

Thematic Area 1. Medalist Symposia (Invited Only)

1.1 Prager Medal Symposium		
Session: 5A, Room: MSC-2406A		
Session Chair(s): David Nordsletten, nordslet@umich.edu		
9:45 AM	10:05 AM	Combining Expert-knowledge and Data-driven Methods to Model Soft Tissue Mechanics
		<i>Vahidullah Tac, Purdue University; Vivek Sree, Purdue University; Manuel Rausch, The University of Texas at Austin; Adrian Buganza Tepole, Purdue University</i>
		Speaker: Adrian Buganza Tepole (Invited Talk)
10:05 AM	10:35 AM	Size Effects in Confined Layer Plasticity
		<i>Mitsutoshi Kuroda, Yamagata University; Viggo Tvergaard, Technical University of Denmark; Alan Needleman, Texas A&M</i>
		Speaker: Alan Needleman (Keynote Talk)
10:35 AM	10:55 AM	Negative mechanotransduction: reduced contractility of fibroblasts in stiffer microenvironments
		<i>Guy Genin, NSF Science and Technology Center for Engineering Mechanobiology, Washington University in St. Louis; Xiangjun Peng, Washington University in St. Louis; Ghiska Ramahdita, Washington University in St. Louis; Yuan Huang, Washington University in St. Louis; Yuxuan Huang, Washington University in St. Louis; David Ju, Ladue Horton Watkins High School; Elliot Elson, Washington University in St. Louis; Delaram Shakiba, Saint Louis University School of Medicine; Nathaniel Huebsch, Washington University in St. Louis; Farid Alisafaei, New Jersey Institute of Technology</i>
		Speaker: Guy Genin (Invited Talk)
Session: 5B, Room: MSC-2406A		
Session Chair(s): David Nordsletten, nordslet@umich.edu		
11:40 AM	12:00 PM	Linking region-specific tissue microstructure to the biaxial mechanics of porcine left anterior descending artery
		<i>Chung-Hao Lee, The University of Oklahoma; Sergio Pineda-Castillo, The University of Oklahoma; Tingting Gu, The University of Oklahoma; Devin Laurence, The University of Oklahoma; Elizabeth Bradshaw, The University of Oklahoma; Gerhard Holzapfel, Graz University of Technology</i>
		Speaker: Sergio Pineda-Castillo (Invited Talk)
12:00 PM	12:20 PM	Mechanophysiology of Human Femoropopliteal Arteries in the Lower Extremity and Its Changes With Age and Disease
		<i>Alexey Kamenskiy, University of Nebraska Omaha</i>
		Speaker: Alexey Kamenskiy (Invited Talk)
Session: 6A, Room: MSC-2406A		
Session Chair(s): Angkur Shaikeea, ajds3@cam.ac.uk; Ivan Grega, ig348@cam.ac.uk		
2:15 PM	2:45 PM	A Numerical Scheme for Anisotropic Reactive Nonlinear Viscoelasticity
		<i>Gerard Ateshian, Columbia University; Courtney Petersen, Columbia University; Steve Maas, University of Utah; Jeffrey Weiss, University of Utah</i>
		Speaker: Gerard Ateshian (Keynote Talk)
2:45 PM	3:05 PM	Engineer metals with internal interfaces for enhanced mechanical performance (for Vikram Deshpande Symposium)

		<i>Huajian Gao, Nanyang Technological University, Institute of High Performance Computing</i>
		Speaker: Huajian Gao (Invited Talk)
3:05 PM	3:25 PM	Right Ventricular Remodeling in Pulmonary Hypertension: An Experimental Study from the Gene to the Organ Level
		<i>Sotirios Kakaletsis, University of Texas at Austin; Marcin Malinowski, Spectrum Health; Matthew Bersi, Washington University in St. Louis; Tomasz Jazwiec, Spectrum Health; Tomasz Timek, Spectrum Health; Manuel Rausch, University of Texas at Austin</i>
		Speaker: Manuel Rausch (Invited Talk)
3:25 PM	3:55 PM	A Structure-Based Constitutive Law for Myocardial Scar
		<i>Jeffrey Holmes, University of Alabama at Birmingham; Laura Caggiano, University of California Irvine</i>
		Speaker: Jeffrey Holmes (Keynote Talk)
Session: 6B, Room: MSC-2406A		
Session Chair(s): Angkur Shaikeea, ajds3@cam.ac.uk; Ivan Grega, ig348@cam.ac.uk		
4:10 PM	4:30 PM	Machine learning of the physics governing cell dynamics
		<i>Siddhartha Srivastava, University of Michigan; Chengyang Huang, University of Michigan; Kenneth Ho, University of Michigan; Wanggang Shen, University of Michigan; Nikola Banovic, University of Michigan; Gary Luker, University of Michigan; Kathryn Luker, University of Michigan; Xun Huan, University of Michigan; Krishna Garikipati, University of Michigan</i>
		Speaker: Krishna Garikipati (Invited Talk)
4:30 PM	4:50 PM	Fracture toughness of 3D mechanical metamaterials: test and design protocol
		<i>Angkur Shaikeea, University of Cambridge; Huachen Cui, University of California Los Angeles; Xiaoyu (Rayne) Zheng, University of California Los Angeles; Vikram Deshpande, University of Cambridge</i>
		Speaker: Angkur Shaikeea (Invited Talk)

1.2 Eringen Medal Symposium		
Session: 5A, Room: MSC-2406B		
Session Chair(s): Pradeep Sharma, psharma@uh.edu		
9:45 AM	10:05 AM	Statistical field theory for the free energy of an electro-mechanical polymer chain: non-local dipole-dipole interactions in the fixed applied field ensemble
		<i>Kaushik Dayal, Carnegie Mellon University</i>
		Speaker: Kaushik Dayal (Invited Talk)
10:05 AM	10:25 AM	Multi-scale Modeling of Metallic Glass Failure: Embedding Atomistically Derived Equation-Free Constitutive Behavior in a Continuum Model
		<i>Michael Falk, Johns Hopkins University</i>
		Speaker: Michael Falk (Invited Talk)
10:25 AM	10:45 AM	Injury Criteria: Multimodal Deformation Thresholds for Soft Tissue Microdamage
		<i>Callan Luetkemeyer, University of Colorado Boulder; Corey Neu, University of Colorado Boulder; Sarah Calve, University of Colorado Boulder</i>
		Speaker: Callan Luetkemeyer (Invited Talk)
10:45 AM	11:05 AM	Exploiting crystallization in semicrystalline polymer nanocomposites

		<i>Frank Fisher, Stevens Institute of Technology</i>
		Speaker: Frank Fisher (Invited Talk)
Session: 5B, Room: MSC-2406B		
Session Chair(s): Pradeep Sharma, psharma@uh.edu		
11:40 AM	12:10 PM	Biomechanics and Remodeling of the Optic Nerve Head
		<i>Thao Nguyen, Johns Hopkins University</i>
		Speaker: Thao Nguyen (Keynote Talk)
12:10 PM	12:30 PM	The mechanical response of multistable knit architectures
		<i>katia bertoldi, Harvard University; Kausalya Mahadevan, Harvard University</i>
		Speaker: Katia Bertoldi (Invited Talk)
Session: 6A, Room: MSC-2406B		
Session Chair(s): Jerry Qi, qih@me.gatech.edu		
2:15 PM	2:35 PM	Structure-property relationships for stochastic and architected foams
		<i>Matthew Begley, University of California, Santa Barbara</i>
		Speaker: Matthew Begley (Invited Talk)
2:35 PM	2:55 PM	Slippery Business: Contact Mechanics and Frictional Behavior of Polymeric Hydrogels
		<i>Robert Carpick, University of Pennsylvania</i>
		Speaker: Robert Carpick (Invited Talk)
2:55 PM	3:15 PM	Operator Learning for Predicting Fracture Paths in Heterogeneous Materials
		<i>Ariana Quek, Duke University; Johann Guilleminot, Duke University</i>
		Speaker: Ariana Quek (Invited Talk)
3:15 PM	3:35 PM	Critiquing motion pictures: evaluating experimental goodness in 3D magnetic resonance cartography
		<i>Jonathan Estrada, University of Michigan</i>
		Speaker: Jonathan Estrada (Invited Talk)
3:35 PM	3:55 PM	Phase transforming materials as adaptive metamaterials
		<i>Ralston Fernandes, Texas A&M University; Sami El-Borgi, Texas A&M University at Qatar; James Boyd, Texas A&M University; Dimitris Lagoudas, Texas A&M University</i>
		Speaker: Dimitris Lagoudas (Invited Talk)
Session: 6B, Room: MSC-2406B		
Session Chair(s): Jerry Qi, qih@me.gatech.edu		
4:10 PM	4:30 PM	Mechanics of biopolymer networks in cell walls
		<i>Sulin Zhang, Penn State University</i>
		Speaker: Sulin Zhang (Invited Talk)
4:30 PM	4:50 PM	Characterizing Interphase Mechanical Property Gradients in Polymer Blends: Implications for Understanding Interfacial Interactions and Fracture Mechanisms

		<i>Pavan Kolluru, Texas A&M University; Suzanne Peterson, Texas A&M University; Glendimar Molero, Texas A&M University; Hung-Jue Sue, Texas A&M University</i>
		Speaker: Pavan Kolluru (Invited Talk)

Thematic Area 2. Biomechanics & Mechanobiology

2.2 Cell and Tissue Mechanics in Health and Disease		
Session: 5A, Room: MSC-2404		
Session Chair(s): Guy Genin, genin@wustl.edu; Farid Alisafaei, farid.alisafaei@njit.edu		
9:45 AM	10:15 AM	Computational Study of Biomechanics Drivers of Renal Cystogenesis
		<i>Gerard Ateshian, Columbia University, New York, NY; Katherine Spack, Columbia University, New York, NY; James Hone, Columbia University, New York, NY; Evren Azeloglu, Mount Sinai School of Medicine, New York, NY; G Gusella, Mount Sinai School of Medicine, New York, NY</i>
		Speaker: Gerard Ateshian (Keynote Talk)
10:15 AM	10:45 AM	Cell Force at the Core of Health and Disease
		<i>M Taher Saif, University of Illinois at Urbana-Champaign</i>
		Speaker: M Taher Saif (Keynote Talk)
10:45 AM	11:05 AM	Molecular Basis of Mechanobiological Investigation of Bone Metastasis of Breast and Prostate Cancer
		<i>Dinesh Katti, North Dakota State University; Sharad Jaswandkar, North Dakota State University; Hanmant Gaikwad, North Dakota State University; Kalpana Katti, North Dakota State University</i>
		Speaker: Dinesh Katti (Contributed Talk)
11:05 AM	11:25 AM	Invasion in breast cancer tumoroids as a mechano-biological instability
		<i>Giancarlo Cicconofri, Centre Internacional de Me'todes Numèrics en Enginyeria (CIMNE); Guillermo Vilanova, Universitat Politècnica de Catalunya; Pau Blanco, Universitat Politècnica de Catalunya; Pablo Saez, Universitat Politècnica de Catalunya; Marino Arroyo, Institute for Bioengineering of Catalonia (IBEC), Universitat Politècnica de Catalunya, Centre Internacional de Me'todes Numèrics en Enginyeria (CIMNE)</i>
		Speaker: Marino Arroyo (Contributed Talk)
Session: 5B, Room: MSC-2404		
Session Chair(s): Guy Genin, genin@wustl.edu; Farid Alisafaei, farid.alisafaei@njit.edu		
11:40 AM	12:00 PM	Understanding Human Somitogenesis through Mechanics and In Vitro Model
		<i>Yue Liu, University of Michigan; Jianping Fu, University of Michigan</i>
		Speaker: Yue Liu (Contributed Talk)
12:00 PM	12:20 PM	Inverse Formulation of Traction Force Microscopy on Crosshatched Nanonets enabled by Deep Learning
		<i>Abinash Padhi, Department of Mechanical Engineering, Virginia Tech; Arka Daw, Department of Computer Science, Virginia Tech; Medha Sawhney, Department of Computer Science, Virginia Tech; Maahi Talukder, Department of Mechanical Engineering, Virginia Tech; Atharva Agashe, Department of Mechanical Engineering, Virginia Tech; Anuj Karpatne, Department of Computer Science, Virginia Tech; Amrinder Nain, Department of Mechanical Engineering, Virginia Tech; Sohan Kale, Department of Mechanical Engineering, Virginia Tech, Center for Soft Matter and Biological Physics, Virginia Tech</i>
		Speaker: Sohan Kale (Contributed Talk)

2.3 Cell Mechanics, Biomechanics and Mechanobiology		
Session: 5A, Room: MSC-2502		
Session Chair(s): Krishna Garikipati, krishna@umich.edu		
9:45 AM	10:15 AM	It takes a network: Cellular integration of microscale contractile forces
		<i>Sanjay Kumar, University of California, Berkeley</i>
		Speaker: Sanjay Kumar (Keynote Talk)
10:15 AM	10:45 AM	Helical Fibers are The Origin of Pre-tension in Fibrin Gels
		<i>Prashant Purohit, University of Pennsylvania</i>
		Speaker: Prashant Purohit (Keynote Talk)
10:45 AM	11:05 AM	Obtaining all Material Sensitivities of a Biomechanical Model from a Single Simulation
		<i>Joseph Carter, Brigham Young University; Christopher Stubbs, Fairleigh Dickinson University; Douglas Cook, Brigham Young University</i>
		Speaker: Douglas Cook (Contributed Talk)
11:05 AM	11:25 AM	Nanomechanical and Fluid Flow Induced Mechanobiological Investigation of Bone Metastasis of Cancer
		<i>Kalpana Katti, North Dakota State University; Haneesh Jasuja, North Dakota State University; Lahcen Akerkouch, North Dakota State University; Sharad Jaswandkar, North Dakota State University; Trung Le, North Dakota State University; Dinesh Katti, North Dakota State University</i>
		Speaker: Kalpana Katti (Contributed Talk)

2.4 Mechanobiology of Disease		
Session: 5A, Room: Hotel-Laurel		
Session Chair(s): Jian Zhang, jianz@uark.edu		
9:45 AM	10:05 AM	The Entropy of Cancer Cell Migration: Bioenergetics and Cell Proliferation Support Invasive Migration in 3D
		<i>Jian Zhang, Vanderbilt University; Jenna Mosier, Vanderbilt University; Yusheng Wu, Vanderbilt University; Paul Taufalele, Vanderbilt University; Wenjun Wang, Vanderbilt University; Heng Sun, Vanderbilt University; Cynthia Reinhart-King, Vanderbilt University</i>
		Speaker: Jian Zhang (Invited Talk)
10:05 AM	10:25 AM	Lung Cancer: Current Challenges and Opportunities
		<i>Chad Eckert, Lung Cancer Initiative, Johnson & Johnson</i>
		Speaker: Chad Eckert (Invited Talk)
10:25 AM	10:45 AM	The diffusion of SK channels is confined by underlying F-actin filaments and related proteins
		<i>Shiju Gu, University of Connecticut; Anastasios Tzingounis, University of Connecticut; George Lykotrafitis, University of Connecticut</i>
		Speaker: Shiju Gu (Invited Talk)
10:45 AM	11:05 AM	Microstructure and Mechanical Behaviors of Tibia for Collagen Induced Arthritic Mice Treated with Gingiva-Derived Mesenchymal Stem Cells
		<i>Yuxiao Zhou, Department of Mechanical Engineering, Texas A&M University, College Station, TX, Department of Biomedical Engineering, and Translational Tissue Engineering Center, Johns Hopkins University School of Medicine, Baltimore, MD, Department of Mechanical Engineering, Pennsylvania State University, University Park, PA; Junlong Dang, Department of Clinical Immunology, Third</i>

		<i>Affiliated Hospital at the Sun Yat-sen University, Guangzhou, China; Ye Chen, Division of Rheumatology and Immunology, Department of Internal Medicine at Ohio State University of Medicine and Wexner Medical Center, Columbus, OH; Song Guo Zheng, Division of Rheumatology and Immunology, Department of Internal Medicine at Ohio State University of Medicine and Wexner Medical Center, Columbus, OH; Jing Du, Department of Mechanical Engineering, Pennsylvania State University, University Park, PA</i>
		Speaker: Yuxiao Zhou (Contributed Talk)
11:05 AM	11:25 AM	A computational model for the periodic axon plasma membrane skeleton under deformation
		<i>Zhaojie Chai, University of Connecticut; Anastasios Tzingounis, University of Connecticut; George Lykotrafitis, University of Connecticut</i>
		Speaker: Zhaojie Chai (Invited Talk)
Session: 6A, Room: Hotel-Laurel		
Session Chair(s): Ashutosh Agrawal, aagrawa4@central.uh.edu		
2:15 PM	2:35 PM	Mechanics of nuclear TCLM
		<i>Ashutosh Agrawal, University of Houston; Tanmay Lele, Texas A&M</i>
		Speaker: Ashutosh Agrawal (Contributed Talk)
2:35 PM	2:55 PM	Compressive Stress Drives Adhesion-Dependent Unjamming Transitions in Breast Cancer Cell Migration
		<i>Allen Liu, University of Michigan; Grace Cai, University of Michigan</i>
		Speaker: Allen Liu (Invited Talk)
2:55 PM	3:15 PM	Effects of left ventricular assist device on cardiac mechanics and interventricular interactions in heart failure patients
		<i>Lei Fan, Michigan State University; Jenny Choy, California Medical Innovations Institute; Ghassan Kassab, California Medical Innovations Institute; Daniel Burkhoff, Cardiovascular Research Foundation; Lik Chuan Lee, Michigan State University</i>
		Speaker: Lei Fan (Contributed Talk)
3:15 PM	3:35 PM	Tumor Evolution through Selection by ECM Stiffness
		<i>Ting-Ching Wang, Texas A&M University; Charles Baer, University of Florida; Tanmay Lele, Texas A&M University</i>
		Speaker: Ting-Ching Wang (Contributed Talk)
3:35 PM	3:55 PM	Association between pulmonary hemodynamics and RV remodeling in pulmonary hypertension
		<i>Sunder Neelakantan, Department of Biomedical Engineering, Texas A&M University, College Station, TX; Alexander Vang, Vascular Research Lab, Providence VA Med Ctr, Providence, RI; Preston Nicely, The Warren Alpert Medical School, Brown university, Providence, RI; Gaurav Choudhary, Department of Medicine, Brown University, Providence, RI, Department of Medicine, Veterans Affairs Medical Center, Providence, RI; Reza Avazmohammadi, Department of Biomedical Engineering, Texas A&M University, College Station, TX, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University, College Station, TX, Department of Cardiovascular Sciences, Houston Methodist Academic Institute, Houston, TX</i>
		Speaker: Sunder Neelakantan (Contributed Talk)

Thematic Area 3. Data Science & Machine Learning

3.1 Advancing Multi-scale Modeling Capabilities in Metal Additive MFG through Machine Learning		
Session: 5A, Room: MSC-2505		
Session Chair(s): Jobin Joy, jobinjoy@tamu.edu		
9:45 AM	10:15 AM	MeltpoolGAN: meltpool prediction from part-scale thermal history
		<i>Hongrui Chen, Intact Solutions; Xin Liu, Intact Solutions; Xingchen Liu, Intact Solutions; Paul Witherell, NIST; Michael Freytag, Intact Solutions; Vadim Shapiro, Intact Solutions</i>
		Speaker: Xingchen Liu (Keynote Talk)
10:15 AM	10:35 AM	Melt Pool Depth Prediction using Machine Learning in Laser Beam Additive Manufacturing
		<i>Mehdi Naderi, Technical Data Analysis, Inc; Jordan Weaver, NIST; David Deisenroth, NIST; Nagaraga Iyyer, Technical Data Analysis, Inc; Raymond Mccauley, NAVY</i>
		Speaker: Mehdi Naderi (Contributed Talk)
10:35 AM	10:55 AM	A Machine Learning Method to Predict Crystallographic Texture in Laser Powder Bed Fusion
		<i>Gregory Wong, Carnegie Mellon University; Anthony Rollett, Carnegie Mellon University; Elizabeth Holm, Carnegie Mellon University; Gregory Rohrer, Carnegie Mellon University</i>
		Speaker: Gregory Wong (Contributed Talk)

3.4 Data-driven and Machine-learning based Mechanics of Materials		
Session: 5A, Room: MSC-1400		
Session Chair(s): Christos E. Athanasiou, christos_edouardos_athanasiou@brown.edu		
9:45 AM	10:05 AM	Systematic approach to improve the accuracy of deep energy method
		<i>Charul Chadha, University of Illinois at Urbana-Champaign; Diab Abueidda, National Center for Supercomputing Applications, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA; Seid Koric, National Center for Super-computing Applications, University of Illinois at Urbana-Champaign; Erman Guleryuz, National Center for Supercomputing Applications, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA; Iwona Jasiuk, Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA</i>
		Speaker: Charul Chadha (Contributed Talk)
10:05 AM	10:25 AM	Data-Driven Material Modeling Employing the Theory of Representations for Tensor Functions
		<i>Dory Peters, Cornell University; Jan Fuhg, Cornell University; Nikolaos Bouklas, Cornell University</i>
		Speaker: Nikolaos Bouklas (Contributed Talk)
10:25 AM	10:45 AM	Hybrid elastoplasticity with data-driven yielding and model-based hardening
		<i>Jan Niklas Fuhg, Cornell University; Nikolaos Bouklas, Cornell University</i>
		Speaker: Jan Niklas Fuhg (Contributed Talk)
10:45 AM	11:05 AM	A Mechanics-Informed Machine Learning Approach for the Constitutive Modeling of Nonlinear Elastic and Viscoelastic Materials
		<i>Faisal As'ad, Stanford University</i>

		Speaker: Faisal Asad (Contributed Talk)
11:05 AM	11:25 AM	Neural Network Driven Nanoindentation Analysis
		<i>Frank Popelar, University of Texas at Austin, Engineering Mechanics; Vahid Morovati, University of Texas at Austin, Engineering Mechanics; Kenneth Liechti, University of Texas at Austin, Engineering Mechanics; Rui Huang, University of Texas at Austin, Engineering Mechanics</i>
		Speaker: Frank Popelar (Contributed Talk)
Session: 5B, Room: MSC-1400		
Session Chair(s): Christos E. Athanasiou, christos_edouardos_athanasiou@brown.edu; Shailendra Joshi, spjoshi3@Central.uh.edu		
11:40 AM	12:00 PM	Machine Learning-Based Structure-Property Correlation in Lightweight Architected Metamaterials
		<i>Shengzhi Luan, Johns Hopkins University; Enze Chen, Johns Hopkins University; Stavros Gaitanaros, Johns Hopkins University</i>
		Speaker: Stavros Gaitanaros (Contributed Talk)
12:00 PM	12:20 PM	Data-Driven Multiscale Mechanics: History-dependence, Nonlocality, Adaptive Sampling
		<i>Konstantinos Karapiperis, ETH Zurich; Anna Gorgogianni, California Institute of Technology; Laurent Stainier, Ecole Centrale de Nantes; Michael Ortiz, California Institute of Technology; Jose Andrade, California Institute of Technology</i>
		Speaker: Konstantinos Karapiperis (Contributed Talk)
12:20 PM	12:40 PM	Physics-Informed Data-Driven Constitutive Modeling of Strain Rate Sensitive Soft Materials
		<i>Kshitiz Upadhyay, Johns Hopkins University; Jan Fuhg, Cornell University; Nikolaos Bouklas, Cornell University; K.T. Ramesh, Johns Hopkins University</i>
		Speaker: Kshitiz Upadhyay (Contributed Talk)
Session: 6A, Room: MSC-1400		
Session Chair(s): Ivan Grega, ig348@cam.ac.uk		
2:15 PM	2:35 PM	Rapid protein mechanical strength prediction with an end-to-end deep learning model
		<i>Frank Liu, Massachusetts Institute of Technology; Bo Ni, Massachusetts Institute of Technology; Markus Buehler, Massachusetts Institute of Technology</i>
		Speaker: Bo Ni (Invited Talk)
2:35 PM	2:55 PM	Optimizing Sequential Experimental Design with Reinforcement Learning in Material Science Research
		<i>Niladri Das, Sandia National Laboratories</i>
		Speaker: Niladri Das (Contributed Talk)
2:55 PM	3:15 PM	Identifying void nucleation sites in incipient spall with multi-channel convolutional neural networks
		<i>Brandon Runnels, University of Colorado Colorado Springs</i>
		Speaker: Brandon Runnels (Contributed Talk)
3:15 PM	3:35 PM	Analyzing Unknown Geometric Features in Materials Using Physics-Informed Neural Networks
		<i>Enrui Zhang, Brown University; Ming Dao, MIT; George Karniadakis, Brown University</i>
		Speaker: Enrui Zhang (Contributed Talk)
3:35 PM	3:55 PM	Graph-based Machine Learning on Architected Materials
		<i>Ivan Grega, Department of Engineering, University of Cambridge, UK; Padmeya Indurkar, Department of Engineering, University of Cambridge, UK; Angkur Shaikeea, Department of Engineering, University of Cambridge, UK; Sri Karlapati, Amazon Research,</i>

		Cambridge, UK * work done outside of Amazon through an informal collaboration; Vikram Deshpande, Department of Engineering, University of Cambridge, UK
		Speaker: Ivan Grega (Invited Talk)

3.5 Machine Learning in Cardiovascular Modeling and Simulations		
Session: 6A, Room: MSC-1403		
Session Chair(s): Michael Sacks, msacks@oden.utexas.edu; Reza Avaz, rezaavaz@tamu.edu		
2:15 PM	2:35 PM	Geometric deep learning and statistical shape modeling for fast surrogate CFD simulations of patient-specific hemodynamics
		Pan Du, University of Notre Dame; Xiaozhi Zhu, Meta; Jian-xun Wang, University of Notre Dame
		Speaker: Pan Du (Contributed Talk)
2:35 PM	2:55 PM	A Deep Learning Method to Estimate Myocardial Stiffness and Collagen Undulation
		Rana Mehdi, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA; Emilio Mendiola, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA; Reza Avazmohammadi, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA
		Speaker: Rana Raza Mehdi (Contributed Talk)
2:55 PM	3:15 PM	Machine Learning Model to Identify the Size and Location of Cardiac Scar in Myocardial Infarction Using Cardiac Strains
		Rana Mehdi, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA; Emilio Mendiola, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA; Reza Avazmohammadi, Department of Biomedical Engineering, Texas A&M University, College Station, TX, USA
		Speaker: Rana Raza Mehdi (Contributed Talk)
3:15 PM	3:35 PM	Learning Reduced-Order Models for cardiovascular simulations with Graph Neural Networks
		Luca Pegolotti, Stanford University; Martin Pfaller, Stanford University; Natalia Rubio, Stanford University; Eric Darve, Stanford University; Alison Marsden, Stanford University
		Speaker: Luca Pegolotti (Contributed Talk)
3:35 PM	3:55 PM	Machine Learning Models of Junction Pressure Losses for Reduced-Order Cardiovascular Modeling
		Natalia Rubio, Stanford University; Luca Pegolotti, Stanford University; Martin Pfaller, Stanford University; Jonathan Pham, Stanford University; Eric Darve, Stanford University; Alison Marsden, Stanford University
		Speaker: Natalia Rubio (Contributed Talk)

3.6 Multiscale Mechanics at the Intersection of Theoretical, Computational and Data Driven Approach		
Session: 5B, Room: MSC-2505		
Session Chair(s): Vikram Gavini, vikramg@umich.edu; Amartya Banerjee, asbanerjee@ucla.edu		
11:40 AM	12:10 PM	An action principle for nonlinear dislocation dynamics
		Amit Acharya, Carnegie Mellon University
		Speaker: Amit Acharya (Keynote Talk)
12:10 PM	12:30 PM	Machine learning-enabled scale bridging between electronic structure, statistical mechanics, and phase-field theories with application in Li-ion batteries

		<i>Mostafa Faghieh Shojaei, University of Michigan; krishna Garikipati, University of Michigan</i>
		Speaker: Mostafa Faghieh Shojaei (Contributed Talk)
Session: 6A, Room: MSC-2505		
Session Chair(s): Mostafa Shojaei, mfsh@umich.edu; Amartya Banerjee, asbanerjee@ucla.edu		
2:15 PM	2:35 PM	GPU accelerated Tucker tensor algorithm for large-scale Kohn-Sham density functional theory calculations
		<i>Chih-Chuen Lin, University of Michigan; Vikram Gavini, University of Michigan</i>
		Speaker: Chih-Chuen Lin (Contributed Talk)
2:35 PM	2:55 PM	Deep Learning Based Quasi-Continuum Theory for Predicting the Force and Structure of a Confined Fluid
		<i>Haiyi Wu, The University of Texas at Austin; Narayana Aluru, The University of Texas at Austin</i>
		Speaker: Haiyi Wu (Contributed Talk)
2:55 PM	3:15 PM	Symmetry Adapted First Principles Calculations of the Electromechanics of Nanotubes
		<i>Hsuan Ming Yu, University of California, Los Angeles; Amartya Banerjee, University of California, Los Angeles</i>
		Speaker: Hsuan Ming Yu (Contributed Talk)
3:15 PM	3:35 PM	Transferable deep learning framework for solving PDEs on unseen domains
		<i>Hengjie Wang, Lawrence Berkeley National Laboratory; Aparna chandramowlshwaran, UCI; Ramin Bostanabad, University of California, Irvine</i>
		Speaker: Ramin Bostanabad (Contributed Talk)
Session: 6B, Room: MSC-2505		
Session Chair(s): Amartya Banerjee, asbanerjee@ucla.edu; Vikram Gavini, vikramg@umich.edu		
4:10 PM	4:30 PM	Carbon Kagome Nanotubes – novel quasi-one-dimensional materials with flat bands
		<i>Shivam Sharma, Graduate Student; Hsuan Yu, Graduate Student; Olivia Liebman, Graduate Student; Shivang Agarwal, Graduate Student; Amartya Banerjee, Assistant Professor</i>
		Speaker: Shivam Sharma (Contributed Talk)
4:30 PM	4:50 PM	Ab initio study of tungsten-based alloys under fusion power-plant conditions
		<i>Yichen Qian, Villanova University; Mark Gilbert, Culham Centre for Fusion Energy; Lucile Dezerald, Universite de Lorraine; Duc Nguyen, Culham Centre for Fusion Energy; David Cereceda, Villanova University</i>
		Speaker: Yichen Qian (Contributed Talk)
4:50 PM	5:10 PM	Learning Dynamics with Adaptive Random Fourier Features
		<i>Gideon Simpson, Drexel University; Jerome Troy, University of Delaware; Petr Plechac, University of Delaware</i>
		Speaker: Jerome Troy (Contributed Talk)

Thematic Area 4. Fluid & Granular

4.2 Hydrodynamic Stability: Theory, Experiments and Numerics		
Session: 5B, Room: Hotel-Shield		
Session Chair(s): Koen Groot, koengroot@tamu.edu		
11:40 AM	12:10 PM	Vortex Breakdown ... Can we achieve control (?)
		<i>Elaine Oran, Texas A&M University; Xiao Zhang, Texas A&M University; E. Tarik Balci, Texas A&M University</i>
		Speaker: Elaine Oran (Keynote Talk)
12:10 PM	12:30 PM	Data Driven Modeling of Multiphase Multicomponent Porous Media Flows of Complex Fluids
		<i>Prabir Daripa, Texas A&M University</i>
		Speaker: Prabir Daripa (Invited Talk)
Session: 6A, Room: Hotel-Shield		
Session Chair(s): Prabir Daripa, daripa@tamu.edu; Craig Epifanio, epifanio@tamu.edu		
2:15 PM	2:45 PM	Some Recent Useful Results On Stability of Viscoelastic Hele-Shaw Flows
		<i>Prabir Daripa, Texas A&M University</i>
		Speaker: Prabir Daripa (Keynote Talk)
2:45 PM	3:05 PM	Resonant instability in subcritical mountain wave flows
		<i>Craig Epifanio, Department of Atmospheric Sciences, Texas A&M University; Kevin Viner, Marine Meteorology Division, Naval Research Laboratory;; James Doyle, Marine Meteorology Division, Naval Research Laboratory; Prabir Daripa, Department of Mathematics, Texas A&M University</i>
		Speaker: Craig Epifanio (Invited Talk)
3:05 PM	3:25 PM	Boundary-Layer Instabilities on a Highly-Swept Fin
		<i>Madeline Peck, Texas A&M University; Koen Groot, Texas A&M University; Helen Reed, Texas A&M University</i>
		Speaker: Madeline Peck (Invited Talk)
Session: 6B, Room: Hotel-Shield		
Session Chair(s): Madeline Peck, mad_mcmillan@tamu.edu		
4:10 PM	4:30 PM	Nonlinear Boundary-Layer Stability of a Slotted, Natural-Laminar-Flow Airfoil
		<i>Koen Groot, Texas A&M University; Jay Patel, Texas A&M University; Ethan Beyak, Texas A&M University; James Coder, University of Tennessee, Knoxville; Helen Reed, Texas A&M University</i>
		Speaker: Koen Groot (Contributed Talk)
4:30 PM	4:50 PM	Experimental Measurements of Velocity and Droplet Lag Distance in a Shock Accelerated Multiphase System
		<i>Vasco Duke, Texas A&M University PhD. Student; Manoj Paudel, Texas A&M University PhD. Student; Jacob McFarland, Texas A&M University Associate Professor</i>
		Speaker: Vasco Duke (Contributed Talk)

4.5 Micro/Nano-Fluidics and Lab-on-Chip		
Session: 5A, Room: Hotel-Shield		
Session Chair(s): Shahin Shafiee, shshafiee@pvamu.edu; Aditya Kuchibhotla, adityak@tamu.edu; Debjyoti Banerjee, dbanerjee@tamu.edu		
9:45 AM	10:05 AM	Wearable plasmonic paper-based microfluidics for continuous sweat analysis
		<i>Umesha Mogera, Texas A&M University; Heng Guo, Texas A&M University; Limei Tian, Texas A&M University</i>
		Speaker: Heng Guo (Contributed Talk)
10:05 AM	10:25 AM	Interdigitated Electrode (IDE)-based Droplet Manipulation Technique for Microfluidic High-throughput Assay
		<i>Han Zhang, Department of Electrical and Computer Engineering</i>
		Speaker: Han Zhang (Contributed Talk)
10:25 AM	10:45 AM	Carbon storage as a solid hydrate using geochemical microfluidics
		<i>Wen Song, University of Texas at Austin</i>
		Speaker: Wen Song (Contributed Talk)

Thematic Area 5. Manufacturing & Infrastructure

5.4 The Mechanics and Manufacturing of Programmable Soft Matter		
Session: 5A, Room: MSC-2504		
Session Chair(s): Jochen Mueller, jochen@jhu.edu; Jordan Raney, raney@seas.upenn.edu		
9:45 AM	10:15 AM	Building with interfacial flows
		<i>PT Brun, Princeton University</i>
		Speaker: Pierre-Thomas Brun (Keynote Talk)
10:15 AM	10:35 AM	A modular, embodied control strategy for electronics-free soft robots
		<i>Qiguang He, University of Pennsylvania; Rui Yin, University of Pennsylvania; Yucong Hua, University of Pennsylvania; Weijian Jiao, University of Pennsylvania; Chengyang Mo, University of Pennsylvania; Hang Shu, University of Pennsylvania; Jordan Raney, University of Pennsylvania</i>
		Speaker: Qiguang He (Contributed Talk)
10:35 AM	10:55 AM	Mechanical proprioception in autonomously-reconfigurable multistable metamaterials
		<i>Weijian Jiao, MEAM Department, University of Pennsylvania; Qiguang He, MEAM Department, University of Pennsylvania; Hang Shu, MEAM Department, University of Pennsylvania; Jordan Raney, MEAM Department, University of Pennsylvania</i>
		Speaker: Weijian Jiao (Contributed Talk)
Session: 5B, Room: MSC-2504		
Session Chair(s): Jochen Mueller, jochen@jhu.edu; Jordan Raney, raney@seas.upenn.edu		
11:40 AM	12:00 PM	Programmable Cardiac Patches in the Infarcted Left Ventricle
		<i>Emilio Mendiola, Texas A&M University; Reza Avazmohammadi, Texas A&M University</i>
		Speaker: Reza Avazmohammadi (Contributed Talk)
12:00 PM	12:20 PM	Inverse design of shape-morphing structures based on kirigami
		<i>Yunlan Zhang, University of Oxford</i>
		Speaker: Yunlan Zhang (Contributed Talk)
Session: 6A, Room: MSC-2504		
Session Chair(s): Jochen Mueller, jochen@jhu.edu; Jordan Raney, raney@seas.upenn.edu		
2:15 PM	2:35 PM	Topology optimization-based synthesis of temperature controlled, 3D printed multi-material microstructures with programmable response
		<i>Weichen Li, University of Illinois Urbana-Champaign; Tian Chen, University of Houston; Xiaojia Shelly Zhang, University of Illinois at Urbana-Champaign</i>
		Speaker: Tian Chen (Contributed Talk)
2:35 PM	2:55 PM	Elastic instability enabled shape-morphing metamaterials
		<i>Mingchao Liu, Nanyang Technological University</i>
		Speaker: Mingchao Liu (Contributed Talk)
2:55 PM	3:15 PM	Metamaterials for Reconfiguration and Soft Robotics

		<i>Juan Osorio, Purdue University - School of Mechanical Engineering; Katherine Riley, Purdue University - School of Mechanical Engineering; Harith Morgan, Purdue University - School of Mechanical Engineering; Andres Arrieta, Purdue University - School of Mechanical Engineering</i>
		Speaker: Andres Arrieta (Contributed Talk)

5.6 Mechanics and Physics of Additive Manufacturing		
Session: 5A, Room: MSC-2503		
Session Chair(s): Lin Cheng, lcheng@wpi.edu		
9:45 AM	10:15 AM	Providing a Rigorous Benchmark Measurement Foundation for the AM Modeling Community
		<i>Lyle Levine, National Institute of Standards and Technology</i>
		Speaker: Lyle Levine (Keynote Talk)
10:15 AM	10:45 AM	Computational Fluid Dynamics Imposed Finite Element Method (CIFEM) for Accelerated High-fidelity Thermal Process Simulation in Laser Powder Bed Fusion Additive Manufacturing
		<i>Seth Strayer, University of Pittsburgh; William Templeton, Carnegie Mellon University; Florian Dugast, University of Pittsburgh; Sneha Narra, Carnegie Mellon University; Albert To, University of Pittsburgh</i>
		Speaker: Seth Strayer (Keynote Talk)
10:45 AM	11:05 AM	Uncertainty Quantification with the Hypercomplex-based Stochastic Perturbation Method in Additive Manufacturing Finite Element Analysis
		<i>Matthew Balcer, The University of Texas at San Antonio; Harry Millwater, The University of Texas at San Antonio; Mauricio Aristizabal, The University of Texas at San Antonio; David Restrepo, The University of Texas at San Antonio; Juan Sebastian Rincon Tabares, The University of Texas at San Antonio</i>
		Speaker: Matthew Balcer (Invited Talk)
11:05 AM	11:25 AM	A mixed interface-capturing and interface-tracking CFD framework for modeling metal AM processes at different scales
		<i>Jinhui Yan, University of Illinois at Urbana-Champaign</i>
		Speaker: Jinhui Yan (Contributed Talk)
Session: 5B, Room: MSC-2503		
Session Chair(s): Jinhui Yan, yjh@illinois.edu		
11:40 AM	12:00 PM	Studying the influence of layer height to develop process-structure-property relations for FFF-processed polycarbonate and thermoplastic polyurethane
		<i>Charul Chadha, Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA; Junyan He, Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA; Albert Patterson, Faculty of Manufacturing and Mechanical Engineering Technology, Department of Engineering Technology and Industrial Distribution, Texas A&M University, College Station, TX, 77843; J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University, College Station, TX, 77843; Iwona Jasiuk, Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign, Urbana, IL 61801, USA</i>
		Speaker: Charul Chadha (Invited Talk)

12:00 PM	12:20 PM	A physic-constrained deep learning model-enabled concurrent multiscale simulation framework for accurate temperature prediction for large-scale laser powder bed fusion (L-PBF)
		<i>Lin Cheng, Worcester Polytechnic Institute</i>
		Speaker: Lin Cheng (Invited Talk)
12:20 PM	12:40 PM	Transient Thermal ZFEM Model for Arbitrary Order Sensitivity Analysis in Powder Bed Fusion Additive Manufacturing
		<i>Juan Sebastian Rincon Tabares, Department of Mechanical Engineering, The University of Texas at San Antonio; Mauricio Aristizabal, Department of Mechanical Engineering, University of Texas at San Antonio;; Matthew Balcer, Department of Mechanical Engineering, University of Texas at San Antonio;; Arturo Montoya, Department of Civil and Environmental Engineering, University of Texas at San Antonio, Department of Mechanical Engineering, University of Texas at San Antonio;; Harry Millwater, Department of Mechanical Engineering, University of Texas at San Antonio; David Restrepo, Department of Mechanical Engineering, University of Texas at San Antonio</i>
		Speaker: Juan Sebastian Rincon Tabares (Invited Talk)
Session: 6A, Room: MSC-2503		
Session Chair(s): Jinhui Yan, yjh@illinois.edu		
2:15 PM	2:35 PM	Densification of Binder Jetted Alumina via Infiltration with Copper in Air
		<i>Quinton Porter, TEXAS A&M UNIVERSITY; Mohammadamin Moghadasi, TEXAS A&M UNIVERSITY; Zhijian Pei, TEXAS A&M UNIVERSITY; Chao Ma, TEXAS A&M UNIVERSITY</i>
		Speaker: Chao Ma (Invited Talk)
2:35 PM	2:55 PM	Dimensionless analysis of laser powder bed fusion - Key insights linking thermo-fluidic factors influencing microstructure and melt pool morphology
		<i>Kunal Bhagat, University of Wisconsin-Madison; Shiva Rudraraju, University of Wisconsin-Madison</i>
		Speaker: Kunal Bhagat (Invited Talk)
2:55 PM	3:15 PM	An Efficient method to Compute Arbitrary-order Multivariable Derivatives in Non-linear Finite Element Problems using the Order Truncated Imaginary Numbers. Applications to powder bed fusion thermomechanical simulations.
		<i>Mauricio Aristizabal, The University of Texas at San Antonio; Juan Rincon-Tabares, The University at Texas at San Antonio; Matthew Balcer, The University at Texas at San Antonio; Arturo Montoya, The University at Texas at San Antonio; David Restrepo, The University at Texas at San Antonio; Harry Millwater, The University at Texas at San Antonio</i>
		Speaker: Mauricio Aristizabal Cano (Invited Talk)

Thematic Area 6. Multifunctional & Multifield

6.2 Chemo-thermo-mechanics of Energetics and Reacting Flows		
<i>Session: 5A, Room: Hotel-Reveille II</i>		
<i>Session Chair(s): Scott Jackson, sij@tamu.edu</i>		
9:45 AM	10:05 AM	Measuring Onset of Hydrodynamic Instability of Spherically Expanding Flames
		<i>Mattias Turner, Texas A&M University; Eric Petersen, Texas A&M University</i>
		Speaker: Mattias Turner (Contributed Talk)
10:05 AM	10:25 AM	Evaluation of Velocity-Adjusted Detonation Product Equation of State Methods with a Data-Driven Model
		<i>Athena Padgiotis, Texas A&M; Scott Jackson, Texas A&M</i>
		Speaker: Athena Padgiotis (Contributed Talk)
10:25 AM	10:45 AM	Blast Wave Decay Model and Scaling Law for Open-Ended Detonation Tube
		<i>Ebuzer Balci, Texas A&M University; James Thomas, Texas A&M University; Felix Rodriguez, Texas A&M University; David Teitge, Texas A&M University; Logan Kunka, Texas A&M University; Nathan Gaddis, Texas A&M University; Zachary Browne, Texas A&M University; Cassio Ahumada, Texas A&M University; Scott Jackson, Texas A&M University; Eric Petersen, Texas A&M University; Elaine Oran, Texas A&M University</i>
		Speaker: Ebuzer Balci (Contributed Talk)
10:45 AM	11:05 AM	High-Speed Species-Specific Imaging of Inhomogeneous Ignition Events Through a Shock-Tube Endwall
		<i>Darryl Mohr, Texas A&M University; Matthew Hay, Texas A&M University; Waruna Kulatilaka, Texas A&M University; Eric Petersen, Texas A&M University</i>
		Speaker: Darryl Mohr (Contributed Talk)
6.5 Frontiers of Tribology for a Green and Sustainable Future, including Hydrogen		
<i>Session: 6A, Room: Hotel-Century IV</i>		
<i>Session Chair(s): Ali Erdemir, aerdemir@tamu.edu; Andreas Polycarpou, apolycarpou@tamu.edu</i>		
2:15 PM	2:45 PM	On the Critical Role of Hydrogen in Superlubricity of Diamondlike Carbon Films: Recent Developments and Future Prospects
		<i>Ali Erdemir, Mechanical Engineering Department, Texas A&M University</i>
		Speaker: Ali Erdemir (Keynote Talk)
2:45 PM	3:15 PM	Nanotribology of Phosphonium Phosphate Ionic Liquid: a Combined Atomic Force Microscopy and Surface Spectroscopic Study
		<i>Filippo Mangolini, The University of Texas at Austin</i>
		Speaker: Filippo Mangolini (Keynote Talk)
3:15 PM	3:35 PM	Safety Analysis of Proton Exchange Membrane Water Electrolysis Process
		<i>Yuanxing Liu, Artie McFerrin Department of Chemical Engineering, Texas A&M University, Mary Kay O'Connor Process Safety Center (MKOPSC), Texas A&M University, Texas A&M Energy Institute, Texas A&M University; Faisal Khan, Artie McFerrin Department of Chemical Engineering, Texas A&M University, Mary Kay O'Connor Process Safety Center (MKOPSC), Texas A&M University; Efstratios</i>

		<i>Pistikopoulos, Artie McFerrin Department of Chemical Engineering, Texas A&M University, Texas A&M Energy Institute, Texas A&M University</i>
		Speaker: Yuanxing Liu (Invited Talk)
Session: 6B, Room: Hotel-Century IV		
Session Chair(s): Ali Erdemir, aerdemir@tamu.edu; Andreas Polycarpou, apolycarpou@tamu.edu		
4:10 PM	4:30 PM	In situ Tribology Studies of Elastomers under High Pressure Hydrogen Environments
		<i>Wenbin Kuang, Pacific Northwest National Laboratory; Kevin Simmons, Pacific Northwest National Laboratory; Bruce Arey, Pacific Northwest National Laboratory; Alice Dohnalkova, Pacific Northwest National Laboratory; Ethan Nickerson, Pacific Northwest National Laboratory</i>
		Speaker: Wenbin Kuang (Invited Talk)
4:30 PM	4:50 PM	Surface coverage-dependent hydrogen uptake in pure Ni under electrochemical charging
		<i>Lai Jiang, Texas A&M University; Michael Demkowicz, Texas A&M University</i>
		Speaker: Lai Jiang (Invited Talk)

6.7 Mechanically-Coupled and Surface-Enabled Functionality in 2D Materials		
Session: 5A, Room: Hotel-Century III		
Session Chair(s): Qing Tu, qing.tu@tamu.edu; Doyun Kim, kimdoyoon88@tamu.edu		
9:45 AM	10:05 AM	In-Plane Thermo-Mechanical Property of 2D Hybrid Organic-Inorganic Perovskites
		<i>Doyun Kim, Department of Materials Science & Engineering, Texas A&M University, College Station; Eugenia Vasileiadou, Department of Chemistry, Northwestern University, Evanston; Ioannis Spanopoulos, Department of Chemistry, University of South Florida, Tampa; Mercouri Kanatzidis, Department of Chemistry, Northwestern University, Evanston; Qing Tu, Department of Materials Science & Engineering, Texas A&M University, College Station</i>
		Speaker: Doyun Kim (Contributed Talk)
10:05 AM	10:25 AM	Strain Engineering of Optoelectronic Devices based on Crumpled Graphene/Organic Semiconductor Heterostructure
		<i>Zhichao Zhang, University of Illinois at Urbana-Champaign; Sungwoo Nam, University of California, Irvine</i>
		Speaker: Zhichao Zhang (Contributed Talk)
10:25 AM	10:45 AM	Interface, Thermal, and Mechanical Properties of Low-dimensional Carbon-Based Materials
		<i>Abigail Eaton, University of Arkansas; Arun Nair, Associate Professor, University of Arkansas</i>
		Speaker: Abigail Eaton (Contributed Talk)
10:45 AM	11:05 AM	Electronic effects of large corrugation amplitude in twisted bilayer graphene
		<i>Tawfiqur Rakib, Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana IL 61801 USA; Elif Ertekin, Department of Mechanical Science and Engineering, Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana IL 61801 USA; Pascal Pochet, Department of Physics, Univ. Grenoble-Alpes and CEA, Grenoble, France.; Harley Johnson, Department of Mechanical Science and Engineering, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, Urbana IL 61801 USA</i>
		Speaker: Tawfiqur Rakib (Contributed Talk)
Session: 5B, Room: Hotel-Century III		

Session Chair(s): Qing Tu, qing.tu@tamu.edu; Doyun Kim, kimdoyoon88@tamu.edu		
11:40 AM	12:00 PM	Strain Engineering of Two-dimensional Tungsten Diselenide for Tunable Exciton Dynamics
		<i>Jin Myung Kim, University of Illinois at Urbana-Champaign; SungWoo Nam, University of California, Irvine</i>
		Speaker: Jin Myung Kim (Contributed Talk)
12:00 PM	12:20 PM	Atomic Fabrication of MXene: In-Situ Observation of Defect Healing
		<i>Chenglin Wu, Missouri University of Science and Technology; Yanxiao Li, Missouri University of Science and Technology; Wenpei Gao, North Carolina State University</i>
		Speaker: Chenglin Wu (Contributed Talk)

6.11 Recent Advances on the Actuation and Failure Response of Active Materials		
Session: 5A, Room: Hotel-Reveille I		
Session Chair(s): Bjoern Kiefer, Bjoern.Kiefer@imfd.tu-freiberg.de		
9:45 AM	10:15 AM	Phase-field simulations probing the temperature and rate dependence of ferroelectric switching
		<i>Dennis Kochmann, ETH Zurich; Roman Indergand, ETH Zurich</i>
		Speaker: Dennis Kochmann (Keynote Talk)
10:15 AM	10:45 AM	Multiscale Aspects of Modeling Ferroelectrics and Applications toward Actuation, Energy Harvesting and Lifetime Assessment
		<i>Andreas Ricoeur, University of Kassel; Lennart Behlen, University of Kassel; Stephan Lange, University of Kassel; Reschad Wakili, University of Kassel; Andreas Warkentin, University of Kassel</i>
		Speaker: Andreas Ricoeur (Keynote Talk)
10:45 AM	11:05 AM	A Finite-Strain Phase-Field Model for Fracture in Shape Memory Alloys: Modeling Framework and Experimental Validation
		<i>Theocharis Baxevanis, University of Houston; Mehedi Hasan, University of Houston</i>
		Speaker: Md Mehedi Hasan (Contributed Talk)
11:05 AM	11:25 AM	A Top-Down Characterization of NiTi Single Crystal Inelastic Properties within Confidence Bounds through Bayesian Inference
		<i>Theocharis Baxevanis, University of Houston; Afzal Hossain, University of Houston; Pejman Honarmadi, Texas A&M University; Raymundo Arroyave, Texas A&M University</i>
		Speaker: Theocharis Baxevanis (Contributed Talk)
Session: 5B, Room: Hotel-Reveille I		
Session Chair(s): Stephan Rudykh, rudykh@wisc.edu		
11:40 AM	12:00 PM	Actuation Response of Glass-Ceramics
		<i>Brian Lester, Sandia National Laboratories; Kevin Strong, Sandia National Laboratories; Thomas Diebold, Sandia National Laboratories; Steve Dai, Sandia National Laboratories; Kevin Long, Sandia National Laboratories</i>
		Speaker: Brian Lester (Contributed Talk)
12:00 PM	12:20 PM	Bending Saint-Venant's principle to create stiff architected morphing materials
		<i>Francois Barthelat, University of Colorado Boulder; Kenichiro Yokota, University of Colorado at Boulder</i>
		Speaker: Kenichiro Yokota (Contributed Talk)
12:20 PM	12:40 PM	Evolution of Localized Deformation in NiTi Tubes in a Constant Stress Thermal Cycle: Experiments and Analysis

		<i>Solon Tsimpoukis, University of Texas at Austin; Stelios Kyriakides, University of Texas at Austin</i>
		Speaker: Solon Tsimpoukis (Contributed Talk)
Session: 6A, Room: Hotel-Reveille I		
Session Chair(s): Marcus Young, Marcus.Young@unt.edu		
2:15 PM	2:45 PM	Shape Memory Alloy Actuators in Aerospace: Past, Present and Optimistic Future Outlook
		<i>Othmane Benafan, NASA Glenn Research Center</i>
		Speaker: Othmane Benafan (Keynote Talk)
2:45 PM	3:05 PM	Characterization, Processing, and Thermo-mechanical Behavior of Ti-Ni-Cu-Pd Low Hysteresis Shape Memory Alloys
		<i>Andre Montagnoli, University of North Texas; Jan Frenzel, ruhr-universität bochum; Marcus Young, University of North Texas; Douglas Nicholson, The Boeing Company; Frederick Calkins, The Boeing Company</i>
		Speaker: Andre Montagnoli (Contributed Talk)
3:05 PM	3:25 PM	On the role of interpolation functions and weighted averaging operators in the phase field modeling of phase transformations
		<i>Bjoern Kiefer, TU Bergakademie Freiberg; Vincent von Oertzen, TU Bergakademie Freiberg</i>
		Speaker: Bjoern Kiefer (Contributed Talk)
3:25 PM	3:45 PM	The Effect of Microstructure on Fracture and Fatigue Properties of NiTiHf High Temperature Shape Memory Alloys
		<i>Benjamin Young, Texas A&M University, Sandian National Laboratories; Roberto Orrostieta, Texas A&M University; Behrouz Haghighouyan, Texas A&M University, Exponent; Dimitris Lagoudas, Texas A&M University; Ibrahim Karaman, Texas A&M University</i>
		Speaker: Roberto Orrostieta (Contributed Talk)
Session: 6B, Room: Hotel-Reveille I		
Session Chair(s): Theocharis Baxevanis, tbaxevanis@uh.edu		
4:10 PM	4:30 PM	On the Fracture Toughness of Shape Memory Alloys
		<i>Chad Landis, The University of Texas at Austin; Mohammed Alsawalhi, The University of Texas at Austin</i>
		Speaker: Chad Landis (Contributed Talk)
4:30 PM	4:50 PM	Magnetomechanical deformations and instability-induced microstructure transformations in soft magnetoactive materials
		<i>Nitesh Arora, University of Wisconsin Madison; Quan Zhang, University of Galway; Vincent Chen, Air Force Research Laboratory, Wright-Patterson AFB; Philip Buskohl, Air Force Research Laboratory, Wright-Patterson AFB; Abigail Juhl, Air Force Research Laboratory, Wright-Patterson AFB; Stephan Rudykh, UW Madison</i>
		Speaker: Stephan Rudykh (Contributed Talk)

Thematic Area 7. Robotics & Controls

7.2 Mechanics and Control to Advance Space Domain Awareness		
Session: 6A, Room: MSC-2401		
Session Chair(s): Maruthi Akella, makella@mail.utexas.edu; Roshan Thomas Eapen, reapen@tamu.edu		
2:15 PM	2:35 PM	Measures of Parameter Identifiability for Learning Applications
		<i>Manoranjan Majji, Texas A&M University; Michael Wang, Texas A&M University</i>
		Speaker: Manoranjan Majji (Contributed Talk)
2:35 PM	2:55 PM	Opinion Dynamics and Multi-Thread Learning for Robust Adaptation and Control
		<i>Maruthi Akella, The University of Texas at Austin</i>
		Speaker: Maruthi Akella (Contributed Talk)
2:55 PM	3:15 PM	Efficient Approximation of Cislunar Highways for Tracking of Non-Cooperative Satellite
		<i>Puneet Singla, The Pennsylvania State University; Roshan Eapen, The Pennsylvania State University; David Schwab, The Pennsylvania State University</i>
		Speaker: Puneet Singla (Contributed Talk)
3:15 PM	3:35 PM	Rapid Orbit Determination Strategies for the Expanded Earth Neighborhood within Lunar Orbit
		<i>Roshan Eapen, The Pennsylvania State University; Madeline Mayer, The Pennsylvania State University; Erin Cope, The Pennsylvania State University; Puneet Singla, The Pennsylvania State University</i>
		Speaker: Roshan Eapen (Contributed Talk)
3:35 PM	3:55 PM	Uncorrelated Track Association Using the Mahalanobis Distance
		<i>Woosang Park, Department of Aerospace Engineering, Texas A&M University; Kyle Alfriend, Department of Aerospace Engineering, Texas A&M University</i>
		Speaker: Woosang Park (Contributed Talk)
7.3 Natural and Engineered Approaches to Dynamic Friction Tuning		
Session: 5A, Room: MSC-2401		
Session Chair(s): Carmel Majidi, cmajidi@andrew.cmu.edu; M. Cynthia Hipwell, cynthia.hipwell@tamu.edu		
9:45 AM	10:15 AM	Switchable Adhesives for Intelligent Manipulation
		<i>Michael Bartlett, Virginia Tech</i>
		Speaker: Michael Bartlett (Keynote Talk)
10:15 AM	10:35 AM	Dynamically Tunable Friction via Subsurface Stiffness Modulation
		<i>Wanliang Shan, Syracuse University; Siavash Sharifi, MAE Dept, Syracuse University; Guangchao Wan, MAE Dept, Syracuse University; Teng Zhang, MAE Dept, Syracuse University</i>
		Speaker: Wanliang Shan (Invited Talk)
10:35 AM	10:55 AM	Contacts with Tunable Friction Realized via Stiffness Tuning
		<i>Christopher Stabile, University of Pennsylvania; Kevin Turner, University of Pennsylvania</i>

		Speaker: Christopher Stabile (Contributed Talk)
10:55 AM	11:15 AM	Dynamics of Electroadhesion
		<i>James Colgate, Northwestern University</i>
		Speaker: Ed Colgate (Contributed Talk)
Session: 5B, Room: MSC-2401		
Session Chair(s): Carmel Majidi, cmajidi@andrew.cmu.edu; M. Cynthia Hipwell, cynthia.hipwell@tamu.edu		
11:40 AM	12:00 PM	Rubber friction: from steady sliding to squeaking
		<i>Gabriele Albertini, Harvard University, University of Nottingham; Adel Djellouli, Harvard University; Ilya Svetlizky, Harvard University; Shmuel Rubinstein, Hebrew University of Jerusalem; David Weitz, Harvard University; Katia Bertoldi, Harvard University</i>
		Speaker: Adel Djellouli (Contributed Talk)
12:00 PM	12:20 PM	Modeling the Multiphysics at the Electroadhesive Finger-device and Finger-material Interfaces
		<i>Xinyi Li, Texas A&M University; Yuan Ma, The Hong Kong Polytechnic University (PolyU); Yinzong Guo, Dow Chemical Company; M. Cynthia Hipwell, Texas A&M University</i>
		Speaker: Xinyi Li (Contributed Talk)
12:20 PM	12:40 PM	Dynamically controllable directional adhesives: applications, functional requirements, and ramifications for manufacturing
		<i>Mark Cutkosky, Stanford University; Amar Hajj-Ahmad, Stanford University</i>
		Speaker: Amar Hajj-Ahmad (Contributed Talk)

Thematic Area 8. Soft & Flexible

8.3 Extreme Soft Materials by Polymer-Network Design		
Session: 5A, Room: Hotel-Century II		
Session Chair(s): Junsoo Kim, junsookim@g.harvard.edu		
9:45 AM	10:15 AM	Programmable Hydrogel Adhesion Via Engineered Network Topology
		<i>Zhen Yang, Mechanical Engineering McGill University; Jianyu Li, Mechanical Engineering, McGill University</i>
		Speaker: Jianyu Li (Keynote Talk)
10:15 AM	10:45 AM	Are polymeric networks flaw tolerant?
		<i>Shi-Qing Wang, University of Akron; Travis Smith, University of Akron; Chaitanya Gupta, University of Akron; Zehao Fan, University of Akron</i>
		Speaker: Shi-Qing Wang (Keynote Talk)
10:45 AM	11:05 AM	Extremely Coupled Stress-order Behavior of Liquid Crystal Elastomers
		<i>Lihua Jin, University of California, Los Angeles</i>
		Speaker: Lihua Jin (Invited Talk)
11:05 AM	11:25 AM	Fracture of highly entangled polymer network
		<i>Junsoo Kim, Harvard University; Guogao Zhang, Harvard University; Meixuanzi Shi, Harvard University; Zhigang Suo, Harvard University</i>
		Speaker: Junsoo Kim (Contributed Talk)
Session: 5B, Room: Hotel-Century II		
Session Chair(s): Aniruddh Vashisth, vashisth@uw.edu		
11:40 AM	12:00 PM	Surpassing intrinsic trade-offs in mechanical properties of polymer networks through sequence-controlled alternating polymer-nanoparticles hybrids
		<i>Shiwan Cheng, Michigan State University; Shalin Patil, Michigan State University; Dongdong Zhou, Sichuan University; Xue-Hui Dong, South China University of Technology</i>
		Speaker: Shiwan Cheng (Invited Talk)
12:00 PM	12:20 PM	Water adsorption by polymers with abnormal temperature dependence
		<i>Xinyue Liu, Massachusetts Institute of Technology; Shaoting Lin, Massachusetts Institute of Technology; Lenan Zhang, Massachusetts Institute of Technology; Evelyn Wang, Massachusetts Institute of Technology</i>
		Speaker: Xinyue Liu (Contributed Talk)
12:20 PM	12:40 PM	Giant Strain-Induced Crystallization in Ideal-Network Elastomers
		<i>Chase Hartquist, Massachusetts Institute of Technology; Shaoting Lin, Massachusetts Institute of Technology; Xuanhe Zhao, Massachusetts Institute of Technology</i>
		Speaker: Chase Hartquist (Contributed Talk)
Session: 6A, Room: Hotel-Century II		
Session Chair(s): Xiaoguang Dong, xiaoguang.dong@vanderbilt.edu		

2:15 PM	2:45 PM	Embodying Energy & Intelligence in Liquid Crystal Elastomer
		<i>Carmel Majidi, Carnegie Mellon University</i>
		Speaker: Carmel Majidi (Keynote Talk)
2:45 PM	3:05 PM	Shape-Morphable Magnetic Miniature Robots Towards Minimally Invasive Medical Applications
		<i>Xiaoguang Dong, Vanderbilt University, Vanderbilt Institute for Surgery and Engineering</i>
		Speaker: Xiaoguang Dong (Contributed Talk)
3:05 PM	3:25 PM	Shape Morphing Liquid Crystal Elastomers: 4D Printing and Self-Assembled Structures
		<i>Taylor Ware, Texas A&M University</i>
		Speaker: Taylor Ware (Invited Talk)
3:25 PM	3:45 PM	Soft adaptive structures with fluidic flexible matrix composite tubes
		<i>Aniruddh Vashisth, Department of Mechanical Engineering, University of Washington, Seattle; Charles Bakis, Engineering Science & Mechanics, Pennsylvania State University</i>
		Speaker: Aniruddh Vashisth (Contributed Talk)
Session: 6B, Room: Hotel-Century II		
Session Chair(s): Zhao Qi, zqin02@syr.edu; Shaoting Lin, linshaot@msu.edu		
4:10 PM	4:30 PM	Rational Polymeric Design of Multifunctional Hydrogels
		<i>Dong Zhang, University of Akron; Yijing Tang, University of Akron; Jie Zheng, University of Akron</i>
		Speaker: Dong Zhang (Contributed Talk)
4:30 PM	4:50 PM	Polymer-network Design of Hydrogels for Atmospheric Water Harvesting
		<i>Shaoting Lin, MASSACHUSETTS INSTITUTE OF TECHNOLOGY; James Zhang, Massachusetts Institute of Technology; Xinyue Liu, Massachusetts Institute of Technology; Xuanhe Zhao, Massachusetts Institute of Technology</i>
		Speaker: Shaoting Lin (Contributed Talk)

8.4 Functional Soft Composites - Design, Mechanics, and Manufacturing		
Session: 5A, Room: Hotel-Traditions		
Session Chair(s): H. Jerry Qi, qih@me.gatech.edu		
9:45 AM	10:05 AM	STRETCHABLE HYBRID RESPONSE PRESSURE SENSORS (SHRPS)
		<i>Nanshu Lu, The University of Texas at Austin</i>
		Speaker: Nanshu Lu (Invited Talk)
10:05 AM	10:25 AM	Bioactive Tissue Derived Nanocomposite Gel for Permanent Arterial Embolization
		<i>Jingjie Hu, North Carolina State University</i>
		Speaker: Jingjie Hu (Contributed Talk)
10:25 AM	10:45 AM	Modeling of Programmable Magnetic Artificial Cilia
		<i>HAO JIANG, Syracuse University; Teng Zhang, Syracuse University</i>
		Speaker: Hao Jiang (Contributed Talk)
10:45 AM	11:05 AM	Magnetic field-controlled buckling patterns in soft magnetoactive composites

		Nitesh Arora, University of Wisconsin-Madison; Vincent Chen, Air Force Research Laboratory, Wright-Patterson AFB, Ohio; Abigail Juhl, Air Force Research Laboratory, Wright-Patterson AFB, Ohio; Philip Buskohl, Air Force Research Laboratory, Wright-Patterson AFB, Ohio; Stephan Rudykh, University of Wisconsin-Madison
		Speaker: Nitesh Arora (Contributed Talk)
11:05 AM	11:25 AM	A Computational Study of the Effective Magnetostrictive Properties of Anisotropic Magneto-Active Elastomers
		Connor Pierce, University of Illinois at Urbana-Champaign; Ignacio Arretche, University of Illinois at Urbana-Champaign; Nusrat Salim, University of Illinois at Urbana-Champaign; Kathryn Matlack, University of Illinois at Urbana-Champaign
		Speaker: Connor Pierce (Contributed Talk)
Session: 5B, Room: Hotel-Traditions		
Session Chair(s): Pu Zhang, pzhang@binghamton.edu		
11:40 AM	12:00 PM	Machine Learning-Evolutionary Algorithm Enabled Design for 4D-Printed Active Composite Structures
		Xiaohao Sun, Georgia Institute of Technology; Ruike Zhao, Stanford University; H. Jerry Qi, Georgia Institute of Technology
		Speaker: Xiaohao Sun (Contributed Talk)
12:00 PM	12:20 PM	Multimaterial 3D Printing using Single Vat Single Cure Grayscale Digital Light Processing
		liang yue, Georgia Institute of Technology; Stuart Montgomery, Georgia Institute of Technology; Xiaohao Sun, Georgia Institute of Technology; Luxia Yu, Georgia Institute of Technology; Jerry Qi, Georgia Institute of Technology
		Speaker: Liang Yue (Contributed Talk)
Session: 6A, Room: Hotel-Traditions		
Session Chair(s): Liang Yue, liang.yue@gatech.edu		
2:15 PM	2:35 PM	Fractal Dimensions in the Parameter Space of Vibration-induced Shape Morphing of Bi-stable Metamaterials
		Md Nahid Hasan, University of Utah; Robert G. Parker, University of Utah; Pai Wang, University of Utah
		Speaker: Md Nahid Hasan (Contributed Talk)
2:35 PM	2:55 PM	Digital Synthesis of Free-form Multimaterial Structures for Realization of Arbitrary Programmed Mechanical Responses
		Weichen Li, University of Illinois Urbana-Champaign; Fengwen Wang, Technical University of Denmark; Ole Sigmund, Technical University of Denmark; Xiaojia Shelly Zhang, University of Illinois Urbana-Champaign
		Speaker: Weichen Li (Contributed Talk)
2:55 PM	3:15 PM	A Self-Heating Wearable Material for In Situ Thermal Decontamination
		Marquise Bell, Rice University; Te Faye Yap, Rice University; Anoop Rajappan, Rice University; Colter Decker, Rice University; Daniel Preston, Rice University
		Speaker: Marquise Bell (Contributed Talk)
3:15 PM	3:35 PM	Producing Functional Fiber-Reinforced Polymer Composites via Hybrid Additive Manufacturing Process
		Connor Armstrong, Georgia Institute of Technology; Liang Yue, Georgia Institute of Technology; Devin Roach, Georgia Institute of Technology; H. Jerry Qi, Georgia Institute of Technology
		Speaker: Connor Armstrong (Contributed Talk)
3:35 PM	3:55 PM	Pixel-level manipulation to improve accuracy in grayscale digital light processing printing
		S. Macrae Montgomery, Georgia Institute of Technology; Craig Hamel, Sandia National Laboratories; Jerry Qi, Georgia Institute of Technology

		Speaker: S. Macrae Montgomery (Contributed Talk)
Session: 6B, Room: Hotel-Traditions		
Session Chair(s): Asaf Dana, adana@tamu.edu		
4:10 PM	4:30 PM	Poroelastic swelling dynamics of plant-inspired closed-cell composites
		<i>Jeongeun Ryu, Department of Mechanical Science and Engineering, University of Illinois Urbana-Champaign; John Chen, Department of Material Science and Engineering, University of Illinois Urbana-Champaign; Shelby Hutchens, Department of Mechanical Science and Engineering, University of Illinois Urbana-Champaign, Department of Material Science and Engineering, University of Illinois Urbana-Champaign</i>
		Speaker: Jeongeun Ryu (Contributed Talk)
4:30 PM	4:50 PM	Role of Interface on Mechanical Behavior of Polymethylmethacrylate/a-Zirconium Phosphate Nanocomposites
		<i>Zewen Zhu, Texas A&M University</i>
		Speaker: Zewen Zhu (Contributed Talk)

8.6 Mechanics and Physics of Soft Materials		
Session: 5A, Room: Hotel-Hullabaloo		
Session Chair(s): Stephan Rudykh, rudykh@wisc.edu; Oscar Lopez-Pamies, pamies@illinois.edu		
9:45 AM	10:05 AM	Modeling surface stresses in soft materials
		<i>Berkin Dortdivanlioglu, The University of Texas at Austin; Animesh Rastogi, The University of Texas at Austin</i>
		Speaker: Berkin Dortdivanlioglu (Contributed Talk)
10:05 AM	10:25 AM	Toughening brittle solids via crack tip instability
		<i>Xinyue Wei, Institute of Mechanical Engineering, School of Engineering, EPFL; John Kolinski, Institute of Mechanical Engineering, School of Engineering, EPFL</i>
		Speaker: John Kolinski (Contributed Talk)
10:25 AM	10:45 AM	Generalized Structure Tensor-based Constitutive Relation without Switching Criterion for Arterial Tissues
		<i>K Arvind, Indian Institute of Technology (Madras), India; Krishna Kannan, Indian Institute of Technology (Madras), India</i>
		Speaker: K Arvind (Contributed Talk)
10:45 AM	11:05 AM	Inertial Microcavitation Rheometry Under Restricted Information
		<i>Bachir Abeid, University of Michigan; Zhiren Zhu, University of Michigan; Jonathan Estrada, University of Michigan</i>
		Speaker: Bachir Abeid (Contributed Talk)
11:05 AM	11:25 AM	A Reactive Multicomponent Theory for Programmable and Stimuli-Responsive Polyelectrolyte Hydrogels
		<i>Brandon Zimmerman, Johns Hopkins University, Lawrence Livermore National Laboratory; Bibekananda Datta, Johns Hopkins University; Thao Nguyen, Johns Hopkins University</i>
		Speaker: Brandon Zimmerman (Contributed Talk)
Session: 6A, Room: Hotel-Hullabaloo		
Session Chair(s): Stephan Rudykh, rudykh@wisc.edu; Oscar Lopez-Pamies, pamies@illinois.edu		
2:15 PM	2:35 PM	Investigation of Thermo-chemo-mechanically Coupled Phenomena in Frontal Polymerization

		<i>Xuanhe Li, MIT; Tal Cohen, MIT</i>
		Speaker: Xuanhe Li (Contributed Talk)
2:35 PM	2:55 PM	Instability-driven microstructure transformations in soft (meta)materials with tunable functions
		<i>Nitesh Arora, University of Wisconsin Madison; Viacheslav Slesarenko, University of Freiburg; Jian Li, Massachusetts Institute of Technology; Stephan Rudykh, UW Madison</i>
		Speaker: Stephan Rudykh (Contributed Talk)
2:55 PM	3:15 PM	A passive bidirectional soft valve
		<i>Wen Song, University of Texas at Austin</i>
		Speaker: Wen Song (Contributed Talk)
3:15 PM	3:35 PM	Transition from subcritical to supercritical buckling in helical elastic rods
		<i>Dezhong Tong, University of California, Los Angeles; Andy Borum, Hofstra University; Khalid Jawed, University of California, Los Angeles</i>
		Speaker: Dezhong Tong (Contributed Talk)
3:35 PM	3:55 PM	Unravelling the Mechanics of Knitted Fabrics Using Multiscale Simulation Techniques
		<i>Xiaoxiao Ding, Harvard University; Chris Rycroft, Harvard University</i>
		Speaker: Xiaoxiao (Catherine) Ding (Contributed Talk)
Session: 6B, Room: Hotel-Hullabaloo		
Session Chair(s): Stephan Rudykh, rudykh@wisc.edu; Oscar Lopez-Pamies, pamies@illinois.edu		
4:10 PM	4:30 PM	Inverse design of magneto-mechanical metamaterials with tunable responses
		<i>Zhi Zhao, University of Illinois at Urbana Champaign; Xiaojia Shelly Zhang, University of Illinois at Urbana Champaign</i>
		Speaker: Xiaojia Shelly Zhang (Contributed Talk)
4:30 PM	4:50 PM	A Subdivision-stabilized B-spline Material Point Method for Nonlinear Nearly Incompressible Solids
		<i>Ashkan Ali Madadi, university of texas at austin; Berkin Dortdivanlioglu, university of texas at austin</i>
		Speaker: Ashkan Ali Madadi (Contributed Talk)
4:50 PM	5:10 PM	Programmable morphologies and snapping capabilities via cutting and pasting
		<i>Yaoye Hong, North Carolina State University; Jie Yin, North Carolina State University</i>
		Speaker: Yaoye Hong (Contributed Talk)

8.9 Mechanics, Materials, Manufacture and Device Innovations of Soft Electronics		
Session: 5A, Room: Hotel-Century IV		
Session Chair(s): Cunjiang Yu, cmy5358@psu.edu; Limei Tian, ltian@tamu.edu		
9:45 AM	10:05 AM	Soft ultrasonic technologies for deep tissue sensing
		<i>Sheng Xu, University of California San Diego</i>
		Speaker: Sheng Xu (Invited Talk)
10:05 AM	10:25 AM	Biointegrated optoelectronic devices with radiative coolers for highly reliable data acquisition
		<i>Young Min Song, GIST</i>

		Speaker: Young Min Song (Invited Talk)
10:25 AM	10:45 AM	Highly Flexible and Wearable Microfluidic Sensors for Healthcare Applications
		<i>Chwee Lim, National University of Singapore</i>
		Speaker: Chwee Teck Lim (Contributed Talk)
10:45 AM	11:05 AM	Shape-Adaptive Curvy Imager Manufactured by Conformal Additive Stamp Printing
		<i>Zhoulyu Rao, Pennsylvania State University; Cunjiang Yu, Department of Engineering Science and Mechanics, Department of Biomedical Engineering, Pennsylvania State University</i>
		Speaker: Zhoulyu Rao (Contributed Talk)
11:05 AM	11:25 AM	Shape-morphing Materials for Deployable Intracortical Probes
		<i>Mahjabeen Javed, Texas A&M University; Joseph Pancrazio, The University of Texas at Dallas; Taylor Ware, Texas A&M University</i>
		Speaker: Mahjabeen Javed (Contributed Talk)
Session: 5B, Room: Hotel-Century IV		
Session Chair(s): Limei Tian, ltian@tamu.edu; Cunjiang Yu, cmy5358@psu.edu		
11:40 AM	12:00 PM	Soft and flexible bioelectronics for brain-machine interface
		<i>Jia Liu, Harvard University</i>
		Speaker: Jia Liu (Invited Talk)
12:00 PM	12:20 PM	Soft Wearable Biosensors for Monitoring Biophysical and Biochemical Parameters
		<i>Limei Tian, Texas A&M University</i>
		Speaker: Limei Tian (Contributed Talk)
12:20 PM	12:40 PM	Implantable, Wireless, Self-fixing Thermal Sensors for Continuous Measurements of Microvascular Blood Flow in Flaps and Organ Grafts
		<i>Shupeng Li, Northwestern University; Yonggang Huang, Northwestern University</i>
		Speaker: Shupeng Li (Contributed Talk)

Thematic Area 9. Solids & Structures

9.1 Vibrations, Adaptive Structures and Testing		
Session: 5A, Room: Hotel-Corps II		
Session Chair(s): Patrick Musgrave, pmusgrave@ufl.edu; Saed Alajlouni, saed@tamu.edu		
9:45 AM	10:05 AM	Modal analysis of a parabolic tape spring boom for space applications
		<i>Deven Mhadgut, Virginia Tech; Sheyda Davaria, Research Associate, Virginia Tech; Jonathan Black, Professor, Virginia Tech</i>
		Speaker: Deven Mhadgut (Invited Talk)
10:05 AM	10:25 AM	Field Evaluation of Machine Learning Models in Augmented Reality Environment
		<i>Alan Smith, Virginia Polytechnic Institute and State University; Rodrigo Sarlo, Virginia Polytechnic Institute and State University</i>
		Speaker: Alan Smith (Contributed Talk)
10:25 AM	10:45 AM	Low-cost sensing strategies for teaching dynamics and signal processing
		<i>Rodrigo Sarlo, Virginia Tech</i>
		Speaker: Rodrigo Sarlo (Contributed Talk)
10:45 AM	11:05 AM	Arbitrary-Order Sensitivity Analysis in Wave Propagation Problems Using the Hypercomplex Time-Domain Spectral Finite Element Method (ZSFEM)
		<i>Juan Navarro, Margie and Bill Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, San Antonio, TX, 78249, USA; Juan Velasquez-Gonzalez, Margie and Bill Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, San Antonio, TX 78249, USA; Harry Millwater, Margie and Bill Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, San Antonio, TX, 78249, USA; Arturo Montoya, Margie and Bill Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, San Antonio, TX, 78249, USA; David Restrepo, Margie and Bill Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, San Antonio, TX, 78249, USA</i>
		Speaker: Juan Navarro (Contributed Talk)
11:05 AM	11:25 AM	Arbitrary-order Sensitivity Analysis of Eigenfrequency Problems Using the Hypercomplex Taylor Series Expansion (ZTSE)
		<i>Juan Velasquez-Gonzalez, University of Texas at San Antonio; Juan David Navarro, University of Texas at San Antonio; Arturo Montoya, University of Texas at San Antonio; Harry Millwater, University of Texas at San Antonio; David Restrepo, University of Texas at San Antonio</i>
		Speaker: Juan C. Velasquez-Gonzalez (Contributed Talk)
Session: 5B, Room: Hotel-Corps II		
Session Chair(s): Pablo Tarazaga, patazaga@tamu.edu; Sriram Malladi, smalladi@mtu.edu		
11:40 AM	12:00 PM	Programming Bandgaps Using Metastructures with Bistable Resonators
		<i>Sriram Malladi, Michigan Tech</i>
		Speaker: Sriram Malladi (Contributed Talk)
12:00 PM	12:20 PM	A Surging FlexWEC: An Adaptive Structure Using Distributed Embedded Energy Converting Technologies for Ocean Wave Energy Conversion

		<i>Sahand Sabet, National Renewable Energy Laboratory; Blake Boren, National Renewable Energy Laboratory</i>
		Speaker: Sahand Sabet (Invited Talk)
12:20 PM	12:40 PM	Generating Traveling Waves in Coexistence of Standing Waves in a Beam under a Single-Point Excitation Using Multiple Spring-Dampers Discontinuities
		<i>Syedmostafa Motaharibidgoli, Virginia Tech; Pablo Tarazaga, Texas A&M</i>
		Speaker: Syedmostafa Motaharibidgoli (Contributed Talk)
Session: 6A, Room: Hotel-Corps II		
Session Chair(s): Rodrigo Sarlo, sarlo@vt.edu; Ipar Ferhat, iparferhat@gmail.com		
2:15 PM	2:35 PM	Examination of Propagation Direction Behavior in Superimposed Two-Dimensional Structure-borne Traveling Waves
		<i>William Rogers, Texas A&M University; Mohammad Albakri, Texas A&M Qatar</i>
		Speaker: William Rogers (Contributed Talk)
2:35 PM	2:55 PM	Utilization of Fracture-Induced Acoustic Emissions in Mechanical Characterization of Soft Materials
		<i>Karthik Yerrapragada, University of Wisconsin-Madison; Dipul Chawla, University of Wisconsin-Madison; Corinne Henak, University of Wisconsin-Madison; Melih Eriten, University of Wisconsin-Madison</i>
		Speaker: Karthik Yerrapragada (Contributed Talk)
2:55 PM	3:15 PM	Leveraging the continuous residue interpolation method for optimizing IMMAT
		<i>Amirhossein Omid Soroor, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University; Pablo Tarazaga, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University</i>
		Speaker: Amirhossein Omid Soroor (Contributed Talk)
3:15 PM	3:35 PM	Selective Pattern for Circular Dimples Distribution as Means to Enhance Structural Mechanical Response of Tubular Components
		<i>Marcelo Paredes, Texas AM University; Cuneyt Sakonder, Texas AM University</i>
		Speaker: Cuneyt Sakonder (Contributed Talk)

9.2 Classical and Nonclassical Continuum Theories and their Application		
Session: 5A, Room: Hotel-Ross II		
Session Chair(s): Karan Surana, kssurana@ku.edu; Jacob Kendall, j842k961@ku.edu		
9:45 AM	10:15 AM	Thermodynamic Consistency of Nonclassical Continuum Theories for Solid Continua Incorporating Rotations
		<i>Karan Surana, University of Kansas; Sri Sai Charan Mathi, University of Kansas</i>
		Speaker: Sri Sai Charan Mathi (Keynote Talk)
10:15 AM	10:45 AM	Stress Waves in Polymeric Fluids
		<i>Karan Surana, University of Kansas; Michael Kitchen, University of Kansas</i>
		Speaker: Karan Surana (Keynote Talk)
10:45 AM	11:05 AM	Exact Cloaks in 3D Classical and Non-Classical Elasticity, Elastic Plates, and Optimal Approximate Cloaks
		<i>Arash Yavari, Georgia Institute of Technology</i>
		Speaker: Arash Yavari (Contributed Talk)
11:05 AM	11:25 AM	Design of Origami Structures with Curved Tiles between the Creases

		<i>Huan Liu, University of Minnesota; Richard James, University of Minnesota</i>
		Speaker: Huan Liu (Contributed Talk)
Session: 5B, Room: Hotel-Ross II		
Session Chair(s): Karan Surana, kssurana@ku.edu; Jacob Kendall, j842k961@ku.edu		
11:40 AM	12:00 PM	Space-time decoupled methods for IVPs arising in classical continuum mechanics in Eulerian descriptions of fluent continua
		<i>Karan Surana, University of Kansas; Payton Miller, University of Kansas</i>
		Speaker: Karan Surana (Contributed Talk)
12:00 PM	12:20 PM	Application of Asymptotic Methods and XFEM to the Analysis of Indentation Fracture
		<i>Alvaro Gomez-Ovalle, Department of Materials Science & Engineering, Texas A&M University, College Station, TX, 77843-3003, USA; George Pharr, Department of Materials Science & Engineering, Texas A&M University, College Station, TX, 77843-3003, USA</i>
		Speaker: Alvaro Gomez-Ovalle (Contributed Talk)
12:20 PM	12:40 PM	Non-classical continuum theories for fluent continua incorporating rotation rates and their thermodynamic consistency
		<i>Karan Surana, University of Kansas; Celso Carranza, University of Kansas</i>
		Speaker: Celso Carranza (Contributed Talk)
Session: 6A, Room: Hotel-Ross II		
Session Chair(s): Karan Suran, kssurana@ku.edu; Celso Carranza, ccarranza@ku.edu		
2:15 PM	2:35 PM	"Homogenization" for Fracture: Peridynamic Models
		<i>Florin Bobaru, University of Nebraska-Lincoln; Ziguang Chen, Huazhong University of Science and Technology</i>
		Speaker: Florin Bobaru (Contributed Talk)
2:35 PM	2:55 PM	Bandgap formation in a locally resonant metamaterial strain gradient nanobeam
		<i>Mohamed TRABELSSI, University of Tunis; Sami EL-BORGI, TEXAS AM University at Qatar</i>
		Speaker: Sami El-Borgi (Contributed Talk)
2:55 PM	3:15 PM	Size Effect on Copper Cantilever Bending Experiments with Couple Stress Elastoplasticity
		<i>Jae-Hoon Choi, Korea Advanced Institute of Science and Technology; Hyemin Ryu, Korea Advanced Institute of Science and Technology; Kwang-Hyeok Lim, Korea Advanced Institute of Science and Technology; Ji-Young Kim, Korea Advanced Institute of Science and Technology; Hojang Kim, Korea Advanced Institute of Science and Technology; Gi-Dong Sim, Korea Advanced Institute of Science and Technology</i>
		Speaker: Jae-Hoon Choi (Contributed Talk)
3:15 PM	3:35 PM	Rotational Inertial Physics in Non-Classical Thermoviscous Fluent Continua Incorporating Internal Rotation Rates
		<i>Karan Surana, University of Kansas; Jacob Kendall, University of Kansas</i>
		Speaker: Jacob Kendall (Contributed Talk)
3:35 PM	3:55 PM	Application of the J-integral and Linear Beam Theories to Single and Double Cantilever Beam Tests to Determine Mode I Interlaminar Fracture Toughness
		<i>Anthony Paris, University of Alaska Anchorage</i>
		Speaker: Anthony Paris (Contributed Talk)

9.4 Continuum Based Modeling of Heterogeneous Materials		
Session: 5A, Room: Hotel-Eagle		
Session Chair(s): Yong-Rak Kim, yong-rak.kim@tamu.edu; David Allen, dhallen@tamu.edu		
9:45 AM	10:15 AM	Modeling the ECOT Test
		<i>Marvin Zocher, Los Alamos National Laboratory</i>
		Speaker: Marvin Zocher (Keynote Talk)
2:55 PM	3:15 PM	Two-way Coupled Multiscale Modeling of Heterogeneous Elastic-Viscoelastic Solids
		<i>Yong-Rak Kim, Texas A&M University</i>
		Speaker: Yong-Rak Kim (Invited Talk)
10:35 AM	10:55 AM	Localization limiter for stochastic computation of quasibrittle fracture
		<i>Jia-Liang Le, University of Minnesota; Anna Gorgogianni, California Institute of Technology; Jan Elias, Brno University of Technology</i>
		Speaker: Jia-Liang Le (Contributed Talk)
10:55 AM	11:15 AM	A Chemo-Elastic Model based on the Chemical Potential
		<i>Kirill Rebrov, Oden Institute for Computational Engineering and Sciences, University of Texas at Austin; Nicolás Molina, Texas Materials Institute, University of Texas at Austin; Logan Kirsch, Department of Aerospace Engineering and Engineering Mechanics, University of Texas at Austin; Filippo Mangolini, Texas Materials Institute, University of Texas at Austin, Walker Department of Mechanical Engineering, University of Texas at Austin; Gregory Rodin, Department of Aerospace Engineering and Engineering Mechanics, University of Texas at Austin, Oden Institute for Computational Engineering and Sciences, University of Texas at Austin</i>
		Speaker: Kirill Rebrov (Contributed Talk)
Session: 6A, Room: Hotel-Eagle		
Session Chair(s): Yong-Rak Kim, yong-rak.kim@tamu.edu; David Allen, dhallen@tamu.edu		
2:15 PM	2:35 PM	Limpet Teeth Microstructure Unites Auxeticity with Extreme Strength and High Stiffness
		<i>Yue Liu, University of Michigan; Huajian Gao, Nanyang Technological University</i>
		Speaker: Yue Liu (Contributed Talk)
2:35 PM	2:55 PM	A poromechanics theory explaining the initial shrinkage of nanoporous materials upon adsorption
		<i>Yida Zhang, University of Colorado Boulder</i>
		Speaker: Yida Zhang (Contributed Talk)
10:15 AM	10:35 AM	Modeling of Fracture in Viscoelastic Bituminous Mixtures Using an Extrinsic Nonlinear Viscoelastic Cohesive Zone Model
		<i>Luiz Veras, Sao Carlos School of Engineering, University of Sao Paulo; Jamilla Teixeira, University of Nebraska - Lincoln; Yong-Rak Kim, Texas A&M University</i>
		Speaker: Jamilla Teixeira (Contributed Talk)
3:15 PM	3:35 PM	Homogenization of the Relaxed Micromorphic Model Towards Multiscale Metamaterial Design
		<i>Noah Francis, University of Colorado Boulder, Center for Integrated Nanotechnologies, Sandia National Laboratories; Fatemeh Pourahmadian, University of Colorado Boulder; Rémi Dingreville, Center for Integrated Nanotechnologies, Sandia National Laboratories</i>
		Speaker: Noah Francis (Contributed Talk)
3:35 PM	3:55 PM	Mechanics of Needle Insertion in Soft Tissues

		<i>Samer Al-Safadi, Temple University; Parsaoran Hutapea, Temple University</i>
		Speaker: Samer Al-Safadi (Contributed Talk)

9.5 Controlling Mechanical Waves with Metamaterials		
Session: 5A, Room: Hotel-Ross I		
Session Chair(s): Thevamaran Ramathasan, thevamaran@wisc.edu		
9:45 AM	10:05 AM	Mathematical structure of bandgaps in 1D phononic crystals
		<i>Joaquin Garcia-Suarez, École Polytechnique Fédérale de Lausanne</i>
		Speaker: Joaquin Garcia-Suarez (Contributed Talk)
10:05 AM	10:25 AM	Topological Maxwell Bilayers with Omnimodal Polarization Capabilities
		<i>Mohammad Charara, University of Minnesota; James McInerney, University of Michigan; Kai Sun, University of Michigan; Xiaoming Mao, University of Michigan; Stefano Gonella, University of Minnesota</i>
		Speaker: Mohammad Charara (Contributed Talk)
10:25 AM	10:45 AM	Ray Tracing for Graded Metamaterial Waveguides
		<i>Charles Dorn, ETH Zurich; Dennis Kochmann, ETH Zurich</i>
		Speaker: Charles Dorn (Contributed Talk)
10:45 AM	11:05 AM	Observation of robust bulk states in non-hermitian acoustic waveguides
		<i>Hamidreza Ramezani, University Of Texas Rio Grande Valley</i>
		Speaker: Hamidreza Ramezani (Contributed Talk)
11:05 AM	11:25 AM	Extreme Frequency Conversion via Transition Waves in Structurally Excited Metastructures
		<i>Myungwon Hwang, Purdue University; Suriyan Anandavel, Purdue University; Andres Arrieta, Purdue University</i>
		Speaker: Andres Arrieta (Contributed Talk)
Session: 5B, Room: Hotel-Ross I		
Session Chair(s): Thevamaran Ramathasan, thevamaran@wisc.edu		
11:40 AM	12:00 PM	High-Throughput Dynamic Characterization of Metamaterials via Laser-Induced Wave Propagation
		<i>Yun Kai, MIT; Thomas Pezeril, CNRS, MIT; Carlos Portela, MIT</i>
		Speaker: Carlos Portela (Contributed Talk)
12:00 PM	12:20 PM	Wave propagation in spatially-variant architected truss lattices
		<i>Bastian Telgen, Mechanics & Materials Lab, Department of Mechanical and Process Engineering, ETH Zurich; Vignesh Kannan, Mechanics & Materials Lab, Department of Mechanical and Process Engineering, ETH Zurich; Charles Dorn, Mechanics & Materials Lab, Department of Mechanical and Process Engineering, ETH Zurich; Dennis Kochmann, Mechanics & Materials Lab, Department of Mechanical and Process Engineering, ETH Zurich</i>
		Speaker: Bastian Telgen (Contributed Talk)
12:20 PM	12:40 PM	Effective phononic crystals to control radially-propagating elastic waves
		<i>Kathryn Matlack, University of Illinois at Urbana-Champaign; Ignacio Arretche, University of Illinois at Urbana-Champaign</i>
		Speaker: Kathryn Matlack (Contributed Talk)

9.6 High-Strain-Rate Behavior of Heterogeneous Materials		
Session: 5A, Room: Hotel-Leadership		
Session Chair(s): Marcia Cooper, macoope@tamu.edu		
9:45 AM	10:15 AM	High-rate Triaxial Compression Behavior of Composite Materials
		<i>Weinong Chen, Purdue University</i>
		Speaker: Weinong "Wayne" Chen (Keynote Talk)
10:15 AM	10:35 AM	A multisurface theory of ductile fracture for rate-dependent solids
		<i>Vigneshwaran Radhakrishnan, Texas A&M university; Amine Benzerga, Texas A&M university</i>
		Speaker: Vigneshwaran Radhakrishnan (Contributed Talk)
10:35 AM	10:55 AM	Intermediate Strain Rate Behavior of a Polymer-Particulate Composite with High Solids Loading
		<i>Mark Luke, Cooper Research Group - Texas A&M University; Marcia Cooper, J. Mike Walker '66 Department of Mechanical Engineering; Judith Brown, Sandia National Laboratories; Michael Kaneshige, Sandia National Laboratories</i>
		Speaker: Mark Luke (Contributed Talk)
10:55 AM	11:15 AM	The effect of impedance contrast on spall strength in multilayered composites
		<i>Liya Semenchenko, Materials Science & Engineering, Texas A&M University</i>
		Speaker: Liya Semenchenko (Contributed Talk)

9.8 Multiscale Mechanics of Materials		
Session: 5A, Room: Hotel-Corps I		
Session Chair(s): Haoran Wang, haoran.wang@usu.edu		
9:45 AM	10:05 AM	Characterizing the Mechanical Properties of Metal Thin Films via Membrane Deflection Experiments
		<i>Hojang Kim, KAIST; Jae-Hoon Choi, KAIST; Yu Hyun Park, KAIST; Sunkun Choi, KAIST; Zhuo Feng Lee, KAIST; Gi-Dong Sim, KAIST</i>
		Speaker: Hojang Kim (Contributed Talk)
10:05 AM	10:25 AM	Comparison of Anisotropic Simulation and Measured Microstructure Evolution in Ni and SrTiO₃
		<i>S. Kiana Naghibzadeh, CARNEGIE MELLON UNIVERSITY; Zipeng Xu, CARNEGIE MELLON UNIVERSITY; Vivekanand Muralikrishnan, University of Florida; Amanda Krause, University of Florida; David Kinderlehrer, CARNEGIE MELLON UNIVERSITY; Robert Suter, CARNEGIE MELLON UNIVERSITY; Kaushik Dayal, CARNEGIE MELLON UNIVERSITY; Gregory Rohrer, CARNEGIE MELLON UNIVERSITY</i>
		Speaker: S. Kiana Naghibzadeh (Contributed Talk)
10:25 AM	10:45 AM	Intermetallic Particle Heterogeneity Controls Shear Localization in High-strength Nanostructured Al Alloys
		<i>Tianjiao Lei, University of California Irvine; Esther Hessong, University of California Irvine; Jungho Shin, University of California Santa Barbara; Gangneung-Wonju National University; Daniel Gianola, University of California Santa Barbara; Timothy Rupert, University of California Irvine</i>
		Speaker: Tianjiao Lei (Invited Talk)
10:45 AM	11:05 AM	Thermodynamically consistent derivation of variational multiscale DG crystal plasticity and finite element implementation

		<i>Amirfarzad Behnam, Department of Civil and Environmental Engineering, University of Tennessee, Knoxville, 318 John D. Tickle Engineering Building, Knoxville, TN 37996, United States; Timothy Truster, Department of Civil and Environmental Engineering, University of Tennessee, Knoxville, 318 John D. Tickle Engineering Building, Knoxville, TN 37996, United States</i>
		Speaker: Amirfarzad Behnam (Contributed Talk)
11:05 AM	11:25 AM	Constitutive Modeling of the Mechanics of Lithium-Metal Anodes in Solid-State Lithium Batteries
		<i>Md Takmil Sakir, Utah State University; Haoran Wang, Utah State University</i>
		Speaker: Md Takmil Sakir (Contributed Talk)
Session: 5B, Room: Hotel-Corps I		
Session Chair(s): Haoran Wang, haoran.wang@usu.edu		
11:40 AM	12:00 PM	Architecture Brings Ductility in a Brittle System
		<i>Angkur Shaikeea, University of Cambridge; Huachen Cui, University of California Los Angeles; Xiaoyu (Rayne) Zheng, University of California Los Angeles; Vikram Deshpande, University of Cambridge</i>
		Speaker: Angkur Shaikeea (Contributed Talk)
12:00 PM	12:20 PM	Spinodoid metamaterials with enhanced toughening mechanisms
		<i>Somayajulu Dhulipala, Massachusetts Institute of Technology; Carlos Portela, Massachusetts Institute of Technology</i>
		Speaker: Somayajulu Dhulipala (Contributed Talk)
12:20 PM	12:40 PM	Toughness Amplification in Lightweight Nano-Bouligand Materials
		<i>Zainab Patel, University of Washington; Lucas Meza, University of Washington</i>
		Speaker: Zainab Patel (Contributed Talk)

9.11 Phase-Field Models of Fracture for Solids, Hard and Soft		
Session: 5A, Room: Hotel-Oak		
Session Chair(s): Trisha Sain, tsain@mtu.edu		
9:45 AM	10:15 AM	Phase-field Fracture Modeling for Large Structures
		<i>Chad Landis, The University of Texas at Austin</i>
		Speaker: Chad Landis (Keynote Talk)
10:15 AM	10:35 AM	The revisited phase-field approach to brittle fracture: Application to indentation and notch problems
		<i>Oscar Lopez-Pamies, Department of Civil and Environmental Engineering, University of Illinois Urbana-Champaign; Aditya Kumar, Department of Aerospace Engineering, University of Illinois Urbana-Champaign</i>
		Speaker: Oscar Lopez-Pamies (Contributed Talk)
10:35 AM	10:55 AM	Phase Field based Cohesive Zone Modeling for Interface Fracture and Fatigue in Fiber Reinforced Polymer Composites
		<i>Trisha Sain, Michigan Technological University; Akash Kumar, Michigan Technological University</i>
		Speaker: Trisha Sain (Contributed Talk)
10:55 AM	11:15 AM	A Phase-Field Model of Ductile Fracture based on a Variational Framework for Materials with Thermo-Viscoplastic Behavior
		<i>Lampros Svolos, Los Alamos National Laboratory; Hashem Mourad, Los Alamos National Laboratory</i>
		Speaker: Lampros Svolos (Contributed Talk)

Session: 5B, Room: Hotel-Oak		
Session Chair(s): Shelly Zhang, zhangxs@illinois.edu		
11:40 AM	12:00 PM	Phase-field model of a surface crack in a graded coating-homogeneous half-plane under thermal loading
		<i>Raghu PISKA, BITS Pilani Hyderabad, Hyderabad, Telangana 500078, India; Sami EL-BORGI, Mechanical Engineering Program, Texas A&M University at Qatar, PO Box 23874, Education City, Doha, Qatar; Amirtham RAJAGOPAL, Department of Civil Engineering, IIT Hyderabad, Hyderabad, Telangana 502285, India; J.N. REDDY, J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University, College Station, Texas, USA; Nafees Muhammad, Texas A&M University</i>
		Speaker: Sami El-Borgi (Contributed Talk)
12:00 PM	12:20 PM	Nucleation and propagation of fracture in viscoelastic elastomers: A phase-field approach
		<i>Bhaves Shrimali, Ph.D. Student (University of Illinois at Urbana-Champaign); Oscar Lopez-Pamies, Professor, University of Illinois at Urbana-Champaign</i>
		Speaker: Bhaves Shrimali (Contributed Talk)
12:20 PM	12:40 PM	Multi-objective Topology Optimization for Fracture Resistant Structures: Integrating Fracture Nucleation and Propagation
		<i>Yingqi Jia, University of Illinois Urbana-Champaign; Oscar Lopez-Pamies, University of Illinois Urbana-Champaign; Xiaojia Shelly Zhang, University of Illinois Urbana-Champaign</i>
		Speaker: Yingqi Jia (Contributed Talk)

9.12 Pushing Materials Mechanics for Extreme Thermo-Mechanical-Environmental Conditions		
Session: 6A, Room: Hotel-Century III		
Session Chair(s): Yupeng Zhang, yupeng@northwestern.edu		
2:15 PM	2:45 PM	A universal bridging law and its use in computational composite fracture models
		<i>brian cox, gentleman scientist</i>
		Speaker: Brian Cox (Keynote Talk)
2:45 PM	3:05 PM	Phase-field Fracture Coupled with Transient Network Theory to Model Thermo-Oxidative Degradation in Polymers
		<i>Trisha Sain, Michigan Technological University</i>
		Speaker: Trisha Sain (Invited Talk)
3:05 PM	3:25 PM	Localized oxidation processes governing the high temperature failure under cyclic conditions
		<i>Yanfei Gao, University of Tennessee</i>
		Speaker: Yanfei Gao (Contributed Talk)
3:25 PM	3:45 PM	A novel dislocation-He bubble interaction mechanism in copper
		<i>Wurong Jian, Stanford University; Shuozi Xu, University of California, Santa Barbara; Yanqing Su, Utah State University; Irene Beyerlein, University of California, Santa Barbara</i>
		Speaker: Yanqing Su (Invited Talk)
Session: 6B, Room: Hotel-Century III		
Session Chair(s): Yupeng Zhang, yupeng@northwestern.edu		
4:10 PM	4:30 PM	Nanotwinned Ni-Mo-W Thin Films with Exceptional Thermal, Mechanical Stability

		<i>Yu Hyun Park, Korea Advanced Institute of Science and Technology; Jung-Hun Park, Korea Advanced Institute of Science and Technology; KenHee Ryou, Korea Advanced Institute of Science and Technology; Pyuck-Pa Choi, Korea Advanced Institute of Science and Technology; Gi-Dong Sim, Korea Advanced Institute of Science and Technology</i>
		Speaker: Gi-Dong Sim (Invited Talk)
4:30 PM	4:50 PM	Biomimetic 'torene' architecture provides significant magnification of flexural stiffness in plates and shells
		<i>Maziyar Bazmara, University of Houston; Roger Sauer, RWTH Aachen University; Ashutosh Agrawal, University of Houston</i>
		Speaker: Maziyar Bazmara (Contributed Talk)

9.13 Recent Advances in Modeling and Simulation of Nano and Micromechanics of Materials		
Session: 5A, Room: Hotel-Century I		
Session Chair(s): Paul Plucinsky, plucinsk@usc.edu		
9:45 AM	10:15 AM	Modeling crystallographic anisotropy effects on crack-propagation at the microscale
		<i>Zubaer Hossain, University of Delaware</i>
		Speaker: Zubaer Hossain (Keynote Talk)
10:15 AM	10:35 AM	Characterizing interface dislocations in 2D heterostructures
		<i>Nikhil Chandra Admal, University of Illinois at Urbana-Champaign; Tusher Ahmed, University of Illinois at Urbana-Champaign</i>
		Speaker: Nikhil Chandra Admal (Invited Talk)
10:35 AM	10:55 AM	Multiscale particles for next-generation battery technologies
		<i>Dibakar Datta, New Jersey Institute of Technology (NJIT)</i>
		Speaker: Dibakar Datta (Invited Talk)
10:55 AM	11:15 AM	Residual Stresses in Thin Film Deposition Mechanics
		<i>Musanna Galib, Department of Mechanical Engineering, University of British Columbia, 2054 - 6250 Applied Science Lane, Vancouver, BC, V6T 1Z4, Canada; Okan Orhan, Department of Mechanical Engineering, University of British Columbia, 2054 - 6250 Applied Science Lane, Vancouver, BC, V6T 1Z4, Canada; Jian Liu, School of Engineering, Faculty of Applied Science, University of British Columbia, Kelowna, BC, Canada; Mauricio Ponga, Department of Mechanical Engineering, University of British Columbia, 2054 - 6250 Applied Science Lane, Vancouver, BC, V6T 1Z4, Canada</i>
		Speaker: Musanna Galib (Contributed Talk)
Session: 5B, Room: Hotel-Century I		
Session Chair(s): Nikhil Chandra Admal, admal@illinois.edu		
11:40 AM	12:00 PM	Untangling inelasticity and phase transition kinetics in Sn under extreme deformation conditions
		<i>William Schill, Lawrence Livermore National Laboratory; Kathleen Schmidt, Lawrence Livermore National Laboratory; Ryan Austin, Lawrence Livermore National Laboratory; Jon Belof, Lawrence Livermore National Laboratory; Justin Brown, Sandia National Laboratories; Nathan Barton, Lawrence Livermore National Laboratory</i>
		Speaker: William Schill (Contributed Talk)
12:00 PM	12:20 PM	Continuum field theory for the deformations of planar kirigami
		<i>Paul Plucinsky, University of Southern California</i>
		Speaker: Paul Plucinsky (Invited Talk)

12:20 PM	12:40 PM	Application of Strain Functionals for Physics Informed Machine Learning
		<i>Edward Kober, Los Alamos National Laboratory; Avanish Mishra, Los Alamos National Laboratory; Colin Adams, Los Alamos National Laboratory; Nithin Mathew, Los Alamos National Laboratory</i>
		Speaker: Edward Kober (Contributed Talk)
Session: 6A, Room: Hotel-Century I		
Session Chair(s): Mauricio Ponga, mponga@mech.ubc.ca		
2:15 PM	2:35 PM	Investigating the Performance of Strength Models for High Energy Density Applications
		<i>Kazem Alidoost, Lawrence Livermore National Laboratory; Damian Swift, Lawrence Livermore National Laboratory; Raymond Smith, Lawrence Livermore National Laboratory; Ryan Austin, Lawrence Livermore National Laboratory; James Mcnane, Lawrence Livermore National Laboratory</i>
		Speaker: Kazem Alidoost (Contributed Talk)
2:35 PM	2:55 PM	Disorder and Strain Driven Phase Transitions in Magnetic Topological Insulators
		<i>Swarnava Ghosh, Oak Ridge National Laboratory; Markus Eisenbach, Oak Ridge National Laboratory</i>
		Speaker: Swarnava Ghosh (Contributed Talk)
2:55 PM	3:15 PM	FFT and FEA based solutions in micromechanical modeling of SMAs
		<i>Jobin Joy, Department of Aerospace Engineering, Texas A&M University, College Station, TX 77843, USA; Aitor Cruzado, Department of Aerospace Engineering, Texas A&M University, College Station, TX 77843, USA; Amine Benzerga, Department of Aerospace Engineering, Texas A&M University, College Station, TX 77843, USA, Department of Materials Science and Engineering, Texas A&M University, College Station, TX 77843, USA; Dimitris Lagoudas, Department of Aerospace Engineering, Texas A&M University, College Station, TX 77843, USA, Department of Materials Science and Engineering, Texas A&M University, College Station, TX 77843, USA</i>
		Speaker: Jobin Joy (Contributed Talk)
3:15 PM	3:35 PM	Symmetric Tilt Grain Boundary Free Energy Calculations by a Finite-Temperature Quasicontinuum Method
		<i>Miguel Spinola, ETH Zürich; Shashank Saxena, ETH Zurich; Prateek Gupta, IIT Delhi; Dennis Kochmann, ETH Zürich</i>
		Speaker: Miguel Spinola (Contributed Talk)
Session: 6B, Room: Hotel-Century I		
Session Chair(s): Swarnava Ghosh, ghoshs@ornl.gov		
4:10 PM	4:30 PM	Lattice instabilities and amorphous shear band formation in intermetallic alloys
		<i>PRAKARSH PANDEY, University of Wisconsin - Madison; Shiva Rudraraju, University of Wisconsin- Madison</i>
		Speaker: Prakarsh Pandey (Contributed Talk)
4:30 PM	4:50 PM	Controlling mechanical properties in high-entropy alloys via alloying and additive manufacturing processes
		<i>Mauricio Ponga, The University of British Columbia</i>
		Speaker: Mauricio Ponga (Contributed Talk)
4:50 PM	5:10 PM	High-throughput exploration of chemical short-range order through OPERA framework
		<i>Gautam Anand, Indian Institute of Engineering Science and Technology, Shibpur, India; Swarnava Ghosh, Oak Ridge National Laboratory, USA; Markus Eisenbach, Oak Ridge National Laboratory, USA</i>
		Speaker: Swarnava Ghosh (Invited Talk)

Thematic Area 10. Special Symposia

10.3 Materials and Structures for Defense Applications		
Session: 5A, Room: MSC-2501		
Session Chair(s): Francis Phillips, francis.r.phillips7.civ@army.mil; Frank Gardea, frank.gardea4.civ@army.mil		
9:45 AM	10:05 AM	Reusable, Liquid-Nanoporous Energy Dissipation Structures
		<i>Baoxing Xu, University of Virginia</i>
		Speaker: Baoxing Xu (Contributed Talk)
10:05 AM	10:25 AM	Thermohydrogen Refinement of Microstructure (THRM) to Improve the Performance of Material Extrusion Additively Manufactured Ti-6Al-4V
		<i>Brady Butler, DEVCOM - ARL, Texas A&M University, Department of Materials Science and Engineering; Daniel Lewis, Texas A&M University, Department of Materials Science and Engineering; Taylor Hurst, DEVCOM - ARL; James Paramore, DEVCOM - ARL, Texas A&M University, Department of Materials Science and Engineering</i>
		Speaker: Brady Butler (Invited Talk)
10:25 AM	10:45 AM	Hydrogen-enabled Microstructural Engineering of Additively Manufactured Titanium Alloys
		<i>James Paramore, DEVCOM Army Research Laboratory; Michael Hurst, DEVCOM Army Research Laboratory; Matthew Dunstan, DEVCOM Army Research Laboratory; Daniel Lewis, Texas A&M University; Brady Butler, DEVCOM Army Research Laboratory</i>
		Speaker: James Paramore (Invited Talk)
10:45 AM	11:05 AM	Thermodynamically Assisted Microstructure Evolution Simulator, THAMES, on the Virtual Microstructure Generation and Kinetic Investigation of Materials at Various Simulation Conditions
		<i>Mine Ucak-Astarlioglu, USACE/ERDC; Jedadiah Burroughs, USACE/ERDC; Yoonjung Han, Texas A&M University; Jeffrey Bullard, Texas A&M University; Robert Moser, USACE/ERDC</i>
		Speaker: Mine Ucak-Astarlioglu (Contributed Talk)
11:05 AM	11:25 AM	Multifunctional Reconfigurable Materials based on Dynamic Covalent Polymer Networks
		<i>Svetlana Sukhishvili, Department of Materials Science & Engineering, Texas A&M University, College Station, Texas 77843; Qing Zhou, Department of Materials Science & Engineering, Texas A&M University, College Station, Texas 77843; Zhen Sang, Department of Materials Science & Engineering, Texas A&M University, College Station, Texas 77843; Kartik Rajagopalan, TDepartment of Materials Science & Engineering, Texas A&M University, College Station, Texas 77843; Frank Gardea, Weapons and Materials Research Directorate, DEVCOM Army Research Laboratory South, College Station, TX 77843, USA</i>
		Speaker: Svetlana Sukhishvili (Invited Talk)
Session: 5B, Room: MSC-2501		
Session Chair(s): Francis Phillips, francis.r.phillips7.civ@army.mil; Frank Gardea, frank.gardea4.civ@army.mil		
11:40 AM	12:00 PM	The Development of a Directed Energy Deposition (DED) Printability Framework for Improving Part Density and Performance in High Strength Steels
		<i>Matthew Vaughan, Texas A&M University; Michael Elverud, Texas A&M University; Jiahui Ye, Texas A&M University; Raiyan Seede, Texas A&M University; Sean Gibbons, Air Force Research Laboratory; Philip Flater, Air Force Research Laboratory; Bernard Gaskey, Air</i>

		<i>Force Research Laboratory; Raymundo Arroyave, Texas A&M University; Alaa Elwany, Texas A&M University; Ibrahim Karaman, Texas A&M University</i>
		Speaker: Matthew Vaughan (Invited Talk)
12:00 PM	12:20 PM	Actuation Improvement in Humidity-driven Artificial Muscles by Graphene Incorporation
		<i>Sevketcan Sarikaya, Texas A&M University; Hannah Strong, Texas A&M University; Frank Gardea, DEVCOM Army Research Laboratory South; Jeffrey Auletta, DEVCOM Army Research Laboratory; David Mackie, DEVCOM Army Research Laboratory; Mohammad Naraghi, Texas A&M University</i>
		Speaker: Sevketcan Sarikaya (Invited Talk)

10.4 Celebrating Mechanics of Materials: Honoring the legacy of Prof. Sia Nemat-Nasser		
Session: 5A, Room: MSC-2500		
Session Chair(s): Mohammed A. Zikry, zikry@ncsu.edu; Alireza Amirkhizi, alireza_amirkhizi@uml.edu		
9:45 AM	10:05 AM	Time-dependent deformation and rupture of vitrimer
		<i>Shengqiang Cai, University of California, San Diego</i>
		Speaker: Shengqiang Cai (Invited Talk)
10:05 AM	10:25 AM	Mechanics of Metamaterials – Origami and Kirigami
		<i>Horacio Espinosa, Northwestern University; Nicolas Alderete, Northwestern University; Zhaowen Lin, Northwestern University</i>
		Speaker: Horacio Espinosa (Invited Talk)
10:25 AM	10:45 AM	Breaking up is hard to do
		<i>KT Ramesh, Johns Hopkins University</i>
		Speaker: K.T. Ramesh (Invited Talk)
10:45 AM	11:05 AM	Overall properties of heterogeneous media for wave propagation
		<i>Alireza Amirkhizi, University of Massachusetts, Lowell</i>
		Speaker: Alireza Amirkhizi (Invited Talk)
Session: 5B, Room: MSC-2500		
Session Chair(s): Mohammed A. Zikry, zikry@ncsu.edu; Alireza Amirkhizi, alireza_amirkhizi@uml.edu		
11:40 AM	12:00 PM	Causality and Metamaterials
		<i>Ankit Srivastava, Illinois Institute of Technology</i>
		Speaker: Ankit Srivastava (Invited Talk)
12:00 PM	12:20 PM	Machine Learning Predictions of Failure in Hydrated Zirconium Materials
		<i>Tamir Hasan, North Carolina State University; Laurent Capolungo, Los Alamos National Laboratory; Mohammed Zikry, North Carolina State University</i>
		Speaker: Mohammed Zikry (Invited Talk)
Session: 6A, Room: MSC-2500		
Session Chair(s): Alireza Amirkhizi, alireza_amirkhizi@uml.edu; Ghatu Subhash, subhash@ufl.edu		
2:15 PM	2:35 PM	Exploiting “Classical Entanglement” of Acoustic Waves for Quantum Analogue Information Processing

		<i>M Arif Hasan, Wayne State University; Pierre Deymier, University of Arizona; Keith Runge, University of Arizona</i>
		Speaker: M Arif Hasan (Invited Talk)
2:35 PM	2:55 PM	Wave Propagation Through A 180-Degree Bend Junction of Rectangular Cross Section - Theoretical Foundation for A Novel Millipede Bar
		<i>Ghatu Subhash, University of Florida</i>
		Speaker: Ghatu Subhash (Invited Talk)
2:55 PM	3:15 PM	An Investigation of Deformation Fields around Collapsing Pores and Associated Failure Modes
		<i>Barry Lawlor, California Institute of Technology; Guruswami Ravichandran, California Institute of Technology</i>
		Speaker: Barry Lawlor (Invited Talk)
3:15 PM	3:35 PM	Understanding how curing rates affect the structure and strength of polyurea through coarse-grained molecular simulation
		<i>Jay Oswald, Arizona State University; Minghao Liu, Arizona State University</i>
		Speaker: Jay Oswald (Invited Talk)
3:35 PM	3:55 PM	Mitigating Shock, Impact and Control Fragmentation with Metamaterials
		<i>Vitali Nesterenko, Distinguished Professor, Department of Mechanical and Aerospace Engineering, Materials Science and Engineering Program, University of California, San Diego</i>
		Speaker: Vitali Nesterenko (Invited Talk)