ASME SMASIS 2022

The ASME 2022 Conference on Smart Materials, Adaptive Structures and Intelligent Systems

CONFERENCE
Sept 12 – 14, 2022

Location:
The Deatborn Inn
Dearborn, MI

Schedule at a Glance

The American Society of Mechanical Engineers®
ASME®

ASME
SETTING THE STANDARD

Schedule at a Glance

SUNDAY, SEPTEMBER 11		
	FIRESTONE	**FAIRLANE**
1:00PM	Division Leadership Summit (By Invitation Only)	
2:00PM		
3:00PM		Let's Zoom Out Student Event 3:30 PM–6:30 PM
4:00PM		
5:00PM		
6:00PM		
7:00PM		
8:00PM		

MONDAY, SEPTEMBER 11		
TECHNICAL COMMITTEES	**TIME**	**ROOM**
Bio Inspired Structures and Systems	12:10PM–1:40PM	Salons II
Active Materials and Multifunctional Materials	12:10PM–1:40PM	Salon III
Active Material Technologies and Integrated Systems	12:10PM–1:40PM	Salon IV
Energy Harvesting	12:10PM–1:40PM	Salon I
Structural Health Monitoring	12:10PM–1:40PM	Firestone

Schedule at a Glance

SYMPOSIA KEY	
Symposium 1	Development and Characterization of Multi-Functional Materials
Symposium 2	Mechanics and Behavior of Acitve Materials
Symposium 3	Modeling Simulation and Contorl of Adaptive Systems
Symposium 4	Integrated System Design and Implementation
Symposium 5	Structural Health and Performance Monitoring
Symposium 6	Bioinspiered Smart Materials and Systems
Symposium 7	Energy Harvesting
Symposium 8	Emerging Technologies
Symposium 9	Best Student Paper & Hardware Competition

Schedule at a Glance

MONDAY, SEPTEMBER 12								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
7:00AM–8:00AM	Breakfast - Alexandria Ballroom							
8:00AM–9:20AM	Keynote: James E. Hubbard, Jr., Professor, Mechanical Engineering, Texas A&M - Salon II							
9:30AM–10:40AM	**Session 4-1: Adaptive Aerospace Structures I**	**Session 6-1: Design and Modeling of Bioinspired Systems I**	**Session 1-1: Shape Memory Alloy Characterization**	**Session 2-1: Multiferroics**	**Session 3-1: Design of Smart and Adaptive Systems I**	**Session 5-1: Machine Learning**		**Symposium 9: Student Best Paper & Hardware Competition**
Session Chairs	Srinivas Vasista (German Aerospace Center (DLR)) and Farhan Gandhi (Rensslear Polytechnic Institute)	Eric Freeman (University of Georgia) and Jeong Yong Kim (North Carolina State University)	Guher Pelin Toker (University of Kentucky) and Reza Rizvi (York University)	Paris Von Lockette (Penn State University) and Douglas Nicholson (Boeing)	Andres Arrietta (Purdue University) and Jovana Jovanova, (TU Delfts, Netherlands)	Nathan Salowitz (University of Wisconsin Milwaukee) and Rishikesh Srinivasaraghavan Govindarajan (Embry Riddle Aeronautical University)		Amin Bibo (Clemson University), and Giovanni Berselli (University of Genoa)
9:30AM	91054 Vasista Design and Manufacture of a Fluid-Actuated Morphing Winglet Trailing Edge Control Surface	91495 Wang On the Paradox of Twisted and Coiled Polymer Actuators	91014 Toker Effects of Heat Treatments on the Shape Memory Behavior of Nitihf High Temperature Shape Memory Alloys Fabricated by Laser Powder Bed Fusion	90574 Glavan Magnetoelectric Response of Multiferroic Polymeric Composites Containing a Magnetoactive Elastomer	88954 Risso Actuation of Fiber-Reinforced Polymer Surfaces With Multiple Programmable Shapes	98033 Invited Talk Ken Loh University of California, San Diego Distributed Damage Characterization Enabled by Tomographic Methods		
9:50AM	91111 Shah Aerodynamic Modeling and Analysis of a Variable Camber Piezocomposite Rotor	91001 Juturu Swetha Workspace Evolution of Hard Magnetic Soft Elastica	98015 D'Silva Empirical Relationships for Calculating the Fracture Toughness of Ni2mnga Magnetic Shape Memory Alloys Accounting for Their Elastic Anisotropy and Magneto-Mechanical Loading	90591 Kwok Effect of Viscoelasticity on Tunneling Conduction of Piezoresistive Carbon Nanotube Polymer Composites	89315 Tao Implementation of an Origami Dynamics Model Based on the Absolute Nodal Coordinate Formulation			
10:10AM	90409 Shan A Reduced-Order Multi-Body Model for Ornithopters With Piezocomposite Flapping Wings	91234 Wang Rapid Design Cycles of Insect Scale Jumping Robot Phenotypes	98912 Kuntz Miniature Self-Biasing High Temperature Sma Actuators: Production and Characterization	91058 Inhoff Multiscale Modeling of Mangetostriction; a Probabilistic Approach to Magnetic Domain Structures	89459 Zeng Self-Assembly by 4D Printing: Design and Fabrication of Sequential Self-Folding	91119 Sarah Malik An Information Theory Approach for Internet of Things Enabled Damage Monitoring		
10:30AM–10:50AM	Coffee Break - Banquet Foyer							

MONDAY, SEPTEMBER 12								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
10:50AM–12:10PM	**Session 4-2: Adaptive Aerospace Structures II**	**Session 6-2: Microfabrication and Soft Tissues**	**Session 1-2: Active Polymers and Elastomers**	**Session 2-2: Performance of Shape Memory Alloys**	**Session 3-2: Acoustics and Vibration Control**	**Session 5-2: Impedance Based Methods**		**Symposium 9: Student Best Paper & Hardware Competition**
Session Chairs	**Johannes Riemenschneider (German Aerospace Center (DLR)) and Patrick Musgrave (University of Florida)**	**Caterina Lamuta (University of Iowa) and Steven Anton (Tennessee Tech University)**	**Ji Su (NASA) and Mason Zadan (Carnegie Mellon)**	**Douglas Nicholson (Boeing) and Drew Forbes (Fort Wayne Metals)**	**Uwe Marschner (Technische Universität Dresden) and Jovana Jovanova, (TU Delfts, Netherlands)**	**Daewon Kim (Embry Riddle Aeronautical University) and Muhammad Istiaque Haider (University of Wisconsin Milwaukee)**		**Amin Bibo (Clemson University) and Giovanni Berselli (University of Genoa)**
10:50AM	91083 Invited Talk Farhan Gandhi Rensselaer Polytechnic Institute Autonomous Morphing in Rotary-Wing Systems	91158 Garcia Feuntes Analyzing the Mechanical Properties Along the Length of Human Achilles Tendon	91144 Zadan Fabrication of 3D Printed Thermoelectric Devices for Integration Into Liquid Crystal Elastomer Actuators	88502 Schmelter Investigations of the Long-Term Behavior of Electrically Heated Shape Memory Alloy Wires Deflected by a 90° Pulley	88324 Billon 2D Active Liner Experimental Results in Acoustic Flow Duct Facility	89142 Tallman On the Development of a Concentric Cylindrical Model for the Deformation-Dependent Electrical Resistivity of Fiber-Reinforced Composites		
11:10AM		91060 Jessie Ringley Bioprinted Droplet Network Functionalized Tissues	91149 Mailen Thermomechanical Properties of Liquid Crystal Elastomer Films	88882 Theren Influence of the Phase Transformation Behaviour of NiTi Shape Memory Alloy Wires on the Predictability of Strain During Operation	90914 Ezzine Numerical Computation of the Acoustic Response of an Active Airfoil With Impedance Boundary Conditions to a Turbulent Wake	91151 Tarazaga Temperature Compensation for Electromechanical Impedance Signatures With Data-Driven Modeling		
11:30AM	90790 AMeduri Aeroacoustic and Structural Achievements for a Morphing Blade Twist System Developed for the European Project Shape Adaptive Blades for Rotorcraft Efficiency	Invited Talk Michael Dickey North Carolina State University	93851 Masoud Effect of Multilayer Dielectric Elastomer Actuator (Dea) Construction on Performance and Breakdown Strength	90483 Mayer Design of a Modular Lifespan Test Bench for Shape Memory Alloy Wires	98911 Lin Electroelastic Metasurface With Multi-Resonant Piezoelectric Shunts for Simultaneous Anomalous Wavefront Control Over Distinct Frequencies	91160 Oyekola Towards Meta-Fixture Design for Indirect Electromechanical Impedance Measurements: On the Effects of Elastic Metastructures on Defect Detection Capabilities		
11:50AM	91454 AMeduri Experimental Tests of a SMA Based Blade Twist System: Wind Tunnel and Whirl Tower Outcomes			90911 Kiefer A Thermodynamically-Informed Phase-Field Model to Study the Martensite Formation in a Novel Type of Iron-Based Smart	98824 Dupont Characterization of Adaptive Piezoelectric Elastic Waveguiding Metasurface			
Technical Committee Meetings								
12:10PM–1:40PM	Energy Harvesting	Bio Inspired Structures and Systems	Active and Multifunctional Materials	Active Material Technologies and Integrated Systems	Adaptive Systems Dynamics and Controls	Structural Health Monitoring		
12:10PM -1:40PM	Student Trivia Lunch - Rouge River							
12:10PM -1:40PM	Lunch - Alexandria Ballroom							

Schedule at a Glance

MONDAY, SEPTEMBER 12								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
1:40PM–3:20PM	**Session 4-3: Optimization and Control of Active Systems**	**Session 6-3: Artificial Synapses and Electroactive Materials**	**Session 1-3: Liquid Metal Composites**	**Session 2-3: Shape Memory Alloys**	**Session 3-3: Modeling Complex Materials and Systems**	**Session 5-3: Vibration Based Methods**		**Symposium 9: Student Best Paper & Hardware Competition**
Session Chairs	**Patrick Musgrave (University of Florida and Onur Bilgen (Rutgers University)**	**Andy Sarles (University of Tennessee) and Steven Anton (Tennessee Tech University)**	**Mohammad Malakooti (University of Washington) and Eric Markvicka (University of Nebraska)**	**Mike Kuntz (Smarter Alloys) and Douglas Nicholson (The Boeing Company)**	**Uwe Marschner (Technische Universität Dresden)**	**Tyler Tallman (Purdue University) and Daewon Kim (Embry Riddle Aeronautical University)**		**Amin Bibo (Clemson University) and Giovanni Berselli (University of Genoa)**
1:40PM	90695 Bhayadia Feedback Control for Traveling Wave Generation With Bending Actuators	91217 Makhoul-Mansour Biomolecular Membrane-Based Soft Materials for Multifunctional, Adaptive, and Neuromorphic Systems	88921 Markvicka Elastomer Composites With Hybrid Liquid Metal Fillers for Independently Controllable Properties	90970 Schuleit Micro Laser Welding of NiTi Shape Memory Wires and Printed Circuit Boards	92010 Baggetta Mechatronic Design and Physical Prototyping of a Three-Fingered Gripper for Underwater Manipulation	90936 Fassois Random Vibration Based Robust Damage Detection on an Operating Wind Turbine Blade Under Variable Natural Excitation Conditions		
2:00PM	91015 Sparenberg Modified Triply Periodic Actuator Topologies	89025 Shakib Novel Geopolymer Based Artificial Synapses	88584 Malakooti Functional Elastomer Composites for Wearable Thermoelectric Energy Scavengers	91582 Hartl Shape Memory Alloy Rendering of Experimental Analysis and Calibration Tool	89013 Weerakkody Dynamic Modelling and Robust Control for Twisted and Coiled Artificial Muscles	88421 Song Vibration-Based Bridge Damage Detection Using Image-Based Pre-Trained Deep Learning Network		
2:20PM	90581 Wright Experimental Validation For A Multi-Objective Optimized Piezocomposite Morphing Airfoil	89181 Maraj Biorealistic Short-Term Plasticity in Biomolecular Synapses Enhances Reservoir Computing Classification	100315 Invited Talk Christopher Tabor Air Force Research Laboratory Liquid Metal Electronics	98307 Renuka Balakrishna Design of Soft Magnetic Materials	91225 Marschner Analogies Between Stimuli-Responsive (Smart) Hydrogel-Based Microfluidic Valves and Electronic Transistor	97722 Yang Towards Computational Super-Resolution Ultrasonic Array Imaging of Material Defects via Hierarchical Multi-Scale Deep Learning		
3:00PM	90706 Katibeh Design Optimization of a Piezocomposite Ornithopter Wing Planform Using a Genetic Algorithm	91020 Hines Investigation Into Piezoelectric Nanoparticle Dispersion in Polymethyl Methacrylate Bone Cement			90955 Bakardjiev Electromechanical Model of Dielectric Elastomer Transducer			
3:20PM–3:40PM	Coffee Break - Banquet Foyer							
3:20PM–3:40PM	Student Event: Networking Over Coffee - Banquet Foyer							

MONDAY, SEPTEMBER 12								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
3:40PM–5:20PM	**Session 4-4: Integrated Smart Systems**	**Session 6-4: Design and Modeling of Bioinspired Systems II**	**Session 1-4: Modeling and Characterization of Multifunctional Materials**	**Session 2-4: Modeling and Simulation of Active Materials**	**Session 3-4: Shape Memory Alloy Characterization II**	**Session 5-4: Sensor Design**	**Session 8-1: Design Optimization**	**Symposium 9: Student Best Paper & Hardware Competition**
Session Chairs	**Brent Utter (Lafayette College) and Jonathan Luntz (University of Michigan)**	**Eric Freeman (University of Georgia) and Michael Philen (Virginia Tech)**	**Sumit Gupta (Oak Ridge National Laboratory) and Gary Seidel (Virginia Tech)**	**Paris Von Lockette (Pennsylvania State University) and Douglas Nicholson (Boeing)**	**Kenny Pagel (Fraunhofer Institute for Machine Tools and Forming Technology) and Jovana Jovanova (TU Delft, Netherlands)**	**Rishikesh Srinivasaraghavan Govindarajan (Embry Riddle Aeronautical University) and Tyler Tallman (Purdue University)**	**Richard Beblo (AFRL/RQVC) and Paul Motzki (Saarland University)**	**Amin Bibo (Clemson University), Giovanni Berselli (University of Genoa)**
3:40PM	91178 Hott Investigation of Mounting Techniques for Concrete Floor-Mounted Accelerometers Used in Smart Buildings	90690 Hargrove Modeling of a Nonlinear Superelastic Thermally Actuated Compliant Mechanism	91426 Seidel Effective Property Prediction of Multifunctional Cnt-Polymer Nanocomposites via Reduced-Order Two-Point Cluster and Blocking Functions	91175 Widdowson Multi-Objective Optimization of Predicted Magnetic Properties From Multifield Processing Conditions in Polymer Matrix Particle Composite	88892 Pagel Characterization and Modeling of the System Behavior of High Load SMA Actuators	91069 Srinivasaraghavan Flexible Piezoelectric Wave-Based Sensor: Numerical Analysis And Validation	98861 Lu Dispersion Optimization of Phononic Crystals Using Learning-Based Approach	
4:00PM	91443 Tiantian Hinged Tile-Based Air Surface for Morphing Windshield Cowling	91008 Gothard A Method to Generate 3D Patient-Specific Total Knee Arthroplasty Tibia Model	90607 Kloster Simulating the Effects of Porosity on the D31 Piezoelectric Coefficient of Polyvinylidene Fluoride	91710 Sutter Finite Element Analysis of the Nonlinear Material Behavior of Ferroelectrics Under Complex Load Scenarios	90983 Panwar Effect of Coating on the Continuous Cycle Actuation of Shape Memory Alloy Wires: Analyses and Experiments	91045 Bergman Additive Manufacturing of Advanced Active Sensing Tags for Structural Health Monitoring Systems	97312 Bielefeldt Development of Material Property Feasibility Constraints for a Multiscale Topology Optimization Framework Using Radial Basis Function Interpolations	
4:20PM	91201 Geier Challenges of Upscaling Power Composites for Aerospace Applications	92022 Duan Optimal Bipennate Fluidic Artificial Muscle Bundle Design for Ankle Joint Motion With Limited Volumetric Capacity	91429 Seidel Effect of Heterogeneity and Voids on the Piezoresistive Response of Cnt-Based Polymer Bonded Energetics Using Statistical Correlation Functions	92672 Shanmugam A Comparison of Meshfree and Finite Element Based Magnetostatic Modeling	88386 Hasan A Finite-Strain Phase-Field Model for Fracture in Shape Memory Alloys: Modeling Framework and Experimental Validation	91047 Reed Development of Embeddable Additive Manufacturing Microsensors for Structural Health Monitoring	98817 Danawe Broadband Subwavelength Imaging via Phononic Crystal Flat Lenses	
5:00PM	91089 Riemenschneider Integrated Piezoceramic Sensors for Local Ice Detection	91587 Kim Implications of Resistive Force on Variable Recruitment Fluidic Artificial Muscle Bundle State Transition	91256 Bartlett Shape Morphing Mechanical Metamaterials for Multifunctional Robots	89036 Song A Common Simulating Model on Complicated Self-Deformation of 4D Printed Bilayer Structures			90737 Li In-Plane Mechanical Properties of an Adaptive Honeycomb Structure	
5:20PM–6:00PM	Bus Loading and Travel to Detroit Princess							
6:30PM–8:45PM	Pioneer Awards Banquet - Detroit Princess Riverboat Dinner Cruise							

Schedule at a Glance

TUESDAY, SEPTEMBER 13								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
7:00AM–8:20AM	**Breakfast - Alexandria Ballroom**							
8:30AM–9:30AM	**Session 4-5: Shape Memory Alloy Applications in Integrated Systems**	**Session 6-5: Design and Modeling of Bioinspired Systems III**	**Session 1-5: Composites and Hybrid Systems**	**Session 2:5: Development of Advanced Actuators and Sensors**	**Session 3-5: Advanced Materials and Transduction Applications**	**Session 5-5 Boundary Condition Considerations**	**Session 8-2: Advanced Manufacturing**	
Session Chairs	**Johannes Riemenschneider (German Aerospace Center (DLR)) and Srinivas Vasista (German Aerospace Center (DLR))**	**Mary Frecker (Pennsylvania State University) and Emily Duan (North Carolina State University)**	**Amir Ameli (University of Massachusetts Lowell) and Tyler Tallman (Purdue University)**	**Patrick Walgren (Texas A&M University) and Mike Kuntz (Smarter Alloys)**	**Oliver Myers (Clemson University) and Maria Sakovsky (Stanford University)**	**Muhammad Istiaque Haider (University of Wisconsin - Milwaukee), Nathan Salowitz (University of Wisconsin - Milwaukee)**	**Jovana Jovanova (TU Delft, Netherlands) and Julianna Abel (University of Minnesota)**	
8:30AM	91898 Invited Talk Burkhard Maass Ingpuls GmbH Shape Memory Alloy Actuators - a Key Technology for Integrated Systems	89275 Sigrest Computational Validation That Whiffling-Inspired Gaps Require Less Work for Roll Control Than Conventional Ailerons at High Rolling Moment Coefficients	97843 Ameli Electrical Conductivity of Multifunctional Blend Composites of Polycarbonate and Polyethylene With Hybrid Fillers	90797 Paira High Strength Actuators	90793 Eaton Simulating Age Related Radial Pulses Using Magneto-Rheological Fluids	90377 Li Methods for the Rapid Detection of Boundary Condition Variations in Structural Systems	88987 Bell Automated Manufacturing Process for Carbon Fiber Twisted and Coiled Artificial Muscles (Tcams)	
8:50AM		91026 Freeman Modeling Shape-Shifting Networks of Biologically-Inspired Membranes	93699 Jamshidi On the Use of Magnetic Fields for Dispersing Steel Fibers in Silicone	91134 Long Self-Folding Polymer Origami as a Deployable Spacecraft Structure	90988 Moretti Numerical Investigation of Bistable Energy Harvesting Based on Silicone Dielectric Elastomer Generators	88793 Sloboda Damage Assessment From Attractor Boundary Deformation	Invited Talk Maria Sakovsky Stanford University Re-Programming Mechanical and Multi-Physics Response in Metastructures	
9:10AM	90573 Molitor High-Power SMA Bowling Ball Catapult	91123 Pan Analytical Modeling of Segmented Magneto-Active Elastomer Unimorph Actuators With Soft or Hard Magnetic Particles	90256 Salowitz Investigation Into Etching Effects on the Interface Strength Between Nickel Titanium and Bismuth Tin for the Creation of Metal Matrix Self Healing Composites	98904 Nataraj Reconfigurable Metamaterials for Aerospace Applications	91114 Momenzadeh Design Tradeoffs and Meso-Architecture in a Magnetorheological Elastomer Peristaltic Pump			
9:30AM - 10:20AM	Coffee Break/ Meet the New SMASIS Division - Lincoln Room							
9:30AM - 10:20AM	Student Event: Student Career Panel - Rouge River							

TUESDAY, SEPTEMBER 13								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
10:20AM–11:40PM	**Session 4-6: Shape Memory Alloy Enabled Mechanisms I**	**Sessions 6-6 and 8-3: Vision Session (Joint Sessions 6-6 and 8-3) Engineered Living Materials I**	**Session 1-6: Additive Fabrication and Manufacturing of Materials and Novel Material Systems**	**Session 2-6: Characterization of Advanced Actuators and Sensors**	**Session 3-6: Reduced Order Modeling**		**Session 8-3: Vision Session (joined 6 and 8 session): Engineered Living Materials I**	**Session 7-1: Applications in Energy Harvesting**
Session Chairs	**Paul Motzki (Saarland University) and Brent Utter (Lafayette College)**	**Joseph Njem (Pennsylvania State University) and Jovana Jovanova (TU Delft, Netherlands)**	**Christopher Bowland (Oak Ridge National Laboratory) and Constantin Ciocanel (Northern Arizona State University)**	**Drew Forbes (Fort Wayne Metals) and Patrick Walgren (Texas A&M University)**	**Hongcheng Tao (Purdue University) and Yongchao Yang (Michigan Technological University)**			**Hrishikesh Danawe (University of Michigan) and Serif Tole (University of Michigan)**
10:20AM	90957 Motzki A Novel Compact Concept Design of an SMA Based Endoscope	Invited Talk Zoubeida Ounaies Pennsylvania State University Living Multifunctional Materials: Opportunities for Collaborations, Community Building and Research Innovations	91072 Newell 3D Printed Flexible Dielectric Electroactive Polymer Sensors	91124 Siwakoti Quantifying Stored Energy for Shape Recovery via Enthalpy Relaxation	93713 Walgren Can the Mathematics of Constitutive Plasticity Describe Structural Nonlinearities? Reduced Order Modeling for Efficient Adaptive Structures Design			90798 Aghazadeh Energy Harvesting From Motions of a Robotic Worm
10:40AM	91002 Hutapea Design and Control Strategy of Tip Manipulation for Shape Memory Alloy Actuated Steerable Needle		88833 Phillips Material Characterization of Fused Filament Fabrication for Lower-Limb Prosthetic Sockets	89537 Ramesh Characterization and Uncertainty Analysis of Heat Transport in 3D Printed Multifractal Media	97724 Yang A Physics-Integrated Deep Learning Framework for Discovering Reduced-Order Models of Nonlinear Dynamical Systems			98913 Khan Characterization of Work Output for Niti-Based Sma Accounting for Application Based Transient Thermo-Mechanical Behaviour
11:00AM	90586 Pagel Development of Contacting Solutions for Shape Memory Alloy Wires	Panel	90852 Wang 4D Printing of Thermosetting Shape Memory Polymer for Active Deformation Structures	90215 Chowdhury Fatigue Analysis of Bistable Composite Laminate	Invited Talk Jian Zhao Ultrasensitive Mass Sensing Utilizing Nonlinear Compliant Microbeams			91270 Erol An Equivalent Circuit Model for the Reconfigurable Ducted Turbine Array Concept
11:20AM			90268 Alavi Digital Information Storage Mechanical Metamaterials	91428 Seidel Investigation of Strain and Damage Sensing of Binder With Mwcnts and Conductive Grains Under Cyclic Compressive Loads				
12:10PM–1:40PM	Lunch Keynote: Paul Krajewski, Director, Vehicle Systems Research, GM Research & Development - Alexandria Ballroom							

Schedule at a Glance

TUESDAY, SEPTEMBER 13								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
1:40PM–3:20PM	**Session 4-7: Shape Memory Alloy Enabled Mechanisms II**	**Session 6-7: Cephalopods-Inspired Systems**	**Session 1-7: Composites for Actuation and Sensing**		**Session 3-7: Dynamics and Control of Morphing Wing**	**Session 8-4: Design of Smart Structures**		**Session 7-2: Energy Harvesting Structures**
Session Chairs	**Kenny Pagel (Fraunhofer Institute for Machine Tools and Forming Technology) and Brent Utter (Lafayette College)**	**Caterina Lamuta (University of Iowa) and Jeong Yong Kim (North Carolina State University)**	**Mohammad Malakooti (University of Washington) and Christopher Bowland (Oak Ridge National Laboratory)**		**Anthony Olivett (University of Buffalo) and Rafael Heeb - (University of Bristol)**	**Guangbo Hao (University College Cork) and Andres Arrietta (Purdue University)**		**Hongcheng Tao (Purdue University)**
1:40PM	90552 Gorges Control of Rotatory Decoupled Antagonistic SMA Actuators	89004 Kotak Marine Biofilm Removal via Cephalopod-Inspired Smart Skin	89153 Restrepo Morphing Composite Membrane With Temperature Induced Shape-Shifting Capabilities		90198 Prabhakar Dynamics and Stability of Camber Morphing Wing With Time-Varying Stiffness	93859 Kallevig Preliminary Design of Martian Rover Wheels Using Superelastic Niti Textiles		98866 Hwang Energy Harvesting From Transition Waves in Bistable Metamaterials
2:00PM	90335 Kiekel Characteristic Value-Based Design System for Shape Memory Springs	89024 Maxon Muscular Hydrostats Inspired by Cephalopods	90788 Saquibb Design and Testing of a Variable Stiffness Honeycomb Composite		92009 Haughn MFC Morphing Aileron Control With Intelligent Sensing	99787 Arrieta Controlled Underactuated Soft Robotics From Hierarchical Multistability		91168 Germer Strain Based Tire Pressure Monitoring Systems (Tpms) With Synchronous Electric Charge Extraction (Sece)
2:20PM	90364 Pagel Development of Design Principles for SMA Wave Springs	Invited Talk Alon Gorodetsky University of California, Irvine Dynamic Materials Inspired by Cephalopods	93821 Gupta Model-Enabled Design of Multifunctional Composites for Passive Self-Sensing and Energy Harvesting With Improved Mechanical Strength		93736 Phillips Analysis of Aeroelastic Deformation in Reconfigurable Wings	90772 Djokikj Enchanced Functionality Design of Soft Grabbing Robot With Virtual Reality		90623 Danzi Nonlinear Dynamics of a Two Members Angle-Shaped Energy Harvester
3:00PM			90742 Kravanja Adaptive Magneto-Responsive Surfaces Fabricated by Laser-Based Microstructuring		93488 Heeb Design Space Exploration and Modelling of GATOR 3D Printed Morphing Skins			
3:20PM–3:40PM	Coffee Break - Banquet Foyer							
3:20PM–3:40PM	Student Event - Networking Over Coffee - Banquet Foyer							

TUESDAY, SEPTEMBER 13								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
3:40PM–5:20PM	**Session 4-8: Emerging Integrated System Applications**	**Session 6-8: Bioinspired Vehicles and Mechanisms**	**Session 1-8: Shape Memory Materials**		**Session 3-8: Design of Smart and Adaptive Systems II**	**Session 8-5: Sensing and Actuation**		**Session 7-3: Emerging Frontiers in Energy Harvesting**
Session Chairs	**Wonhee Kim (General Motors) and Amit Bhayadia (University at Buffalo)**	**Zahra Soltani (Pennsylvania State University) and Michael Philen (Virginia Tech)**	**Ji Su (NASA) and Amir Ameli (University of Massachusetts Lowell)**		**Manuel Collet (Université de Lyon) and Uwe Marschner (Technische Universität Dresden)**	**Juliana Abel (University of Minnesota) and Paul Motzki (Saarland University)**		**Serif Tole (University of Michigan)**
3:40PM	91090 Olivett Power Efficiency of Drag Reduction Using Traveling Waves for Morphing Wing Airfoil	93775 Lee Free Flight Experiment and Design of a Deployable Wing Mechanism of an Insect-Inspired Glider Based on Morphological and Aerodynamic Characterization of Dissosteira Carolina Grasshoppers	90905 Luo Shape Memory Epoxy Resin and Its Composites With Narrow Transition Temperature		89963 Sakovsky Low-Energy Stiffness Modulation in Laminated Hinges	90779 Pettys-Baker Characterizing the Effects of Annealing Temperature on Knitted Shape Memory Actuators		Invited Talk Chris Vermillion North Carolina State University Motion in the Ocean – Revolutionizing Marine Hydrokinetic Energy Harvesting Through the Design and Periodic Motion Control of Underwater Kites
4:00PM	91040 Vasista Analysis and Design of an Adaptive Turbofan Engine Inlet	88529 Hess The Role of Compliance in Generating Traveling Waves on a Bio-Inspired Flexible Propulsor	98731 D'Silva The Dependency of Twinning Stress on the Magneto-Mechanical Loading in Ni2mnga Magnetic Shape Memory Alloys		91622 Quan Digital Stiffness and Inertial Programming	90349 Salowitz Investigation of the Resistive Response of Reduced Graphene Oxide for Sensing Large Strains (>10%)		
4:20PM	98915 Khan Novel Method to Fabricate Monolithic Niti Based Torque Tubes Using Electrical Discharge Machining	93727 Saro-Cortes Design, Fabrication, and Evaluation of a Flying Fish Inspired Robotic Model Organism	90933 Krancher Investigation of Transformation Temperatures, Microstructure, and Deformation Behavior of a Pseudoelastic Cu-Based Shape Memory Alloy		88355 Wheatcroft Conceptual Design of a Shape-Adaptive Structure With Tailored Structural Instability	89055 Woo Soft Actuators From Auxetic Structures and Shape Memory Alloys		91165 Mousavi Micro Triboelectric Generators to Toggle Mems Switches
5:00PM	90430 Langbein Charging Plug With Smart Clamp Contacts for Fast Charging of Electric Cars	93789 Zekry Coverts as Yaw and Roll Bio-Inspired Control Devices for Tailless Uavs	91681 Courant Bridging the Scales Between Twin Level and Component Level Models of Magnetic Shape Memory Alloys		88516 Fuchi Machine Learning and Finite Element Hybrid Analysis for Reduced Cost Flow Simulations	90707 Boerkamp Design of a Flexible Transducer Array and Characterisation of Piezoelectric Sensors for Curvature Compensation		
5:20PM	99246 Luntz Planar Design of Multi-Axial Rigid Load-Bearing Tendon Constrained Inflatables	91075 Olivett Traveling Waves for Flow Control: Biological Mechanisms in Aquatic Life Guide Design of Efficient Morphing Wing Aircraft	90963 Krancher Examination of the Interdependency of Applied Load, Realizable Stroke and Transition Temperatures in Cyclic Tests Concerning Lifetime of Single Crystalline CuAlNi					
6:00PM-7:30PM	SMASIS Division Meeting - Alexandria Ballroom							
8:30PM- 10:30PM	Student Game Night - Ten Eyck Tavern							

Schedule at a Glance

WEDNESDAY, SEPTEMBER 14								
	SALON I	**SALON II**	**SALON III**	**SALON IV**	**FAIRLANE**	**FIRESTONE**	**ROUGE RIVER**	**GROSSE POINTE**
8:00AM–9:20AM	Keynote: Charles Farrar, LADSS - Salon II							
9:20AM - 9:30AM	Coffee Break - Banquet Foyer							
9:30AM - 10:40AM		**Sessions 6-9 and 8-6: Vision Session (Joint Sessions 6-9 and 8-6) Engineered Living Materials II**	**Session 1-9: Advanced Electronic Materials**	**Session 7-4: Triboelectric Energy Harvesting**				
Session Chairs		**Caterina Lamuta (University of Iowa) and Jovana Jovanova (TU Delft, Netherlands)**	**Reza Rizvi (York University) and Sumit Gupta (Oak Ridge National Laboratory)**	**Zenkun Lin (University of Michigan) and Mohammad Alzgool (Binghamton University)**				
9:30AM		91281 Rojas Chains of Miura-Ori Spring Origami Blocks	93861 Rizvi Enhanced Electrical Conductivity of Functionally-Graded Graphene Oxide Films for Transient Electronics	89368 LI A Triboelectric Transduction Mechanism From Flow Induced Low-Frequency Structural Resonance				
9:50AM		90743 Jovanova Shark Skin Inspired Lattice Structure for Drag Reduction	89332 Liu A Special Electrode Can Be Bonded to Stainless Steel for High Temperature Application in MEMS Structure	90875 Yang Comparison of Power Density of Triboelectric Generators via Frequency-Up-Conversion Method				
10:10AM		98870 Palaniswamy Electrostatic Artificial Muscle Soft Actuators		91120 Hossain A Liquid Metal-Based Flexible and Stretchable Triboelectric Generator for Soft Robotic Applications				

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