

Program as of October 3, 2003

Plenary Lectures

Monday, October 13, 8:00-8:55 AM, Location: Mendelssohn Theatre

Prof. Gerard Maugin, Uniuersite Pierre et Marie Curie, SES 2003 Eringen Medalist
From Mathematical Physics to Engineering Science

Tuesday, October 14, 8:00-8:55 AM, Location: Mendelssohn Theatre

Prof. Tony Maxworthy, University of Southern California, SES 2003 G. I. Taylor Medalist
A Fascination with Fluids

Wednesday, October 15, 8:00-8:55 AM, Location: Mendelssohn Theatre

Prof. K. R. Rajagopal, Texas A&M University,
Foundations and Applications of Mixture Theory

Concurrent Sessions Monday A, 9:15 to 11:20 AM

MA1		Organizers D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: D. Lagoudas, A. Srinivasa
9:15-9:40	<i>An Inverse Problem in Elasticity: The Eshelby Inclusion</i> , X. Markenscoff	
9:40-10:05	<i>Micromechanics of Porous Shape Memory Alloys</i> , Dimitris Lagoudas, Pavlin Entchev	
10:05-10:30	<i>The Void Size Effect on the Void Growth Rate in Ductile Materials</i> , B. Liu, Y. Huang, X. Qiu, K.C. Hwang, M. Li, C. Liu	
10:30-10:55	<i>Evaluation of Energy Release Rate in Strain Gradient Material Model</i> , Shoji Imatani, Koujiro Hatada, Gerard Maugin	
10:55-11:20	<i>Smooth Inhomogeneity vis-a-vis Local Isotropy in Classical Elasticity</i> , Martin Ostoja-Starzewski	
MA2		Organizers: K. Grosh
Room TBA	<i>Growth & Mechanics of Soft Tissue</i>	Chair: K. Grosh
9:15-9:40	<i>A Continuum Framework for Growth in Soft Biological Tissue: Mass transport Coupled with Mechanics</i> , Krishna Garikipati, Ellen Arruda, Karl Grosh, Harish Narayanan, Sarah Calve	
9:40-10:05	<i>Vascular Growth and Remodeling In Response to Altered Flows</i> , Jay Humphrey, K.R. Rajagopal	
10:05-10:30	<i>Role of Configurational Forces on the Growth and Remodelling of tissues</i> , Narendra Simha	
10:30-10:55	<i>Mechanics of Self-Assembling Tendon Constructs</i> , Sarah Calve, Robert Dennis, Karl Grosh, Ellen Arruda	
10:55-11:20	<i>Mechanical Properties of Biomaterials with Application to Cell Mechanics and Kinetics</i> , Edward Berger, Yash Kolambkar, Kumar Vemaganti	
11:20-11:55	<i>Two-State Boltzmann Model for Outer Hair Cell Electromotility and Stiffness</i> , Niranjana Deo, Karl Grosh	
MA3	<i>Nonlinear Homogenization and Stability in Microstructured Solids</i>	Organizers: N. Triantafyllidis
Room TBA		Chair: P. Ponte-Castaneda
9:15-9:40	<i>Homogenization-Based Constitutive Models for Reinforced and Porous Elastomers</i> , Pedro Ponte-Castaneda, Oscar Lopez-Pamies	

- 9:40-10:05 *Multi-Scale Stress Analysis for Composite Media: Estimation of Overstressed Zones and Development of Macroscopic Failure Criteria*, Robert Lipton
- 10:05-10:30 *Micromechanics of Electrostrictive Composites*, Jiangyu Li, Negadip Rao
- 10:30-10:55 *Dynamic Strength Enhancement in Cellular Solids due to Buckling and Kink Band Instabilities*, Murat Vural
- 10:55-11:20

(more Monday A on next page)

Concurrent Sessions Monday A, 9:15 to 11:20 AM

MA4		Organizer: T. Powers
Room TBA	<i>Molecular and Cellular Biomechanics</i>	Chair: T. Powers
9:15-9:40	<i>Mechanics of DNA Packaging and Ejection in Viruses</i> , Rob Phillips, Prashant Purohit, Jane' Kondev	
9:40-10:05	<i>Mechanics of Bacterial Flagella</i> , Thomas Powers	
10:05-10:30	<i>Linking Mechanics to Biochemistry in Biology and Medicine: Exploring the Science of Molecular to Cellular Biomechanics with Nano- and Micro-technology</i> , Philip LeDuc	
10:30-10:55	<i>Biophysical Investigation of the Cellular and Molecular Dynamics of Drosophila Morphogenesis</i> , Glenn Edwards, Shane Hutson, Xomalin Peralta, Yoichiro Tokutake, Stephanos Venakides, Dan Kiehart	
10:55-11:20	<i>A Statistical Approach in the Mechanics of Cell Adhesion</i> , Jean Francois Ganghoffer, Bernard Haussy	
MA5	<i>Thermomechanical Behavior of Polymer Materials at the Nanoscale</i>	Organizers: M. Begley
Room TBA		Chair: M. Begley
9:15-9:40	<i>Tough, Nanostructured Block Copolymers with Unentangled Glassy Matrices</i> , Ed Kramer	
9:40-10:05	<i>Towards Molecular-Level Understanding Of Plasticity in Amorphous Polymers</i> , Marcel Utz	
10:05-10:30	<i>Near-Surface Mechanical Properties of Glassy Polymers</i> , Leon Govaert, Harold van Melick, Jaap Den Toonder, Han Meijer	
10:30-10:55	<i>Effect of Strain Hardening on Deformation of Strain Gradient Solids</i> , Jun Wang, David C.C. Lam	
10:55-11:20	<i>Deconvolution of Mechanical Behavior at the Nanoscale: The Adhesion Length Scale Problem</i> , W. W. Gerberich, M. Palacio, Y. Garif, A. Pocius	
MA6	<i>Atoms to Continua: Modeling Physics Hierarchically</i>	Organizer: K. Garikipati, M. Falk
Room TBA		Chair: M. Falk
9:15-9:40	<i>The Minimum Entropy Production</i> , A. D. Kirwan	
9:40-10:05	<i>Coupled Atomistic-Continuum Simulation of Nanowire Relaxation</i> , Patrick Klein, Jonathan Zimmerman	
10:05-10:30	<i>Coupling Continuum and Atomistic Stress to Quantum Dot Optical Properties</i> , H. T. Johnson, J.-H. You, R. Bose	
10:30-10:55	<i>Effects of Elasticity and of Supercell Size on the Calculation of Stress-Defect Coupling</i> , Mathieu Bouville, Michael Falk, Krishna Garikipati	
10:55-11:20	<i>Modeling Void Nucleation in Polycrystalline Solids: The Effect of Compositional Stress</i> ,	

Hashem Mourad, Krishna Garikipati

Concurrent Sessions Monday B, 12:30 to 2:35 PM

MB1		Organizers: D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: V. Levitas, N. Simha
12:30-12:55	<i>Multiscale Techniques for Modeling Damage Evolution in Inelastic Composites</i> , David Allen	
12:55-1:20	<i>Material Force Models for Cracks</i> , Narendra Simha, Franz Fischer, Otmar Kolednik	
1:20-1:45	<i>Localized Strain and Defect Propagation in Solids : Lattice and Quasi-Continuum Models</i> , Joel Pouget	
1:45-2:10	<i>On Compatibility Conditions for Singular Surfaces--Unified Approach</i> , Jovo Jaric	
2:10-2:35	<i>High Pressure Mechanochemistry: Conceptual Multiscale Modeling and Interpretation of Experiments</i> , Valery Levitas	
MB2		Organizers: A. Wineman
Room TBA	<i>Graduate Student Paper Competition</i>	Chair:
12:30-12:55	<i>A Multiscale Reduced Order Model for Computing Frequency Spectra of Periodic Materials</i> , Mahmoud I. Hussein, Gregory M. Hulbert	
12:55-1:20	<i>Computational Modeling of Indentation of Biomaterials</i> , Yash Kolambkar, Edward Berger, Kumar Vemaganti	
1:20-1:45	<i>Application of Wavelet Transforms in the Analysis of High Frequency Squeal in a Disc-Brake System</i> , Manish Paliwal, Ajay Mahajan, Jarlen Don, Peter Filip	
1:45-2:10	<i>Instability Analysis on the Biaxial Stretching of Superplastic Materials</i> , Naveen Thuramalla	
2:10-2:35	<i>On Saint-Venant's Principle in the Dynamics of Elastic Beams</i> , David Foster	
MB3	<i>Magnetorheological & Electrorheological Materials</i>	Organizer: J. Ginder
Room TBA		Chair: J. Ginder
12:30-12:55	<i>MR Elastomers: Composition and Geometric Effects</i> , Anne-Marie Albanese, Kenneth Cunefare	
12:55-1:20	<i>On Finitely Strained Magnetorheological Elastomers</i> , Sundeep Kankanala, Nicolas Triantafyllidis	
1:20-1:45	<i>Coupled Magneto-Mechanical Modeling of Ferromagnetic Particle Reinforced Composites</i> , Huiming Yin, Lizhi Sun	
1:45-2:10	<i>Nanorheology of Magnetic Elastomers Studied by Coherent X-ray Speckle</i> , Roy Clarke, William Schlotter, Jevne Micheau-Cunningham, John Ginder, Mark Nichols, Eric Dufresne, Codrin Cionca	
2:10-2:35	<i>A Comparative Study of the Ferrofluid Magnetization Equations</i> , Soma Venkat, P.N. Kaloni	
MB4		Organizer: J. Gao, L. C. Brinson, J. Shaw
Room TBA	<i>Shape Memory Materials</i>	Chairs: J. Shaw, S. White
12:30-12:55	<i>Measurement of Strain and Magnetization Response of a Ferromagnetic Shape-Memory Alloy</i> , T. W. Shield	
12:55-1:20	<i>Experimental Characterization of the Fatigue Behavior of Thin Sheet Nitinol</i> , Qingzhong Li, Sungho Yoon, Scott White	
1:20-1:45	<i>Linking Standard Processing Practice to Structure and Properties in NiTi</i> , Carl Frick, Alicia Ortega, Jeff Tyber, Ken Gall	
1:45-2:10	<i>Shape Memory Polymers: Thermomechanics and Applications</i> , Ken Gall, Yiping Liu, Marty Dunn	
2:10-2:35	<i>Deformation Mechanisms of U-Nb Shape Memory Alloys</i> , Brown, Mark Bourke, Bob Field, Larry Hulst, Dave Teter, Dan Thoma	

(more Monday B on next page)

Concurrent Sessions Monday B, 12:30 to 2:35 PM

MB5	<i>Thermomechanical Behavior of Polymer</i>	Organizers: M. Begley
Room TBA	<i>Materials at the Nanoscale</i>	Chair: M. Utz
12:30-12:55	<i>Nanomechanical Testing of Circular Freestanding Polymer Films with Sub-Micron Thickness,</i> Kyle Maner, Matthew Begley	
12:55-1:20	<i>Instrumented Indentation of Polymers,</i> Mark VanLandingham	
1:20-1:45	<i>Stress Evolution in Spin Coated PMMA Thin Films</i> <i>Stress Evolution in Spin Coated Films of</i> PMMA, Anita Bowles, John Hutchinson, Frans Spaepen	
1:45-2:10	<i>Multiscale Experimental Study of Fracture Response of a Photosensitive Polyethylene Co-</i> Polymer, Jorge Abanto-Bueno, Jay Patel, Charles Prebil, John Lambros	
2:10-2:35	<i>Structure-Property Relationships of Nanoplatelet-Reinforced Polymer Composites,</i> Ioannis Chasiotis, Qi Chen, Gregory Odegard, Thomas Gates, Lawrence T. Drzal	
MB6	<i>Atoms to Continua: Modeling Physics</i>	Organizers: K. Garikipati, M. Falk
Room TBA	<i>Hierarchically</i>	Chairs: K. Garikipati
12:30-12:55		
12:55-1:20	<i>Mechanics of Macromolecules and Their Assemblies: Do We Need All the Atoms?,</i> Rob Phillips	
1:20-1:45	<i>A Gradient Plasticity Model with Strict Anti-Plane Shear Kinematics: Formulation and Finite</i> <i>Element Implementation,</i> Richard Regueiro, Krishna Garikipati	
1:45-2:10	<i>Nonlinear Structural Mechanics Based Modeling of Carbon Nanotube Deformation,</i> Antonio Pantano, Mary C. Boyce, David M. Parks	
2:10-2:35	<i>Electronic Properties of Deformed Carbon Nanotubes,</i> Harley Johnson, Bin Liu, Young Huang	

Concurrent Sessions Monday C, 3:00 to 5:05 PM

MC1		Organizers D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: I. Jasiuk, Y. Chen
3:00-3:25	<i>Atomistic Formulation of a Field Theory for Nano/Micro Physics</i> , Youping Chen, James Lee	
3:25-3:50	<i>Nonlocal Eshelby Entities</i> , Marcelo Epstein, Jędrzej \Sniatycki	
3:50-4:15	<i>Stress Invariance in Planar Cosserat Elasticity with Eigenstrains and Eigencurvatures</i> , Iwona Jasiuk	
4:15-4:40	<i>Mesoscopic Continuum Theory of Complex Materials</i> , Wolfgang Muschik	
4:40-5:05	<i>Material Forces in Micromorphic Elastic Solids</i> , James Lee, Youping Chen	
MC2		Organizers: Stephen Davis, William Schultz
Room TBA	<i>Maxworthy Symposium</i>	Chair: S. Davis
3:00-3:25	<i>Sudden Transitions, Hysteresis, and Oscillations in Geophysical Fluid Dynamics and Climate Laboratory Experiments</i> , J. A. Whitehead	
3:25-3:50	<i>Flames as Discontinuity Surfaces in Gasdynamic Flows</i> , Bernard J. Matkowsky	
3:50-4:15	<i>Instabilities of Gaseous Non-Premixed Flames near Extinction</i> , Peter A. Monkewitz	
4:15-4:40	<i>Momentum and Scalar Transport and their Relationship to Vorticity Dynamics in Bounded and Unbounded Turbulent Shear Flows</i> , James M. Wallace	
4:40-5:05	<i>Sediment Erosion by Goertler Vortices: The Scour Hole Problem</i> , E.J. Hopfinger, A. Kurniawan	
5:05-5:30	<i>The Dynamics of Miscible Interfaces - A Space Flight Experiment (MIDAS): Concentration Field Measurement by interferometry</i> , R. Balasubramaniam, Nasser Rashidnia, Richard Lauver	
MC3		Organizer: J. Ginder
Room TBA	<i>Magnetorheological & Electrorheological Materials</i>	Chairs: K. Cunefare
3:00-3:25	<i>Transient Response of MR Fluids: Shear Flow between Concentric Cylinders</i> , John Ulicny, Mark Golden, Daniel Klingenberg	
3:25-3:50	<i>Time Dependence of Rheological Properties of MR Fluids</i> , Constantin Ciocanel, Kevin Molyet, Hideki Yamamoto, Sheila Vieira, Nagi Naganathan	
3:50-4:15	<i>Response-Time Measurements of Commercial Magnetorheological Dampers</i> , Clay Maranville, John Ginder	
4:15-4:40	<i>A Magneto-Rheological Fluid Limited Slip Differential Clutch</i> , Barkan Kavlicoglu, Faramarz Gordaninejad, Cahit Evrensel, Alan Fuchs, George Korol	
4:40-5:05	<i>Design Considerations for a MR Torque Transfer Device</i> , Kevin Molyet, Constantin Ciocanel, Hideki Yamamoto, Sheila Vieira, Nagi Naganathan	
MC4		Organizer: J. Gao, L. C. Brinson, J. Shaw
Room TBA	<i>Shape Memory Materials</i>	Chairs: D. Lagoudas, K. Gall
3:00-3:25	<i>Representing SMA Multivariant Model Simulation Results Using Peak Intensity and Pole Figures</i> , Xiujie Gao, Anping Cheng, Deborah Burton, L. Catherine Brinson	
3:25-3:50	<i>Grain-Size Effects in a Nanocrystalline NiTi Shape-Memory Alloy</i> , Thomas Waitz, Thomas Antretter, Franz Fischer, Narendra Simha	
3:50-4:15	<i>Thermo-Mechanically Coupled Superelastic Response of Nitinol</i> , Lallit Anand	
4:15-4:40	<i>A Phenomenological Model Based on the Experimental Characterization of Ferromagnetic Shape Memory Alloy Systems</i> , Dimitris C. Lagoudas, Ibrahim Karaman, Bjoern Kiefer, Pavlin Entchev, Ersin Karaca	
4:40-5:05	<i>A Thermomechanically Coupled Model for Pseudoelastic Nitinol Wires</i> , Stefan Seelecke, Olaf Heintze	

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Concurrent Sessions Monday C, 3:00 to 5:05 PM

MC5	Room	<i>Thermomechanical Behavior of Polymer Materials at the Nanoscale</i>	Organizers: M. Begley Chairs: I. Chasiotis
3:00-3:25		<i>Viscoelastic Constitutive Equations for Polymer Based Nanocomposites Inspired by Discrete Simulation</i> , Catalin Picu, Alireza Sarvestani, Murat Ozmusul	
3:25-3:50		<i>Microstructure and Mechanical Behavior of Novel Low-K Dielectric Films</i> , Alex Volinsky, Wento Qin	
3:50-4:15		<i>Micro-Thermomechanical Properties of Composite Polymer Surfaces as Probed By Scanning Probe Microscopy</i> , Vladimir Tsukruk	
4:15-4:40		<i>Modeling of Synergistic Crazeing and Shear-Yielding in Micro/nano-layered Polymer Laminate Composites</i> , R. Sharma, S. Socrate, M. C. Boyce	
4:40-5:05		<i>An Analysis of Spatial Heterogeneity in Filled Polymers and Its Consequence on the Constitutive Description</i> , Arnab Sarkar, James Caruthers	
MC6	Room	<i>Thermoelastic Contact & Stability</i>	Organizers: J. Barber Chair: J. Barber
3:00-3:25		<i>Generic Bifurcations of the Thermoelastic Contact Instability with Frictional Sliding</i> , Jason Miller, D. Dane Quinn	
3:25-3:50		<i>On ALDO Thermo-Elastic Contact Models</i> , Michele Ciavarella, Luciano Afferrante	
3:50-4:15		<i>Modal Analysis of a General Case of a Sliding Contact with Frictionally Excited Thermoelastic Instability</i> , Przemyslaw Zagrodzki	
4:15-4:40		<i>Effect of Design Parameters on TEI in an Automotive Disc Brake</i> , Jiayin Li, Robert Sporzynski	
4:40-5:05		<i>A Study of Critical Speed of Automotive Disk Brake Using FFT FEM Technique</i> , Chongdu Cho, Byungha Lee, Seonguck Lee, Heungsik Lee	
5:05-5:30			

Concurrent Sessions Tuesday A, 9:15 to 11:20 AM

TA1		Organizers: D. Lagoudas, P. Steinmann
Room TBA	Maugin Symposium	Chairs: R. Tucker, C. Trimarco
9:15-9:40	<i>Non-Linear Behavior of a Piezothermoelastic Laminate Considering the Effect of Damping</i> , Naotake Noda, Masayuki Isihara	
9:40-10:05	<i>A Model for the Electromigration Mechanism under Applied Magnetic Field</i> , Sadik Dost, Yongcai Liu, Hamdi Sheibani, Brian Lent	
10:05-10:30	<i>The Total Kinetic Energy of an Electromagnetic Body.</i> , Carmine Trimarco	
10:30-10:55	<i>The Remanence Enhancement in Magnetically Interacting Particles</i> , Jiangyu Li, Heliang Qu	
10:55-11:20	<i>Relativistic Balance Laws for Media in General Spacetimes</i> , Robin Tucker	
TA2		Organizers: Stephen Davis, William Schultz
Room TBA	Maxworthy Symposium	Chair: W. Schultz
9:15-9:40	<i>Permanent Noncoalescence and Nonwetting and Applications</i> , G. Paul Neitzel, Pasquale Dell'Aversana, Maria-Isabel Carnasciali, Peter Nagy	
9:40-10:05	<i>Dynamics of the Molten Metal Puddle in Single-Roll Spin Casting</i> , Paul H. Steen, Cormac Byrne	
10:05-10:30	<i>A Pressure-Driven Three-Dimensional Turbulent Boundary Layer Documented with Stereo Particle Image Velocimetry</i> , Hassan Nagib, Steve Gravante, Ivanka Pelivan	
10:30-10:55	<i>Synchronized Nonlinear States in Shear and Swirling Flows</i> , Patrick Huerre	
10:55-11:20	<i>Motion of an Interface with a Moving Contact Line</i> , Michael Miksis	
TA3	<i>Nonlinear Homogenization and Stability in Microstructured Solids</i>	Organizers: N. Triantafyllidis
Room TBA		Chair: S. Kyriakides
9:15-9:40	<i>Bending of Steel Tubes with Luders Bands</i> , Stelios Kyriakides, Franz Aguirre	
9:40-10:05	<i>Influence of Perturbation Wavelength on the Stability of Periodic Continua</i> , Nicolas Triantafyllidis, Miroslav Nestorovic	
10:05-10:30	<i>Wavelength-Dependent Stability Considerations for a Nanoscale Thermomechanical Model of Bi-Atomic Crystals</i> , Ryan S. Elliott, Nicolas Triantafyllidis, John A. Shaw	
10:30-10:55	<i>Shape-Memory Polycrystals</i> , Kaushik Bhattacharya	
10:55-11:20		
TA4		Organizers: J. Gao, L. C. Brinson, J. Shaw
Room TBA	Shape Memory Materials	Chairs: V. Levitas, J. Gao
9:15-9:40	<i>Landau Theory for Shape Memory Polycrystals</i> , Rajeev Ahluwalia, Turab Lookman, Avadh Saxena, Robert Albers	
9:40-10:05	<i>Complete Solutions and Triality Theory to Landau-Ginzburg Equation in Imperfect Ferroelectrics</i> , David Gao, Jie-Fang Li, Dwight Viehland	
10:05-10:30	<i>A Numerical Algorithm Describing the Mechanical Effects of Martensitic Transformation</i> , Thomas Antretter, Georges Cailletaud, Franz Dieter Fischer	
10:30-10:55	<i>Dynamics of Stress-Induced Martensitic Phase Transformations: Analytical and Numerical Solutions</i> , Valery Levitas, Dean Preston, Dong-Wook Lee	
10:55-11:20	<i>Bifurcation and Stability of Multilattice Crystals with Internal Shifts</i> , Ryan S. Elliott, John A. Shaw, Nicolas Triantafyllidis	

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Concurrent Sessions Tuesday A, 9:15 to 11:20 AM

TA5	<i>Developments in Continuum</i>	Organizers: D. Steigmann
Room TBA	<i>Electrodynamics</i>	Chair: L. Dorfmann
9:15-9:40	<i>Nonlinear Magnetoelasticity Theory and Boundary-Value Problems</i> , Ray Ogden, Luis Dorfmann	
9:40-10:05	<i>Electromagnetic Wave Propagation in Micromorphic Solid</i> , James Lee, Youping Chen	
10:05-10:30	<i>Effective Behavior and Field Fluctuations in Nonlinear Conductors</i> , Pedro Ponte Castaneda, Martin Idiart	
10:30-10:55	<i>Polarity Principle and Algorithm for Electrodynamics</i> , David Y Gao	
10:55-11:20	<i>Mechanics of Pre-Stressed and Pre-Polarized Piezoelectric Single Crystals: Stability Issues</i> , Eveline Baesu, Fenghong Liu	
TA6	<i>Atoms to Continua: Modeling Physics</i>	Organizers: K. Garikipati, M. Falk
Room TBA	<i>Hierarchically</i>	Chairs: H. Johnson
9:15-9:40	<i>Nucleation of Defects in Crystal Structures</i> , Victor Berdichevsky	
9:40-10:05	<i>Robust Design of Material Microstructures for Highly Constrained Design Applications</i> , Surya Kalidindi, Joshua Houskamp, Gwenaelle Proust, Brent Adams	
10:05-10:30	<i>Surface Stress Induced Phase Transformation in Metal Nanowires</i> , Ken Gall, Jiankuai Diao, Martin Dunn	
10:30-10:55	<i>Hierarchical Multiscale Study of Metal Nanoparticles</i> , Byeongchan Lee, Kyeongjae Cho	
10:55-11:20	<i>Gradient Plasticity Theory with Variable Length Scale Parameters</i> , George Voyiadjis, Rashid Abu Al-Rub	
11:20-11:55	<i>Meso-scale Model for Structural Relaxation in Glass Forming Materials</i> , Grigori Medvedev, Ritwik Bhatia, James Caruthers	

Concurrent Sessions Tuesday B, 12:30 to 2:35 PM

TB1		Organizers: D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: D. Gao, M. Micunovic
12:30-12:55	<i>Damage-Induced Anisotropy in Rubberlike Solids</i> , Ray Ogden	
12:55-1:20	<i>Complementary Principle and Algorithm to Phase Transitions in Finite Deformation Solids</i> , David Gao	
1:20-1:45	<i>About the Origin of the Nucleation Peak in Transformational Plasticity</i> , Lev Truskinovsky, Anna Vainchtein	
1:45-2:10	<i>Self-Consistent Method Applied to Quasi-Rate Independent Polycrystals</i> , Milan Micunovic	
2:10-2:35	<i>The Third Law of Thermodynamics</i> , Victor Berdichevsky	
TB2		Organizers: Stephen Davis, William Schultz.
Room TBA	<i>Maxworthy Symposium</i>	Chair: A. Cotel
12:30-12:55	<i>A Mechanism for Cell-Activation by Shear Stresses in Abdominal Aortic Aneurysms</i> , Juan C. Lasheras	
12:55-1:20	<i>How and Why do Birds Fly?</i> , Geoffrey Spedding	
1:20-1:45	<i>Turbulence and Vortex Structure in Stratified Rotating Fluids</i> , Adam Fincham, Olivier Praud	
1:45-2:10	<i>New Insight into the Dynamics of Particle-Laden Gravity Currents</i> , Frieder Necker, Carlos \ Haertel, Leonhard Kleiser, Eckart Meiburg	
2:10-2:35	<i>The Fluid Mechanics of Frost Heave</i> , John S. Wettlaufer	
TB3		Organizers: N. Sottos
Room TBA	<i>Healing & Toughening Mechanisms in Polymers & Composites</i>	Chairs: N. Sottos, A. Jones
12:30-12:55	<i>Self-Healing Structural Composites with Electromagnetic Functionality</i> , Sia Nemat-Nasser, Thomas Plaisted, Alireza V. Amirkhizi, Syrus C. Nemat-Nasser	
12:55-1:20	<i>Self-Healing Structural Polymers and Composites</i> , Scott White, Nancy Sottos, Jeff Moore, Jennifer Lewis	
1:20-1:45	<i>Kinetics of Autonomic Crack Healing During Fatigue</i> , Eric Brown, Scott White, Nancy Sottos	
1:45-2:10	<i>'Bleeding Fibres' – Enhancing Damage Detection and Effecting Self-Repair</i> , Jody Pang, Ian Bond	
2:10-2:35		
TB4		Organizers: J. Gao, L. C. Brinson, J. Shaw
Room TBA	<i>Shape Memory Materials</i>	Chairs: J. Shaw, S. Seelecke
12:30-12:55	<i>Localization and Cyclic Behavior of Uniaxially Deformed Pseudoelastic NiTi</i> , Mark A. Iadicola, John A. Shaw	
12:55-1:20	<i>SMA Continuum Model with Martensite Reorientation Effects</i> , Deborah Burton, Xiujie Gao, L. Catherine Brinson	
1:20-1:45	<i>Analytical and Experimental Study of Micro-Scale SMA Actuators</i> , Olaf Heintze, Stefan Seelecke	
1:45-2:10	<i>Finite Element Analysis and Fatigue Testing on Nitinol</i> , Xiao-Yan Gong, Alan Pelton	
2:10-2:35	<i>Multiscale Material Model Calibration for Superelastic NiTi Device Reliability</i> , Paul E. Labossiere, Kenneth E. Perry, Eric D. Steffler	

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Concurrent Sessions Tuesday B, 12:30 to 2:35 PM

TB5	Developments in Continuum Electrodynamics	Organizers: Steigmann Chair: G. Tomassetti
Room TBA		
12:30-12:55	<i>Effects of Electric Boundary Conditions upon the Static and Dynamic Fracture Behavior of Cracked Piezoelectric Materials</i> , Xiadong Wang, Liying Jiang	
12:55-1:20	<i>Notion and Use of Configurational Forces in the Electrodynamics of Deformable Continua</i> , Gerard Maugin	
1:20-1:45	<i>The Effective Moduli of Ferroelectric Crystals with Engineered Domain Configurations</i> , Jiangyu Li, Dan Liu	
1:45-2:10	<i>A Model of Liquid Phase Electroepitaxial Lateral Overgrowth of Semiconductor Epilayers</i> , Yongcai Liu, Zbigniew Zykiewicz, Sadik Dost	
2:10-2:35	<i>Motion by Curvature of Magnetic Domain Walls</i> , Giuseppe Tomassetti	
2:35-3:00	<i>Structural Composites with Tuned Electric Permittivity and Magnetic Permeability</i> , Sia Nemat-Nasser, Alireza V. Amirkhizi, Syrus C. Nemat-Nasser, Thomas Plaisted	
TB6	<i>Graduate Student Paper Competition</i>	Organizers: Wineman Chairs:
Room TBA		
12:30-12:55	<i>Intrinsic Length Scale of Gradient Plasticity and Indentation Size Effect</i> , Rashid Abu Al-Rub, George Voyiadjis	
12:55-1:20	<i>Microstructure Evolution Under Nanoindentations On High Purity Titanium</i> , Gwenaelle Proust, Surya Kalidindi	
1:20-1:45	<i>Novel Advanced Composites with Nanoengineered Interfaces</i> , Brent T. Petersen, Yuris A. Dzenis	
1:45-2:10	<i>Interfacial Debonding Evolution in Particle Reinforced Composites</i> , Haitao Liu, Lizhi Sun	
2:10-2:35	<i>High Frequency Cut-Off of the Cochlear Outer Hair Cell Piezo-motility and the Cochlear Amplifier</i> , Sripriya Ramamoorthy, Karl Grosh	

Concurrent Sessions Tuesday C, 3:00 to 5:05 PM

TC1		Organizers: D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: J. Engelbrecht, J. Ganghoffer
3:00-3:25	<i>New Goal Functions for Biological Systems Under Growth</i> , Jean-François Ganghoffer	
3:25-3:50	<i>The Growing Of A Bicrystal Interface</i> , Peng Liu, Chien H. Wu	
3:50-4:15	<i>Response of a Fluid-Solid Interface to an Impulsive Point-Source</i> , Piotr Borejko, Franz Ziegler	
4:15-4:40	<i>Application of the Reciprocity Theorem to Determine Surface Waves on a Transversely Isotropic Half-Space</i> , Jan Achenbach	
4:40-5:05	<i>Nonlinear Waves and Microstructured Solids: Mathematical Modeling</i> , Juri Engelbrecht	
TC2		Organizers: T. Pence, H. Tsai
Room TBA	<i>Multi-Field Effects in Elastomers</i>	Chairs: T. Pence, H. Tsai
3:00-3:25	<i>Constitutive Modeling of Thermal Diffusivity of Deformed Elastomers</i> , Yuhui Wang, Neil Wright	
3:25-3:50	<i>Peridynamic Modeling of Defects and Phase Transformations</i> , Stewart Silling, Kaushik Dayal, Kaushik Bhattacharya	
3:50-4:15	<i>Swelling Induced Cavitation of Elastic Spheres with Local Volume Constraint</i> , Thomas J. Pence, Hungyu Tsai	
4:15-4:40	<i>A Global Bifurcation Approach to Multi-Phase Equilibria in Elastic Solids</i> , Timothy J. Healey	
4:40-5:05		
TC3	<i>Healing & Toughening Mechanisms in Polymers & Composites</i>	Organizers: N. Sottos
Room TBA		Chairs: I. Bond, S. White
3:00-3:25	<i>Mechanical, Thermal and Viscoelastic Properties of Alumina/PMMA Nanocomposites</i> , A. Bansal, B. J. Ash, L. C. Brinson, L. S. Schadler	
3:25-3:50	<i>Micromechanics and Macromechanics of Rubber-Toughened Polymers</i> , Mats Danielsson, Mary C. Boyce, David M. Parks	
3:50-4:15	<i>Time-Dependent Response of Natural Rubber at Elevated Temperature due to Scission and Healing</i> , Alan Jones, John Shaw, Alan Wineman	
4:15-4:40	<i>Crack Bridging and R-Curves in a Composite in a Discontinuously Reinforced Composite</i> , Jibin Han, Thomas Siegmund	
4:40-5:05		
TC4		Organizers: J. Gao, L. C. Brinson, J. Shaw
Room TBA	<i>Shape Memory Materials</i>	Chairs: D. Grumman, J. Gao
3:00-3:25	<i>Shape Memory Behavior of NiTi Castings</i> , Alicia Ortega, Carl Frick, Jeff Tyber, Ken Gall	
3:25-3:50	<i>Load-Deflection Characteristics of NiTi Cylinders and Tubes under Radial Compression</i> , Eugene I. Rivin, Gautam Sayal, Prithvi Raj Singh Johal	
3:50-4:15	<i>Interaction Between Evolving Phase Boundaries and a Growing Crack in a NiTi Shape-Memory Alloy</i> , Narendra Simha, Murat Tabanlı	
4:15-4:40	<i>Modification of Shape Memory Activity in TiNi Thin Films by Heavy Ion Irradiation</i> , David S. Grummon, Rolf Gotthardt, Thomas LaGrange	
4:40-5:05	<i>Increasing Penetration Resistance Using the Superelastic Behaviour of Shape Memory Material</i> , George M. A. Kamel	

(more Tuesday C on next page)

Concurrent Sessions Tuesday C, 3:00 to 5:05 PM

TC5		Organizers: A. Wineman
Room TBA	<i>Graduate Student Paper Competition</i>	Chairs:
3:00-3:25	<i>Micromechanics-Based Elastic Model for Functionally Graded Composites</i> , Huiming Yin, Lizhi Sun, Glaucio Paulino	
3:25-3:50	<i>Friction Stir Processing of Aluminum 5052</i> , Rajeswari Itharaju, Marwan Khraisheh	
3:50-4:15	<i>Using Triaxial Testing to Determine the Effects of Initial Consolidation Path on the Strength of a Common Pharmaceutical Powder</i> , Steven Galen, Antonios Zavaliangos	
4:15-4:40		
TC6		Organizers: A. Segall
Room TBA	<i>Tribology & Wear</i>	Chair: J. Kiely
3:00-3:25	<i>Experimental Wear Results for a Water Cooled Mechanical Seal Prototype Operating Under Dry Running Conditions</i> , Daryl Schneider, Dr. L. Scott Stephens	
3:25-3:50	<i>A Multi-Scale Approach to Predicting Friction and Wear in MEMS</i> , Erin E. Flater, Can K. Bora, Michael E. Plesha, Alex D. Corwin, Maarten P. de Boer, Robert W. Carpick	
3:50-4:15	<i>Evaluation of Fretting Wear Regimes at Ti6Al4V Interfaces</i> , Carl Hager Jr., Jeffrey Sanders, Shashi Sharma	
4:15-4:40	<i>Development of Replacements for Zinc Phosphate Coating Lubrication Systems Used in Forging, Extrusion, and Metal Forming Processes</i> , Mark Gariety, Gracious Ngaile, Taylan Altan	
4:40-5:05	<i>Contact and Deformation Mechanisms of Semiconductors and Ceramics at the Nano to Micro Scale</i> , John Patten	

Concurrent Sessions Wednesday A, 9:15 to 11:20 AM

WA1		Organizers D. Lagoudas, P. Steinmann
Room TBA	<i>Maugin Symposium</i>	Chairs: M. Ostoja-Starzewski, V. Kalpakides
9:15-9:40	<i>Finite Plastic Deformation of Granular Materials in Compression</i> , Sia Nemat-Nasser	
9:40-10:05	<i>Finite Deformation of an Elasto Plastic Slab Confined Between Two Plates that Rotate About Non-Coincident Axes</i> , P. Harihara, K. R. Rajagopal, A. R. Srinivasa	
10:05-10:30	<i>Complex System as a Triad: Mathematical Model- Realization - Observables</i> , Isaak Kunin	
10:30-10:55	<i>Passive Damping of Beam Vibrations Through Distributed Electric Networks and Piezoelectric Transducers: Prototype Design and Experimental Validation</i> , F. dell'Isola, C. Maurini, M. Porfiri	
10:55-11:20	<i>The Use of the Inverse Motion Mapping in the Finite Element Method</i> , Vassilios Kalpakides, Konstantinos Balassas	
WA2		Organizers: E. Arruda, A. Wineman
Room TBA	<i>General Papers</i>	Chairs:
9:15-9:40		
9:40-10:05	<i>3D Cell and Tissue Distribution Patterns Characterized by Micro-CT</i> , Amy Wagoner Johnson, Jennifer Dellinger, Francesco De Carlo, Russ Jamison	
10:05-10:30	<i>Multiple Fields Couplings in Smart Structures: {large Improved Vibration Characteristics / Micro-Polar Effects}</i> , Krystyna Majorkowska-Knap	
10:30-10:55	<i>Mixed-Mode Stable Tearing Fracture Under Combined Tension/Torsion Loading</i> , X. Deng, M. A. Sutton, L. Lan, J. Zuo, E. Mahgoub, Ching-Shan Cheng	
10:55-11:20		
WA3	<i>Problems involving Material interfaces & Inhomogeneities in Solids</i>	Organizers: P. Schiavone, L. Sudak
Room TBA		Chairs: L. Sudak
9:15-9:40	<i>A Generalized Dynamic Micromechanics Model for Treating Interacting Defects in Advanced Composites</i> , Xiaodong Wang	
9:40-10:05	<i>The Ventricular Boundary Interface Motion in Shunted Hydrocephalus</i> , Drapaca Corina, Siv Sivaloganathan, Giuseppe Tenti, James Drake	
10:05-10:30	<i>Interfacial Dislocation Activity in Thin Films</i> , Enhui Tan, Lizhi Sun	
10:30-10:55	<i>The Interaction Between a Matrix Crack and a Three-Phase Circular Inclusion with Imperfect Interface in Plane Elasticity</i> , Keekyoung Kim, Les Sudak	
10:55-11:20	<i>Thermal Behavior of an Elliptic Inhomogeneity Surrounded by a Compliant Interphase Layer</i> , Hongnian Shen, Stanislav Potapenko	
WA4	<i>Application of Multiple Natural Configurations to the Thermomechanics of Metals and Polymers</i>	Organizers: I. J. Rao, A Srinivasa, S. Bechtel
Room TBA		Chair: A. Srinivasa
9:15-9:40	<i>What Do We Mean by an Elastic Body?</i> , K.R. Rajagopal	
9:40-10:05	<i>Compressive Response and Failure of Bbraided Textile Composites</i> , Antony Waas	
10:05-10:30	<i>A Study of the Drawing of Polymer Fibers</i> , Stephen Bechtel, Kurt Kolling	
10:30-10:55	<i>A Multiconfigurational Model for the Thermomechanical Response of Polymer Fibers</i> , Arun Srinivasa, Stephen Bechtel	
10:55-11:20	<i>Thermomechanical Characterization of Crystallization in PET</i> , Mehrdad Negahban, Jean-Marc Saiter, Philippe Dos Santos Claro	

(more Wednesday A on next page)

Concurrent Sessions Wednesday A, 9:15 to 11:20 AM

WA5	Organizers: M. Massoudi
Room TBA	<i>Granular Materials</i>
9:15-9:40	<i>Experimental and Theoretical Investigation of the Low-Pressure Behavior of Polyethylene Pellets</i> , Claudia Genovese, Oana Cazacu, Raluca Ioana Rosca
9:40-10:05	<i>Structure and Kinematics in Laminar Boundary Layer Granular Flow</i> , Kimberly Hill, Gustavo Gioia, Stephanie Ott-Monsivais, Vinay Tota
10:05-10:30	<i>A Study of Particle Migration in Rotating Viscous Flows</i> , Adetola A. Abatan, Joseph J. McCarthy
10:30-10:55	<i>A Novel Finite Element Model of Discrete Particles and its use in the Compaction of Soft and Hard Particle Mixtures</i> , Adam Procopio, Antonios Zavaliangos
10:55-11:20	<i>A Non-Coaxial Dilatant Double Shearing Model for Granular Materials Including the Effect of Fabric</i> , Huaning Zhu, Morteza Mehrabadi
WA6	Organizers: A. Segall
Room TBA	<i>Tribology & Wear</i>
9:15-9:40	<i>Machining and Tool Wear of Bulk Metallic Glass</i> , Mustafa Bakkal, Albert J. Shih, Ronald O. Scattergood
9:40-10:05	<i>Topography Studies of Thermoplastic Polyurethanes upon Cyclic Micro Scratching Tests</i> , Hang (Jerry) Qi, Mary C. Boyce
10:05-10:30	<i>2-d vs 3-d Abrasive Scratch Wear Analysis</i> , Daniel Blankenship, Amber Romasco, Jim Rawers, Albert Segall
10:30-10:55	<i>Bounds on the Electrical Resistance Between Contacting Elastic Rough Bodies</i> , James Barber
10:55-11:20	<i>A Scratch Intersection Model of Material Removal During Chemical Mechanical Planarization</i> , Wei Che, Yongjin Guo, Abhijit Chandra, Ashraf Bastawros

Concurrent Sessions Wednesday B, 12:30 to 2:35 PM

WB1		Organizers: R. Lakes
Room TBA	<i>Viscoelasticity</i>	Chair: R. Lakes
12:30-12:55	<i>The Illusive and Fickle Viscoelastic Poisson's Ratio</i> , Harry H. Hilton	
12:55-1:20	<i>Stability of Discrete Viscoelastic Spring Networks with Negative Stiffness Components</i> , Yun-Che Wang, Roderic Lakes	
1:20-1:45	<i>Description and Validation of a Nonlinear Viscoelastic Model for Glassy Polymers</i> , Robert Chambers, Douglas Adolf, James Caruthers	
1:45-2:10	<i>Constitutive Equations for the Viscoelastic and Viscoplastic Behavior of Semicrystalline Polymers</i> , Aleksey Drozdov	
2:10-2:35	<i>Experimental Evaluation of Nonlinear Viscoelastic Behavior in Rabbit Ligament</i> , Rittu Hingorani, Paolo Provenzano, Roderic Lakes, Anthony Escarcega, Ray Vanderby Jr.	
2:35-3:00	<i>Application of Interrelation of Creep and Relaxation to Ligament</i> , Ashish Oza, Ray Vanderby, Roderic Lakes	
3:00-3:25	<i>Experimental Study on the Metastability of the Zn-Al System</i> , Tim Jaglinski, Yun-Che Wang, Roderic Lakes	
WB2		Organizers: E. Arruda, A. Wineman
Room TBA	<i>General Papers</i>	Chairs:
12:30-12:55	<i>Statistical Mechanics of Vortex Lines and Schrodinger Equation</i> , Victor Berdichevsky	
12:55-1:20	<i>Friction-Stir Welding: Process Modeling and Simulation</i> , Shaowen Xu, Xiaomin Deng	
1:20-1:45	<i>Solid-Solid Phase Transformation via Virtual Melt, Significantly Below the Melting Temperature. Application to HMX Energetic Crystals</i> , Valery Levitas, Bryan Henson, Laura Smilowitz, Blaine Asay	
1:45-2:10	<i>Timoshenko-Beam Effects on Vibration and Wave Propagation in Carbon Nanotubes</i> , J. Yoon, C.Q. Ru, A. Mioduchowski	
2:10-2:35		
WB3	<i>Problems involving Material interfaces & Inhomogeneities in Solids</i>	Organizers: P. Schiavone, L. Sudak
Room TBA		Chairs:
12:30-12:55	<i>Integral Equation Methods in Plane Strain Elasticity with Boundary Reinforcement</i> , Peter Schiavone, Chongqing Ru	
12:55-1:20	<i>Stability of a Screw Dislocation Near a Three-Phase Circular Inclusion with Imperfect Interface</i> , Les Sudak	
1:20-1:45	<i>A Semi-Infinite Crack Along an Imperfect Interface: an Exact Solution</i> , Yuri Antipov	
1:45-2:10	<i>On Bending Instabilities for Elastic Structures</i> , Ciprian Coman	
2:10-2:35		
WB4	<i>Application of Multiple Natural Configurations to the Thermomechanics of Metals and Polymers</i>	Organizers: I. J. Rao, A. Srinivasa, S. Bechtel
Room TBA		Chair: I. J. Rao
12:30-12:55	<i>Large Strain Constitutive Modeling of the Finite Strain Behavior of poly(ethylene terephthalate) and poly(ethylene terephthalate)-glycol Above the Glass Transition</i> , Rebecca Dupaix, Mary Boyce	
12:55-1:20	<i>On the Thermo-Mechanics of Shape Memory Polymers</i> , I Joga Rao	
1:20-1:45	<i>A Covariant Formulation of Anisotropic Finite Plasticity</i> , Panos Papodopoulos	
1:45-2:10	<i>A Multi-scale Finite Element Method for Thermo-Mechanical Modeling of Polymers</i> , Arif Masud	

(more Wednesday B on next page)

Concurrent Sessions Wednesday B, 12:30 to 2:35 PM

WB5	<i>Developments in Continuum</i>	Organizers: D. Steigmann
Room TBA	<i>Electrodynamics</i>	Chair: X. Wang
12:30-12:55	<i>Modeling of Electro-Active Composite Plates: Analysis and Numerical Results</i> , A. Fernandes, J. Pouget	
12:55-1:20		
1:20-1:45	<i>The Response of Magneto-Sensitive Elastomers</i> , Luis Dorfmann, Ray Ogden	
1:45-2:10		
2:10-2:35	<i>Equilibrium Theory for Magnetic Elastomers and Magnetoelastic Membranes</i> , David Steigmann, Mike McElfresh, Robert E. Rudd	
WB6		Organizers: A. Segall
Room TBA	<i>Tribology & Wear</i>	Chair: A. Segall
12:30-12:55	<i>Evolution of Wear at the Head-Disc Interface</i> , James Kiely, Wei Peng, Yiao-Tee Hsia	
12:55-1:20	<i>Tribological Performance of Multi-layered Disks due to Single Asperity Impacts</i> , Tze-jer Chuang, Stephen M. Hsu	
1:20-1:45	<i>Sliding Wear Behavior of Transformed Alumina and Hypereutectic Al-Si Alloys Under Simulated Wire-Rope Interactions</i> , Albert Segall, John McConnell, Tim Eden	
1:45-2:10		
2:10-2:35		