielectric Elastomer Actuators</i> , T.G. McKay, I. Anderson, E. Calius	
3:45–4:10	<i>Phenomenological Constitutive Models for Dielectric Elastomer Membranes</i> , E. Yang, E. Mockensturm, M. Frecker	
TC6 Ballroom-D	<i>Advanced Mathematical Tools: A Frontier Between Mathematics and Engineering (2) – II</i>	Organizers: R. Ablamowicz, J. Liu Chair: P. Nag
2:55–3:20	<i>Application of Gröbner Basis on Profile Inspection</i> , C. Xue, K.R. Currie, K.-L. Ting, J. Liu	
3:20–3:45	<i>Subdivision Scheme for Generating Arcs and Circles</i> , J. Wang, K.-L. Ting	
3:45–4:10	<i>From Higher Degrees of Shakiness to Mobility</i> , K. Wohllhart	
4:10–4:35	<i>A Note on the Global Controllability of a Class of Planar Nonlinear Systems</i> , P. Nag, R. Kavasseri	
TC7 Ballroom-E	<i>Modeling and Characterization of Biological Materials and Biomaterials (13) – I</i>	Organizers: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson Chairs: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson
2:55–3:20	<i>Characterization and Modeling of Carbon Nanofiber Composite Biomaterials for Functional Tissue Engineering Applications</i> , N. Billade, K. Vemaganti, S. Hunter	
3:20–3:45	<i>Design and Characterization of New Biomaterials</i> , H.R. Allcock	
3:45–4:10	<i>Synthesis and Characterization of Alginate Hydrogels with Controlled Pore Size Distribution</i> , N.S. Babu, S. Gadkari, L. Stepanskiy, E.S. Papazoglou	
4:10–4:35	<i>A Growth Mechanics Theory for Biological Materials</i> , Y.-C. Chen	
4:35–5:00	<i>Towards a Structural Model of the Urinary Bladder Wall</i> , S. Wognum, M. Sacks	
TC8 Alumni Lounge	<i>Multiscale Modeling and Simulation of Elastic Complex Fluids (17) – I</i>	Organizers: C. Liu, Q. Wang Chairs: C. Liu, Q. Wang
2:55–3:20	<i>Modeling Strong Extensional Flows of Polymers Solutions and Melts</i> , A.N. Beris, J. Mukherjee	
3:20–3:45	<i>Linear Viscoelastic Moduli of Sheared Rigid-Rod Suspensions</i> , E. Choate, M.G. Forest, Z. Cui	
3:45–4:10	<i>Wormlike Micellar Solutions: a Model, Solution, and Comparison with Experiment</i> , P. Cook, G. McKinley, P. Vasquez, L. Zhou	
4:10–4:35	<i>Vesicle Membranes in Fluid Field</i> , Q. Du	
4:35–5:00	<i>Viscoelastic Stokes Flows and Microrheology</i> , M.G. Forest, K. Xu, I. Klapper	
TC9 Mt. Nittany	<i>Size Effects at the Micron and Submicron Length Scales in Metals (24) – I</i>	Organizers: G.Z. Voyiadjis, R.K. Abu Al-Rub, F.H. Abed Chairs: G.Z. Voyiadjis, R.K. Abu Al-Rub
2:55–3:45	<b>Keynote:</b> <i>Dislocation Based Continuum Gradient Plasticity</i> , G.Z. Voyiadjis, R.K. Abu Al-Rub	
3:45–4:10	<i>A Thermodynamics Based Damage Mechanics Model with Size Effect</i> , J. Gomez	
4:10–4:35	<i>Higher-Order Gradient Theory for Size Dependent Plasticity</i> , R.K. Abu Al-Rub, G.Z. Voyiadjis, D.J. Bammann	

## Concurrent Sessions — Wednesday A, Aug 16, 9:15 AM – 11:20 AM

WA1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – VII</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: P. Podio-Guidugli, T. Healey
9:15–9:40	<i>Optimal Stresses for Continuous Bodies and Structures</i> , R. Segev, G. deBotton	
9:40–10:05	<i>Mechanics of Fractal Bodies</i> , M. Epstein, J. Sniatycki	
10:05–10:30	<i>Eshelby’s Tensor Fields for Arbitrarly Domain: Irreducible Structure</i> , Q. Zheng, Z. Zhao, D. Du	
10:30–10:55	<i>Elasticity with Disarrangements</i> , D.R. Owen	
10:55–11:20	<i>A Continuum Theory of Brittle Fracture Incorporating Nanoscale Effects</i> , J.R. Walton, T. Sendova	
WA2 Boardroom-2	<i>Mechanics of Nano- and Biosystems (12) – III</i>	Organizers: H. Jiang, H. Gao, A. Chandra, T. Saif Chair: H. Jiang
9:15–9:40	<i>Fabrication and Mechanics of Nanowires</i> , H. Huang	
9:40–10:05	<i>Ferroelectricity and Piezoelectricity in One Dimensional Nanostructures</i> , M.-F. Yu	
10:05–10:30	<i>Mechanical Instability in a Self-Assembling Network of Microtubules</i> , J.X. Tang, Y. Liu, Y. Guo, J.M. Valles	
10:30–10:55	<i>Multiphysics and Multiscale Analysis of Electrostatic NEMS</i> , N.R. Aluru	
WA3 Ballroom-A	<i>Tribology (27)</i>	Organizers: A. Segall, C. Hager Chair: A. Segall
9:15–9:40	<i>Classic Fretting Fatigue of Forged Ti-6Al-4V for Compressor Disc Application</i> , R.K. Betts	
9:40–10:05	<i>An Order of Magnitude Analysis of CMP Material Removal at the Molecular Scale</i> , L. Chang	
10:05–10:30	<i>MEMS Tribometer for Normal and Lateral Force Measurement in Micro and Nano-Tribology Studies</i> , A.V. Desai, A. Haque	
10:30–10:55	<i>Development and Evaluation of the Wear Behaviors of Self-Lubricating Coating Systems Manufactured by High Velocity Particle Consolidated (HVPC)</i> , A. Segall, I. Smid, T. Eden, G. Aggarwal, P. Walia	
WA4 Boardroom-1	<i>Multifunctional Materials and Structures (15) – II</i>	Organizers: D. Lagoudas, Z. Ounaies, A. Beskok, D. Leo Chair: P. Bahukudumbi
9:15–9:40	<i>A Constitutive Theory for Shape Memory Polymers</i> , Y.-C. Chen, D.C. Lagoudas	
9:40–10:05	<i>Coupled Magnetic-Elastic Domain Evolution in Ferromagnetic Shape Memory Alloys: Modeling and Simulation</i> , Y.M. Jin	
10:05–10:30	<i>Shape Memory and Pseudoelasticity in Metal Nanowires</i> , H.S. Park, K. Gall, J.A. Zimmerman	
10:30–10:55	<i>Modeling of the Magnetic Shape Memory Alloy Response to Multicomponent Mechanical and Magnetic Loading</i> , D.C. Lagoudas, B. Kiefer	

## Concurrent Sessions — Wednesday A, Aug 16, 9:15 AM – 11:20 AM

WA5 Ballroom-B	<i>Multi-Scale Modeling and Simulation of Nano Structured Materials (14) – I</i>	Organizers: A. Al-Ostaz, G.M. Odegard, I. Jasiuk, S. Lopatnikov Chairs: I. Jasiuk, S.L. Lopatnikov
9:15–9:40	<i>An Adaptive Model Reduction Technique for the Multi-Scale Modeling of Materials with Bravais Multi-Lattice Structure</i> , A. Mahdavi, E. Mockensturm	
9:40–10:05	<i>A Multiscale Approach to the Modeling and Analysis of Growth Rate of Carbon Nanostructures</i> , S. Naha, S. Banerjee, I.K. Puri	
10:05–10:30	<i>Micromechanical Analysis of Interphase and Interface Effects on Load Transfer in Carbon Nanotube Composites</i> , G.D. Seidel, D.C. Lagoudas	
10:30–10:55	<i>Local Failure Modes and Twin Boundary Effects in Nanocrystalline Systems</i> , W.M. Ashmawi	
10:55–11:20	<i>Atomic-Scale Finite Element Method in Multiscale Computation</i> , H. Jiang, Y. Huang, B. Liu, S. Qu, M.-F. Yu, K.-C. Hwang	
WA6 Ballroom-D	<i>Advanced Mathematical Tools: A Frontier Between Mathematics and Engineering (2) – III</i>	Organizers: R. Ablamowicz, J. Liu Chair: L. Traversoni
9:15–9:40	<i>Mathematical Models of Technical Systems and Technological Processes</i> , M. Burgin	
9:40–10:05	<i>Small-Scale Analysis of the Boundary Conditions at the Walls of Large Cooling Towers Containing Structured Packing</i> , S.C. Kranc	
10:05–10:30	<i>Solutions of Self-Similar Viscosity Approximation to an Incompressible Two-Phase Flow Model</i> , F. Zhang	
10:30–10:55	<i>Stereoscopic Films Analysis</i> , L. Traversoni	
WA7 Ballroom-E	<i>Modeling and Characterization of Biological Materials and Biomaterials (13) – II</i>	Organizers: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson Chairs: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson
9:15–9:40	<i>Intra- and Inter-Individual Variations of Shear Stress in Human Tibial Cancellous Bone</i> , X.N. Dong, Y.N. Yeni, D.P. Fyhrie	
9:40–10:05	<i>Hierarchical Flaw Tolerance Strategies in Bone and Gecko</i> , H. Gao	
10:05–10:30	<i>Universal Morphological Patterns in Bone: Micromechanics-Based Prediction of Anisotropic Material Behavior</i> , C. Hellmich, A. Fritsch, L. Dormieux	
10:30–10:55	<i>Modeling of Cortical Bone as a Hierarchical Material</i> , I. Jasiuk	
WA8 Alumni Lounge	<i>Multiscale Modeling and Simulation of Elastic Complex Fluids (17) – II</i>	Organizers: C. Liu, Q. Wang Chairs: C. Liu, Q. Wang
9:15–9:40	<i>A Development of a Macroscopic Closure Approximation for the Macro-Micro FENE Model</i> , Y. Hyon, Q. Du, C. Liu	
9:40–10:05	<i>An Energetic Consistent Closure Method for Micro-Macro Models</i> , C. Liu	
10:05–10:30	<i>Boundary Conditions for the Microscopic FENE</i> , C. Liu, H. Liu	
10:30–10:55	<i>Coarse Graining the Dynamics of Polymeric Melts and Polymer Nanocomposites</i> , C. Picu, A. Rakshit	

**Concurrent Sessions — Wednesday A, Aug 16, 9:15 AM – 11:20 AM**

WA9 Mt. Nittany	<i>Size Effects at the Micron and Submicron Length Scales in Metals (24) – II</i>	Organizers: G.Z. Voyiadjis, R.K. Abu Al-Rub, F.H. Abed Chairs: G.Z. Voyiadjis, F.H. Abed
9:15–9:40	<i>Computational Simulations of Nanoindentation of Pb/Sn Solder Alloys</i> , C. Basaran, J. Gomez	
9:40–10:05	<i>Parametric Study of the Voyiadjis-Abed Microstructural Based Flow Stress Models</i> , F.H. Abed, G.Z. Voyiadjis	
10:05–10:30	<i>Size Effect in the Flow Stress of Single-Crystal Microbeams During Bending: A Dislocation Dynamics Study</i> , J. Segurado, I. Romero, J. LLorca	

## Concurrent Sessions — Wednesday B, Aug 16, 12:30 PM – 2:35 PM

WB1 Assembly	<i>In Memory of Ronald S. Rivlin (9) – VIII</i>	Organizers: D. Steigmann, Y.-C. Chen, A.S. Wineman Chairs: D.E. Carlson, B. Bernstein
12:30–12:55	<i>A New Mathematical Model of the Allen-Cahn-Hilliard Type</i> , P. Podio-Guidugli	
12:55–1:20	<i>Variational Characterization of a Quasi-Rigid Body</i> , R. Fosdick, G. Royer-Carfagni	
1:20–1:45	<i>Constitutive Equations of Nematic Elastomers and an Application</i> , Y.-C. Chen, E. Fried	
1:45–2:10	<i>Vanishing Capillarity as a Selection for Young-Measure Equilibrium Solutions in a Model Two-Phase Problem of Nonlinear Elasticity</i> , T. Healey	
2:10–2:35	<i>Invertibility of the Stress-Stretch Relation as a Constitutive Restriction</i> , J.G. Murphy	
WB2 Boardroom-2	<i>Mechanics of Nano- and Biosystems (12) – IV</i>	Organizers: H. Jiang, H. Gao, A. Chandra, T. Saif Chair: A. Chandra
12:30–12:55	<i>Surface Evolution During the Chemical Mechanical Planarization of Copper</i> , W. Che, A.F. Bastawros, A. Chandra	
12:55–1:20	<i>Mechanics of Cochlear Outer Hair Cells and Stereocilia</i> , K. Grosh, N.V. Deo	
1:20–1:45	<i>Electromigration Induced Strain Field Simulation for Nanoelectronics</i> , C. Basaran, M. Lin	
1:45–2:10	<i>MEMS Enabled Mechanical Testing of Nano-Scale Gold and Zinc-Oxide Specimens</i> , D.C. Miller, B.L. Boyce, K. Gall	
2:10–2:35	<i>Reverse Quantum Confinement-Strain Coupling in Ultra-Small Quantum Dots</i> , P. Sharma	
WB3 Ballroom-A	<i>General Sessions (8) – II</i>	Organizers: G.L. Gray, F. Costanzo Chair: H.H. Hilton
12:30–12:55	<i>Fictitious Fluid Approach and Anomalous Blow-up of the Dissipation Rate in a 2D Model of Concentrated Suspensions</i> , Y. Gorb, L. Berlyand, A. Novikov	
12:55–1:20	<i>Viscoelastic Timoshenko Beam Theory</i> , H.H. Hilton	
1:20–1:45	<i>An Effective Stress Model for Geological Materials Subjected to High Strain Rate Loading</i> , P.A. Taylor	
1:45–2:10	<i>Internal State Variable-Based Strain Rate Effect on Thermo-Mechanical Material Behavior</i> , G.Z. Voyiadjis, F.H. Abed	
2:10–2:35	<i>The Mechanics of Rotating Wound Rolls</i> , R. Balaji, E. Mockensturm	
WB4 Boardroom-1	<i>Multifunctional Materials and Structures (15) – III</i>	Organizers: D. Lagoudas, Z. Ounaies, A. Beskok, D. Leo Chair: Y.-C. Chen
12:30–12:55	<i>A new design of a colloidal micro-pump</i> , O. Bozkurt, M.R. Maxey, G.E. Karniadakis	
12:55–1:20	<i>Engineering Colloidal Microfluidic Networks with Directed Assembly</i> , P. Bahukudumbi, W.N. Everett, M. Bevan, A. Beskok	
1:20–1:45	<i>Electric Field-Tailoring of Polymer Nanocomposites for Dual Sensing and Actuation</i> , Z. Ounaies, S. Banda	

## Concurrent Sessions — Wednesday B, Aug 16, 12:30 PM – 2:35 PM

WB5 Ballroom-B	<i>Multi-Scale Modeling and Simulation of Nano Structured Materials (14) – II</i>	Organizers: A. Al-Ostaz, G.M. Odegard, I. Jasiuk, S. Lopatnikov Chairs: G.M. Odegard, A. Al-Ostaz
12:30–12:55	<i>Action-Optimization Approach to the Multiple Time-Scale Simulation of Nanomaterials</i> , S. Jun, S. Pendurti, I.-H. Lee, V. Prasad	
12:55–1:20	<i>Continuum Model of Single and Multi-Wall Nano-Tubes</i> , S.L. Lopatnikov, J.W. Gillespie, Jr.	
1:20–1:45	<i>Functionalization of Silica Nanoparticles to Improve Stab Resistance of Kevlar Fabrics</i> , H. Mahfuz, F. Clements, J. Stewart	
1:45–2:10	<i>Multiscale Constitutive Modeling of Polymer Materials</i> , G.M. Odegard, P.K. Valavala	
2:10–2:35	<i>Multi-Scale Model of Failure Mechanisms in Metal-Matrix Nano-Composites</i> , V. Stoilov	
WB6 Ballroom-D	<i>Advanced Mathematical Tools: A Frontier Between Mathematics and Engineering (2) – IV</i>	Organizers: R. Ablamowicz, J. Liu Chair: J. Liu
12:30–12:55	<i>The Refined Theory of Transversely Isotropic Beams Based on General Solutions of Elasticity</i> , Y. Gao, B. Zhao	
12:55–1:20	<i>On the Parallel Lines for Bezier Cubics and Surfaces</i> , R. Ablamowicz, J. Liu	
1:20–1:45	<i>Algebraic Geometry Approach in the Modeling of a Free Vibration Analysis of Laminated Toroidal Shells with Elliptical Cross-Section</i> , J. Liu, S. Madhavapeddy, G. Buchanan	
WB7 Ballroom-E	<i>Modeling and Characterization of Biological Materials and Biomaterials (13) – III</i>	Organizers: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson Chairs: I. Jasiuk, T. Lekszycki, A.K. Ghosh, A. Wagoner Johnson
12:30–12:55	<i>Structure-Function Relationship at the Soft Tissue-to-Bone Interface</i> , H.H. Lu, K.L. Moffat, J.P. Spalazzi, I.-N.E. Wang	
12:55–1:20	<i>Brittle to Bone-Like Behavior of Porous Hydroxyapatite Implants with Tailored Porosity</i> , A. Wagoner Johnson, J. Woodard, A. Hilldore, R.D. Jamison, M. Wheeler, S. Clark	
1:20–1:45	<i>Laminar Flow Past a Bumpy Circle: An Implication of Virus Locomotion</i> , Y. Kim, D.W. Kim, S. Pendurti, S. Jun	
WB8 Alumni Lounge	<i>Multiscale Modeling and Simulation of Elastic Complex Fluids (17) – III</i>	Organizers: C. Liu, Q. Wang Chairs: C. Liu, Q. Wang
12:30–12:55	<i>Heat Transfer Enhancement in the Internal Flows of Complex Fluids</i> , D.A. Siginer	
12:55–1:20	<i>A New Adaptive Local Mesh Refinement Algorithm and Its Application on Fourth Order Thin Film Flow Problem</i> , P. Sun, B. Russell, J. Xu	
1:20–1:45	<i>New Numerical Techniques for 2D Steady-State Two-Phase Transport Model in the Cathode of PEM Fuel Cell</i> , P. Sun, C. Wang, J. Xu, G. Xue	
1:45–2:10	<i>Error Estimation for Coupled Physics Problems</i> , S.J. Tavener, V. Carey, D. Estep	

## Concurrent Sessions — Wednesday B, Aug 16, 12:30 PM – 2:35 PM

WB9 Mt. Nittany	<i>Ultrasonic Guided Wave Inspection (28)</i> – I	Organizer: J.L. Rose Chair: J.L. Rose
12:30–1:20	<b>Keynote:</b> <i>Guided Waves for Nondestructive Evaluation (NDE) and Structural Health Monitoring (SHM)</i> , C.J. Lissenden	
1:20–1:45	<i>Piezoelectric Wafer Active Sensor Development for Structural Health Monitoring Using Guided Waves</i> , H. Gao, J.L. Rose	
1:45–2:10	<i>Ultrasonic Guided Wave Tomographic Study on a Composite Plate</i> , F. Yan, E. Hauck	
2:10–2:35	<i>Aircraft De-Icing System with Ultrasonic Guided Wave</i> , Y. Zhu, J. Palacios, H. Gao, J.L. Rose	

**Concurrent Sessions — Wednesday C, Aug 16, 2:55 PM – 5:00 PM**

WC1 Assembly	<i>Fabric Tensors in Damage Mechanics (6)</i>	Organizers: G.Z. Voyiadjis, P.I. Kattan Chairs: G.Z. Voyiadjis, P.I. Kattan
2:55–3:45	<b>Keynote:</b> <i>Evolution of Fabric Tensors in Damage Mechanics</i> , G.Z. Voyiadjis, P.I. Kattan	
3:45–4:10	<i>Damage Variable and Damage Evolution Through Fabric Tensors</i> , A.H. Almasri, G.Z. Voyiadjis	
4:10–4:35	<i>Damage Mechanics in the Elastic Analysis of Composite Materials Using Fabric Tensors</i> , Z.N. Taqieddin, G.Z. Voyiadjis, P.I. Kattan	
4:35–5:00	<i>Fabric Tensors to Quantify Micro-Cracks in Metal Matrix Composite Materials</i> , A.H. Almasri, G.Z. Voyiadjis	
WC2 Boardroom-2	<i>Numerical Modeling of Damage and Irreversible Phenomena in Composite Materials (19)</i>	Organizers: J.A. Mayugo Majo, E.J. Barbero Chair: E.J. Barbero
2:55–3:45	<b>Keynote:</b> <i>Damage and Self Healing Behavior of Laminated Fiberglass Reinforced Polymer Composites</i> , E.J. Barbero, K.J. Ford	
3:45–4:10	<i>An Analysis of Interlaminar and Intralaminar Damage in Fiber-Reinforced Laminates</i> , D. Bruno, F. Greco, P. Lonetti	
4:10–4:35	<i>On the Use of Plate and Interface Variables for Delamination in Composite Structures</i> , F. Greco, P. Lonetti, R. Carpino	
4:35–5:00	<i>Thermodynamic Modelling and Numerical Simulation of the Damage of Concrete as a Particle-Reinforced Composite</i> , E. Stora, B. Bary, Q.-C. He	
WC4 Boardroom-1	<i>Application of Discrete Element Method in Engineering Problems (4)</i>	Organizers: Z. You, J. Favier, L. Wang Chair: X. Hu
2:55–3:45	<b>Keynote:</b> <i>3D DEM Simulation and Non-Invasive Strain Quantification of Shear Banding at Microscopic Scale</i> , Y. Fu, L. Wang	
3:45–4:10	<i>Polyhedron Generation Arithmetic and Program in Simulation Analyses of Asphalt Mixture by DEM</i> , X. Hu, L. Tian, Y. Liu	
4:10–4:35	<i>Aggregate Effect to Asphalt Mixture Properties by Modeling Particle-To-Particle Interaction</i> , Z. You	
WC8 Alumni Lounge	<i>Multiscale Modeling and Simulation of Elastic Complex Fluids (17) – IV</i>	Organizers: C. Liu, Q. Wang Chairs: C. Liu, Q. Wang
2:55–3:20	<i>Modeling and Algorithmic Approaches to Constitutively Complex Fluids</i> , D. Trebotich, G.H. Miller	
3:20–3:45	<i>Hydrodynamics of Solutions of Biaxial Liquid Crystal Polymers</i> , Q. Wang, S. Sircar, J. Li	
3:45–4:10	<i>Numerical Simulations of Rod and Platelet Dispersions</i> , R. Zhou, M.G. Forest, Q. Wang	
4:10–4:35	<i>A Kinetic Network Model for Anisotropic Viscoelastic Liquids</i> , H. Zhu, D. De Kee	

**Concurrent Sessions — Wednesday C, Aug 16, 2:55 PM – 5:00 PM**

WC9 Mt. Nittany	<i>Ultrasonic Guided Wave Inspection (28)</i> – II	Organizer: J.L. Rose Chair: J.L. Rose
2:55–3:20	<i>Elastic Waves in Bounded Structures with an Arbitrary Cross-Section</i> , C.M. Lee	
3:20–3:45	<i>Theoretical, Numerical, and Experimental Long Range Ultrasonic Guided Wave Focusing in Pipe for Defect Detection, Location and Circumferential Length Determination Analysis</i> , J. Mu, L. Zhang, J.L. Rose, J. Spanner	
3:45–4:10	<i>A Study of the Effects of Viscoelastic Coating on Guided Wave Propagation in Pipe</i> , J.K. Van Velsor, L. Zhang, M.J. Avioli, J.L. Rose	
4:10–4:35	<i>Three-Dimensional FE Modeling of Ultrasonic Guided Wave Scattering from 3-D Defects in a Hollow Cylinder</i> , W. Luo	
4:35–5:00	<i>Guided Wave Focusing Beyond an Elbow</i> , L. Zhang, J.L. Rose	