SMASIS Conference Synopsis

Adaptive Structures and Materials Systems by definition are intelligent systems that have sentience and responsiveness to changing environments. The field has rapidly matured due to interdisciplinary efforts across universities, government, and industry. To continue the high impact growth of this field, the purpose of this conference is to assemble world experts across engineering and scientific disciplines (mechanical, aerospace, electrical, materials, and civil engineering, biology, physics chemistry, etc.) to actively discuss the latest breakthroughs in smart materials, the cutting edge in adaptive structure applications and the recent advances in new device technologies and basic engineering research. The conference is divided into symposia ranging from basic research to applied technological design and development to industrial and governmental integrated system and application demonstrations.

Schedule

Feb 15, 2023: 400 word abstract due
Feb 22, 2023: Abstract acceptance notification
March 22, 2023: Full-length draft paper due
May 3, 2023: Paper acceptance notification
June 9, 2023: Copyright form due
June 12, 2023: Final revised paper due

Full papers will appear in an archival ASME Conference Proceedings. High quality conference papers will be considered for publications in relevant ASME journals with an expedited review process.

Authors please note: Only 2 presentations per author with one full registration.

Participation

Authors should submit a 400 word abstract to the conference web site https://event.asme.org/smasis

Questions can be directed to:

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Image courtesy of Henry Han

Call for Abstracts

ASME Conference on

SMART MATERIALS, ADAPTIVE STRUCTURES AND INTELLIGENT SYSTEMS

September 11 – 13, 2023
Austin, TX

Sponsored by the Smart Materials, Adaptive Structures, and Intelligent Systems Division

The conference is divided into symposia broadly ranging from basic research to applied technological design and development to industrial and governmental integrated system and application demonstrations. The symposia and their topical areas specifically are:

Development and Characterization of Multifunctional Materials

Chair: Mohammad Malakooti, *U. of Washington*
Co-Chairs: Amir Ameli, *U. of Mass. Lowell*
Ji Su, *NASA*

Multifunctional material formulations, evaluation, synthesis, and processing; multifunctional composites and hybrid materials; bio-inspired and nano-composites; self-healing, shape memory, piezoelectric, electrostrictive and magnetostrictive materials; material property enhancement; interface and interaction science; data and AI/machine learning driven multifunctional materials discovery.

Bioinspired Smart Materials and Systems

Chair: Matthew Bryant, *NC State*
Co-Chairs: Vanessa Restrepo Perez, *TAMU*
Caterina Lamuta, *U. of Iowa*

Convergent topics in engineering and biology such as modeling and simulation of biological systems; biomechanics; biomimetic and bioinspired devices and materials; biomolecular assemblies, bioinspired or soft robotics; biohybrid or living machines; smart prosthetics and implants.

Modeling, Simulation and Control of Adaptive Systems

Chair: Giovanni Berselli, *Univ. of Genoa*
Co-Chairs: Abdessattar Abdelkefi, *NMS Univ.*
Jeff Hill, *Brigham Young Univ.*

Micro and macro level modeling; vibration and acoustic control; passive/semi-active/active damping and stiffness variation; actuation and motion control; intelligent and adaptive control; nonlinear control; hysteresis control; modeling simulation and control of micro/nano systems; nonlinear dynamics, and nonlinear vibration.

Energy Harvesting

Chair: Serife Tol, *Univ. of Michigan*
Co-Chairs: Wei Che Tai, *Michigan State Univ.*
Lihua Tang, *Univ. of Auckland*

Modeling and experiments of energy harvesting transducers and applied systems using piezoelectric and magnetostrictive materials; electroactive polymers; inductive and capacitive devices; MEMS and NEMS configurations; novel circuits and storage devices; novel applications/analysis of traditional transduction (e.g. solar, thermoelectric); energy harvesting using metamaterials.

Structural Health Monitoring

Chair: Daewon Kim, *Embry Riddle*
Co-Chairs: Zhenhua Tian, *Virginia Tech*
Sumit Gupta, *ORNL*

Structural asset and life cycle monitoring; condition-based and predictive maintenance; damage detection; digital twin; digital thread and authoritative source of truth; product lifecycle management; industrial IOT; AI and machine learning; physics-informed machine learning; data analytics, data science and big data; wireless and remote monitoring; edge computing; distributed sensing; human performance monitoring; HSI.

Integrated System Design and Implementation

Chair: Brent Utter, *Lafayette College*
Co-Chairs: Patrick Musgrave, *Univ. of Florida*
Farhan Gandhi, *Rensselaer Poly.*

Adaptive/intelligent/integrated systems design; smart structures design processes and tools; smart devices and technologies; compliant mechanism design; Industrial and government smart products and system applications; sensors and actuators; power and control electronics; smart electronics and devices; MEMS.

Mechanics & Behavior of Active Materials

Chair: Paris von Lockette, *Penn State Univ.*
Co-Chairs: Douglas Nicholson, *Boeing*
John Gallagher, *Merrimack College*

Advanced constitutive measurements; micro- and nano-mechanics of actuator & sensor materials; phase field modeling; multi-scale and multi-physics material models; finite element implementations; reliability issues: aging, fatigue, and fracture; materials for energy storage; multi-ferroic materials.

Student Events

Student events at SMASIS2023 will provide opportunities for technical communication, networking, and community outreach. All student authors are invited to compete for the student best paper award, and the student hardware competition. Hardware demonstrators and prototypes will be exhibited throughout the conference. The conference will also include formal and informal networking opportunities, as well as an excursion to explore Austin.

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