



**ENGINEERING
MECHANICS
INSTITUTE**



**Georgia
Tech**



**ASCE Engineering Mechanics Institute 2023 Conference
Atlanta, GA, USA | June 6 – 9, 2023**

Program at a Glance

- **Ferst Center for the Arts:** Opening remarks and plenary lectures
- **EH** – Exhibition Hall; **SC** – John Lewis Student Center; **IC** – Instructional Center

Tuesday, June 6	8:00 – 17:00 Registration (daily in EH)	Wednesday, June 7	Thursday, June 8	Friday, June 9
17:00 – 19:00 Registration (EH)	7:45 – 8:15 8:15 – 8:30	Continental Breakfast (SC) Opening Remarks	Continental Breakfast (SC)	Continental Breakfast (SC)
8:00 – 17:00 Short Courses	8:30 – 9:30	Plenary: Eleni Chatzi	Plenary: Catherine O’Sullivan	Plenary: Genda Chen
8:00 – 15:00 EMI Board of Governors Meeting (SC3245)	9:30 – 10:00 10:00 – 12:00 12:00 – 13:00	Coffee Break (SC & EH) ¹ Technical Sessions ² SGH Lunch (SC & EH)	Coffee Break (SC & EH) Technical Sessions ³ Thornton Tomasetti lunch (SC & EH)	Coffee Break (SC & EH) Technical Sessions Lunch (SC & EH) ⁴
9:00 – 17:00 NSF Education Workshop (EH226)	13:00 – 14:00 14:15 – 15:35 15:35 – 16:00	Plenary: Chad M. Landis Technical Sessions Coffee Break (SC & EH)	Plenary: Yuri Bazilevs Technical Sessions Coffee Break (SC & EH)	Plenary: Daniel Straub Technical Sessions
14:00 – 18:00 EMI Technical Committee Meetings	16:00 – 18:00 19:00 – 21:00	Technical Sessions ⁵	Technical Sessions Conference Banquet and Award Ceremony (EH)	
18:00 – 20:00 Reception (EH)				

¹ 9:30 – 17:00 Wednesday, June 7 – General Poster Presentations, John Lewis Student Center 3rd floor hallway

² 11:00 – 13:00 Wednesday, June 7 – Safe Space Workshop - LGBTQIA Inclusive Practices, EH 222 - Buckhead

³ 11:00 – 13:00 Thursday, June 8 – Tenured. Now what? Mentoring and Career Planning for Tenure-track and Recently Tenured Faculty Members, EH 122 – Midtown V

⁴ 12:00 – 13:00 Friday, June 9 – Industry-Student Mixer, EH 127 – Midtown I

⁵ 18:00 – 19:30 Wednesday, June 7 – Joint USACM Large Scale TTA EMI CMC Career Path Panel, IC 103

ASCE EMI 2023

ASCE ENGINEERING MECHANICS INSTITUTE 2023 CONFERENCE

Atlanta, Georgia, USA

June 6 – 9, 2023

ORGANIZED BY

GEORGIA INSTITUTE OF TECHNOLOGY (Georgia Tech)

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Yang Wang

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Welcome Message from the EMI President



Sankaran Mahadevan, Ph.D., F.EMI, M.ASCE
Vanderbilt University
EMI President (2021-2023)



Greetings everyone!

I am excited to welcome you to EMI 2023 at Georgia Tech, partly because Georgia Tech is one of the very best engineering schools in the world, and partly because it is my alma mater! (I received my Ph.D. here in 1988).

We have seen a substantial rise in EMI activities during the past year, including an outstanding EMI 2022 conference hosted by Johns Hopkins University. This year, in addition to EMI 2023 at Georgia Tech, we also look forward to the international counterpart EMI-IC 2023 in Palermo, Italy in August. The EMI international conferences have become a regular annual feature, cementing our global outreach and impact.

At EMI, we have added new technical committees and streamlined existing administrative committees during the past year. We have added a prestigious new award (thanks to the efforts of Professor Pol Spanos), the Wilfred D. Iwan Award for Mentorship in Mechanics Research, to recognize outstanding mentors of young researchers in our community. We are now embarking on developing a strategic plan for the next decade, in line with ASCE's six strategic directions: innovate, advocate, inspire, stimulate, magnify, and deliver.

Almost 25% of EMI members are active in various technical committees, and our conference attendance has ranged from 800 to 1000 during the past few years. We are also grateful for the substantial international participation (almost 30% of the membership), and the considerable number of student paper competitions. Another notable factor is that more than 40% of our members are early in their career (40 years old or younger). The Journal of Engineering Mechanics, under the outstanding leadership of Professor Franz Ulm, continues to grow in quality and impact, with a recent impact factor of 3.125. The remarkable participation by

our members has resulted in the excellent growth of the EMI community, which we get to showcase at our conferences.

I thank Professors Chloé Arson and Yang Wang, the entire Georgia Tech team, and Verna Jameson and Tisha Kramer at EMI, for their outstanding work in organizing EMI 2023. My thanks also to all the minisymposium and student competition organizers. An important activity in this year's conference is the NSF workshop on engineering mechanics education. Thanks to these tremendous efforts, I am confident that all of us will have a very enjoyable and productive conference this week. I wish you an excellent time at Georgia Tech!

Best wishes,

A handwritten signature in black ink, appearing to read 'Sankaran Mahadevan'.

Sankaran Mahadevan

Special Events

- **Ferst Center for the Arts:** Opening remarks and plenary lectures
- **EH** – Exhibition Hall; **SC** – John Lewis Student Center; **IC** – Instructional Center

Tuesday June 6, 2023

8:30 – 12:30 Short course - Bayesian Model Updating and Uncertainty Quantification: Theory, Computational Tools, and Applications, *IC 109*

9:00 – 17:00 NSF Engineering Mechanics Education Workshop, *EH 226 – Home Park*

18:00 – 20:00 Reception, *Exhibition Hall Midtown*

Wednesday June 7, 2023

8:15 – 8:30 Opening remarks, *Ferst Center for the Arts*

8:30 – 9:30 Plenary lecture: Eleni Chatzi, *Ferst Center for the Arts*

9:30 – 17:00 General poster presentations, *John Lewis Student Center 3rd floor hallway*

11:00 – 13:00 Safe Space Workshop - LGBTQIA Inclusive Practices, *EH 222 - Buckhead*

12:00 – 13:00 SGH lunch (*SC & EH*)

13:00 – 14:00 Plenary lecture: Chad M. Landis, *Ferst Center for the Arts*

18:00 – 19:30 Joint USACM Large Scale TTA EMI CMC Career Path Panel, *IC 103*

Thursday June 8, 2023

8:30 – 9:30 Plenary lecture: Catherine O’Sullivan, *Ferst Center for the Arts*

11:00 – 13:00 Tenured. Now what? Mentoring and Career Planning for Tenure-track and Recently Tenured Faculty Members, *EH 122 – Midtown V*

12:00 – 13:00 Thornton Tomasetti lunch (*SC & EH*)

13:00 – 14:00 Plenary lecture: Yuri Bazilevs, *Ferst Center for the Arts*

19:00 – 21:00 Conference Banquet and Award Ceremony, *Exhibition Hall Midtown*

Friday June 9, 2023

8:30 – 9:30 Plenary lecture: Genda Chen, *Ferst Center for the Arts*

12:00 – 13:00 Lunch (*SC & EH*)

12:00 – 13:00 Industry-student mixer, *EH 127 – Midtown I*

13:00 – 14:00 Plenary lecture: Daniel Straub, *Ferst Center for the Arts*

EMI Technical Committee Meetings and Student Competitions

Tuesday June 6, 2023

8:00 – 15:00 EMI Board of Governors Meeting, *SC 3245 - Northside*
14:00 – 16:00 Computational Mechanics, *IC 211*
14:00 – 16:00 Nanomechanics and Micromechanics, *IC 105*
14:00 – 16:00 Objective Resilience, *IC 109*
14:00 – 16:00 Pavement Mechanics, *SC 3294 – Castleberry*
14:00 – 16:00 Structural Health Monitoring and Control (Meeting and Competition), *IC 103*
16:00 – 17:00 Elasticity, *IC 105*
16:00 – 17:00 Modeling Inelasticity and Multiscale Behavior, *IC 215*
16:00 – 18:00 Dynamics, *IC 211*
16:00 – 18:00 Structural Stability, *SC 3294 - Castleberry*
17:00 – 18:00 Granular Materials, *IC 109*
17:00 – 18:00 Mechanical Properties of Materials, *IC 105*
17:00 – 18:00 Poromechanics, *IC 215*
17:00 – 18:00 Probabilistic Methods, *IC 103*

Wednesday June 7, 2023

12:00 – 13:00 Biomechanics, *SC 3249 – Peachtree*
12:00 – 13:00 Dynamics (Competition), *EH 127 – Midtown I*
12:00 – 13:00 Elasticity (Competition), *SC 1216 – Piedmont*
12:00 – 13:00 Experimental Analysis & Instrumentation Committee, *EH 270 – Inman Park*
12:00 – 13:00 Modeling Inelasticity and Multiscale Behavior (Competition), *SC 3294 – Castleberry*
12:00 – 13:00 Objective Resilience (Competition), *EH 122 – Midtown V*
12:00 – 13:00 Poromechanics (Competition), *SC 3252 – Techwood*
12:00 – 13:00 Probabilistic Methods (Competition), *EH 142 – Midtown III*
18:30 – 20:30 Computational Mechanics (Student Poster Competition), *SC 3rd floor hallway*

Thursday June 8, 2023

12:00 – 13:00 Architected Materials, *SC 3294 - Castleberry*
12:00 – 13:00 Fluid Dynamics (Meeting and Competition), *SC 3252 - Techwood*
12:00 – 13:00 JEM Editorial Board Meeting, *EH 270 – Inman Park*
12:00 – 13:00 Machine Learning for Mechanics, *SC 3294 - Castleberry*

- *SC – John Lewis Student Center; EH – Exhibition Hall; IC – Instructional Center*
- All committee events are committee meeting by default. Student competitions are noted in parentheses.



2023 SOCIETY/EMI AWARD RECIPIENTS

The Executive Committee of the ASCE Board of Direction approved the list of recipients of several prestigious 2023 Society awards administered by the Engineering Mechanics Institute.

Congratulations to the Award Winners!

Jack E. Cermak Medal

Held jointly with the Structural Engineering Institute of ASCE



Partha P. Sarkar, Ph.D., F.ASCE, for his pioneering contributions to wind engineering by developing tornado and downburst wind tunnels and acquiring responses of flexible structures such as long-span bridges, tall-mast light poles and street traffic signal structures.

George W. Housner Structural Control and Monitoring Medal



Nicos Makris, Ph.D., C.Eng, F.ASCE, for his contributions to passive and semi-active structural control from supplemental energy dissipation and rocking isolation to pioneering development of electrorheological dampers and health monitoring and condition assessment of fluid dampers.

Robert H. Scanlan Medal



Hui Li, Ph.D., Aff.M.ASCE, for contributions to advancing bridge aerodynamics and application of machine learning tools and CFD to the wind engineering field.

Masanobu Shinozuka Medal



Ross B. Corotis, Ph.D., P.E., S.E., NAE, F.EMI, Dist.M.ASCE, for his leadership and visionary research in the development and practical application of structural reliability theory.

Theodore von Karman Medal



Firdaus E. Udwadia, Ph.D., M.ASCE, for extraordinary, original, and seminal research contributions to civil, mechanical, and aerospace engineering, through far-reaching advances in engineering mechanics related to earthquake engineering, structural dynamics, structural control, analytical dynamics, and structural stability.

Walter L. Huber Civil Engineering Research Prize



Steve WaiChing Sun, Ph.D., M.ASCE, for his fundamental contributions to computational and data-driven poromechanics.

EMI Leonardo da Vinci Award



Evgueni T. Filipov, Ph.D., M.ASCE, for outstanding contributions to the field of origami-inspired deployable and reconfigurable structures including: establishing new simulation tools, creating stiff lightweight origami, developing functional origami structures at multiple scales, and leading in service and education that broaden the field.

2022 Zdeněk P. Bažant Medal for Failure and Damage Prevention



Huajian Gao, Ph.D., Aff.M.ASCE, for his contributions to fracture mechanics and failure prevention in nanostructured materials, including metals, metamaterials and battery electrodes.

EMI FELLOWS CLASS OF 2023

- **Ramesh Agarwal, Ph.D., F.EMI, F.ASCE**
- **Bjorn Birgisson, Ph.D., P.E., F.EMI, F.ASCE**
- **John Charles Brigham, Ph.D., F.EMI, A.M.ASCE**
- **Oral Buyukozturk, Ph.D., F.EMI, F.ASCE**
- **Noël Challamel, Ph.D., F.EMI, Aff.M.ASCE**
- **Jia-Liang Le, Ph.D., P.E., F.EMI, M.ASCE**
- **Babak Moaveni, Ph.D., F.EMI, M.ASCE**
- **Hayder A. Rasheed, P.E., F.EMI, F.SEI, F.ASCE**
- **Hao Wang, Ph.D., F.EMI, M.ASCE**

Plenary Lecture



Nurturing Augmented Twins; From First Principles, to Learning, to Real-time Virtualization

Eleni Chatzi, Ph.D., M.ASCE, Eidgenössische Technische Hochschule (ETH) Zürich (Switzerland)

8:30 – 9:30, Wednesday June 7, 2023
Ferst Center for the Arts

Abstract Modern engineering structures form complex assemblies that operate under highly varying loads and adverse environments. To ensure a resource-efficient and resilient operation of such systems, it is imperative to understand their performance as-is; a task which can be effectuated through Structural Health Monitoring (SHM). SHM comprises a hierarchy across levels of increasing complexity aiming to i) detect, ii) localize and iii) quantify damage, and iv) finally offer a prognosis over the system's residual life. When considering higher levels in this hierarchy, including damage assessment and even performance prognosis, purely data-driven methods are found to be lacking. For higher-level SHM tasks, or for furnishing a digital twin of a monitored structure, it is necessary to integrate the knowledge stemming from physics-based representations, relying on the underlying principles of mechanics/dynamics. This talk discusses implementation of such a hybrid approach to SHM aiming to tackle the aforementioned challenges for robust simulation and monitoring of engineered systems. It offers a view to establishing augmented twin representations, capable of representing the structure as-is, anticipating performance under future stressors, and advising on preventive and remedial actions.

Biographical Sketch Eleni Chatzi is an Associate Professor and Chair of Structural Mechanics and Monitoring at the Department of Civil, Environmental and Geomatic Engineering of ETH Zurich, Switzerland. Her research interests include the fields of Structural Health Monitoring (SHM) and structural dynamics, nonlinear system identification, and intelligent life-cycle assessment for engineered systems. She has authored more than 300 papers in peer-reviewed

journals and conference proceedings, and further serves as an editor for international journals in the domains of Dynamics and SHM. She led the recently completed ERC Starting Grant WINDMIL on the topic of "Smart Monitoring, Inspection and Life-Cycle Assessment of Wind Turbines". Her work in the domain of self-aware infrastructure was recognized with the 2020 Walter L. Huber Research prize, awarded by the American Society of Civil Engineers (ASCE).

Plenary Lecture



Shape Memory Alloy Structures: Modeling, Simulation, and Experiments

Chad M. Landis, Ph.D., University of Texas at Austin

13:00 – 14:00 Wednesday June 7, 2023
Ferst Center for the Arts

Abstract In this lecture I will present work with my colleague, Prof. Stelios Kyriakides, and our students on our recent investigations of the physical response of shape memory alloy structures, under a wide range of thermal and mechanical loadings that link careful experiments with detailed numerical simulations. The first part of the talk will focus on the structure of a newly devised constitutive modeling framework describing the thermomechanical response of SMAs. As the ultimate goal of the model is its implementation within finite element calculations of SMA structures, it is a phenomenological model with a small set of internal variables, specifically the transformation strains and the transformation entropy that is directly related to the martensite volume fraction. The construction of the model is based on a usual flow-theory plasticity framework with kinematic hardening. One novelty of the approach is that a *single* transformation, i.e. yield, surface in effective stress and effective temperature space is introduced, and an associated flow rule then governs the evolution of the transformation strain and entropy. To capture the multitude of SMA behaviors, a transformation potential function is introduced in transformation strain and entropy space for the derivation of the back stresses and back temperatures that define the kinematic hardening behavior. It is this potential function that governs all the important behaviors within the model. The model is capable of capturing the asymmetries in tension versus compression for transformation strain, transformation stress, and in the hardening in tension versus compression with softening allowed in tension along with hardening in compression. The second part of the talk will describe the implementation of the model for the simulation of SMA strips and tubes subjected to a wide range of thermomechanical loadings (tension, compression, bending, iso- and non-isothermal). Meticulously devised experiments were performed that show that these structures exhibit instabilities, e.g. buckling in compression and Lüders-like bands in tension due to softening, that are all reproduced in the simulations. Finally, I will discuss our work on a

transformation strain gradient enhancement of the model for incorporating the material length scale associated with the macroscopic interface between austenite and martensite in these structures, and how that length scale can be determined by linking careful experiments to detailed numerical simulations.

Biographical Sketch Professor Landis has a broad range of interests in the mechanics of materials, including fracture mechanics, plasticity, micromechanics, composites, and finite element methods. He has made contributions to the constitutive modeling and fracture mechanics of ferroelectrics, ferromagnetic materials, and shape memory alloys. He has also made significant contributions to phase-field modeling of fracture where he has applied and extended this approach to dynamic crack propagation, ductile failure, hydraulic fracture, and fatigue crack growth. His work is highly collaborative and he is always looking to cooperate with other researchers both in his own department, nationally, and internationally. Professor Landis serves as an Associate Editor for the International Journal of Solids and Structures, a Regional Editor for the International Journal of Fracture, Associate Editor for the Journal of the American Ceramics Society, and in the past as Associate Editor for the Journal of Applied Mechanics. He also serves on the Editorial Board of Computational Methods in Theoretical and Applied Mechanics. Additionally, he is a member of the U.S. National Committee for Theoretical and Applied Mechanics, and in the summer of 2022, he served as the co-Chair of the 19th U.S. National Congress on Theoretical and Applied Mechanics.

Plenary Lecture



Particle Scale Modelling of Clay: Opportunities and Challenges

Catherine O'Sullivan, Ph.D., Imperial College London (UK)

8:30 – 9:30, Thursday June 8, 2023
Ferst Center for the Arts

Abstract Understanding of the mechanical behaviour of granular materials, including sand, has been greatly improved thanks to our ability to use the discrete element method to develop numerical models that explicitly consider the individual particles and their interactions. In many civil engineering projects the more significant geotechnical challenges are posed by clay deposits. In contrast to sand grains, clay particles are platy, the electrostatic forces between them influence their movement, and the interactions are sensitive to the pore water chemistry. This means we cannot directly apply software and algorithms developed for sand to clay; instead the modelling toolkit needs adaptation and extension to enable us to address problems that can have a real impact on civil engineering practice. In other words, the models are, by necessity, significantly more complex. This presentation will lay out the argument in favour of the development of particle-based models of clay. Then, drawing on her own experience, the speaker will lay out the key challenges that must be addressed to develop useful particle-based models of clay. This discussion will encompass the particle interaction models (potential functions) required including their calibration, interparticle friction, system size effects, and the anisotropy of the particle surface charge. The arguments will largely be supported by considering data from recent molecular dynamics simulations of systems of kaolinite particles, however many of the points made are applicable to other mineralogies and other colloidal materials.

Biographical Sketch Catherine O'Sullivan is a Professor in Particulate Soil Mechanics at Imperial College London. Originally from Ireland, she obtained her PhD from the University of California at Berkeley in 2002. Her research has examined soil behaviour focussing on the particulate scale. Catherine has

authored a textbook on the use of discrete element modelling in geomechanics and has authored/co-authored over 100 contributions to international journals. In 2015 she delivered the Géotechnique lecture. Funding for her post-graduate studies and research has been provided by the Fulbright Programme, the O'Reilly Foundation, IRCSET, the EPSRC, the ICE, the Leverhulme Trust and ARUP. Catherine is currently a member of the editorial boards of *Soils and Foundations*, *Computers and Geotechnics*, *Granular Matter* and an Editor of the *ASCE Journal of Geotechnical and Geoenvironmental Engineering*.

Plenary Lecture



Recent Advances and Breakthroughs in the Modeling and Simulation of Extreme Events

Yuri Bazilevs, Ph.D., A.M.ASCE, Brown University

13:00 – 14:00, Thursday June 8, 2023
Ferst Center for the Arts

Abstract In this presentation we'll first give a broad discussion of computational Fluid-Structure Interaction (FSI), focusing on several classes of problems and the corresponding numerical formulations that deliver efficient, accurate and practical solutions. Next, we'll discuss a new class of formulations for the immersed coupling of Isogeometric Analysis (IGA) and Meshfree Methods for the simulation of FSI with applications to extreme events. We'll focus on air- and water-blast FSI applications, and address the computational challenges of immersed FSI methods in the simulation of fracture and fragmentation by developing strongly and weakly volume-coupled FSI formulations and showing these in action. In the present work, we employ *Peridynamics-as-a-discretization* as a meshfree methods of choice, however, the proposed approach works just as easily with other meshfree methods. We show the mathematical formulations and present several numerical examples in 2D and 3D, and with experimental validation, of inelastic ductile, brittle and quasi-brittle solids under blast loading that clearly demonstrate the power and robustness of the proposed methodologies.

Biographical Sketch Yuri Bazilevs is the E. Paul Sorensen Professor in the School of Engineering at Brown University, where he was the Lead and Executive Committee representative of the Mechanics of Solids and Structures group. He was previously a Professor and Vice Chair in the Structural Engineering Department at the University of California, San Diego. Yuri's research interests lie in the broad field of computational science and engineering, with emphasis on the modeling and simulation in solids and structures, fluids, and their coupling in HPC environments. For his research contributions Yuri received many awards and honors, including the 2018 Walter E. Huber Research Prize from the ASCE,

the 2020 Gustus L. Larson Award from the ASME, the inaugural 2021 Centennial Mid-Career Award from the Materials Division of the ASME, and the Computational Mechanics Award from the International Association for Computational Mechanics (IACM). He is included in the lists of Highly Cited Researchers, both in the Engineering (2015-2018) and Computer Science (2014-2019) categories. Yuri recently completed his service as the President of the US Association for Computational Mechanics (USACM) and as the Chairman of the Applied Mechanics Division of the ASME. He currently serves on the US National Committee for Theoretical and Applied Mechanics (USNCTAM).

Plenary Lecture



Engineering Mechanics Role in Robot-enabled Infrastructure Preservation

Genda Chen, Ph.D., P.E., F.ASCE, Missouri Science & Technology University

8:30 – 9:30, Friday June 9, 2023
Ferst Center for the Arts

Abstract More than 42% of over 617,000 U.S. bridges are 50 years (design life) or older. It is thus imperative to meet more frequent and more rigorous preservation needs to ensure that the aging infrastructure is safe during everyday operations and resilient to catastrophic events. Drones and structural crawlers, or robots in general, are efficient and effective platforms that can be rapidly deployed to support sensor installation, visual inspection, nondestructive evaluation, and preventive maintenance of bridges. This presentation will provide an overview of engineering mechanics problems and solutions to platform dynamics, the probability of deterioration detection, aerial testing and evaluation, and machine learning for data-driven asset management enabled by the INSPIRE University Transportation Center partners. For example, control design equations of structural crawlers and/or drones with robotic arms will be established and solved to support bridge inspection and maintenance tasks. Given k robots, a NP-hard min-max k -Chinese postman problem will be formulated to generate optimal inspection routes using generic algorithms. Aerial impact-echo tests for delamination detection and/or ultrasonic metal thickness measurement will show their superior performance that is comparable to ground-based nondestructive tests. Mathematically rigorous approaches to evaluate the level of deterioration based on the data taken from in-situ sensors will be presented to shed light on the unconservative nature of traditional statistical analysis. Explainable artificial intelligence will engage inspectors at two levels: (1) inspectors-in-the-loop during training and testing of semi-supervised deep learning algorithms and (2) sensitivity analysis to understand the effect of individual key factors to a desirable prediction from neural additive models. This presentation will conclude with a few key challenges and research opportunities in robot-enabled infrastructure preservation.

Biographical Sketch Dr. Genda Chen is Professor and Abbett Distinguished Chair in Civil Engineering, Director of the Center for Intelligent Infrastructure, and Director of INSPIRE University Transportation Center at Missouri University of Science and Technology. He has authored or co-authored over 400 technical publications and delivered 28 keynote/invited presentations at international conferences. He received the international 2019 Structural Health Monitoring Person of the Year Award and the 1998 National Science Foundation CAREER Award. He is a Fellow of American Society of Civil Engineers and the International Society for Structural Health Monitoring of Intelligent Infrastructure. He serves as Vice President of the U.S. Panel on Structural Control and Monitoring.

Plenary Lecture



Decision-Oriented Sensitivity Analysis with Applications to Engineering Mechanics

Daniel Straub, Ph.D., Technical University of Munich (Germany)

13:00 – 14:00, Friday June 9, 2023
Ferst Center for the Arts

Abstract In engineering, models are created and employed to support decision making. Consider a structural engineering model that serves to determine the materials, shapes and dimensions of structural members. Or a fracture mechanics model that is established to assess the safety of a mechanical component against fatigue, to decide if the component can be safely continued in operation. As engineers are aware, such models and their predictions are subject to uncertainty, which must be considered when making decisions based on the model output, e.g., by using safety factors. Sensitivity analysis can be employed to better understand the effect of specific input uncertainties on the model outcome. There exist a myriad of sensitivity measures that can be employed, which can be confusing. Since the engineering model is ultimately used for decision making, what measure could be better suited than one that directly quantifies the effect of the uncertainty on the decision, i.e., a measure of decision sensitivity? Such measures have been around for a while, but have received no attention in the engineering community. They measure the importance of a specific input uncertainty by quantifying how likely this uncertainty causes a change in the decision, and how much can be gained by an improved decision. As I will show in this talk, they are easier to interpret than other sensitivity measures and their computation is not necessarily more demanding than that of other commonly used measures, such as the Sobol' index. I start out the talk with a brief introduction to sensitivity analysis and its goals. This includes a discussion of uncertainty in engineering models and their treatment in decision support. I then present the decision-theoretic background (which is less complicated than it sounds) and show the derivation of decision sensitivity measures. Since the measures depend on the decision context, I propose a categorization of decisions encountered in engineering mechanics and derive the proper sensitivity measures for these different decision categories. Along the way, the relation to other

commonly used sensitivity measures are highlighted – which also helps to better interpret those measures. This is followed by a presentation of different computational strategies to evaluate these sensitivity measures. I show that often the measures can be obtained by a mere post-processing of results obtained from a standard uncertainty or reliability analysis. Throughout the talk, application examples illustrate the concepts and methods and demonstrate their easy interpretability. The talk ends with a discussion of lessons learnt from real-life applications and remaining challenges.

Biographical Sketch Daniel Straub is Associate Professor for engineering risk and reliability analysis at Technical University of Munich (TUM). He develops physics-based stochastic models and methods for decision support and safety analysis of engineering systems, with a particular focus on Bayesian techniques and AI methods. Daniel obtained his Dipl.-Ing. degree in civil engineering in 2000 and his PhD in 2004 from ETH Zürich and was a postdoc and adjunct faculty at UC Berkeley before joining TUM in 2009. He is also active as a consultant to the industry on reliability and risk assessments and decision making under uncertainty. His awards include the ETH Silbermedaille, the Early Achievement Research Award of IASSAR and the SAE Ralph H. Isbrandt Automotive Safety Engineering Award.

Wednesday, June 7

7:45 – 8:15 Continental Breakfast · John Lewis Student Center 2nd and 3rd floor hallway

8:15 – 8:30 Opening Remarks · Ferst Center for the Arts

8:30 – 9:30 Plenary Lecture · Ferst Center for the Arts

Nurturing Augmented Twins; From First Principles, to Learning, to Real-time Virtualization

Eleni Chatzi, Ph.D., M.ASCE, Eidgenössische Technische Hochschule (ETH) Zürich(Switzerland)

9:30 – 10:00 Coffee Break · Exhibition Hall & John Lewis Student Center 3rd floor hallway

9:30 – 17:00 General Poster Presentations · John Lewis Student Center 3rd floor hallway

Wednesday, June 7, General Poster Presentations, 9:30 – 17:00

John Lewis Student Center 3rd floor hallway

- ID 134: Machine-learning based optimum retrofit scheme development of FRP column jacketing system for seismically-vulnerable RC building structures.
Author(s): Jiuk Shin
- ID 242: Learning and prediction of structure-property relationships of cracked metamaterials via deep neural networks.
Author(s): Yunche Wang, Yichen Hong, Weilun Hsieh
- ID 295: Experimental Validation real-time, weighted control algorithm on civil infrastructure.
Author(s): Courtney Peckens, Clara Voskuil, Dylan Clem
- ID 335: 3D Boundary Kinematic Phenomena Observed on a Series of Sand Specimens.
Author(s): Yichuan Zhu, Zenon Medina-Cetina
- ID 339: DEM-MBD Coupled Simulation of a Dual-auger Burrowing Robot in Dry Sand.
Author(s): Sarina Shahhosseini, Mohan Parekh, Junliang Tao
- ID 347: ASCE Student Steel Bridge Optimized Design and Modeling.
Author(s): Brayden Shaver, Paul Pike, Kyle Branning, Ignatius Fomunung, Joseph Owino, Weidong Wu
- ID 421: Reducing Heavy Fuel Oil Consumption in Shipping: The Impact of V-Shaped Riblets on Hull Drag.
Author(s): Nathaniel Werner, Katherine Rioux, Ryan Pritzkau
- ID 463: Deep learning-based bridge corrosion detection using UAV images.
Author(s): Zahra Ameli, Eric Landis
- ID 473: CFD analysis of materials surface roughness changes on heat transport in multi-layer walls.
Author(s): Arkadiusz Urzedowski, Joanna Styczen
- ID 551: DEM Simulations of the Seismic Response of Tunnels in Deep Granular Deposit.
Author(s): Ahmed Khamiss, Usama El Shamy
- ID 568: Thermo-Hydro-Mechanical-Bio (THMB) Modeling of Microbially-Induced Calcite Precipitation (MICP) Technique for Ground Improvement in Cold Regions.
Author(s): Sophie Jung, Pooneh Maghoul, Amade Pouya
- ID 570: Multiband Red/NIR/SWIR synthesis of MgGeO₃:Pr³⁺ persistent phosphor material.
Author(s): Syed Niaz Ali Shah, Sikandar Khan
- ID 658: Numerical Simulations of Particle Behavior and Breakage within a Pressurized Sand Damper Subjected to Cyclic Loading.
Author(s): Mehrdad Karimipetanlar, Usama El Shamy, Konstantinos Kalfas, Nicos Makris
- ID 914: Development of Johnson-Holmquist-Beissel Model in Discontinuous Deformation Analysis and its Application in Projectile Penetration.
Author(s): Chenghao Li, Rui Li, Junjie Chen, Jianjun Ma, Linchong Huang

Wednesday, June 7, Morning Sessions, 10:00 – 12:00

MS212: Probabilistic assessment, data-driven inference, and optimization for decision-making under uncertainty. Chair(s): Pablo Morato		
EH 242 - Centennial	10:00 - 10:20	ID 366: Knowledge transfer for life-cycle optimization: Applications to the management of bridge networks and ship structures Author(s): Jianda Cheng, Minghui Cheng*, Yan Liu, Jun Wu, Wei Li, Dan M. Frangopol
	10:20 - 10:40	ID 681: Transportation Asset Management With Incorporation Of Traffic Operations Adaptation Using Deep Reinforcement Learning Author(s): Mohammad Saifullah*, Kostas Papakonstantinou, Shelley Stoffels, Weiwen Zhou, Elise Miller-Hooks
	10:40 - 11:00	ID 301: Data-driven non-homogeneous Markov deterioration models for bridges Author(s): Min Li, Gaofeng Jia*
	11:00 - 11:20	ID 934: Development of an integrated platform for probabilistic risk assessment using fault tree analysis Author(s): Nailah Afshan*, Saran Srikanth Bodda, Abhinav Gupta, Kevin Han
	11:20 - 11:40	ID 576: POMDP inference and solution of railway optimal maintenance and comparisons with deep reinforcement learning Author(s): Giacomo Arcieri*, Cyprien Hoelzl, Oliver Schwery, Daniel Straub, Konstantinos G. Papakonstantinou, Eleni Chatzi
MS209: Advances in probabilistic and data assimilation approaches for assessment and mitigation of climatological hazards. Chair(s): Michele Barbato and Alexandros Taflanidis		
IC 105	10:00 - 10:20	ID 280: Assessment of the combined effects of climate change and structural aging on the hurricane-induced losses for typical US wooden single-family homes Author(s): Michele Barbato*
	10:20 - 10:40	ID 363: Multi-fidelity Monte Carlo for real-time probabilistic storm surge predictions Author(s): WoongHee Jung*, Alexandros Taflanidis
	10:40 - 11:00	ID 657: Resilience of Gulf Coast communities under a changing climate Author(s): Mohamed Abdelhafez*, Hussam Mahmoud, Bruce Ellingwood
	11:00 - 11:20	ID 283: Statistical Comparison of Resilience for Civil Infrastructure Systems and Application for Rural Distribution System subject to Hurricane Hazards Author(s): ZhiQiang Chen*, Prativa Sharma
	11:20 - 11:40	ID 749: Development and Uncertainty Analysis of Probabilistic Vulnerability Model for Mid/High-Rise Buildings Author(s): Zhuoxuan Wei*, Jean-Paul Pinelli, Kurtis Gurley, Christian Bedwell
MS802: Integrated Computational Materials Engineering (ICME). Chair(s): George Z. Voyiadjis		
SC 3294 - Castleberry	10:00 - 10:20	ID 676: Crystal plasticity modeling for material strengthening effects of multilayered copper-graphene nanopillar compression Author(s): George Z. Voyiadjis*, Juyoung Jeong
MS616: CIVIC Transportation and Resilient Solutions Towards Smart and Connected Communities. Chair(s): Fernando Moreu and Su Zhang		
IC 215	10:00 - 10:20	ID 852: Route Travel Time Prediction and Uncertainty Quantification using Hierarchical Bayesian Regression Author(s): Sevin Mohammadi*, Audrey Olivier, Andrew Smyth
	10:20 - 10:40	ID 854: Application of GNN for edge ranking in Transportation systems Author(s): Debasish Jana*, Sven Malama, Sriram Narasimhan, Ertugrul Taciroglu
	10:40 - 11:00	ID 942: Human-disaster interfaces enabled by Low-cost Efficient Wireless Intelligent Sensors (LEWIS) Author(s): Fernando Moreu, Ali Khorasani*, Kaveh Malek
MS214: Data-driven Methods for Uncertainty Quantification: Improvements and New Approaches. Chair(s): Ruda Zhang		
EH 203 - Highlands	10:00 - 10:20	ID 275: Improving Accuracy and Computational Efficiency of Optimal Design of Experiment via Greedy Backward Approach Author(s): Mehdi Taghizadeh, Dongbin Xiu, Negin Alemazkooor*
	10:20 - 10:40	ID 326: Modeling Degrading Hysteretic Systems under Uncertainty with a Bi-fidelity DeepONet Author(s): Subhayan De, Patrick Brewick*
	10:40 - 11:00	ID 472: Probabilistic Operator Learning via Stochastic Processes with Implicit Kernels Author(s): Ruda Zhang*

EH 203 - Highlands	11:00 - 11:20	ID 970: Whitening-curvelet-based Filter for SNR Enhancement of Distributed Acoustic Sensing Data Author(s): Naveed Iqbal*, Sikandar Khan*
MS609: Geometries & Design: Opportunities for Sustainable Construction. Chair(s): Ann Sychterz		
IC 103	10:00 - 10:20	ID 144: Effect of stamped dimples on the stiffness of plates under uniaxial compression Author(s): Isabel de Oliveira*, Jun Sato, Sigrid Adriaenssens
	10:20 - 10:40	ID 290: A new method for fast testing of the shear strength of the interface between artificial rock and printed concrete at super-early ages Author(s): Jiao-Long Zhang*, Yong Yuan, Xiaoyun Wang, Yaxin Tao, Kim Van Tittelboom, Luc Taerwe, Geert De Schutter
	10:40 - 11:00	ID 302: Analysis of Coreless Filament Wound Structures Using Alternative Performance Indicators Author(s): David Forster*, Ann Sychterz, Manfred Bischoff
	11:00 - 11:20	ID 318: Automated planning for the construction of laterally resistant masonry walls using irregular stones Author(s): Qianqing Wang*, Bryan German Pantoja Rosero, Ketson Roberto Maximiano dos Santos, Katrin Beyer
	11:20 - 11:40	ID 490: Tensile Behavior of Multi-layered Randomized Architected Material (MLRAM) Author(s): Sagnik Paul*, Ann Christine Sychterz
MS903: Eighth Symposium on Molecular Scale Modeling and Experimentation. Chair(s): Sharad Jaswandkar and Hanmant Gaikwad		
EH 270 - Inman Park	10:00 - 10:20	ID 496: The mechanics and adhesion of $\alpha v\beta 3$ integrin on biomaterials using steered molecular dynamics simulations Author(s): Hanmant Gaikwad*, Sharad Jaswandkar, Kalpana Katti, Dinesh Katti
	10:20 - 10:40	ID 405: Coarse-Graining of Thermomechanical Behaviors of Functional Polymer via Energy Renormalization Author(s): Zhaofan Li*, Wenjian Nie, Dawei Zhang, Wenjie Xia
	10:40 - 11:00	ID 534: Exploring the Thermomechanical and Interfacial Behaviors of Nano-Clay Using Molecular Modeling Author(s): Sarah Ghazanfari*, Wenjie Xia
	11:00 - 11:20	ID 562: Optimization and machine-assisted Δ -learning for multiscale modeling of polymer nanocomposites Author(s): Hamid Ghasemi, Hessam Yazdani*
	11:20 - 11:40	ID 813: Compress Au Nanoparticle towards 2-Dimensional Extreme: A Molecular Dynamics Study Author(s): Tanuj Gupta, Michael Cai Wang, Huijuan Zhao*
MS307: Structural instabilities: From failure to function. Chair(s): Stylianos Yiatros and Rainer Groh		
IC 211	10:00 - 10:20	ID 121: Thin rectangular plate behavior under in-plane harmonic compression Author(s): Mehdi Bohlooly Fotovat, Przemyslaw Perlikowski, Tomasz Kubiak*
	10:20 - 10:40	ID 298: Inelastic Buckling of Hybrid FRP-Metal Long Tubes under External Pressure Author(s): Hayder Rasheed*
	10:40 - 11:00	ID 369: Insight into the stability and load carrying capacity estimations of double curved shells Author(s): Adrian Gliszczynski*
	11:00 - 11:20	ID 379: Interactive buckling in thin-walled steel angle columns leading to a more consistent structural design methodology Author(s): Behnam Behzadi-Sofiani, Leroy Gardner, Ahmer Wadee*
MS701: Computational Geomechanics. Chair(s): Qiushi Chen		
EH 127 - Midtown I	10:00 - 10:20	ID 396: Multiscale modeling of flowslide triggering and runoff by accounting for hydro-mechanical feedbacks and granular dynamics Author(s): Ming Yang*, Giuseppe Buscarnera
	10:20 - 10:40	ID 875: Physics-informed Machine Learning for Porous Media Author(s): Ruofan Wu*, Shabnam Semnani
	10:40 - 11:00	ID 395: Homogenization model for layered media: the coupling effect of bedding direction and mineral fabric Author(s): Tingting Xu*, Chloé Arson
	11:00 - 11:20	ID 930: Nano-scale soil-water retention mechanism through MD and machine learning Author(s): Zhe Zhang, Xiaoyu Song*

MS216: Advances in Computer Vision, Deep Learning, & Artificial Intelligence for Structural Health Monitoring & Inspections.		
Chair(s): Mohammad Jahanshahi and Arash Noshadravan		
EH 123 - Midtown II	10:00 - 10:20	ID 251: High-fidelity Seismic-induced Failure Mode Prediction for RC Bridge Columns Using Generative Adversarial Networks Author(s): Ting-Yan Wu*, Rih-Teng Wu, Ping-Hsiung Wang, Tzu-Kang Lin, Kuo-Chun Chang
	10:20 - 10:40	ID 848: General, unsupervised structural health monitoring based on generative adversarial networks Author(s): Mohammad Hesam Soleimani-Babakamali, Ismini Lourentzou, Korosh Nasrollahzadeh, Rodrigo Sarlo*
	10:40 - 11:00	ID 281: Multi-view deep learning for post-hurricane damage assessment of buildings Author(s): Asim Khajwal , Chih-Shen Cheng , Arash Noshadravan*
	11:00 - 11:20	ID 606: RGB-D Fusion through Depth Hallucination for Enhanced Deep Learning-based Damage Segmentation Author(s): Tarutal Ghosh Mondal, Mohammad Jahanshahi*
	11:20 - 11:40	ID 385: Can you trust your AI crack detection model in the wild: benchmarks & enhancement strategies Author(s): Chen ZHANG, Jize ZHANG*
MS704: Data-Driven Approaches and Digital Twins for Solid and Geological Mechanics.		
Chair(s): Jiun-Shyan Chen		
EH 142 - Midtown III	10:00 - 10:20	ID 319: Microstructure transitions from stress field latent features extracted by a Variational Autoencoder Author(s): Daniel Chou*, Chloe Arson
	10:20 - 10:40	ID 409: Deep Learning models for subterranean navigation and soil characterization Author(s): Sanshrit Singhai*, Chloé Arson
	10:40 - 11:00	ID 870: Multi-Resolution Physics-Informed Machine Learning Approaches for Digital Twin Applications. Author(s): Karan Taneja*, Xiaolong He, Qizhi He, J. S. Chen
	11:00 - 11:20	ID 874: High-dimensional symbolic regression via neural feature polynomials for interpretable machine learning plasticity Author(s): Bahador Bahmani*, Hyoung Suk Suh, WaiChing Sun
MS708: Bio-inspired geotechnics: learning from nature to solve geotechnical challenges.		
Chair(s): Julian Tao and Nariman Mahabadi		
EH 126 - Midtown IV	10:00 - 10:20	ID 161: Bio-inspired Horizontal Burrowing Robot by Breaking Symmetries in Granular Media Author(s): Yi Zhong*, Julian Tao
	10:20 - 10:40	ID 488: Numerical Analysis of Sequential Tunnel Excavation Inspired by Ants Author(s): Meron Belachew*, Karie Yamamoto, Chloé Arson, David Frost
	10:40 - 11:00	ID 491: Investigation of densification effect and anti-scour potential using mangrove-inspired pile group Author(s): Xiwei Li*, Leon van Paassen, Junliang Tao
	11:00 - 11:20	ID 578: Optimal design and mechanical behaviour of root-inspired anchors under combined loading Author(s): Fernando Patino-Ramirez*, Catherine O'Sullivan
MS208: Advances in bridge health monitoring: Data-driven and machine learning methods, indirect monitoring, crowdsourced mobile sensing.		
Chair(s): Debarshi Sen		
EH 122 - Midtown V	10:00 - 10:20	ID 107: A Decision Tree-based Neural Network Approach for Railroad Bridge Event Classification Author(s): Omobolaji Lawal*, Shaik Althaf V. Shajihan, Kirill Mechitov, Billie Spencer
	10:20 - 10:40	ID 140: Bridge health monitoring using WIM-data driven reliability assessment Author(s): Mi G. Chorzepa*, Ananta Sinha
	10:40 - 11:00	ID 637: Structural Vibration Monitoring Via Mobile LiDAR Author(s): Adriana Trias Blanco*, John Vrabel
	11:00 - 11:20	ID 709: Field implementation of indirect strain sensing using acceleration response of bridges Author(s): Soheila Eshkevari*, Soheil Eshkevari, Debarshi Sen, Iman Dabbaghchian, Shamim Pakzad
	11:20 - 11:40	ID 711: Wavelet-based modal identification of bridges using field mobile sensing data Author(s): Liam Cronin*, Debarshi Sen, Shamim Pakzad

MS402: Topology Optimization: from Algorithmic Developments to Applications.		
Chair(s): Mazdak Tootkaboni		
SC 3245 - Northside	10:00 - 10:20	ID 173: Exploiting Buckling and Contact: Exploring a New Approach for Tackling Shape and Topology Optimization With Challenging Solid Mechanics Behavior Author(s): Ryan Alberdi*, Craig Hamel, Kevin Long, Aabhas Singh, Adam Cook
	10:20 - 10:40	ID 188: Material design for thermal regulation in vascular systems using topology optimization Author(s): Kripa Adhikari*, Kalyana Babu Nakshatrala
	10:40 - 11:00	ID 475: Embodied Carbon Optimization of Multi-Material Truss Structures Subjected to Manufacturability Constraints Author(s): Zane Schemmer*, Josephine Carstensen
	11:00 - 11:20	ID 533: Topology and Aerodynamic Shape Optimization of a Bistable Camber-Morphing Airfoil Author(s): Rachel Harvey*, Kai James
	11:20 - 11:40	ID 541: Discrete topology optimization of structures through deep reinforcement learning Author(s): Maximilian Ororbia*, Gordon Warn
MS601: 2nd Annual Mini-Symposium: Resilience of Coastal Structures, Systems, and Community Subjected to Hazards.		
Chair(s): Wei Zhang and Claudia Reis		
EH 241 - Old Fourth Ward	10:00 - 10:20	ID 377: Design Targets to Achieve Community Resilience Metrics in a Changing Climate Author(s): Jiatae Li*, John van de Lindt
	10:20 - 10:40	ID 331: Past hurricane performance of above-ground storage tanks and their future risk considering sea level rise and subsidence scenarios Author(s): Santosh Ghimire*, Sabarethinam Kameshwar
	10:40 - 11:00	ID 403: Progressive Failure of Low-rise Buildings Considering Internal Wind Pressure Change Author(s): Zhixia Ding, Wei Zhang*, Dongping Zhu, William Hughes
	11:00 - 11:20	ID 703: The Evaluation of Explicit Parameters on Eulerian-Lagrangian Simulations of Wave Impact on Coastal Bridges Author(s): Arsalan Majlesi, Adnan Shahriar, Arturo Montoya*, Ao Du, Adolfo Matamoros
	11:20 - 11:40	ID 650: Investigation of Vegetation Shielding Effects on Structural Vulnerability Author(s): Aikaterini (Katerina) P. Kyprioti*, Joaquin P. Morris Barra, Chris Irwin, Alexandros A. Taflanidis, Andrew B. Kennedy
MS610: Objective Resilience: Balancing Portfolio of Actions Across Mitigation and Recovery to Enhance Resilience in an Uncertain Environment.		
Chair(s): Alice Alipour and Paolo Gardoni		
SC 1216 - Piedmont	10:00 - 10:20	ID 143: Hindcasting Residential Building Damage and Predicting Recovery for the Mayfield, Kentucky December 2021 Tornado Author(s): Wanting (Lisa) Wang*, John W. van de Lindt, P. Shane Crawford, Blythe Johnston, Guirong Yan
	10:20 - 10:40	ID 184: Risk Communication of Urban Flood Hazards and Damaging Effects through Augmented Reality Author(s): ZhiQiang Chen*, Molan Zhang, Chengye Li
	10:40 - 11:00	ID 453: Multi-Stage Optimization of Mitigation and Response to Enhance Resilience of Infrastructure Systems Author(s): Alice Alipour*, Ning Zhang
	11:00 - 11:20	ID 238: Ensemble-based time series analysis considering lag information and feature importance to predict power outages during winter storms Author(s): Jangjae Lee*, Stephanie Paal
	11:20 - 11:40	ID 139: Sensitivity analysis for the development of class fragility models of transmission towers under hurricanes Author(s): Xinyue Wang*, Paolo Bocchini
MS403: Origami/Kirigami Inspired Structures and Metamaterials.		
Chair(s): John Brigham and Martin Walker		
EH 247 - Sweet Auburn	10:00 - 10:20	ID 300: Origami Metamaterials with Near-Constant Poisson Functions over Finite Strains Author(s): Siva Poornan Vasudevan, Phanisri Pradeep Pratapa*
	10:20 - 10:40	ID 190: Phononic Bandgap Programming and Fine-Tuning in Stretched Kirigami Author(s): Hesameddin Khosravi, Suyi Li*
	10:40 - 11:00	ID 792: Tube-Based Multifunctional 3D Origami-Architected Metamaterials Author(s): Hannah Kim*, Glaucio H. Paulino
	11:00 - 11:20	ID 687: Holistic inverse design of origami using interpretable machine learning Author(s): Yi Zhu, Evgueni Filipov*

	11:20 - 11:40	ID 303: Geometric mechanics of random kirigami Author(s): Lauren Niu*, Gaurav Chaudhary, Qing Han, Marta Lewicka, Lakshminarayanan Mahadevan
MS602: Advanced Analysis for Earthquake Engineering: 7th Edition. Chair(s): Kevin Wong		
EH 266 - Summerhill	10:00 - 10:20	ID 155: Seismic retrofit of low-rise reinforced concrete buildings typical to Haiti using a deterministic and a probabilistic approach. Author(s): Marc-Ansy Laguerre*, Reginald DesRoches, Mohammad Salehi
	10:20 - 10:40	ID 371: A versatile Python-based framework for EDP seismic response estimation using reduced order structural models Author(s): Parisa Toofani Movaghar*, Alexandros Taflanidis
	10:40 - 11:00	ID 476: Realistic Out-Of-Plane Shear Strength of Reinforced Concrete Walls and Slabs for Seismic Probabilistic Risk Assessment Applications Author(s): Siavash Dorvash*, Greg S. Hardy, John Richards, Tim Graf
	11:00 - 11:20	ID 588: Rocking of Deformable Bodies on Flexible Ground Author(s): Mohammad Daud*, Suparno Mukhopadhyay
	11:20 - 11:40	ID 788: Structural Behavior of 3D Printed Concrete Buildings Subjected to Seismic Loads: Numerical Modeling Author(s): Hao Chen, Mohammad Aghajani Delavar, Sumedh Sharma*, Petros Sideris
MS310: Maximizing information content for data-scarce engineering mechanics applications. Chair(s): Lori Graham-Brady and Audrey Olivier		
SC 3252 - Techwood	10:00 - 10:20	ID 584: Fisher Information based Optimal Sensor Locations for Structural Identification: Non-Stationary Inputs and Non-Classically Damped Systems Author(s): Dhiraj Ghosh*, Suparno Mukhopadhyay
	10:20 - 10:40	ID 794: Heterogenous Sensor Placement Under Uncertainty Considering Sensor Failure Author(s): Amin Jabini*, Erik Johnson
	10:40 - 11:00	ID 324: A knowledge transfer LSTM model to predict the seismic response of structures Author(s): Hongrak Pak*, Stephanie German Paal
	11:00 - 11:20	ID 514: A multifidelity control variates formulation for rare event simulation when model covariance estimation is infeasible Author(s): Promit Chakroborty*, Michael Shields, Somayajulu Dhulipala
MS902: 21st Symposium on Biological and Biologically Inspired Materials and Structures. Chair(s): Dinesh Katti and Christian Hellmich		
IC 109	10:00 - 10:20	ID 494: Actin Dynamics at Cancer Metastasis to Bone Author(s): Dinesh Katti*, Sharad Jaswandkar, Kalpana Katti
	10:20 - 10:40	ID 621: Inducing Bone Regeneration in Critical Bone Defects using “LegoBlocks” and Bone Morphogenic Proteins Author(s): kalpana katti*, Krishna Kundu, Dinesh Katti
	10:40 - 11:00	ID 717: A bone organoid to simulate human bone formation Author(s): Elisa Budyn*
	11:00 - 11:20	ID 878: Nanoindentation and micromechanics of dental cement paste Author(s): Petr Dohnalik, Bernhard Pichler, Gilles Richard, Christian Hellmich*
	11:20 - 11:40	ID 497: Horizontal flow bioreactor for mimicking the migration of late-stage prostate cancer cells to bone Author(s): Sharad Jaswandkar*, Haneesh Jasuja, Kalpana Katti, Dinesh Katti

11:00 – 13:00 Safe Space Workshop - LGBTQIA Inclusive Practices · EH 222 - Buckhead

12:00 – 13:00 SGH Lunch · Exhibition Hall & John Lewis Student Center 3rd floor hallway

13:00 – 14:00 Plenary Lecture · Ferst Center for the Arts

Shape Memory Alloy Structures: Modeling, Simulation, and Experiments

Chad M. Landis, Ph.D., University of Texas at Austin

Wednesday, June 7, Early Afternoon Sessions, 14:15 – 15:35

MS212: Probabilistic assessment, data-driven inference, and optimization for decision-making under uncertainty.		
Chair(s): Mariyam Amir		
EH 242 - Centennial	14:15 - 14:35	ID 566: Truncated Unscented Kalman Filter for Incorporating Constraints in Joint State-Parameter Estimation Author(s): Adrita Kundu*, Suparno Mukhopadhyay
	14:35 - 14:55	ID 678: Copula-based Quadratic Point Estimate Method under Incomplete Probability Information Author(s): Minhyeok Ko*, Kostas Papakonstantinou
	14:55 - 15:15	ID 235: Bayesian Model Calibration Under Statistical and Model Errors Based on Polynomial Chaos Methodologies Author(s): Zhiheng Wang*, Roger Ghanem
	15:15 - 15:35	ID 509: Rare Event Uncertainty Quantification Using Hamiltonian MCMC and Inverse Importance Sampling Approaches Author(s): Kostas G. Papakonstantinou, Elsayed Eshra*, Hamed Nikbakht
MS607: Advances in Resilience Analytics and Quantitative Sustainability.		
Chair(s): Arghavan Louhghalam		
EH 222 - Buckhead	14:15 - 14:35	ID 174: Handling High-dimensional Data through Basis Reduction via Interactive Decomposition: Application to Smart Meter Big Data Author(s): Esmail Rezaei*, Mohammad Pourghasemi Saghand, Yanlai Chen, Arghavan Louhghalam, Mazdak Tootkaboni
	14:35 - 14:55	ID 332: A Potential of Mean Force-Based Lattice Element Method for Modeling Progressive Collapse of Structures Author(s): Shayan Razi*, Mazdak Tootkaboni, Arghavan Louhghalam
	14:55 - 15:15	ID 469: A Dynamic Potential of Mean Force Approach to Lattice Element Method for Estimation of Damage Under Extreme Events Author(s): Soolmaz Khoshkalam*, Shayan Razi, Mazdak Tootkaboni, Arghavan Louhghalam
	15:15 - 15:35	ID 483: The Impact of Urban Texture on Flood Hazards Author(s): Sarah Balaian*, Brett Sanders, Mohammad Javad Abdolhosseini Qomi
MS302: Challenges and Advances in Material Damage Modeling.		
Chair(s): Lampros Svalos and Alessandro Fascetti		
SC 3294 - Castleberry	14:15 - 14:35	ID 304: Density-Driven Damage Model (D3M) of Concrete Structures Author(s): Yingbo Zhu*, Zachary Grasley, Alessandro Fascetti
	14:35 - 14:55	ID 124: Understanding the training dynamics of PINNs for the non-local gradient damage equation Author(s): Panos Pantidis*, Mostafa Mobasher
	14:55 - 15:15	ID 427: Mechanistic Mapping of Random Fields for Stochastic FE Simulations of Quasibrittle Fracture Author(s): Josh Vievering*, Jia-Liang Le
	15:15 - 15:35	ID 808: Physics and chemistry-based constitutive framework for thermo-chemically aged elastomer using phase-field approach Author(s): Aïmane Najmeddine*, Maryam Shakiba
MS202: Structural Identification and Damage Detection.		
Chair(s): Eleonora Tronci and Eleni Chatzi		
IC 215	14:15 - 14:35	ID 634: The Impact of Modelling Error when estimating the foundation parameters of Offshore Wind Turbines through Bayesian Model Updating Author(s): Harry Simpson*, Imad Abdallah, Costas Papadimitriou, Eleni Chatzi, Manolis Chatzis
	14:35 - 14:55	ID 310: Operational Modal Analysis of Two Offshore Wind Turbines in CVOW Wind Farm Author(s): Burak Bagirgan*, Babak Moaveni, Eric Hines
	14:55 - 15:15	ID 690: Digital Twinning and Wind Load Estimation of Block Island Offshore Wind Turbines Using One Year of Data Author(s): Babak Moaveni*, Eric Hines
	15:15 - 15:35	ID 747: Output-Only Bayesian System Identification for Digital Twinning of Floating Offshore Wind Turbines Author(s): Martin Masanes Didyk, Vahid Bagherian, Saeed Eftekhari Azam*, Mohsen Ebrahimzadeh Hassanabadi, Babak Moaveni
MS301: Advances and Applications of Elasticity within Applied Mechanics.		
Chair(s): Ney Dumont and Sonia Mogilevskaya		
EH 203 - Highlands	14:15 - 14:35	ID 648: Machine-precision, complex-variable implementation of the consistent boundary element method in two-dimensional elasticity Author(s): Ney Dumont*

EH 203 - Highlands	14:35 - 14:55	ID 821: A NOVEL ANALYTICAL APPROACH FOR CYLINDRICAL CAVITY EXPANSION/ CONTRACTION PROBLEMS IN MOHR-COULOMB MATERIALS Author(s): Shengli Chen, Xu Wang*, Yanhui Han, Younane Abohleiman
	14:55 - 15:15	ID 589: Eshelby Tensor in Integral Nonlocal Elasticity: Theoretical Formulation and Numerical Validation Author(s): Wei Ding*, Fabio Semperlotti
	15:15 - 15:35	ID 293: Two dimensional problem of an elastic matrix containing multiple Gurtin-Murdoch material surfaces along straight segments Author(s): Rohit S Patil*, Sofia G Mogilevska
MS401: Design optimization of long span bridges and tall buildings. Chair(s): Santiago Hernández		
IC 103	14:15 - 14:35	ID 135: Advances in aero-structural optimization techniques for long-span bridges Author(s): Miguel Cid Montoya*, Santiago Hernández, Ahsan Kareem
	14:35 - 14:55	ID 176: Tall Building Optimization in Regions of High Seismicity: Balancing Stiffness and Ductility Requirements Author(s): Abel Diaz*, David Shook
	14:55 - 15:15	ID 839: Multi-fidelity Sequential Design with CFD Applications of Twisted Building Design Author(s): Fei Ding*, Jize Zhang, Ahsan Kareem
	15:15 - 15:35	ID 181: MULTIDISCIPLINARY APPROACH FOR THE CROSS-SECTION SHAPE OPTIMIZATION OF HIGH-RISE BUILDINGS Author(s): Felix Nieto*, Santiago Hernandez, Miguel Cid-Montoya
MS613: Scientific computing for regional risk assessment and performance/resiliency based design. Chair(s): Seymour M.J. Spence		
EH 270 - Inman Park	14:15 - 14:35	ID 258: Leveraging Automation and Surrogate Modeling to Quantify Post-Earthquake Functional Recovery Performance at the Regional Scale Author(s): Laxman Dahal*, Henry Burton*
	14:35 - 14:55	ID 265: Spatial and Computational Analysis to Prioritize Green and Grey Flood Infrastructure under Uncertainty to Increase Resilience Author(s): Michelle Reckner*, Iris Tien
	14:55 - 15:15	ID 273: Computational tool for community-level probabilistic building performance assessment under excavation-induced ground settlements. Author(s): Jinyan Zhao*, Matthew DeJong
	15:15 - 15:35	ID 311: Informed post-earthquake building inspection planning using adaptive batch-mode active learning Author(s): Amirhossein Cheraghi*, Ge Ou, Yinhu Wang, Nikola Markovic
MS307: Structural instabilities: From failure to function. Chair(s): M. Ahmer Wadee and Jifeng Xu		
IC 211	14:15 - 14:35	ID 175: Buckling of Short Beams Considering Warping with Application to Fiber-Reinforced Elastomeric Isolators Author(s): Eduardo Montalto*, Dimitrios Konstantinidis
	14:35 - 14:55	ID 515: Stability of Thin Cylindrical Shells Under Combined Bending and Torsion Author(s): Victoria Ding*, Shahab Torabian, Sandor Adany, Xiang Yun, Ben Schafer
	14:55 - 15:15	ID 545: POST-BUCKLING CAPACITY OF OF CORRODED STEEL BRIDGE BEAMS UNDER REPETITIVE MONOTONIC LOADING Author(s): Shahrukh Islam*, Aidan Q. Provost, Simos Gerasimidis
	15:15 - 15:35	ID 645: Stochastic Buckling Analysis of Geometrically Imperfect Spherical Shells Author(s): Zheren Baizhikova*, Jia-Liang Le, Roberto Ballarini
MS701: Computational Geomechanics. Chair(s): Xiaoyu Song		
EH 127 - Midtown I	14:15 - 14:35	ID 425: Data-driven breakage mechanics for granular media Author(s): Jacinto Ulloa*, Anna Gorgogianni, Michael Ortiz, José E. Andrade
	14:35 - 14:55	ID 208: Direct Numerical Simulation (DNS) of Binder-Grain Composite Materials Using Pure Discrete Element Method (DEM) Modeling Author(s): Beichuan Yan*, Richard Regueiro
	14:55 - 15:15	ID 484: Effect of anisotropic consolidation on cyclic liquefaction of granular materials: insights from 3D-DEM modeling Author(s): Ming Yang, Mahdi Taiebat*
	15:15 - 15:35	ID 928: Discrete element modeling and design optimization of bio-inspired drilling into the lunar regolith Author(s): Liang Zhang, Lei Wang*, Quan Sun, Jesus Badal, Qiushi Chen

MS216: Advances in Computer Vision, Deep Learning, & Artificial Intelligence for Structural Health Monitoring & Inspections. Chair(s): Vedhus Hoskere and Yasutaka Narazaki		
EH 123 - Midtown II	14:15 - 14:35	ID 683: Unpaired Image-to-Image Translation of Structural Damage Author(s): Subin Varghese*, Vedhus Hoskere
	14:35 - 14:55	ID 525: A Deep Learning-Based Data Fusion Model to Predict Building Attributes Using Google Street View Images, Census Block Group Characteristics, and Real-Estate Data Author(s): Abhishek Subedi*, Mohammad R. Jahanshahi, David Johnson
	14:55 - 15:15	ID 216: Roadmap for fully autonomous robotic visual inspection of bridges Author(s): Yasutaka Narazaki*
MS706: Understanding the mechanics of induced seismicity. Chair(s): Xiao Ma and Dakshina Valiveti		
EH 142 - Midtown III	14:15 - 14:35	ID 148: The influence of fluid injection on energy partitioning during the earthquake cycle Author(s): Maryam Alghannam*, Hector Gomez, Ruben Juanes
	14:35 - 14:55	ID 156: Scale dependence of frictional rupture prestress: Implications for earthquake statistics and inferences of fault stress Author(s): Valère Lambert*, Nadia Lapusta, Daniel Faulkner
	14:55 - 15:15	ID 468: How well do we really know the b-value? New estimates of earthquake magnitude for the Delaware Basin and the effect of magnitude uncertainty on induced seismic hazard estimates. Author(s): Sydney Gable *, Yihe Huang, David Shelly
	15:15 - 15:35	ID 659: Role of fault zone complexity in modulating injection-induced seismicity Author(s): Md Shumon Mia*, Mohamed Abdelmeguid, Chunhui Zhao, Ahmed Elbanna
MS708: Bio-inspired geotechnics: learning from nature to solve geotechnical challenges. Chair(s): Nariman Mahabadi and Julian Tao		
EH 126 - Midtown IV	14:15 - 14:35	ID 882: How fracture properties of sediments influences bioturbation: A discrete numerical approach Author(s): Xuejing Wang*, Sanjay Arwade, Kelly Dorgan, Arghavan Louhghalam
	14:35 - 14:55	ID 916: Stability of kangaroo rat burrows in the Sonoran Desert: initial evidence of bio-cementation Author(s): Sera Tirkes, Duygu Aydin, Haluk Beyenal, Clint Collins, Idil Deniz Akin*
	14:55 - 15:15	ID 924: Investigating Changes to Seabed Properties Due to Biogenic Processes in the York River Estuary, Chesapeake Bay Author(s): Chesna Cox*, Kelly Dorgan, Nina Stark, Grace Massey, Carl Friedrichs , Adrian Rodriguez-Marek, Eric Hunstein, Md Rejwanur Rahman
	15:15 - 15:35	ID 929: From Geo to Bio and back – Learning from Multiphysics processes in porous media to explore the evolution of branched biological networks Author(s): Nariman Mahabadi*, Benjamin Blonder
MS201: Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering. Chair(s): Johann Guilleminot		
EH 122 - Midtown V	14:15 - 14:35	ID 312: Probabilistic Gait Parameters from Floor Vibrations Author(s): Yohanna MejiaCruz*, Juan M. Caicedo, Zhaoshuo Jiang, Jean Franco Lozada
	14:35 - 14:55	ID 334: Multi-fidelity Physics-informed Generative Adversarial Network for Solving Partial Differential Equations Author(s): Mehdi Taghizadeh*, Mohammad Amin Nabian, Negin Alemazkooor
	14:55 - 15:15	ID 375: Quantification of the effect of uncertainty in noise on posterior probability values Author(s): Yupeng Zhang*, Jeffrey Hart
	15:15 - 15:35	ID 410: Multi-scale stochastic modeling and uncertainty quantification of rare events using the switching diffusion model Author(s): Zheming Gou*, Xiaohui Tu, Sergey Lototsky, Roger Ghanem
MS807: Innovations in advanced cementitious materials and low-carbon concrete. Chair(s): Jianqiang Wei		
SC 3245 - Northside	14:15 - 14:35	ID 416: Commercial and Sustainable Hydrogels for Internal Curing and Shrinkage Control in Concrete Author(s): Asif Jalal*, Ravi Kiran
	14:35 - 14:55	ID 817: Influence of carbonation on alkali-silica reaction Author(s): Dayou Luo*, Jianqiang Wei
	14:55 - 15:15	ID 569: Experimental study of the effect of single fiber pullout behavior of recycled steel fiber on the performance of fiber reinforced concrete Author(s): Md. Mashfiqul Islam*, Qian Zhang

	15:15 - 15:35	ID 836: Phase and Property Evolutions of Alkali-silica Reaction Gels Under Carbonation Author(s): Arkabrata Sinha*, Jianqiang Wei
MS601: 2nd Annual Mini-Symposium: Resilience of Coastal Structures, Systems, and Community Subjected to Hazards. Chair(s): Wei Zhang		
EH 241 - Old Fourth Ward	14:15 - 14:35	ID 633: Probabilistic Analysis of Hurricane-Induced Debris Impacts towards Enhancing Coastal Community Resilience Author(s): Kooshan Amini*, Jamie Padgett
	14:35 - 14:55	ID 667: Analysis of the equity in post hurricane access to emergency services Author(s): Naqib Mashrur*, Sabarethinam Kameshwar
	14:55 - 15:15	ID 189: Prestressed Concrete Piles with GFRP Spirals against Corrosion Hazard Author(s): Olayiwola Adegbulugbe*, Sungmoon Jung
	15:15 - 15:35	ID 261: Long-term Salt Spray and Electrochemical Corrosion Behavior of Cu-Al-Mn Shape Memory Alloys and Steel Rebar Author(s): Huanpeng Hong*, Bora Gencturk
MS207: Recent Advances in Hybrid Simulation and Real-time Hybrid Simulation. Chair(s): Wei Song and Richard Christenson		
SC 3249 - Peachtree	14:15 - 14:35	ID 116: Hybrid Simulation with Combined Displacement and Force Based Experimental Control Points Author(s): Claudio Sepulveda*, Gilberto Mosqueda, Chia-Ming Uang, Chung-Che Chou, Kung-Juin Wang
	14:35 - 14:55	ID 778: Revisiting Hybrid Simulation with a Cost-Effective Hardware-Software Platform Author(s): Juan Meriles*, Khalid M. Mosalam
MS610: Objective Resilience: Balancing Portfolio of Actions Across Mitigation and Recovery to Enhance Resilience in an Uncertain Environment. Chair(s): Alice Alipour and Paolo Gardoni		
SC 1216 - Piedmont	14:15 - 14:35	ID 517: Optimal Strategies for Enhancing Healthcare Resilience Under Mainshock-Aftershock Events Author(s): Emad Hassan*, Hussam Mahmoud
	14:35 - 14:55	ID 192: A dynamic Bayesian network approach to assess resilience to cascading events in industrial facilities Author(s): QI TONG*, Thomas Gernay
MS403: Origami/Kirigami Inspired Structures and Metamaterials. Chair(s): Martin Walker and Evgueni Filipov		
EH 247 - Sweet Auburn	14:15 - 14:35	ID 737: Coarse graining planar kirigami, Part 1: Continuum PDE description Author(s): Paul Plucinsky*, Ian Tobasco
	14:35 - 14:55	ID 736: Coarse graining planar kirigami, Part 2: A Mechanism Gradient Theory Author(s): Ian Tobasco*, Paul Plucinsky
	14:55 - 15:15	ID 287: Homogeneous lattice modes of Miura-ori tessellations with voids Author(s): Anandaroop Lahiri*, Phanisri Pradeep Pratapa
	15:15 - 15:35	ID 98: REPROGRAMMING THE ENERGY LANDSCAPE OF META-STRUCTURES FOR TUNABLE MULTI-STABILITY Author(s): Giada Risso*, Max Kudisch, Paolo Ermanni, Chiara Daraio
MS602: Advanced Analysis for Earthquake Engineering: 7th Edition. Chair(s): Kevin Wong		
EH 266 - Summerhill	14:15 - 14:35	ID 909: A multiaxial plasticity model to represent softening in steel hollow square beam-columns under monotonic loading Author(s): Diego I. Heredia Rosa*, Albano de Castro e Sousa, Dimitrios G. Lignos, Arka Maity, Amit Kanvinde
	14:35 - 14:55	ID 972: Distribution of Seismic Demand and Damage During the 2015 Gorkha Earthquake Author(s): Raymond Hilly, Supratik Bose, Andreas Stavridis*, Yingjie Hu
MS310: Maximizing information content for data-scarce engineering mechanics applications. Chair(s): Michael Shields and Audrey Olivier		
SC 3252 - Techwood	14:15 - 14:35	ID 712: Bayesian Neural Networks with Physics-Aware Regularization For Travel Time Modeling from Imbalanced Data Author(s): Audrey Olivier*, Sevin Mohammadi, Andrew Smyth, Matt Adams
	14:35 - 14:55	ID 810: The impact of data-driven design approaches on shear connector reliability Author(s): Hyeyoung Koh*, Hannah Blum
	14:55 - 15:15	ID 883: Evaluation of Feature Selection Methods for the Shear Failure Mode Prediction of Prestressed Concrete Beams Author(s): Luis Alberto Bedriñana*, Jhon Tovar, Christian Malaga-Chuquitaype

	15:15 - 15:35	ID 399: From partial and limited structural health data to optimal management of engineering systems Author(s): Pablo G. Morato*, Charalampos P. Andriotis, Konstantinos G. Papakonstantinou
MS703: Porous flow and geomechanics of CO2 storage - high fidelity physics and surrogate modeling approaches. Chair(s): Dakshina Valiveti and Yanhui Han		
IC 105	14:15 - 14:35	ID 206: Uncertainty-aware time-lapse monitoring of geological carbon storage with learned surrogates Author(s): Ziyi Yin, Rafael Orozco, Mathias Louboutin, Ali Siahkoochi, Felix Herrmann*
	14:35 - 14:55	ID 99: Coupled Reservoir-Geomechanical Analysis and CO2 Leakage Modeling during CO2 Injection into the Hanifa Reservoir: A Study Focused on Climate Change Mitigation Author(s): Sikandar Khan*, Abdullatif Al-Shuhail
	14:55 - 15:15	ID 117: Uncertainty Quantification of CO2 Leakage and Risk Analysis of Induced Seismicity for Large-scale Geological CO2 Sequestration Author(s): Hannah Lu*, Lluís Salo Salgado, Ruben Juanes, Youssef Marzouk
MS902: 21st Symposium on Biological and Biologically Inspired Materials and Structures. Chair(s): Kalpana Katti and John Brigham		
IC 109	14:15 - 14:35	ID 456: The Effect of Intraocular and Intracranial Pressure Gradient on Lamina Cribrosa Biomechanics for Subjects with and without Glaucoma Author(s): Soumaya Ouhsousou*, Lucy Q. Shen, Amin Pourasghar, Chhavi Saini, Mengyu Wang, John C. Brigham
	14:35 - 14:55	ID 115: Modeling of Heat Flow in the Eye Author(s): Dipika Gongal, Craig Foster*
	14:55 - 15:15	ID 892: Nanomechanical Characterization of Bacterial Biofilms via Bioindentation and Nanoscratch Tests Author(s): Haklae Lee*, Ange-Therese Akono
	15:15 - 15:35	ID 112: Bio-inspired silica coating for steel fibers Author(s): Jialai Wang*

15:35 – 16:00 Coffee Break · Exhibition Hall & John Lewis Student Center 3rd floor hallway

Wednesday, June 7, Late Afternoon Sessions, 16:00 – 18:00

MS212: Probabilistic assessment, data-driven inference, and optimization for decision-making under uncertainty. Chair(s): Pablo Morato		
EH 242 - Centennial	16:00 - 16:20	ID 741: Rapid Uncertainty Propagation by LSTM Networks and Knowledge Transfer in High-dimensional Nonlinear System subject Stochastic Excitation Author(s): Bowei Li, Seymour Spence*
	16:20 - 16:40	ID 223: Mapping component reliabilities to system reliability in flange-angle partially restrained steel moment connections Author(s): Trisha Chakravorty*, Aritra Chatterjee, Baidurya Bhattacharya
	16:40 - 17:00	ID 760: A sequential decision process for the multi-objective design optimization of structural systems based on life cycle costs Author(s): Aditya Sharma*, Gordon Warn
	17:00 - 17:20	ID 542: Discrete optimization of structures through a sequential decision process: benchmarking and validation Author(s): Maximilian Ororbia*, Gordon Warn
	17:20 - 17:40	ID 831: Performance-based design optimization of uncertain wind-excited systems under life-cycle loss constraint with climate change considerations Author(s): Thays Duarte, Imad Alhayik*, Arthriya Subgranon
	17:40 - 18:00	ID 720: A Novel Fragility Framework for Assessing the Performance of Marine Vessels Author(s): Aws Idris*, Mohamed Soliman*
MS209: Advances in probabilistic and data assimilation approaches for assessment and mitigation of climatological hazards. Chair(s): Michele Barbato and Alexandros Taflanidis		
EH 222 - Buckhead	16:00 - 16:20	ID 755: Text mining to predict the impact of wind disasters Author(s): Huy Pham*, Monica Arul Jayachandran
	16:20 - 16:40	ID 768: Digital twin for damage diagnosis in steel framed structures Author(s): GBANDI NIKABOU*, JingWen Du, Pranav M. Karve, Sankaran Mahadevan

EH 222 - Buckhead	16:40 - 17:00	ID 779: Knowledge Discovery from Post-Storm Reconnaissance Data: From Frequentist Inference to Bayesian Knowledge Graphs Author(s): Jordan Nakayama*, Daniel Yahya, David Roueche
	17:00 - 17:20	ID 863: Tiered Infrastructure Performance Assessment Framework for Field Reconnaissance of Built Environment Across Hazards (Seismic, Windstorm, and Coastal) and Infrastructure Typologies Author(s): Mohammad Alam*, Tracy Kijewski-Correa, Khalid Mosalam, Ian Robertson, David Prevatt, David Roueche
	17:20 - 17:40	ID 889: The utility of visual document understanding in regional building inventory generation Author(s): Rachel Hamburger*, Tracy Kijewski-Correa
MS302: Challenges and Advances in Material Damage Modeling. Chair(s): Alessandro Fascetti and Lampros Svalos		
SC 3294 - Castleberry	16:00 - 16:20	ID 762: A virtual element method for the fourth-order phase-field equation with application to fracture modeling in materials with microstructure Author(s): Lampros Svolos*, Gianmarco Manzini, Hashem Mourad
	16:20 - 16:40	ID 596: An efficient computational framework for the damage assessment of multistory steel frames Author(s): Jade Cohen*, Filip Filippou
	16:40 - 17:00	ID 133: A displacement-controlled Arc Length scheme for Continuum Damage Mechanics problems Author(s): Roshan Philip Saji*, Mostafa Mobasher
	17:00 - 17:20	ID 486: Adaptive domain decomposition using image detection for local and nonlocal damage formulations Author(s): Cornelius Otchere*, Panos Pantidis, Mostafa Mobasher
	17:20 - 17:40	ID 574: Fracture mode investigation in the Brazilian splitting test using a micromechanics-based variational phase-field model Author(s): Mina Sarem*, Nuhamin Eshetu Deresse, Jaincto Ulloa, Els Verstryngge, Stijn François
	17:40 - 18:00	ID 847: Preventing cracks in continuously reinforced concrete with peridynamic models: temperature/shrinking effects in early-age CRCP, and corrosion-induced fracture Author(s): Yupeng Liu, Ziguang Chen, Jiangming Zhao, Florin Bobaru*
MS202: Structural Identification and Damage Detection. Chair(s): Jian Li and Eleni Chatzi		
IC 215	16:00 - 16:20	ID 707: A Transfer Learning Strategy for Virtual Sensing in Offshore Wind Farms Author(s): Eleonora Maria Tronci*, Anna Haensch, Babak Moaveni, Eric Hines
	16:20 - 16:40	ID 552: Unsupervised Damage Detection for Smart Extraterrestrial Habitats Using Autoencoders and Information Fusion Author(s): Zixin Wang*, Mohammad Jahanshahi, Ilias Bilionis, Amin Maghareh, Yuguang Fu, Shirley Dyke
	16:40 - 17:00	ID 734: Physics-informed machine learning for hidden crack localization in concrete structure: Experimental evaluation of multi-fidelity transfer learning approaches Author(s): Sarah Miele*, Pranav Karve, Sankaran Mahadevan
	17:00 - 17:20	ID 268: Framework for Near-real-time Seismic Damage Detection of Structural Systems using Structural-mode-based Graph Neural Network Author(s): Minkyu Kim*, Junho Song
	17:20 - 17:40	ID 434: Transfer Learning Enhanced Neural ODEs for Adaptive Digital Twin Modeling Author(s): Yujie GAN*, Zhilu LAI
	17:40 - 18:00	ID 804: Supervised Learning with GPR A-scans for Material Property Prediction in Building Envelopes Author(s): Ahmed Nirjhar Alam*, Wesley Reinhart, Rebecca Napolitano
MS605: Analysis of Heritage Structures: Tools and Methods for Assessing Unknowns in Historic Monuments and Structures. Chair(s): Linda M. Seymour and Moriah Hughes		
EH 203 - Highlands	16:00 - 16:20	ID 136: Looking into the Void: Detecting and Evaluating Voids Beneath Concrete Slabs-On-Grade Author(s): Linda Seymour*
	16:20 - 16:40	ID 256: Nonlinear dimensionality reduction to identify building attributes that influence tornado damage for historic buildings Author(s): Saanchi Singh Kaushal*, Mariantonieta Gutierrez Soto, Rebecca Napolitano
	16:40 - 17:00	ID 519: Image-based 3D Modeling as a Damage Tool Prioritization in Post-Disaster Areas Author(s): Joe Kallas*, Rebecca Napolitano
	17:00 - 17:20	ID 642: Assessing Vulnerability of Historic Midwestern U.S. Timber Barns under Severe Windstorms Author(s): Moriah Hughes*, Branko Glisic*
	17:20 - 17:40	ID 744: Discrete, nonlinear, FE model for structural analysis of adobe piers at Huaca de la Luna Author(s): Cristiana Riccio, Anna Remus*, Selman Tezcan, Luis C. Silva, Gabriele Milani, Renato Perucchio

MS811: Architected Materials. Chair(s): Stavros Gaitanaros		
IC 103	16:00 - 16:20	ID 237: Arbitrary-Order Sensitivity Analysis in the Wave Propagation Behavior of Architected Materials Using HYPAD-FEM Author(s): Juan David Navarro, Juan Camilo Velasquez, Arturo Montoya, Harry Millwater, David Restrepo*
	16:20 - 16:40	ID 504: Acoustic metasurface for wavefront manipulation of ultrasound waves Author(s): Xhorxha Kuci*, Marc G.D. Geers, Varvara G. Kouznetsova
	16:40 - 17:00	ID 245: Dynamics of bilayer topological Maxwell lattices and the quest for omnimodal polarization Author(s): Mohammad Charara, James McNerney, Kai Sun, Xiaoming Mao, Stefano Gonella*
	17:00 - 17:20	ID 969: Dispersive engineering of metasurfaces for directional and omnidirectional band gaps Author(s): Heedong Goh*, Ke Ma, Loukas Kallivokas
	17:20 - 17:40	ID 663: Effects of encapsulated granular media on energy absorption under dynamic loading Author(s): Luis Baldelomar Pinto*, Kathryn Matlack
	17:40 - 18:00	ID 378: Irregular architected materials with programmable properties Author(s): Ke Liu*, Rachel Sun, Chiara Daraio
MS613: Scientific computing for regional risk assessment and performance/resiliency based design. Chair(s): Claudia Reis		
EH 270 - Inman Park	16:00 - 16:20	ID 398: Computational tsunami risk management Author(s): Cláudia Reis*, André R. Barbosa
	16:20 - 16:40	ID 426: Adaptive importance sampling for efficient probabilistic storm surge estimation Author(s): WoongHee Jung, Alexandros Taflanidis*, Aikaterini Kyprioti
	16:40 - 17:00	ID 556: Life-cycle assessment of long-span bridge's wind resistant performance considering multi-source time-variant effects and uncertainties Author(s): Xiaolei Chu*, Wei Cui, Lin Zhao, Yaojun Ge
	17:00 - 17:20	ID 735: A Multi-fidelity Bayesian-based framework for collapse reliability analysis under hurricane hazards Author(s): Liuyun Xu*, Srinivasan Arunachalam, Seymour Spence
	17:20 - 17:40	ID 799: Propagation of modeling uncertainty in the seismic behavior of specimens employing spines. Author(s): Bryam Astudillo*, Barbara Simpson
	17:40 - 18:00	ID 825: Error quantification and guidance on the use of wind tunnel-informed stochastic wind load models for the applications of performance-based wind engineering Author(s): Thays Duarte*, Srinivasan Arunachalam, Arthriya Subgranon, Seymour Spence
MS705: Mechanics and Physics of Granular Materials. Chair(s): Marcial Gonzalez, Ryan Hurley, Yida Zhang and Payam Poorolhjouy		
IC 211	16:00 - 16:20	GMTC Introduction
	16:20 - 16:40	ID 96: In-Situ Measurements of Stresses and Kinematics in Triaxial Tests Author(s): Ryan Hurley*, Ghassan Shahin, Ye Tian, Oyvind Torgersrud, Eleni Stavropoulou, Edward Ando, Andrew King
	16:40 - 17:00	ID 604: Influence of Loading Rate and Crystal Structure on Constitutive Anisotropy of Silica Cubes Author(s): Ibraheem Gharaibeh*, Daniel Casem, Wadi Imseeh, Khalid Alshibli, Peter Kenesei, Hemant Sharma
	17:00 - 17:20	ID 374: Evolution of Stress Tensor in terms of Multivariate Probability Distributions using Internal State Variable Theory Author(s): Abhinav Ramkumar*, Marcial Gonzalez
	17:20 - 17:40	ID 523: Particle shape effect on granular materials mechanics under high strain rate Author(s): Dawa Seo*, Nitin Pandurang Daphalapurkar, Darby Jon Luscher
	17:40 - 18:00	ID 704: A unified descriptive framework for co-evolving particle shape and size in comminution Author(s): Priya Tripathi, Seung Jae Lee*, Moochul Shin, Chang Hoon Lee
MS701: Computational Geomechanics. Chair(s): Xiaoyu Song		
EH 127 - Midtown I	16:00 - 16:20	ID 521: A New Assumed Deformation Gradient Approach for Mitigating Volumetric Locking in Explicit Material Point Methods Author(s): Yidong Zhao*, Chenfanfu Jiang, Jinhyun Choo
	16:20 - 16:40	ID 917: Neural network-encoded signed distance field for shape representation and computational particle mechanics of granular materials Author(s): Zhengshou Lai*

EH 127 - Midtown I	16:40 - 17:00	ID 464: Formulation of a nonlocal gradient enhanced numerical model for geomaterials guided by controllability criteria Author(s): Dawei Xue*, Xilin Lu, Giuseppe Buscarnera
	17:00 - 17:20	ID 362: Modeling fracture propagation in porous media with assumed enhanced strain method Author(s): Fushen Liu*
	17:20 - 17:40	ID 636: Numerical Study on Phase Transformation Induced Material Fracture Author(s): S. Sindhusuta*, Sheng-Wei Chi, Craig Foster
	17:40 - 18:00	ID 526: Modeling of high strain rate impact of single crystal silica cubes using phase field fracture formulation Author(s): Shank Kulkarni*, Timothy Truster, Ibraheem Gharaibeh, Khalid Alshibli, Daniel Casem
MS216: Advances in Computer Vision, Deep Learning, & Artificial Intelligence for Structural Health Monitoring & Inspections. Chair(s): Rih-Teng Wu and Shirley Dyke		
EH 123 - Midtown II	16:00 - 16:20	ID 548: Active Perception Based on Deep Reinforcement Learning for Autonomous Robotic Inspection Author(s): Wen Tang*, Mohammad Jahanshahi*
	16:20 - 16:40	ID 402: Methods of Inspection of Deteriorated Steel Beam Ends using LiDAR & 3D Scanning Author(s): Aidan Provost*, Shahrukh Islam, Georgios Tzortzinis, Chengbo Ai, Simos Gerasimidis
	16:40 - 17:00	ID 872: Integrating image and LiDAR data for measuring road and roadside objects on hillside streets Author(s): Sven Malama*, Debasish Jana, Sriram Narasimhan, Ertugrul Taciroglu
	17:00 - 17:20	ID 553: Autonomous Pavement Surface Evaluation and Rating (PASER) Condition Assessment Using a Cost-effective RGB-D Data Acquisition System Author(s): Yu-Ting Huang*, Nikkhil Vijaya Sankar, Mohammad Reza Jahanshahi, Fangjia Shen
	17:20 - 17:40	ID 101: Automated Multi-Damage Detection on Historic Buildings in Post-Disaster Areas Using Image Segmentation Author(s): Joe Kallas*, Rebecca Napolitano
	17:40 - 18:00	ID 462: Automated image localization to support rapid building reconnaissance in a large-scale area Author(s): Xiaoyu Liu*, Shirley Dyke, Ali Lenjani, Ilias Bilionis, Xin Zhang, Jongseong Choi
MS312: Surrogate modeling for uncertainty quantification, optimization, and statistical inference in engineering applications. Chair(s): Gaofeng Jia		
EH 142 - Midtown III	16:00 - 16:20	ID 153: Discrete Wavelet Transform Based Earthquake Data Augmentation for Training Surrogate Models of Nonlinear Structures Author(s): Siddharth Parida*, Christina Bocirnea, Supratik Bose, Georgios Apostolakis
	16:20 - 16:40	ID 209: Non-Deterministic Kriging for Systems with Mixed Continuous and Discrete Input Variables Author(s): J Heeralu P Ravindu Jayasekara *, Sabarethinam Kameshwar
	16:40 - 17:00	ID 495: Advances in node condition classification within storm surge surrogate modeling framework Author(s): Christopher Irwin*, Alexandros Taflanidis
	17:00 - 17:20	ID 264: Physics-Informed Machine Learning for Structural Metamodeling of Nonlinear Structures Author(s): Robert Bond*, Pu Ren, Hao Sun, Jerome Hajjar
	17:20 - 17:40	ID 698: Adaptive Surrogate Improvement for High-dimensional Problems Author(s): Yulin Guo*, Paromita Nath, Sankaran Mahadevan
	17:40 - 18:00	ID 342: Physics-constrained Gaussian Process Model for Prediction of Power Generation in Wave Energy Converter Arrays Author(s): Suraj Khanal*, Gaofeng Jia
MS803: Coupled chemical, physical and mechanical processes in porous heterogeneous materials - From additive manufacturing to long term deterioration. Chair(s): Gianluca Cusatis		
EH 126 - Midtown IV	16:00 - 16:20	ID 906: Coupling between ion irradiation-induced expansion and mechanical stress: An irradiation-induced flow phenomenon Author(s): Mohammed Alnaggar*, Yann Le Pape
	16:20 - 16:40	ID 580: Thermal stability and degradation kinetics of polystyrene-layered double hydroxide composites Author(s): Farrukh Shehzad*, Sikandar Khan, Mamdouh Al-Harhi
	16:40 - 17:00	ID 922: Microstructure and mechanical properties of brucite recovered from reject brine via different precipitating agents Author(s): Inderjeet Singh*, Rotana Hay, Kemal Celik
	17:00 - 17:20	ID 939: Study of Effect of Oxide Layer on the Strength of the Cold Spray Layer Author(s): Mobin Vandadi*, Nima Rahbar, Winston Soboyejo

	17:20 - 17:40	ID 493: Poly-Material Lattice Discrete Particle Model (P-LDPM) for the Multiscale Prediction of Concrete Mechanical Behavior Author(s): Matthew Troemner*, Elham Ramyar, Gianluca Cusatis
	17:40 - 18:00	ID 696: Stochastic Lattice Discrete Particle Modeling of Fracture in Pervious Cementitious Composites Author(s): Alessandro Fascetti*, John Bolander
MS215: Probabilistic Learning, Stochastic Optimization, and Digital Twins. Chair(s): Roger Ghanem		
EH 122 - Midtown V	16:00 - 16:20	ID 879: A data-driven statistical inverse identification method for phase field modeling of fracture in random heterogeneous elastic media Author(s): Florent Pled*, Christophe Desceliers
	16:20 - 16:40	ID 442: Bayesian deep learning for probabilistic virtual load monitoring of offshore wind farms Author(s): Nandar Hlaing*, Pablo G. Morato, Francisco de Nolasco Santos, Wout Weijtjens, Philippe Rigo, Christof Devriendt
	16:40 - 17:00	ID 803: Probabilistic digital twin for damage-adaptive rotorcraft control Author(s): William Sisson*, Pranav Karve, Sankaran Mahadevan
	17:00 - 17:20	ID 512: Surrogate Modeling of Highway Bridge Column Earthquake Response Using Probabilistic Learning on Manifolds (PLoM) Author(s): Peter Lee, Kuanshi Zhong*, Sanjay Govindjee, Gregory Deierlein
	17:20 - 17:40	ID 661: Rare-events simulation using normalizing flows Author(s): Agnimitra Dasgupta*, Erik Johnson
	17:40 - 18:00	ID 481: Quantifying Uncertainty in Quantum Approximate Optimization Algorithms Author(s): Jungin Kim*, Yan Wang
MS402: Topology Optimization: from Algorithmic Developments to Applications. Chair(s): Mazdak Tootkaboni		
SC 3245 - Northside	16:00 - 16:20	ID 601: Addressing the issue of parameter tuning in topology optimization algorithms Author(s): Dat Ha*, Josephine Carstensen
	16:20 - 16:40	ID 622: Stress-constrained topology optimization of anisotropic structures Author(s): Oliver Giraldo-Londono*, Rogelio Muneton-Lopez, Chadwick Bettale
	16:40 - 17:00	ID 701: Fiber Orientation and Topology Optimization of Tow-Steered Composite Laminates with Manufacturability Control Author(s): CHUAN LUO*, James Guest
	17:00 - 17:20	ID 769: Finite Strain Robust Topology Optimization Considering Multiple Uncertainties Author(s): Nan Feng, Shiyao Sun*, Guodong Zhang, Kapil Khandelwal
	17:20 - 17:40	ID 775: Multiphysics topology optimization of heat sinks considering additive manufacturing constraints Author(s): Ardalan Nejat*, James Guest
	17:40 - 18:00	ID 777: Efficient reliability-based topology optimization via polynomial chaos expansion: A multi-fidelity, greedy-Kaczmarz approach Author(s): Alberto Torres*, James Guest, James Warner, Mazdak Tootkaboni
MS211: Complex Dynamics and Vibration Control of Infrastructure Exposed to Single/Multiple Hazards. Chair(s): Chao Sun		
EH 241 - Old Fourth Ward	16:00 - 16:20	ID 266: Global Motions of a Floating Platform with Tuned Liquid Damper in Waves Author(s): Wen-Huai Tsao*, Ying-Chuan Chen, Christopher Kees, Lance Manuel
	16:20 - 16:40	ID 289: A New Macro Model for Steel-Concrete Shear Walls using CSI PERFORM-3D Author(s): Nakisa Haghi*, siamak Epackachi, Steve Efe
	16:40 - 17:00	ID 381: Numerical Evaluation of Dynamic Responses of Oregon Bridge Rail under Multi-level Vehicular Impacts Author(s): Howie Fang*, Qian Wang
	17:00 - 17:20	ID 539: Investigation on the performance of a rolling pendulum isolation system subject to 3D seismic excitations Author(s): Esteban Villalobos Vega*, Erika Vanderheiden, P. Scott Harvey
	17:20 - 17:40	ID 668: Assessment of ship impact force on offshore structures with varying collision scenarios Author(s): Hyunjoong Kim*

MS804: Mechanics of Pavements and Pavement Materials.		
Chair(s): Shane Underwood		
SC 3249 - Peachtree	16:00 - 16:20	ID 306: Acceleration Monitoring for Pavements Author(s): Linbing Wang*, Zhoujing Ye
	16:20 - 16:40	ID 308: Use of time-temperature shift factors for waveform-based viscoelastic measures in asphalt binder systems Author(s): Saqib Gulzar*, Shane Underwood
	16:40 - 17:00	ID 851: Computational Modeling of Skid Resistance of Aircraft Tire on Wet Runway Pavement Author(s): Baiyu Jiang*, Hao Wang
	17:00 - 17:20	ID 895: Modeling Plastic Deformation of Granular Materials in Pavements Using the Modified Drucker-Prager Cap (MDPC) Model Author(s): Mohammad Rahmani*, Santosh Kommidi*, Yong-Rak Kim*, Dallas Little, John Rushing
	17:20 - 17:40	ID 898: Strain Field Distribution in Asphalt Mixes Using Digital Image Correlation Author(s): Babak Asadi*, Ramez Hajj
MS611: Objective Resilience: From Performance-Based Engineering to Community Resilience.		
Chair(s): Alice Alipour and Paolo Gardoni		
SC 1216 - Piedmont	16:00 - 16:20	ID 255: Multi-Disciplinary Simulation-Based Model for Interdependent Seismic Resilience Assessment of Communities Author(s): Omar Sediek*, Milad Roohi, John van de Lindt, Nathanael Rosenheim, Sara Hamideh
	16:20 - 16:40	ID 742: An Objective-based Framework for Linking Reconnaissance Data to Performance-based Engineering and Community Resilience Performance Metrics Author(s): Amir Safiey*, David Roueche
	16:40 - 17:00	ID 759: Enhancing Community Resilience with Minimal Instrumentation and Performance-based Seismic Monitoring of Buildings Author(s): Milad Cheraghzade*, Milad Roohi*
	17:00 - 17:20	ID 920: Cascade failure analysis of transmission tower systems Author(s): Saransh Dikshit*, Alice Alipour*
MS403: Origami/Kirigami Inspired Structures and Metamaterials.		
Chair(s): Evgueni Filipov and Pradeep Pratapa		
EH 247 - Sweet Auburn	16:00 - 16:20	ID 786: A nonlinear iterated map for a graded Waterbomb origami tube Author(s): Americo Cunha Jr*, Glaucio Paulino
	16:20 - 16:40	ID 577: Folding Polygonal Kirigami Tubes Author(s): Martin Walker*
	16:40 - 17:00	ID 754: Multi-Objective Optimisation of Origami Bellows Author(s): Mengzhu Yang, Fabrizio Scarpa, Mark Schenk*
	17:00 - 17:20	ID 609: Hybrid Origami Patterns Author(s): Kevin T. Liu*, Glaucio H. Paulino
	17:20 - 17:40	ID 750: Structural morphing surfaces based on self-standing, snap-through building blocks Author(s): Asifur Rahman, Samuele Ferracin, Sujata Tank, Paolo Celli*
	17:40 - 18:00	ID 142: Multifunctional magnetic origami robots Author(s): Renee Zhao*
MS808: Cementitious Materials: Experiments and Modeling Across the Scales.		
Chair(s): Bernhard Pichler		
EH 266 - Summerhill	16:00 - 16:20	ID 122: Modeling the chloride ingress in well cement due to the carbonation reaction underground Author(s): Jinliang Liu, Yuxiang Jing, Linfei Li*
	16:20 - 16:40	ID 169: A framework for predicting tensile strength of cement paste using multi-scale micro-CT and nanoindentation Author(s): Tong-Seok Han*, Se-Yun Kim, Donghwi Eum
	16:40 - 17:00	ID 355: Multiscale modeling of thermal Young's modulus degradation of concrete at elevated temperatures Author(s): Simon Peters*, Günther Meschke
	17:00 - 17:20	ID 452: Viscoelastic properties of an LC3-paste: ultrasound pulse transmission and hourly repeated minute-long creep testing Author(s): Sophie J. Schmid*, Luis Zelaya-Lainez, Olaf Lahayne, Martin Peyerl, Bernhard L.A. Pichler

	17:20 - 17:40	ID 466: Measurements of Rate Effects on Damage and Fracture of Different Ultra-High Performance Concretes Author(s): Aidan Carlson, Eric Landis*
	17:40 - 18:00	ID 414: Multiscale Characterization to Examine Carbonation of Alkali-Activated Binders in Cementitious Materials Author(s): Shayan Gholami*, Yong-Rak Kim*, Dallas Little, Sukmin Kwon, Jong Suk Jung
MS501: Computational/Experimental Fluid Dynamics and Fluid-Structure Interaction. Chair(s): Georgios Moutsanidis		
SC 3252 - Techwood	16:00 - 16:20	ID 226: Recent Advances on Multiscale Simulations of Multiphase Interactions under Extreme Loadings with Continuum- and Particle-Based Methods Author(s): Zhen Chen*, Andrew Bowman, Mohammed Saffarini, Hani Salim
	16:20 - 16:40	ID 231: Multiphase Fluid-Structure Interaction in Deformable Porous Media at Multiple Scales Author(s): Samuel Fagbemi*, Pejman Tahmasebi, Mohammad Piri
	16:40 - 17:00	ID 358: HYBRID RANS-LES SIMULATION OF TURBULENT HEAT TRANSFER IN A BACKWARD-FACING STEP FLOW Author(s): Olalekan Olubunmi Shobayo*, Dibbon Keith Walters, Samuel Ruegsegger
MS703: Porous flow and geomechanics of CO2 storage - high fidelity physics and surrogate modeling approaches. Chair(s): Dakshina Valiveti and Yanhui Han		
IC 105	16:00 - 16:20	ID 146: Surrogate Model for CO2 Storage with Coupled Flow and Geomechanics and Its Use in MCMC-based Data Assimilation Author(s): Yifu Han*, Francois Hamon, Su Jiang, Louis Durlofsky
	16:20 - 16:40	ID 307: Simulation of large-scale geological carbon sequestration in the Gulf of Mexico using fully coupled flow and geomechanics Author(s): Yanhua Yuan, Kevin Dugan, Prasanna Krishnamurthy, Stephen Morgan*, Josh White
	16:40 - 17:00	ID 309: Fourier-enhanced multiple-input neural operators for accurate and efficient surrogate modeling for geological carbon sequestration Author(s): Zhongyi Jiang, Min Zhu, Lu Lu, Dongzhuo Li, Yanhua Yuan, Qiuzi Li, Kun Wang*
	17:00 - 17:20	ID 424: Characterizing the geomechanical constraints of long-term CO2 injection and storage through fully coupled 3D fluid flow, geomechanics and hydraulic fracture simulations. Author(s): Ankush Singh*, Mark McClure, Garrett Fowler
	17:20 - 17:40	ID 435: FluidFlow concept for visualizing and studying CO2 storage: From lab experiments to quantitative imaging Author(s): Jakub W. Both*, Martin A. Fernø, Jan M. Nordbotten
	17:40 - 18:00	ID 908: Anomaly detection for CO2 capture and sequestration monitoring Author(s): Jose Hernandez Mejia*, Matthias Imhof, Michael Pyrcz
MS902: 21st Symposium on Biological and Biologically Inspired Materials and Structures. Chair(s): Ange-Therese Akono and Elisa Budyn		
IC 109	16:00 - 16:20	ID 114: Soft Solid-Liquid Composites in Biomedical Applications: Understanding the Size Effect Author(s): Karthik Kundapur, Vinu Unnikrishnan*
	16:20 - 16:40	ID 614: Viscoelastic characteristics of nacre-like materials Author(s): Li-Wei Liu*, Yuan-Jyun Shih
	16:40 - 17:00	ID 725: On the mechanics of the tooth-stylus-radula systems of chitons: a soft conveying-belt for efficient force transduction Author(s): John Connolly, Phani Saketh Dasika, Jungeun Lee, Taifeng Wang, David Kisailus, Pablo Zavattieri*

18:00 – 19:30 Joint USACM Large Scale TTA EMI CMC Career Path Panel · IC 103

Thursday, June 8

7:45 – 8:30 Continental Breakfast · John Lewis Student Center 2nd and 3rd floor hallway

8:30 – 9:30 Plenary Lecture · Ferst Center for the Arts
Particle Scale Modelling of Clay: Opportunities and Challenges
Catherine O’Sullivan, Ph.D., Imperial College London (UK)

9:30 – 10:00 Coffee Break · Exhibition Hall & John Lewis Student Center 3rd floor hallway

Thursday, June 8, Morning Sessions, 10:00 – 12:00

MS104: Advanced Engineering Concepts, Designs, and Technologies for Aerospace and Extraterrestrial Applications (Sponsored by ASCE Aerospace Division). Chair(s): Ramesh B. Malla and Roberto de Moraes		
EH 242 - Centennial	10:00 - 10:20	ID 816: Industrialized and Robotic Construction Advances in Terrestrial Construction and Opportunities in Space Construction Author(s): Naveen Kumar Muthumanickam*
	10:20 - 10:40	ID 554: Temperature Profile on a Lunar Habitat Structure Covered with Regolith Protective Layer Author(s): Sachin Tripathi*, Ramesh Malla*
	10:40 - 11:00	ID 253: Incorporating a Finite Element-Based Structural model within a System of Systems Modeling Framework to Analyze Smart Habitats in Deep Space Environments. Author(s): Adnan Shahriar*, Arsalan Majlesi, David Avila, Arturo Montoya
	11:00 - 11:20	ID 728: Considering the non-linear behavior of materials in the design of lunar habitats Author(s): Arsalan Majlesi*, Amir Behjat, Adnan Shahriar, David Avila, Arturo Montoya, Shirley Dyke, Julio Ramirez
	11:20 - 11:40	ID 793: Seismic Regolith-Structure Interaction on Proposed Martian Habitats Author(s): Hamed Seifamiri, Pooneh Maghoul*, Roberto de Moraes, Ramesh B. Malla
MS307: Structural instabilities: From failure to function. Chair(s): Hayder Rasheed and Stylianos Yiatros		
EH 222 - Buckhead	10:00 - 10:20	ID 660: CANCELLED - Waisted Post-buckling Configuration of Mechanical Metamaterials Cylindrical Shell and Its Applications Author(s): Jiabin Sun, C.W. Lim*, Zhenhuan Zhou, Xincheng Xu
	10:20 - 10:40	ID 738: Static friction models for a rod deforming on a cylinder Author(s): Gert van der Heijden*, Rehan Shah
	10:40 - 11:00	ID 809: Comparison of stiffness reduction factors for rotary-straightened and hot-rolled W-shape members Author(s): Hyeyoung Koh*, Barry Rosson, Hannah Blum
	11:00 - 11:20	ID 815: Stability of a novel all-steel modular floor assembly Author(s): Rajshri Chidambaram Muthu Kumar*, Sandor Adany, Benjamin Schafer
MS303: Multiscale Behavior of Damage and Failure Mechanics. Chair(s): Oliver Girdo-Londono		
IC 115	10:00 - 10:40	Keynote ID 234: Strong and tough fibrous hydrogels reinforced by multiscale hierarchical structures with multimechanisms Author(s): Huajian Gao*
	10:40 - 11:00	ID 152: Computationally Efficient Modeling of Microstructurally Short Cracks in Polycrystalline Materials Author(s): Damin Xia*, Caglar Oskay
	11:00 - 11:20	ID 353: A simple implementation of localizing gradient damage model in Abaqus for the dynamic fracture Author(s): Guangyuan Yang, Leong Hien Poh*
	11:20 - 11:40	ID 215: Multiscale Phase Field formulation for capturing Anisotropy in Network Response of Rubber-like materials Author(s): Prajwal Kammardi Arunachala*, Matthias Neuner, Christian Linder
	11:40 - 12:00	ID 474: A phase-field formulation for fracture modeling of rate- and temperature-dependent materials Author(s): Rogelio Muñeton-Lopez*, Oliver Giraldo-Londoño

MS202: Structural Identification and Damage Detection.		
Chair(s): Lauren Lindermann and Babak Moaveni		
IC 215	10:00 - 10:20	ID 351: Model-based Unknown Input Estimation via Partially Observable Markov Decision Processes Author(s): Wei Liu*, Zhilu Lai, Charikleia Stoura, Kiran Bacsa, Eleni Chatzi
	10:20 - 10:40	ID 397: Kernel ridge regression based force identification in the time domain Author(s): Shuo HAO*, Su-Mei WANG, Yi-Qing NI
	10:40 - 11:00	ID 510: Identification of Fractional Dynamical Systems using Recursive Nonlinear Stochastic Filtering Methods Author(s): Kalil Erazo*, Alberto Di Matteo
	11:00 - 11:20	ID 662: Wind Load Estimation of an Operational 6 MW Offshore Wind Turbine: a comparison of physics-based vs. data-driven approaches Author(s): Azin Mehrjoo*, Finn Rüdinger, Ross McAdam, Babak Moaveni, Eric Hines
	11:20 - 11:40	ID 305: Dual state-parameter estimation of continuous structural systems using Adaptive Physics-informed parallel neural networks Author(s): Rui Zhang*, Gordon P. Warn, Aleksandra Radlińska
	11:40 - 12:00	ID 592: State-Input-Parameter Identifiability in Output Only Structural Identification Author(s): Adrita Kundu*, Suparno Mukhopadhyay
MS301: Advances and Applications of Elasticity within Applied Mechanics.		
Chair(s): Ney Dumont and Sonia Mogilevskaia		
EH 203 - Highlands	10:00 - 10:20	ID 593: Biaxial testing and elastic characterization of a laminated membrane composite Author(s): Steven Palkovic*, Andrew Sarawit, Mehdi Zarghamee
	10:20 - 10:40	ID 726: Tailorable thermoelectricity of cubic lattice-based cellular and granular materials by the configuration stress Author(s): Chao Liu*, Huiming Yin
	10:40 - 11:00	ID 257: Analytical solution for Mode I stress intensity factor in aviation pavement reflection cracking model Author(s): Kairat Tuleubekov*, David Brill
	11:00 - 11:20	ID 357: Simulation of a hot forming tool with a thermoelastic boundary element formulation Author(s): Michael Leitner, Martin Schanz*
	11:20 - 11:40	ID 590: The response of multi-span railway bridges accounting for dynamic soil-structure interaction Author(s): Pieter Reumers, Geert Lombaert, Geert Degrande*
	11:40 - 12:00	ID 239: A Transfer Matrix Approach for the Simulation of 2D Rainbow Traps Author(s): Prasannakumar Salasiya*, Bojan Guzina
MS811: Architected Materials.		
Chair(s): Yunlan Emma Zhang		
IC 103	10:00 - 10:20	ID 716: A Data-Driven Framework for Structure-Property Correlation in Ordered and Disordered Cellular Metamaterials Author(s): Shengzhi Luan, Enze Chen, Stavros Gaitanaros*
	10:20 - 10:40	ID 938: Computational Modeling of Tensegrity Metamaterials Author(s): Julian Rimoli*, Kevin Garanger, Julie Kraus
	10:40 - 11:00	ID 166: Stress focusing and damage protection in topological Maxwell metamaterials Author(s): Caleb Widstrand*, Chen Hu, Xiaoming Mao, Joseph Labuz, Stefano Gonella
	11:00 - 11:20	ID 106: Auxetic confinement of steel-reinforced concrete members with architected truss lattices Author(s): Thomas Vitalis*, Andrew Gross, Georgios Tzortzinis, Brian Schagen, Simos Gerasimidis
	11:20 - 11:40	ID 420: Nanogenerator Mechanical Metamaterial Concrete Systems Author(s): Amir Alavi*, Kaveh Barri, Qianyun Zhang, Wenyun Lu, Jianzhe Luo
	11:40 - 12:00	ID 943: Influence of Carbon Nanofibers and Multiwalled Carbon Nanotubes on the Elastic and Creep Properties of Metakaolin - Based Geopolymers Author(s): Ange-Therese Akono*, Yunzhi Xu, Haklae Lee, Nathaniel Buettner
MS613: Scientific computing for regional risk assessment and performance/resiliency based design.		
Chair(s): Alexandros Taflanidis		
EH 270 - Inman Park	10:00 - 10:20	ID 843: Stochastic emulation of seismic structural response using enhanced partial replication strategy Author(s): Sang-ri Yi*, Alexandros Taflanidis
	10:20 - 10:40	ID 864: Graph Neural Networks for Efficient Assessment of Transportation Network Response to Disasters Author(s): Tong Liu, Hadi Meidani*

EH 270 - Inman Park	10:40 - 11:00	ID 948: Seismic reliability-based retrofitting optimization of non-ductile reinforced concrete frame structures Author(s): Antonio Pio Sberna*, Angshuman Deb, Fabio Di Trapani, Joel P. Conte
	11:00 - 11:20	ID 827: Accounting for Cascading Failure of Interdependent Civil Infrastructure in Seismic Resilience Modeling of Communities Author(s): Saeid Ghasemi Gavabar*, Milad Roohi*
MS705: Mechanics and Physics of Granular Materials. Chair(s): Yida Zhang, Payam Poorsolhjoui, Marcial Gonzalez		
IC 211	10:00 - 10:20	ID 850: An experimental investigation of the transient friction of granular materials at low sliding velocities and pressures Author(s): Aizhan Zhakupova*, Behrooz Ferdowsi
	10:20 - 10:40	ID 110: Fabric characteristics of jammed and unjammed granular materials Author(s): Yida Zhang, Yuxuan Wen*
	10:40 - 11:00	ID 204: Particle-scale kinematics and kinetics of particle rearrangement in granular materials Author(s): Kwangmin Lee*, Ryan Hurley
	11:00 - 11:20	ID 455: A nonlinear elastic constitutive framework for anisotropic granular materials based on particle-scale mechanics Author(s): Shubjot Singh*, Giuseppe Buscarnera
	11:20 - 11:40	ID 624: Multiscale analysis of fiber-reinforced 3D printed concrete Author(s): Pouriya Pirmoradi, Payam Poorsolhjoui*, Akke Suiker
	11:40 - 12:00	ID 202: The effect of drained cyclic loading on changes in fabric anisotropy using DEM Author(s): Tara Sassel*, Catherine O'Sullivan
MS701: Computational Geomechanics. Chair(s): Jinhyun Choo		
EH 127 - Midtown I	10:00 - 10:20	ID 182: Yielding and fracture in the nucleation of frictional slip Author(s): Miguel Castellano*, Flavio Lorez, David Kammer
	10:20 - 10:40	ID 746: Finite element model of fault zone of northeast Japan subduction zone for intermediate depth earthquake initiation. Author(s): Ashay Panse*, Craig Foster, Shen Wei Chi, Fnu Sindhusuta
	10:40 - 11:00	ID 945: On the effects of fabric on the instability onset under constant shear drained loading Author(s): Srinivas Vivek Bokkisa*, Jorge Macedo, Alexandros Petalas
	11:00 - 11:20	ID 572: Reaction cross-diffusion and the long-term behaviour of bio-geomaterials Author(s): Manman Hu*, Klaus Regenauer-Lieb
	11:20 - 11:40	ID 546: Anisotropic bounding surface model for clay under monotonic and cyclic loading conditions Author(s): Yang Yu*, Zhongxuan Yang
	11:40 - 12:00	ID 167: A domain reduction approach for moving loads on half-space and its implementation to ABAQUS Author(s): Yufeng Dong*, Ertugrul Taciroglu, Wenyang Zhang, Ahmad Dehghanpoor, Anoosh Shamsabadi, Li Shi
MS216: Advances in Computer Vision, Deep Learning, & Artificial Intelligence for Structural Health Monitoring & Inspections. Chair(s): Jian Li and Yongchao Yang		
EH 123 - Midtown II	10:00 - 10:20	ID 270: Multi-Vision System for Full-field Strain Measurement and Crack Tracking on UHPC Beams Author(s): Mostafa Iraniparast*, Seyed Sina Shid-Moosavi, Peng "Patrick" Sun, Tiancheng Wang, Georgios Apostolakis, Kevin Mackie
	10:20 - 10:40	ID 679: Super-sensitivity full-field displacement measurements Author(s): Shanwu Li, Yongchao Yang*
	10:40 - 11:00	ID 830: Photogrammetric Reconstructions for Bridge Inspections: Establishing Performance Metrics for Automated Drone Acquisition Algorithms Author(s): Emilie Hollingsworth*, Ishan Pradhan*, Michael Sanchez, Rodrigo Sarlo
	11:00 - 11:20	ID 254: A Novel Multi-scale Branch Fusion Network for Tile Spalling Segmentation Using Limited Samples Author(s): Hai-Wei Wang*, Rih-Teng Wu
MS312: Surrogate modeling for uncertainty quantification, optimization, and statistical inference in engineering applications. Chair(s): Gaofeng Jia		
EH 142 - Midtown III	10:00 - 10:20	ID 384: Scalable Bayesian Optimization with Metaheuristics for Efficiency and Exploitation Author(s): Ibrahim Aydogdu*, Michaela Kempner, Yan Wang
	10:20 - 10:40	ID 722: Efficient Bayesian Posterior Sampling Aided by Kriging Surrogate Model Author(s): Aakash Bangalore Satish*, Sang-ri Yi, Alexandros Taflanidis

EH 142 - Midtown III	10:40 - 11:00	ID 354: The Application of Surrogate Modelling Methods to the Calibration of Crystal Plasticity Finite Element Models Author(s): Hugh Dorward*, Matthew Peel, Mahmoud Mostafavi
	11:00 - 11:20	ID 341: Augmented sample-based approach for multi-fidelity uncertainty quantification Author(s): Leila Naderi*, Gaofeng Jia
MS803: Coupled chemical, physical and mechanical processes in porous heterogeneous materials - From additive manufacturing to long term deterioration. Chair(s): Mohammed Alnaggar		
EH 126 - Midtown IV	10:00 - 10:20	ID 957: Investigation of Scaling-Up Cement Paste Rheological Measurement to Fresh State Behavior of Concrete Author(s): Raul Marrero Rosa*, Ayesha Ahmed, Elmer Irizarry, Liza Dill, Nasser Nduhi, David Corr, Gianluca Cusatis
	10:20 - 10:40	ID 543: Computational Modelling of Flow-induced Fiber Orientation for Ultra-high-performance Concrete Flow Author(s): Tathagata Bhaduri*, Shady Gomma, Mohammed Alnaggar
	10:40 - 11:00	ID 288: Characterizing the basic creep behavior of 3D printed concrete with layered structures Author(s): Mohammadhossein (Mahan) Kosarimovahhed*, Qian Zhang, Sungmoon Jung
	11:00 - 11:20	ID 975: Osmotic Ion Concentration Control of Steady-State Subcritical Fracture Growth in Shale Author(s): Anh Tay Nguyen*, Hoang T Nguyen, Zdeněk P. Bažant
MS201: Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering. Chair(s): Michael Shields		
IC 209	10:00 - 10:20	ID 450: Reconstruction of 3D microstructures from 2D images by using a pre-trained deep neural network in a gradient-based sequential optimization approach Author(s): Ashwini Gupta*, Noah Wade, Lori Graham-Brady
	10:20 - 10:40	ID 498: Data-driven projection pursuit adaptation in polynomial chaos expansion for high-dimensional problems Author(s): Xiaoshu Zeng*, Roger Ghanem
	10:40 - 11:00	ID 638: Constitutive Relationship Exploration in A fiber-reinforced Composite Material with Uncertainty Author(s): Zhengtao Yao*, Roger Ghanem, Venkat Aitharaju, Jay Mahishi
	11:00 - 11:20	ID 789: Manifold Learning to Map Amorphous Microstructural Features to Local Yield Stress Author(s): Rahul Meena*, Spencer Fajardo, Michael D. Shields, Michael L. Falk, Dimitris Giovanis, Thomas J. Hardin, Michael Chandross, Yannis Kevrekidis
	11:20 - 11:40	ID 818: Prediction of Microstructure Evolution with Physics-Constrained Bayesian Neural Networks Author(s): Luka Malashkhia, Dehao Liu, Anh Tran, Yanglong Lu, Yan Wang*
	11:40 - 12:00	ID 840: Error quantification of wind tunnel-informed stochastic wind model based on the translation processes for simulation of non-Gaussian wind pressures on buildings Author(s): Thays Duarte, Srinivasan Arunachalam, Arthriya Subgranon*, Seymour Spence
MS402: Topology Optimization: from Algorithmic Developments to Applications. Chair(s): Mazdak Tootkaboni		
SC 3245 - Northside	10:00 - 10:20	ID 894: Development of Material Property Feasibility Constraints for a Multiscale Topology Optimization Framework Using Radial Basis Function Interpolations Author(s): Brent Bielefeldt*, Richard Beblo, Eddie Meixner, Robert :Lowe
	10:20 - 10:40	ID 946: A Smooth Maximum Regularization Approach for Robust Topology Optimization in the Ground Structure Setting Author(s): Emily Alcazar*, Lorrán Foliveira, Fernando Vasconcelos Da Senhora, Adeildo Ramos, Glaucio Paulino
	10:40 - 11:00	ID 968: Embodied carbon-based topology and sizing optimization of seismic retrofit for non-conforming RC structures Author(s): Fabio Di Trapani*, Antonio P. Sberna, Josephine V. Carstensen, Giuseppe C. Marano
MS309: Modeling of Materials with Interfaces and Scales Using Physics-Based and Machine-Learning Methods. Chair(s): Xiang Zhang		
EH 241 - Old Fourth Ward	10:00 - 10:40	Keynote ID 109: Micromechanical Analysis of Materials with Complex Microstructures: Automated Modeling and Deep Learning Algorithms Author(s): Soheil Soghrati*, Salil Pai, Pengfei Zhang, Balavignesh Vemparala
	10:40 - 11:00	ID 524: Physics-Informed Neural Network-based computational Solid Mechanics Model for Problems with Material Heterogeneity Author(s): Hyeon Kong*, Pinlei Chen
	11:00 - 11:20	ID 252: A paradigm for fast exploring of material reponses space considering microstructure statistics and application to particulate composites Author(s): Min Lin, Xiang Zhang*

EH 241 - Old Fourth Ward	11:20 - 11:40	ID 178: Computation Infrastructure for Modeling Discontinuities within Materials: DEIP, BEAVER and MOOSE Author(s): Timothy Truster*, Sunday Aduloju, Amirfarzad Behnam
	11:40 - 12:00	ID 411: Novel Lagrange Multiplier Formulation for Imposing Displacement and Traction Discontinuities in Material Microstructures Author(s): ARIFUL HASAN*, Timothy Truster
MS207: Recent Advances in Hybrid Simulation and Real-time Hybrid Simulation. Chair(s): Wei Song and Richard Christenson		
SC 3249 - Peachtree	10:00 - 10:20	ID 276: Modeling of the Dynamic Interaction between the NHERI@UCSD 6-DOF Large High-Performance Outdoor Shake Table and TallWood Building Specimen Author(s): Chin-Ta Lai*, Joel Conte
	10:20 - 10:40	ID 796: Multi-Axis Shake Table Real-time Hybrid Simulations of Buildings with Floor Isolation Systems Author(s): James Ricles*, Liang Cao, Esteban Villalobos Vega, Scott Harvey, Thomas Marullo, Faisal Malik
	10:40 - 11:00	ID 880: Experimental Validation of Real-Time Hybrid Substructuring for a Seismically Excited Building using an Inertial Shaker Transfer System Author(s): David Vanasse, Sergio Lobo-Aguilar, Richard Christenson*
	11:00 - 11:20	ID 171: Investigation of the Effect of Dynamic Axial Force on the Lateral Response of RC Columns Using Real-Time Hybrid Simulation Author(s): Yunbyeong Chae*, Jamin Park, Minseok Park, Chul-Young Kim
	11:20 - 11:40	ID 798: Thermomechanical Real-Time Hybrid Simulation: Identification, Control, and Experimental Implementation Author(s): Herta Montoya*, Christian Silva, Shirley Dyke, Manuel Salmeron
MS805: Self-healing infrastructure materials and systems. Chair(s): Ali Ghahremaninezhad		
SC 1216 - Piedmont	10:00 - 10:20	ID 272: Crack-healing in reinforced concrete beams with engineered aggregates Author(s): Xiaoying Pan, Bora Gencturk*, Hadi Aryan
	10:20 - 10:40	ID 587: Towards self-healing concrete using protein encapsulated hydrogels Author(s): Elvis Baffoe, Ali Ghahremaninezhad*
	10:40 - 11:00	ID 926: Development of a damage-responsive self-healing system using bio-inspired polymeric fiber (BioFiber) for incorporation into infrastructure materials Author(s): Mohammad Houshmand Khaneghahi*, Divya Kamireddi, Seyed Ali Rahmaninezhad, Aidan Cotton, Caroline L. Schauer, Christopher M. Sales, Ahmad Najafi, Reeva Street, Amirreza Sadighi, Yaghoob (Amir) Farnam*
MS403: Origami/Kirigami Inspired Structures and Metamaterials. Chair(s): Pradeep Pratapa and Mark Schenk		
EH 247 - Sweet Auburn	10:00 - 10:20	ID 529: Cable-Actuated Prestressed Origami Tubes Author(s): Megan Ochalek, Manan Arya*
	10:20 - 10:40	ID 390: Additively Manufactured Multi-material Monolithic Self Deployable Spacecraft Structures containing Hinges Author(s): Colin Hunter*, Avinkrishnan Ambika Vijayachandran, Anthony Waas
	10:40 - 11:00	ID 612: Design of Thick Origami for Reusable and Deployable Load Carrying Structures and Infrastructure Author(s): Yi Zhu*, Evgueni Filipov
	11:00 - 11:20	ID 457: Evaluation of kirigami-inspired façade concepts to improve building energy performance Author(s): Rodrigo Arauz*, Aminallah Pourasghar, John Brigham
	11:20 - 12:00	Open Discussion on 'Education with Origami/Kirigami Mechanics'
MS808: Cementitious Materials: Experiments and Modeling Across the Scales. Chair(s): Bernhard Pichler		
EH 266 - Summerhill	10:00 - 10:20	ID 467: Seasonal variation of FWD test results of a concrete-over-asphalt composite pavement: asphalt-related temperature correction of measured deflections Author(s): Rodrigo Diaz Flores*, Valentin Donev, Mehdi Aminbaghai, Lukas Eberhardsteiner, Luis Zelaya-Lainez, Raphael Höller, Christian Hellmich, Martin Buchta, Bernhard L.A. Pichler
	10:20 - 10:40	ID 485: A Numerical Investigation of Gas Migration in Wellbore Cementing Processes using the Lattice Boltzmann Method Author(s): Carlos Garcia Verdugo*, Ping Lyu, Eilis Rosenbaum, Julie Vandenbossche, Anthony Iannacchione, John Brigham
	10:40 - 11:00	ID 501: Carbon nanotube (CNT) reinforced cementitious composites using carboxymethyl cellulose (CMC) treatment for enhanced dispersion, mechanical, and piezoresistive properties Author(s): Dawei Zhang*, Ying Huang, Wenjie Xia, Leonard Chia

EH 266 - Summerhill	11:00 - 11:20	ID 819: Raman Imaging of Alkali Silica Reaction Product Formed Under Accelerated Conditions Author(s): Chirayu Kothari*, Nishant Garg
	11:20 - 11:40	ID 887: Carbon sequestration in cementitious materials: Characterizing the hydration processes in early-stage carbonated concretes Author(s): Marcin Hajduczek*, Damian Stefaniuk, James C. Weaver, Franz-Josef Ulm, Admir Masic
MS501: Computational/Experimental Fluid Dynamics and Fluid-Structure Interaction. Chair(s): Georgios Moutsanidis		
SC 3252 - Techwood	10:00 - 10:20	ID 516: Reducing Drag, Improving Performance: A Study of V-Shaped Riblets on Shipping Vessel Hulls Author(s): Nathaniel Werner, Katherine Rioux*, Ryan Pritzkau
	10:20 - 10:40	ID 549: High Fidelity Modeling of Fracture Under Extreme Hydrodynamic Events: A Coupled SPH-Phase-Field FSI Approach Author(s): Mohammad Naqib Rahimi*, Georgios Moutsanidis
	10:40 - 11:00	ID 617: An Enriched Immersed Boundary Method for Solidification and Melting Problems in Additive Manufacturing Author(s): Ze Zhao*, Jinhui Yan
	11:00 - 11:20	ID 699: Heat and mass transfer analysis for nanofluid flows in a channel Author(s): Gabriella Bogner*
MS101: Mechanics, Physics, and Chemistry for Sustainable and Resilient Civil, Energy, and Bio-related Infrastructures and Materials - In Honor of the NAE Recognition of Prof. Franz-Josef Ulm. Chair(s): Matthieu Vandamme		
IC 105	10:00 - 10:40	Keynote ID 520: Engineering now! Are we ready? Author(s): Franz-Josef Ulm*
	10:40 - 11:00	ID 389: Chemo-mechanical homogenization applied to climate and energy geomechanics Author(s): Chloe Arson*
	11:00 - 11:20	ID 333: The Physics of Urban Flooding Author(s): Sarah Balaian, Brett Sanders, Mohammad Javad Abdolhosseini Qomi*
	11:20 - 11:40	ID 923: Mesoscale logic mediates microscale chatter and scientific discovery Author(s): Roger Ghanem*, Zheming Gou
	11:40 - 12:00	ID 118: Sustainable and Resilient Coastal Infrastructure Amidst A Sea Level Rise and Coastal Storm Environment Author(s): George Deodatis*, Kyle Mandli, Yuki Miura
MS314: Mechanics of Wood and Wood Based Materials. Chair(s): Markus Lukacevic		
IC 109	10:00 - 10:20	ID 360: Microprestress Theory for the Simulation of Mechanosorptive Effects in Wood Author(s): Susan Alexis Brown*, Danyang Tong, Hao Yin, Gianluca Cusatis
	10:20 - 10:40	ID 286: Phase field method-based modeling of wood fracture Author(s): Sebastian Pech*, Markus Lukacevic, Josef Füssl
	10:40 - 11:00	ID 451: Energy Dissipation Mechanisms in Cross-Grain Fracture of Spruce Author(s): Parinaz Belalpour Dastjerdi*, Eric Landis
	11:00 - 11:20	ID 595: Size effect of glued laminated timber beams predicted by numerical simulations Author(s): Markus Lukacevic*, Christoffer Vida, Josef Füssl
	11:20 - 11:40	ID 751: A Probabilistic Model for the Spatial Variation of Eastern Hemlock Tensile Strength Author(s): Fiona O'Donnell*

11:00 – 13:00 Tenured. Now what? Mentoring and Career Planning for Tenure-track and Recently Tenured Faculty Members • EH 122 – Midtown V

12:00 – 13:00 Thornton Tomasetti lunch • Exhibition Hall & John Lewis Student Center 3rd floor hallway

13:00 – 14:00 Plenary Lecture • Ferst Center for the Arts
Recent Advances and Breakthroughs in the Modeling and Simulation of Extreme Events
Yuri Bazilevs, Ph.D., A.M.ASCE, Brown University

Thursday, June 8, Early Afternoon Sessions, 14:15 – 15:35

MS104: Advanced Engineering Concepts, Designs, and Technologies for Aerospace and Extraterrestrial Applications (Sponsored by ASCE Aerospace Division).		
Chair(s): Naveen K. Muthumanickam and Yong-Rak Kim		
EH 242 - Centennial	14:15 - 14:35	ID 811: Micromechanics-guided design of functional cementitious composites for 3D printing Author(s): Hongyu Zhou*, Adam Brooks, Zhenglai Shen
	14:35 - 14:55	ID 388: Experimental investigation on the in-plane compressive behavior of curved steered fiber laminated panels Author(s): Avinkrishnan Ambika Vijayachandran*, Shiyao Lin, Anthony Waas
	14:55 - 15:15	ID 260: Machinability Characteristics of Cu-Al-Mn and NiTi Shape Memory Alloys and Common Steels Author(s): Huanpeng Hong, Bora Gencturk*
MS307: Structural instabilities: From failure to function.		
Chair(s): Hayder Rasheed and CW Lim		
EH 222 - Buckhead	14:15 - 14:35	ID 961: Lowerbound buckling loads of cylindrical shells with periodic imperfections Author(s): Rainer Groh*
	14:35 - 14:55	ID 967: Progressive Wrinkling and Collapse of Lined Pipe due to Cyclic Bending and Reeling Author(s): Stelios Kyriakides*, Emile Naous
MS303: Multiscale Behavior of Damage and Failure Mechanics.		
Chair(s): Poh Leong Hien		
SC 3294 - Castleberry	14:15 - 14:35	ID 241: A Micromorphic Filter for Determining Stress and Deformation from Grain-Resolving DNS Author(s): Nathan Miller, Farhad Shahabi, Joseph Bishop, Richard Regueiro*
	14:35 - 14:55	ID 599: Modeling Frictional Contact Between a Blunt Tool and Rock With Anisotropic Damage Author(s): Yaneng Zhou*, George Z. Voyiadjis
	14:55 - 15:15	ID 284: A Machine Learning-Aided Digital Twin for Damage Sensing based on a Multiphysics-Multiscale Computational Modeling Framework using Piezoelectric Composites Author(s): Saikat Dan*, Preetam Tarafder, Somnath Ghosh
	15:15 - 15:35	ID 180: Prediction and Multi-objective Optimization of the Three-Phase Particulate Concrete Parameters with Artificial Neural Network and Particle Swarm Optimization Author(s): YIJIE CHEN*, Sze Dai Pang
MS312: Surrogate modeling for uncertainty quantification, optimization, and statistical inference in engineering applications.		
Chair(s): Abdollah Shafieezadeh		
IC 215	14:15 - 14:35	ID 771: Enhanced Support Vector Machine for efficient reliability analysis of offshore wind turbines Author(s): Xukai Zhang*, Asim Khajwal, Arash Noshadravan
	14:35 - 14:55	ID 695: Deep Learning-based Integrated Probabilistic Cost Analysis for Future Decarbonized Hurricane-Prone Power Systems Author(s): Kamiar Khayambashi*, Andrés Clarens, William Shobe, Negin Alemazkoor
	14:55 - 15:15	ID 758: Quantifying the Fatigue Reliability of Ship Hulls with Long Propagating Cracks Author(s): Mohamed Soliman, Mohammad F. Tamimi, Somayeh Shojaekhah*
MS210: Integration of Physics-based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification.		
Chair(s): Hamed Ebrahimian and Haeyoung Noh		
EH 203 - Highlands	14:15 - 14:35	ID 123: Finite Element Model Updating using Primal-Relaxed Dual Global Optimization Algorithm Author(s): Trent Schreiber*, Yu Otsuki, Yang Wang
	14:35 - 14:55	ID 294: Normalizing Flow-based Deep Variational Bayesian Network for Seismic Multi-hazards and Impacts Estimation from InSAR Imagery Author(s): Xuechun Li, Susu Xu*
	14:55 - 15:15	ID 443: Dynamic response prediction of nonlinear MDOF systems by neural-network-augmented physics models Author(s): Jaehwan Jeon*, Junho Song
	15:15 - 15:35	ID 471: DISPLACEMENT-BASED STRUCTURAL IDENTIFICATION USING DIFFERENTIABLE PHYSICS Author(s): Borna Rahnamay Farnod*, Wesley Reinhart, Rebecca Napolitano

MS811: Architected Materials. Chair(s): Tian Chen		
IC 103	14:15 - 14:35	ID 677: Light stiff instability-tolerant lattice architectures: the topological efficiency of deep sea sponges Author(s): Mazdak Tootkaboni, Ladan Salari, Lorenzo Valdevit, Ardalan Nejat, Alireza Asadpoure*
	14:35 - 14:55	ID 141: Superkagome: a framework for augmented topological lattices Author(s): Mohammad Charara*, Stefano Gonella
	14:55 - 15:15	ID 530: Enhanced Mechanical Properties of Marine sponges Inspired Tubular Metamaterials Author(s): Zhennan Zhang*, Yanyu Chen
	15:15 - 15:35	ID 149: Fragile topology and corner modes in elastic self-dual kagome metamaterials Author(s): Pegah Azizi*, Siddhartha Sarkar, Kai Sun, Stefano Gonella
MS709: Recent Advances in Unsaturated Poromechanics. Chair(s): Xiaoyu Song		
EH 270 - Inman Park	14:15 - 14:35	ID 487: 2D stochastic analysis of Vette fault stability in potential CO2 storage site Smeaheia, offshore Norway Author(s): Xiongyu Hu*, Marte Gutierrez, Nazmul Haque Mondol, Md Jamilur Rahman
	14:35 - 14:55	ID 931: Nonlocal micro-polar poromechanics for shear bands and cracks in porous media under dynamic loads Author(s): Xiaoyu Song*, Hossesin Pashazad
MS705: Mechanics and Physics of Granular Materials. Chair(s): Payam Poorsolhjoui, Marcial Gonzalez, Yida Zhang		
IC 211	14:15 - 14:35	ID 195: Fracture and damage mechanics on sea ice floes using LS-ICE DEM Author(s): Rigoberto Moncada Lopez*, Jacinto Ulloa, Mukund Gupta, Andrew Thompson, Jose Andrade
	14:35 - 14:55	ID 952: Predicting the yield limit of sandstones Author(s): Julien Houry*, Sébastien Boutareaud, Gilles Pijaudier-Cabot
	14:55 - 15:15	ID 723: Continuum stress and strain analysis of the Discrete Element Method (DEM) as applied to shear loading of cuboidal grain assemblies Author(s): Yu-Hsuan Lee*, Beichuan Yan, Zhou Lei, Richard Regueiro
	15:15 - 15:35	ID 869: Micromechanics based homogenization of truss lattices with experimental validation Author(s): Kehinde Omotayo*, Samal Aminashairi, Ranganathan Parthasarathy, Paul Resch
MS701: Computational Geomechanics. Chair(s): Qiushi Chen		
EH 127 - Midtown I	14:15 - 14:35	ID 350: Numerical implementation and validation of an advanced Thermo-Elasto-Viscoplastic (TEVP) constitutive model for saturated frozen geomaterials Author(s): Dana Amini*, Pooneh Maghoul, Amade Pouya
	14:35 - 14:55	ID 907: Implementation of a fabric driven mobilized friction angle to improve estimated K0 in Norsand Author(s): Mason Ghafghazi, Wyatt Handspiker*
MS201: Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering. Chair(s): Lori Graham Brady		
EH 123 - Midtown II	14:15 - 14:35	ID 868: A First-Order formulation with exact imposition of boundary conditions for physics-informed neural networks Author(s): Rini J. Gladstone*, Mohammad A. Nabian, Hadi Meidani
MS301: Advances and Applications of Elasticity within Applied Mechanics. Chair(s): Ney Dumont and Sonia Mogilevskaya		
EH 142 - Midtown III	14:15 - 14:35	ID 212: TRANSIENT RESPONSE OF FRAME STRUCTURES INTERACTING WITH SOIL PROFILES BY MODIFIED MODAL BASIS Author(s): Amauri Ferraz, Lucas Pacheco, Ronaldo Carrion, Euclides Mesquita*
	14:35 - 14:55	ID 837: Mechanics of nanomaterials from first principles Author(s): Phanish Suryanarayana*

MS807: Innovations in advanced cementitious materials and low-carbon concrete.		
Chair(s): Jianqiang Wei		
SC 3245 - Northside	14:15 - 14:35	ID 859: Data-driven design of low-carbon concrete mixture for additive construction Author(s): Chaofeng Wang*, Jianhao Gao
	14:35 - 14:55	ID 845: Understanding the role of magnesium in modifying structure and properties of calcium silicate hydrate Author(s): Amirhossein Madadi*, Jianqiang Wei
MS212: Probabilistic assessment, data-driven inference, and optimization for decision-making under uncertainty.		
Chair(s): Mariyam Amir		
EH 241 - Old Fourth Ward	14:15 - 14:35	ID 733: Bayesian fragility estimation for risk assessment of structures within the setting of generalized stratified sampling Author(s): Srinivasan Arunachalam*, Seymour Spence
	14:35 - 14:55	ID 835: A Novel Approach to Computing Generalized Variability Response Functions for Structures with Random Parameters Author(s): Manuel Miranda*
	14:55 - 15:15	ID 224: Threat-independent progressive collapse analysis to identify dominant failure sequences and estimate system failure probability Author(s): Trisha Chakravorty*, Minangshu Baidya, Aritra Chatterjee, Baidurya Bhattacharya
MS207: Recent Advances in Hybrid Simulation and Real-time Hybrid Simulation.		
Chair(s): Richard Christenson and Wei Song		
SC 3249 - Peachtree	14:15 - 14:35	ID 230: Application of Hydro-Real-Time Hybrid Simulation to Examine the Response of Offshore Wind Turbines Author(s): Akiri Seki*, Jonah Gadasi, Cameron Irmias, Bret Bosma, Shangyan Zou, Michael Devin, Barbara Simpson, Bryson Robertson, Bryony DuPont, Ted Brekken, Andreas Schellenberg, Pedro Lomonaco
	14:35 - 14:55	ID 664: A Real-Time Hybrid Simulation Platform for Monopile Offshore Wind Turbines Author(s): Wei Song*, Chao Sun, Santiago Ruiz*
	14:55 - 15:15	ID 217: Real-time hybrid simulation test of mast structure considering fluid-structure interaction Author(s): Yucai Chen*, Xiaojun Zheng, X. Shawn Gao, Kun Wang, Jiurong Wu, Huimeng Zhou, Pin Tan
	15:15 - 15:35	ID 602: Multi-directional Behavior of a Tall Building Equipped with Damped Outriggers using 3D Real-Time Hybrid Simulation Author(s): Safwan Al-Subaihawi*, James Ricles, Thomas Marullo, Liang Cao
MS308: Machine Learning in Mechanics, Materials, and Structures.		
Chair(s): Christos Athanasiou		
SC 1216 - Piedmont	14:15 - 14:35	ID 194: Transfer Learning Genetic Expression Programming for Reduced Data Modeling of Civil Engineering Systems Author(s): Jacob Murphy*
	14:35 - 14:55	ID 382: Characterization of the Damage Tolerance of Composite Overlays through Subspace Evaluation Author(s): Corey Arndt, Stephanie TerMaath*
	14:55 - 15:15	ID 433: How can graph neural networks help in the analysis and design of structures Author(s): Kai Guo*
	15:15 - 15:35	ID 441: A conditional Variational AutoEncoder-boosted Reduced Order Model for multi-parametric dependencies in nonlinear dynamics Author(s): Kontantinos Vlachas*, Thomas Simpson, Anthony Garland, Carianne Martinez, Eleni Chatzi
MS810: Advanced Design and Manufacturing of Programmable Matter.		
Chair(s): Jochen Mueller and Amir Alavi		
EH 247 - Sweet Auburn	14:15 - 14:35	ID 168: Development of a custom metal DED 3D printer for real-time printing quality control Author(s): Subin Shin*, Sangjun Kim, Hoon Sohn
	14:35 - 14:55	ID 220: Architected materials with effective water intake, storage, and release properties inspired by the feathers of namaqua sandgrouse (Pterocles namaqua) Author(s): Jochen Mueller*, Lorna Gibson
	14:55 - 15:15	ID 419: Automated Design and Discovery of Mechanical Metamaterials Author(s): Qianyun Zhang, Kaveh Barri, Wenyun Lu, Jianzhe Luo, Amir Alavi*
	15:15 - 15:35	ID 787: Evaluating Regression and Generative Modeling Paradigms for Materials Design Author(s): Arindam Debnath, Wesley Reinhart*

MS809: Mechanics of Sustainable Alternative Pavement Materials.		
Chair(s): Ramez M. Hajj		
EH 266 - Summerhill	14:15 - 14:35	ID 428: How Does Chemical Makeup of Recycling Agents and Antioxidants Affect the Long-Term Performance of Recycled Asphalt Binder Blends? Author(s): Hamzeh Haghshenas*, David Mensching, Michael Elwardany, Panos Apostolidis
	14:35 - 14:55	ID 591: On the Use of Alternative Paving Materials: a RILEM research from TC 279 WMR Author(s): Augusto Cannone Falchetto*, Lily Poulidakos, Emiliano Pasquini, Di Wang, Marjan Tušar, Jorge Pais, Fernando Moreno-Navarro, Davide Lo Presti, Ana Jiménez del Barco Carrión
	14:55 - 15:15	ID 888: Investigation of the Reactivity in Epoxy-Modified Asphalt (EMA) as an Alternative Paving Material for Durable Open-Graded Friction Course (OGFC) Author(s): Michael Elwardany*, Adrian Andriescu, Hamzeh Haghshenas, Panos Apostolidis, Raj Dongré, David Mensching, Jack Youtcheff
	15:15 - 15:35	ID 933: Rheological modeling of recycled asphalt binder blends as fluid mixtures Author(s): Saqib Gulzar*, Andrew Fried, Jaime Preciado, Shane Underwood, Cassie Castorena
MS608: Analysis and Prediction of Wind Effects on the Built Environment.		
Chair(s): R. Panneer Selvam		
SC 3252 - Techwood	14:15 - 14:35	ID 447: Application of Incremental Dynamic Analysis to Performance-Based Wind Design Author(s): Baichuan Deng*, Teng Wu
	14:35 - 14:55	ID 482: Performance-Based Wind Design of Tall Buildings: Challenges of Implementation Author(s): Teng Wu*, Baichuan Deng
	14:55 - 15:15	ID 844: Database-enabled surrogate-assisted investigation on the interference effects of two adjacent buildings Author(s): Fei Ding*, Sang-ri Yi, Alexandros Taflanidis, Ahsan Kareem
	15:15 - 15:35	ID 262: Computation of Building Corner Peak Pressure Using CFD Author(s): Rathinam Selvam*
MS101: Mechanics, Physics, and Chemistry for Sustainable and Resilient Civil, Energy, and Bio-related Infrastructures and Materials - In Honor of the NAE Recognition of Prof. Franz-Josef Ulm.		
Chair(s): Ange-Therese Akono		
IC 105	14:15 - 14:35	ID 291: Viscous behavior of shale rocks due to dissolution and precipitation processes Author(s): Ravi Prakash, Arash Noshadravan, Sara Abedi*
	14:35 - 14:55	ID 903: Analytical solution for a poroelastic inclusion embedded within an elastoplastic matrix Author(s): Yidi Wu, Amin Mehrabian*, Shengli Chen, Younane Abousleiman
	14:55 - 15:15	ID 567: Falling Weight Deflectometer tests on multi-layered pavements: design and evaluation of innovative experiments Author(s): Rodrigo Díaz Flores, Valentin Donev, Mehdi Aminbaghai, Lukas Eberhardsteiner, Luis H. Zelaya-Lainez, Raphael Höller, Christian Hellmich, Ronald Blab, Martin Buchta, Bernhard L.A. Pichler*
	15:15 - 15:35	ID 824: Hidden environmental footprint of roadway network: when mechanistic models meet data analytics Author(s): Mazdak Tootkaboni*, Meshkat Botshekan, Franz Ulm, Arghavan Louhghalam
MS314: Mechanics of Wood and Wood Based Materials.		
Chair(s): Sebastian Pech		
IC 109	14:15 - 14:35	ID 757: A Probabilistic Modeling Approach for Wind Uplift Resistance in Wood-Frame Load Paths Author(s): Brandon Rittelmeyer*, David Roueche
	14:35 - 14:55	ID 336: Experimental Evaluation of Post-Tensioning Losses in Mass Timber Wall Panels Author(s): Jacob Gesh*, Esther Baas, Mariapaola Riggio, Andre R. Barbosa, Lech Muszynski, Gabriele Granello
	14:55 - 15:15	ID 902: Computational Evaluations of the Flexural Behavior of Steel-CLT Composite Floor Members Author(s): Megan Potuzak*, Kadir Sener, David Roueche

15:35 – 16:00 Coffee Break · Exhibition Hall & John Lewis Student Center 3rd floor hallway

Thursday, June 8, Late Afternoon Sessions, 16:00 – 18:00

MS104: Advanced Engineering Concepts, Designs, and Technologies for Aerospace and Extraterrestrial Applications (Sponsored by ASCE Aerospace Division). Chair(s): Hongyou (Nick) Zhou and Pooneh Maghoul		
EH 242 - Centennial	16:00 - 16:20	ID 415: Sintering for ISRU-Oriented Lunar Regolith Densification: Multiscale Characterization and Multiphysics Computational Modeling Author(s): Shayan Gholami, Young-Jae Kim, Xiang Zhang, Yong-Rak Kim*, Bai Cui, Hyu-Soung Shin, Janguen Lee
	16:20 - 16:40	ID 564: A Stabilized Interface Method for 3D Printing: Terrestrial and Extraterrestrial Applications Author(s): Arif Masud*, Ignasius Wijaya, Eric Kreiger
	16:40 - 17:00	ID 682: Discrete Element Method for Regolith-Tool Interaction Modeling of RASSOR Collection System Author(s): Daniel Gaines*, Qiushi Chen, Laura Redmond
	17:00 - 17:20	ID 345: Vibration effects on assisting penetration into granular materials Author(s): Mahdi Alaei, Pooneh Maghoul*, Nan Wu
	17:20 - 17:40	ID 274: Risks and Challenges of Using Earth Rock Mass Classification System on the Moon Author(s): Roberto Mendonca de Moraes*, Antonio Bobet
MS213: Smart sensing and artificial intelligence for civil infrastructure monitoring. Chair(s): Yuguang Fu and Jian Li		
EH 222 - Buckhead	16:00 - 16:20	ID 271: Measuring 3D Torsional Displacement of Structures by Computer Vision Author(s): Mohammad Vasef*, Mostafa Iraniparast*, Lin Chen, Peng "Patrick" Sun*
	16:20 - 16:40	ID 461: Simultaneous seismic input and state estimation with optimal sensor placement for building structures using incomplete acceleration measurements Author(s): Jian Li*, Sdiq Taher, Huazhen Fang
	16:40 - 17:00	ID 536: Prototyping of An Edge-Intelligence-Enabled Smart Adaptive Triggering Mechanism for Wireless Vibration-based Structural Health Monitoring Author(s): Shuaiwen Cui*, Yuguang Fu
	17:00 - 17:20	ID 232: Impact Detection and Localization Using Deep Learning and Information Fusion Author(s): Yuguang Fu*, Zixing Wang, Amin Maghareh, Shirley Dyke, Mohammad Jahanshahi
	17:20 - 17:40	ID 296: Bridge pier structural performance prediction framework driven by scour monitoring and extreme event forecasting Author(s): Neandro DeMello*, Jennifer A. Bridge
17:40 - 18:00	ID 772: Investigation of heterogeneous strain data fusion for output-only system identification Author(s): Tahsin Afroz Hoque Nishat*, Hongki Jo, Jian Li, Simon Laflamme, Austin Downey, Caroline Bennette, William Collins, Sdiq Taher, Han Liu	
MS303: Multiscale Behavior of Damage and Failure Mechanics. Chair(s): Poh Leong Hien		
SC 3294 - Castleberry	16:00 - 16:20	ID 842: Modeling fatigue overload behavior in microstructurally short cracks: connecting initiation and long crack behavior Author(s): Robert Fleishel*, Stephanie TerMaath
	16:20 - 16:40	ID 236: Molecular Dynamics Study of the Impact Response of Architected Metallic Foam Nanocomposites Author(s): Mohammed Saffarini, Tommy Sewell*, Zhen Chen
MS202: Structural Identification and Damage Detection. Chair(s): Manolis Chatzis and Yashar Eftekhari Azam		
IC 215	16:00 - 16:20	ID 761: A framework for design allowables accounting for paucity of data and errors in complex models Author(s): Philippe Hawi*, Roger Ghanem
	16:20 - 16:40	ID 248: Sensitivity Analysis of Model-Assisted Probability of Detection for Guided-Wave-Based Structural Health Monitoring Systems Author(s): Juan David Navarro*, Juan Camilo Velasquez-Gonzalez, Mauricio Aristizabal, Harry Millwater, Arturo Montoya, David Restrepo
	16:40 - 17:00	ID 249: Rapid performance evaluation of building structures under seismic excitations based on prior dynamic testing Author(s): Luji Wang*, Jiazeng Shan
	17:00 - 17:20	ID 518: Environmental Effects on Output-Only Vibration Parameters of Reinforced Concrete Systems Author(s): Maya Rao, Riley Brown, Karl Gaebler, Carol Shield, Lauren Linderman*
	17:20 - 17:40	ID 598: Strain Transfer Mechanisms of Fiber Optic Sensors and Recent Applications of Distributed Fiber Optic Sensing on Structural Component Testing Author(s): Shenghan Zhang*, Matthew DeJong
17:40 - 18:00	ID 710: Finite element model updating of non-proportional non-viscous damping systems using complex eigenvalues and eigenvectors Author(s): Yu Otsuki*, Yang Wang	

MS210: Integration of Physics-based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification.		
Chair(s): Hamed Ebrahimi and Babak Moaveni		
EH 203 - Highlands	16:00 - 16:20	ID 528: Axial stress measurement in continuous welded rails using impact-driven vibrations Author(s): Alireza Enshaeian*, Matthew Belding, Piervincenzo Rizzo
	16:20 - 16:40	ID 563: Learning nonlinear material constitutive models using machine-infused mechanics-based model training Author(s): Mohammad Valikhani*, Kasra Shamsaei, Hamed Ebrahimi
	16:40 - 17:00	ID 635: TelecomTM: A Fine-grained and Ubiquitous Traffic Monitoring System Using Pre-Existing Telecommunication Cables as Sensors Author(s): Jingxiao Liu*, Siyuan Yuan, Yiwen Dong, Biondo Biondi, Hae Young Noh
	17:00 - 17:20	ID 641: Efficient Combination of Modal Data for Structural Parameter Estimation Using Artificial Neural Networks Author(s): Milad Mehrkash*, Erin Bell
	17:20 - 17:40	ID 670: Bayesian Inversion for Soil-Structure System Identification Author(s): Abdelrahman Taha*, Hamed Ebrahimi
	17:40 - 18:00	ID 714: Physics-Constrained Dictionary Learning with Sensor Fusion for Machine Health Monitoring Author(s): Sungjin Hong*, Yanglong Lu, Sung-Hoon Ahn, Yan Wang
MS811: Architected Materials.		
Chair(s): Stefano Gonella		
IC 103	16:00 - 16:20	ID 846: Phase Transforming Cellular Materials under Concentrated Loading Conditions Author(s): Yunlan Zhang*, Phani Saketh Dasika, Nilesh Mankame, Pablo Zavattieri
	16:20 - 16:40	ID 666: Time Domain Analysis of Resonant Microstructured Media under Impact Loading Author(s): Erdem Caliskan*, Willoughby Cheney, Weidi Wang, Reza Abedi, Alireza Amirkhizi
	16:40 - 17:00	ID 763: Tension-Compression Asymmetry and Failure of Lattice Metamaterials Author(s): Enze Chen*, Shengzhi Luan, Stavros Gaitanaros
	17:00 - 17:20	ID 233: Study of architected materials exhibiting simultaneously negative Poisson's ratio and negative thermal expansion Author(s): Yunche Wang*, Tsechun Liso
	17:20 - 17:40	ID 337: Healable Magneto-elastic Networks from Self-assembly with Tunable Network Patterns and Mechanical Properties Author(s): Xinyan Yang*, Junqing Leng, Cheng Sun, Sinan Keten
	17:40 - 18:00	ID 392: Design and 3D-Printing of Woven Textiles Author(s): Tian Chen*
MS313: 7th Mini-Symposium on 4M (Modeling of Multiphysics-Multiscale-Multifunctional) Engineering Materials and Structures.		
Chair(s): Xiaoyu Song and Qiming Wang		
EH 270 - Inman Park	16:00 - 16:20	ID 314: Harnessing Carbon Sequestration to Manufacture Coral-Inspired Extremely Tough Materials Author(s): Haoxiang Deng*, Yuyan Gao, Haixu Du, Ketian Li, Yanchu Zhang, Kyunghoon Lee, Qiming Wang
	16:20 - 16:40	ID 412: Inverse Determination of Shrinkage and Fracture Properties of Engineered Buffer Materials for Geological Repositories of Nuclear Waste Using an Integrated DIC-FEM Approach Author(s): Mohammad Rahmani*, Abdullah Azzam*, Julia Grasley, Yong-Rak Kim, Jongwan Eun, Seunghee Kim
	16:40 - 17:00	ID 610: The effect of wrapping force on the transverse stiffness of packed bridge cables: an elastoplastic analysis Author(s): Linda Teka*, Huiming Yin
	17:00 - 17:20	ID 348: Modeling of the environment-dependent microstructure of hydrogel-based concrete (HBC) – for Mars application Author(s): Ning Liu*, Jishen Qiu
	17:20 - 17:40	ID 618: Stress and Fracture Analysis of a Perforated Spherical Container under Internal Pressure Author(s): Xin He*, Huiming Yin
	17:40 - 18:00	ID 511: Harnessing microorganisms to manufacture engineered living materials with environmentally friendly, low-cost, mechanically strong, and fire-resistant performance Author(s): Yuyan Gao*, Audie Lee, Qiming Wang
MS203: Computational Methods for Stochastic Engineering Dynamics.		
Chair(s): Ketson R. M. dos Santos		
IC 211	16:00 - 16:20	ID 108: Is self-similarity useful for finding the fractional Fokker-Planck equation? Author(s): Antonina Pirrotta*, Salvatore Russotto, Mario Di Paola

IC 211	16:20 - 16:40	ID 718: Combination of Statistical Linearization and Harmonic Balance for non-stationary random vibration analyses. Author(s): Beatrice Pomaro*, Pol D. Spanos
	16:40 - 17:00	ID 446: Efficient Wiener path integral most probable path determination based on extrapolation Author(s): Ilias Mavromatis*, Ioannis Kougioumtzoglou
	17:00 - 17:20	ID 465: A Rayleigh-Ritz solution approach for determining the Wiener path integral technique most probable path with mixed fixed/free boundaries Author(s): Ketson Roberto Maximiano dos Santos*, Ioannis A. Kougioumtzoglou
	17:20 - 17:40	ID 439: Response evolutionary power spectrum determination of nonlinear oscillators endowed with fractional derivative elements Author(s): Vasileios Fragkoulis*, Ioannis Kougioumtzoglou, Athanasios Pantelous, Michael Beer
	17:40 - 18:00	ID 327: The Emergence of an Inherent Urban Resilience to Natural Hazards Author(s): Nicos Makris*, Tue Vu, Gholamreza Moghimi, Georgios Chatzikyriakidis, Eric Godat
MS702: Characterization and modeling of physical processes in porous materials across scales. Chair(s): Giuseppe Buscarnera		
SC 3245 - Northside	16:00 - 16:20	ID 111: Unified surface poromechanics theory capturing condensation-induced contraction of mesoporous materials Author(s): Yida Zhang*, Mohammadali Behboodi
	16:20 - 16:40	ID 207: Bound Preserving Numerical Methods for Infiltration in Porous Media Author(s): Arnob Barua*, CE Kees
	16:40 - 17:00	ID 338: Porohyperelastic modeling of high-dose subcutaneous injection of monoclonal antibodies using data-driven tissue geometries Author(s): Mario de Lucio*, Yu Leng, Atharva Hans, Ilias Bilonis, Melissa Brindise, Arezoo M. Ardekani, Pavlos P. Vlachos, Hector Gomez
	17:00 - 17:20	ID 367: Classical density functional theory for nanoconfined inhomogeneous water-Co2 mixture on mineral surfaces. Author(s): Ali Morshedifard*, Mohammad Javad Abdolhosseini Qomi, Mehrdad Youzi
	17:20 - 17:40	ID 391: Finite Element Analysis for Predicting greenhouse gas emissions in riparian and hyporheic zones Author(s): Chengwu Jiang*, Martial Tallefert, Chloe Arson
MS308: Machine Learning in Mechanics, Materials, and Structures. Chair(s): Kai Guo		
EH 241 - Old Fourth Ward	16:00 - 16:20	ID 459: Predicting Fracture Paths in Heterogeneous Brittle Materials using Deep and Probabilistic Learning Author(s): Yen Peng (Ariana) Quek*, Jin Yi Yong, Johann Guilleminot
	16:20 - 16:40	ID 477: Multiscale mechanics modeling by transferring knowledge across scales using a deep convolutional network Author(s): Ashwini Gupta, Lori Graham-Brady*
	16:40 - 17:00	ID 565: Prestressed Concrete Beam Shear Capacity Prediction Models based on Regression and Genetic Programming Author(s): Wonsuh Sung*, Suhaib Alfaris, Nikhil Potnuru, Stephanie Paal, Maria Koliou, Petros Sideris, Anna Birely, Mary Beth Hueste, Stefan Hurtlebaus
	17:00 - 17:20	ID 603: Investigating large language models' understanding of mechanics Author(s): Mohd Zaki*, N. M. Anoop Krishnan
	17:20 - 17:40	ID 628: Predicting floor response of RC buildings under near-field ground motions using convolutional neural network Author(s): Iqra Latif*, Arnab Banerjee, Mitesh Surana
	17:40 - 18:00	ID 706: Knowledge extraction and transfer in data-driven fracture mechanics Author(s): Xing Liu*, Christos Athanasiou, Nitin Padture, Brian Sheldon, Huajian Gao
MS205: Innovations and Advances in Passive, Active, and Semi-active Structural Control. Chair(s): P. Scott Harvey		
SC 3249 - Peachtree	16:00 - 16:20	ID 359: Tuned-inerter dampers in vibration control of semi-submersible offshore wind platforms to improve system lifespan and energy harvesting Author(s): Lauren Hall*, Duncan Lambert, Ryan Okuda, Lei Zuo, Biao Fang, Yifan Luo, Javad Javaherian
	16:20 - 16:40	ID 557: Inerters: Mapping the Multiple Mechanisms for Magnifying Mass Author(s): Jonathan Shell*, Nicholas Wierschem
	16:40 - 17:00	ID 278: Deep reinforcement learning strategies for structural control devices with variable inerter Author(s): Takehiko Asai*, Yuto Inaba
	17:00 - 17:20	ID 561: Seismic Performance of Multi-degree-of-freedom Structures with Variable Inertia Rotational Mechanisms Author(s): Anika Sarkar*, Nicholas Wierschem
	17:20 - 17:40	ID 832: Experimental Testing of T-FLC Yielding Element with Non-Degrading Hysteretic Profile to Limit Floor Accelerations in SMF-Spine Systems Author(s): Jessica Duke*, Richard Sause, James Ricles, Larry Fahnestock, Barbara Simpson, Bryam Astudillo, Zhuoqi Tao

	17:40 - 18:00	ID 674: Application of Fe-SMA Bars as Self-Centering Elements in Bridge Piers to Improved Seismic Resilience Author(s): Masood Vahedi*, Hamed Ebrahimiyan, M. Saïid Saïidi
MS206: Infrastructure assessment automation with robotics, deep learning and digital twins. Chair(s): Vedhus Hoskere and Wei Song		
SC 1216 - Piedmont	16:00 - 16:20	ID 352: Towards real-time digital twins for post-earthquake damage assessment of masonry buildings Author(s): Bryan German Pantoja-Rosero*, Radhakrishna Achanta, Katrin Beyer
	16:20 - 16:40	ID 853: The role of digital twins for predictive maintenance of concrete deck bridges Author(s): Manuel Salmeron*, Xin Zhang, Shirley Dyke, Julio Ramirez
	16:40 - 17:00	ID 932: Digital twins for inspections of reinforced concrete bridges Author(s): Asad ur Rahman*, Deepank Kumar Singh, Subin Varghese, Vedhus Hoskere
	17:00 - 17:20	ID 829: Agile Simulation of Structural Systems within a Digital Twin Framework Author(s): Zahra Zhiyanpour*, Ayatollah Yehia, Mehrdad Shafiei Dizaji, Devin Harris
MS810: Advanced Design and Manufacturing of Programmable Matter. Chair(s): Jochen Mueller and Amir Alavi		
EH 247 - Sweet Auburn	16:00 - 16:20	ID 790: Studying Neural Network Constitutive Models in Open-Source Finite Element Analysis Software Author(s): Nilay Upadhyay*, Wesley Reinhart
	16:20 - 17:00	Keynote ID 949: Universal principles of flexible mechanical metamaterials Author(s): Zeb Rocklin*
	17:00 - 17:20	ID 956: Pathways to Manufacturing Mechanical Metamaterials by Examining Auxeticity in Nonwoven Fiber Networks Author(s): Prateek Verma, Anselm Griffin, Meisha Shofner*
MS614: Sustainable and Resilient Infrastructure Using Lightweight Materials. Chair(s): Fariborz M Tehrani		
EH 266 - Summerhill	16:00 - 16:20	ID 727: Contributions of Internally-Cured Concrete to Sustainability and Resilience of Pavements Author(s): Daron Brown*
	16:20 - 16:40	ID 103: What Goes Up On a Roof Can Come Down But It Will Cost You. Understanding the Sustainable Design Indent of Green Roof Growing Media Author(s): Chuck Friedrich, PLA, GRP*
	16:40 - 17:00	ID 361: Asphalt Chip Seal: An Alternative to Sealcoating Author(s): Steven Hoard*
	17:00 - 17:20	ID 615: Sustainable Biobased Coatings for In-situ Repair of Damaged Coated Rebars Author(s): Sher Afgan*, Ravi Kiran
	17:20 - 17:40	ID 492: Applied Development of Environmental Declarations for Rotary-Kiln Manufactured Expanded Aggregates Author(s): Fariborz Tehrani*
MS502: New advances in tropical cyclone induced winds, surge-wave, and flooding. Chair(s): Chao Sun and Grace Yan		
SC 3252 - Techwood	16:00 - 16:20	ID 210: Fragility assessment of bottom plate and shell of above ground storage tanks during flood events using finite element analysis Author(s): Md Manik Mia*, Sabarethinam Kameshwar
	16:20 - 16:40	ID 555: Investigation of Hurricane Wind Effects on Solitary Wave Energy Dissipation in a Storm Surge Author(s): Hunter Boswell, Grace Yan*, Wouter Mostert
	16:40 - 17:00	ID 605: Large Eddy Simulation of Wind Loading on Elevated Low-rise Buildings Author(s): Xiangjie Wang*, Chao Sun*, Chunsheng Cai
	17:00 - 17:20	ID 689: Large Eddy Simulation of Wind Turbulences Over Non-breaking and Breaking Waves Author(s): Tianqi Ma*, Chao Sun
	17:20 - 17:40	ID 801: Analysis of the Non-Linear Tide-River Flow Interactions of the Lower Mississippi and Atchafalaya Rivers in the Low-Lying Louisiana Coastline Author(s): Sayed Omar Hofioni*, Peter Bacopoulos, Jin Ikeda, Celalettin Emre Ozdemir
	17:40 - 18:00	ID 918: The Role of Turbulence and Roughness Length Parameterizations in Improving Major Hurricane Simulations in Weather Forecasting Models Author(s): Mostafa Momen*, Leo Matak, Meng Li

**MS101: Mechanics, Physics, and Chemistry for Sustainable and Resilient Civil, Energy, and Bio-related Infrastructures and Materials - In Honor of the NAE
Recognition of Prof. Franz-Josef Ulm.
Chair(s): Ange-Therese Akono**

IC 105	16:00 - 16:20	ID 630: Elastic and Plastic Characteristics of Lithium–Graphite Intercalation Phase Author(s): Edris Akbari*, George Z. Voyiadjis
	16:20 - 16:40	ID 890: Carbon-cement supercapacitors: A scalable bulk energy storage solution Author(s): Damian Stefaniuk, Nicolas Chanut, James C. Weaver, Yang Shao-Horn, Franz-Jozef Ulm, Admir Masic*
	16:40 - 17:00	ID 611: Reducing Thermal Conductivity of Calcium Silicate Hydrates: New Technological Opportunities provided by Cross-Linking with Organic Molecules Author(s): Amir Moshiri, Ali Morshedifard, Damian Stefaniuk, Santiago EL Awad, Kamil Krzywinski, Debora Frigi Rodrigues, Tejasree Phatak, Mohammad Abdolhosseini Qomi, Konrad Krakowiak*
	17:00 - 17:20	ID 619: Molecular simulations study of freezing of water confined in C-S-H, and implications for the cryo-suction process Author(s): Xinping ZHU, Laurent Brochard, Matthieu Vandamme*
	17:20 - 17:40	ID 826: Forces between Calcium-Silicate-Hydrate Surfaces: A Density Functional Approach Author(s): Thomas Petersen*
	17:40 - 18:00	ID 200: Thermo-poro-mechanical couplings from molecular fluctuations and application to cellulose Author(s): Laurent Brochard*

19:00 – 21:00 Conference Banquet and Award Ceremony, Exhibition Hall Midtown

Friday, June 9

7:45 – 8:30 Continental Breakfast · John Lewis Student Center 2nd and 3rd floor hallway

8:30 – 9:30 Plenary Lecture · Ferst Center for the Arts
 Engineering Mechanics Role in Robot-enabled Infrastructure Preservation
 Genda Chen, Ph.D., P.E., F.ASCE, Missouri Science & Technology University

9:30 – 10:00 Coffee Break · Exhibition Hall & John Lewis Student Center 3rd floor hallway

Friday, June 9, Morning Sessions, 10:00 – 12:00

MS702: Characterization and modeling of physical processes in porous materials across scales.		
Chair(s): Pania Newell		
IC 109	10:00 - 10:20	ID 407: Simulation of spontaneous excess pore pressure development during compaction band formation in saturated porous rock Author(s): Divyanshu Lal*, Giuseppe Buscarnera
	10:20 - 10:40	ID 573: Reactive chemo-hydro-mechanics for modelling aggressive fluid injection Author(s): Xiaojie Tang*, Manman Hu
	10:40 - 11:00	ID 575: Multiscale modeling of heterogeneous porous solids saturated by a thermoviscous fluid: beyond longwave homogenization Author(s): Renan Liupekevicius*, Hans van Dommelen, Marc Geers, Varvara Kouznetsova
	11:00 - 11:20	ID 600: Particle Scale Assessment of Strain Localization in Saturated Sheared Sand Author(s): Mohammed Elnur*, Khalid Alshibli
	11:20 - 11:40	ID 644: Influence of Micro- and Crystalline-Scale Properties on the Fracture of Silica Sand Particles Using 3D Finite Element Analysis Author(s): Wadi Imseeh, Mohammad Safi*, Khalid Alshibli
	11:40 - 12:00	ID 838: Poroelastic Spherical Indentation for Material Characterization Author(s): Ming Liu, Haiying Huang*
MS707: Mechanics of Nonconventional Granular Materials.		
Chair(s): Wencheng Jin		
EH 126 - Midtown IV	10:00 - 10:20	ID 187: Shear Characterization of Particulate Rigid Plastics From Non-recyclable Municipal Solid Waste Author(s): Abdallah Ikbarieh*, Yimin Lu, Sheng Dai
	10:20 - 10:40	ID 113: Smoothed particle hydrodynamics development for modeling granular biomass handling Author(s): Yumeng Zhao*, Wencheng Jin, Sheng Dai
	10:40 - 11:00	ID 130: Impacts of moisture content on the flowability of milled biomass Author(s): Yimin Lu*, Wencheng Jin, Jordan Klinger, Hariswaran Sitaraman, Sheng Dai
	11:00 - 11:20	ID 503: A material-point-method based model for the flow behavior of biomass particles with varying moisture content Author(s): Yudong Li*, Nicholas Deak, Yimin Lu, Hariswaran Sitaraman
	11:20 - 11:40	ID 165: Quantitative Assessment of Particle Characteristics Impact on the Flowability of Granular Biomass in Handling and Feeding Units Author(s): Ahmed Hamed*, Yidong Xia, Nepu Saha, Jordan Klinger, David Lanning, Jim Dooley, Neal Yancey
	11:40 - 12:00	ID 259: Discrete particle simulation of granular pine residues in an FT4 powder rheometer Author(s): Zakia Tasnim*, Dr. Qiushi Chen, Dr. Yidong Xia, Dr. Ahmed Hamed
MS901: Biomechanics of Human Movement, Performance, and Training.		
Chair(s): Amir Alavi and John Brigham		
SC 3294 - Castleberry	10:00 - 10:30	Keynote ID 959: Motion Tape Sensors and the Warfighter Digital Twin for Enhancing Physical Performance Author(s): Ken Loh*
	10:30 - 11:00	Keynote ID 653: Neuromechanical Approaches for Improving Human Movement Author(s): Minoru Shinohara*
	11:00 - 11:20	ID 685: Robotic System to Enable Active and Passive Embodiment for Hand Rehabilitation Author(s): Joshua Posen*, Joshua Lee, Frank Hammond III, Minoru Shinohara

SC 3294 - Castleberry	11:20 - 11:40	ID 160: Effect of occupant position on ejection and injury mitigation during the rollover of cutaway buses Author(s): Mohamad Alagheband*, Sungmoon Jung, MohammadReza Seyedi
	11:40 - 12:00	ID 418: In-Vitro Assessment of Lumbar Spinal Fusion in Human Cadaver Models Using Self-powered Sensors Author(s): Amir Alavi*, Kaveh Barri, Jianzhe Luo
MS210: Integration of Physics-based Models with Data for Identification, Monitoring, Estimation, and Uncertainty Quantification. Chair(s): Saeed Eftekhari-Azam and Eleonora Tronci		
EH 203 - Highlands	10:00 - 10:20	ID 782: Operational Health Monitoring of Bridges Using Bayesian Model Updating and Computer Vision Techniques Author(s): Niloofar Malekghaini*, Farid Ghahari, Hamed Ebrahimian, Vinayak Sachidanandam, Eric Ahlberg, Matthew Bowers, Ertugrul Taciroglu
	10:20 - 10:40	ID 950: Scaled Spherical Simplex Filter for finite-element model updating and system identification Author(s): Mariyam Amir*, Konstantinos G. Papakonstantinou, Gordon P. Warn
MS806: Small Scale Phenomena in Sustainable & Complex Materials. Chair(s): Nishant Garg and Claire White		
IC 215	10:00 - 10:20	ID 540: Composition-structure-reactivity relationship for aluminosilicate glasses in alkaline environment Author(s): Kai Gong*, Claire White, Elsa Olivetti
	10:20 - 10:40	ID 279: INDENTATION SIZE EFFECT IN CARBONTRIDED AISI 1045 STEEL Author(s): TABIRI KWAYIE ASUMADU*, Dr. Kwadwo MENSAH-DARKWA, Dr. Emmanuel Gikunoo, Dr. Desmond Klenam*, Mobin Vandadi, Prof. Samuel Kwofie, Prof. Nima Rahbar*, Prof. Winston Wole Soboyejo*
	10:40 - 11:00	ID 370: CO2 mineralization of silicate minerals and the potential inhibiting effect of amorphous silica-rich surface layers Author(s): Kumaran Coopamootoo*, Claire E. White
	11:00 - 11:20	ID 691: Dissolution kinetics of silica fume in alkaline solutions Author(s): Yoonjung Han*, Jonathan Lapeyre, Umme Zakira, Mine G. Ucak-Astarlioglu, Jedediah F. Burroughs, Jeffrey W. Bullard
	11:20 - 11:40	ID 885: Novel Polymer-Ceramic Nanocomposites Using Advanced Electrospinning Methods Author(s): Yunzhi Xu*, Ping Guo, Ange-Therese Akono
	11:40 - 12:00	ID 531: Molecular insight on creep of cement-based systems from in situ neutron total scattering experiments Author(s): Nishant Garg, Brendan Kehoe, Daniel Olds, Joseph Vocaturo, Michelle Everett, Katharine Page, Joerg Neufeind, Claire White*
MS811: Architected Materials. Chair(s): Ange-Therese Akono		
IC 103	10:00 - 10:20	ID 721: Mechanics of bioinspired and hierarchical tape-springs Author(s): Kristiaan Hector, Phani Saketh Dasika, Adwait Trikanad, Julian Rimoli, Nilesh Mankame, Pablo Zavattieri*
	10:20 - 10:40	ID 925: Experimental investigation of nature-inspired nano-architected porous materials Author(s): Seo Young Ahn*, Pania Newell
	10:40 - 11:00	ID 285: Tunable Mechanical Properties and Functions in Stretchable Architected Materials Author(s): Yanyu Chen*
	11:00 - 11:20	ID 857: Evaluating and tailoring stiffness of lattices for various states Author(s): Yash Agrawal*, Gabriel Dreisbach, James Guest
MS313: 7th Mini-Symposium on 4M (Modeling of Multiphysics-Multiscale-Multifunctional) Engineering Materials and Structures. Chair(s): Huiming Yin and Yong-Rak Kim		
EH 270 - Inman Park	10:00 - 10:20	ID 458: Parametric Study to Determine Hydrodynamics Input Parameters in FLOW-3D-Hydro for Crushed Limestones in Nebraska Author(s): Basil Abualshar*, Chung Song
	10:20 - 10:40	ID 413: Use of Alkali-activated Slag Binder and Shape-stabilized Phase Change Material to Develop an Energy-efficient Multifunctional Cementitious Composite in Buildings Author(s): In Kyu Jeon*, Abdullah Azzam, Hussein Al Jebaei , Yong-Rak Kim, Ashrant Aryal, Juan Carlos Baltazar
	10:40 - 11:00	ID 654: Thermoelastic Model of Cubic Crystals for Structural Metals Author(s): Byung-Wook Kim*, Chao Liu, Huiming Yin
	11:00 - 11:20	ID 694: Size effect on the thermoelastic behavior of a particulate composite beam - a comparative study of micromechanical models and numerical simulation Author(s): Jinming Zhang*, S.H. Chu, Chunlin Wu, Huiming Yin
	11:20 - 11:40	ID 470: AI- Approach to Predict the Erosion Resistance of Highway Shoulder Gravels Author(s): Bashar Al-Nimri*, Aiman Tariq, Basil Abualshar, Chung Song, Babur Deliktas
	11:40 - 12:00	ID 729: Bspline material point method for strongly coupled poroelastic materials Author(s): Ashkan Ali Madadi*, David Garza, Berkin Dortdivanlioglu

MS203: Computational Methods for Stochastic Engineering Dynamics.		
Chair(s): Ketson R. M. dos Santos		
IC 211	10:00 - 10:20	ID 159: Dynamics and extreme response probability distributions of linear elastic structures subjected to harmonizable loads Author(s): Zifeng Huang*, Michael Beer
	10:20 - 10:40	ID 582: First-passage stochastic incremental dynamics methodology for nonlinear structural systems with fractional derivative elements Author(s): Peihua Ni*, Ioannis Mitsos, Vasileios Fragkoulis, Michael Beer
	10:40 - 11:00	ID 150: A Bayesian compressive sampling approach for modeling, analysis and diagnostics of dynamic cerebral autoregulation in cardiovascular disease Author(s): Maria Katsidoniotaki*, Leonidas Taliadouros, Ioannis Kougioumtzoglou, Eliza Miller, Randolph Marshall
	11:00 - 11:20	ID 480: Hierarchical Bayesian Approach for Electromechanical Properties Updating in Piezoelectric Energy Harvesters Author(s): Rafael Ruiz*, Alejandro Poblete, Gaofeng Jia
	11:20 - 11:40	ID 205: Performance Enhancement of Vibro-Impact Targeted Energy Transfer Within a Random Environment Author(s): Rahul Kumar*, Daniil Yurchenko, Rachel Kuske
	11:40 - 12:00	ID 269: Response statistics of vibro-impact system via the Step Matrix Multiplication based on Path Integration method Author(s): Henrik Tamás Sykora, Rachel Kuske, Daniil Yurchenko*
MS606: Wildfire Engineering: Research and practice in wildland and wildland-urban-interface.		
Chair(s): Hamed Ebrahimian		
EH 222 - Buckhead	10:00 - 10:20	ID 191: Mapping wildfire ignition probability with ensemble-based machine learning models Author(s): Qi Tong, Thomas Gernay*
	10:20 - 10:40	ID 320: A Physics-Based Model for Predicting Diurnal and Seasonal Changes in the Ignition Potential of Complex Landscapes and Fuels Author(s): Saurabh Saxena*, Ritambhara Dubey, Neda Yaghoobian
	10:40 - 11:00	ID 321: Investigation of the Impact of Dynamic Fuel Moisture on Fire and Plume Behavior Author(s): Ritambhara Dubey*, Neda Yaghoobian
	11:00 - 11:20	ID 731: WRF-Fire for Landscape-Scale Wildfire Simulation: Sensitivity Analysis, The Role of Fuel Characteristics and Fire Spotting, and Data Assimilation Author(s): Kasra Shamsaei, Timothy W. Juliano, Matthew Roberts, Hamed Ebrahimian*, Branko Kosovic, Neil P. Lareau
	11:20 - 11:40	ID 356: The Influence of Urban Landscape on Firebrand Spotting Author(s): Iago Dal-Ri dos Santos*, Neda Yaghoobian
	11:40 - 12:00	ID 643: Modeling Wildfire Propagation: A Stochastic Level-Set Formulation Author(s): Sourangshu Ghosh*, Armin Tabendah, Paolo Gardoni
MS603: Machine Learning Applications in Wind Engineering.		
Chair(s): Sungmoon Jung and Pedro Fernández-Cabán		
EH 123 - Midtown II	10:00 - 10:20	ID 151: Producing Heterogeneous Upwind Terrain Dataset for Wind Tunnel Testing Using Image Classification Method Author(s): Nasrollah Alinejad*, Sungmoon Jung
	10:20 - 10:40	ID 127: Experimental study on the effect of complex heterogeneous terrain on wind pressure in low-rise building Author(s): Lee Sak An*, Sungmoon Jung
	10:40 - 11:00	ID 128: Physics-informed few-shot learning for wind pressure prediction of low-rise buildings Author(s): Yanmo Weng*, Stephanie Paal
	11:00 - 11:20	ID 201: A data-driven DNN model for wind load prediction based on inflow turbulence and minor architectural features of low-rise building roof systems Author(s): Nasreldin Mokhtar, Pedro Fernández-Cabán*
	11:20 - 11:40	ID 244: Prediction of pressure coefficients on roof soffits and walls of low-rise building using artificial neural networks and ensemble methods Author(s): Karim Mostafa*, Ioannis Zisis*, Amal Elawady
	11:40 - 12:00	ID 328: Machine Learning-Enabled Parameterization Scheme for Aerodynamic Shape Optimization of Wind-Sensitive Structures Author(s): Shaopeng Li*, Brian Phillips, Zhaoshuo Jiang
MS315: Meshfree, Peridynamic, and Particle Methods: Contemporary Methods and Applications.		
Chair(s): Mike Hillman, Pablo Seleson and Sheng-Wei Chi		
EH 142 - Midtown III	10:00 - 10:20	ID 522: Concurrent Semi-Lagrangian Reproducing Kernel Formulation and Stability Analysis Author(s): Mohammed Atif, Sheng-Wei Chi*
	10:20 - 10:40	ID 849: Partition of Unity Neural Network-enhanced Reproducing Kernel Particle Method for Localization Modeling Author(s): Jonghyuk Baek*, J. S. Chen
	10:40 - 11:00	ID 499: CabanaPD: A meshfree GPU-enabled peridynamics code for exascale fracture simulations Author(s): Pablo Seleson*, Sam Reeve

EH 142 - Midtown III	11:00 - 11:20	ID 508: Naturally Stabilized Conforming Nodal Integration with Novel Stress Update Author(s): Mike Hillman*, Jiarui Wang, Dominic Wilmes, Joseph Magallanes
	11:20 - 11:40	ID 866: Maximum principle preserving meshfree methods for linear elliptic equations via nonlocal relaxation Author(s): Xiaochuan Tian*, Qihao Ye
	11:40 - 12:00	ID 965: Multiphase dissipative particle dynamics modeling of dynamic spreading of molten sand droplet on porous surfaces Author(s): Zhen Li*, Rahul Koneru, Alison Flatau, Luis Bravo, Muthuvel Murugan, Anindya Ghoshal, George Karniadakis
MS217: Infrastructure Health Condition Evaluation Using Emerging Sensor and AI Technologies. Chair(s): Yichang (James) Tsai and Mohamad Alipour		
EH 122 - Midtown V	10:00 - 10:20	ID 145: Self-Powered Sensors for Sustainable Condition Monitoring of Bridges under Traffic-Induced Vibration Author(s): Mohsen Amjadian*, Anil Kumar Agrawal, Hani Nasif
	10:20 - 10:40	ID 684: Pavement Crack Detection Using Machine Learning and a Fusion of 2D & 3D Data Author(s): Paul Roeser*, Yi-Chang (James) Tsai
	10:40 - 11:00	ID 631: Gaze informed path optimization of building inspection for automated damage diagnostics Author(s): Muhammad Rakeh Saleem*, Rebecca Napolitano
	11:00 - 11:20	ID 513: Performance-based UAS path planning for automated infrastructure inspection Author(s): Yuxiang Zhao*, Binyao Guo, Mohamad Alipour
	11:20 - 11:40	ID 344: Automatic Segmentation and Measurement of Surface Concrete Spalling for Structural Members Author(s): Luis Espinola-Diaz*, Smith Huamani-Rojas, Luis Alberto Bedriñana
	11:40 - 12:00	ID 373: Autonomous delamination detection in reinforced concrete bridge decks using infrared thermography and an encoder-decoder-type DCNN model Author(s): Eberechi ICHI*, Sattar Dorafshan*
MS612: Mechanics and Impacts of Wind-borne Debris. Chair(s): David Roueche		
SC 3245 - Northside	10:00 - 10:20	ID 95: Validation of an analytical model for estimating debris trajectories in a tornadic wind field Author(s): Connell Miller*, Gregory Kopp
	10:20 - 10:40	ID 137: Predicting Wildfire Ignition and Windborne Ember Accumulation on Roofs via Deep Learning (DL) Author(s): Mohammad khaled al-Bashiti*, Dac Nguyen, Nigel B Kaye, M.Z Naser
	10:40 - 11:00	ID 138: Experimental Study of Roof Gravel Motion Initiation Author(s): Md Safwan Ahsanullah*, Nigel Kaye
	11:00 - 11:20	ID 330: Impact of Tall Building Cluster Layout on Urban Wind Field and Debris Flight Trajectory Author(s): Shaopeng Li, Yue Dong, Kimia Yousefi Anarak, Yanlin Guo*, Kurtis Gurley, John van de Lindt, Ryan Catarelli
	11:20 - 11:40	ID 179: Wind-Borne Debris Façade Impact Design: Validation of a 2D Monte Carlo Numerical Model Author(s): Angela Mejorin*, Gregory Kopp
	11:40 - 12:00	ID 158: A tornadic field retrieval method based on wind-induced debris video-analysis Author(s): Guangzhao Chen*, Franklin Lombardo, David Roueche
MS615: Assessing Human-Infrastructure Interactions and their Performance. Chair(s): Haeyoung Noh and Jingxiao Liu		
EH 241 - Old Fourth Ward	10:00 - 10:20	ID 240: Understanding Gait Biomechanics through Structural Mechanics: Foot-Floor Contact Modeling using Footstep-induced Structural Vibrations Author(s): Yiwen Dong*, Hae Young Noh
	10:20 - 10:40	ID 376: Theory and Computational Framework for Quantifying Social Capital Derived from Human-Human and Human-Infrastructure Interactions Author(s): Maral Doctor Arastoo, Katherine Flanigan*, Mario Bergés
	10:40 - 11:00	ID 532: A novel approach for repairing corroded structural steel bridge structures using plasma arc additive manufacturing Author(s): Rajat Kawalkar*, Shengbiao Zhang, John Hart, Wen Chen, Simos Gerasimidis
	11:00 - 11:20	ID 740: Emotion Recognition Using Footstep-Induced Floor Vibration Signals Author(s): Yuyan Wu*, Yiwen Dong, Hae Young Noh
MS205: Innovations and Advances in Passive, Active, and Semi-active Structural Control. Chair(s): Nicholas Wierschem		
SC 3249 - Peachtree	10:00 - 10:20	ID 125: Control Performance of Sloped Rolling-type Bearings with an Added Rotational Inerter Author(s): Shiang-Jung Wang*, Yi-An Lai, Chung-Han Yu, Yu-Wen Chang, Ting-Yu Hsu
	10:20 - 10:40	ID 559: A Numerical Study of Clutching Inerter Dampers for Mitigating the response of Multi-degree-of-freedom Base-Isolated Structures Author(s): Wyatt Cupp*, Nicholas Wierschem

SC 3249 - Peachtree	10:40 - 11:00	ID 781: On the effect of vertical flexibility in objects isolated on pendulum-type systems Author(s): Mia Griffin, P. Scott Harvey*
	11:00 - 11:20	ID 199: Active Control of Equipment Seismic Isolation System by Output Feedback Skyhook Algorithm Author(s): Yong-An Lai*, Po-Yen Wu
	11:20 - 11:40	ID 607: Semi-active cam-lever friction device for structural control of buildings subjected to natural hazards Author(s): Alejandro Palacio-Betancur*, Mariantonieta Gutierrez Soto
MS206: Infrastructure assessment automation with robotics, deep learning and digital twins. Chair(s): Wei Song and Jian Li		
SC 1216 - Piedmont	10:00 - 10:20	ID 627: Addressing Structural Health Monitoring Uncertainty in a Deep Learning-based Anomaly Detection System Author(s): Kareem Eltoumy*, Xiao Liang
	10:20 - 10:40	ID 322: Autonomous Defect Detection in Bolted Connections of Highway Ancillary Structures Using Deep Learning Author(s): Faezeh Jafari*, Sattar Dorafshan
	10:40 - 11:00	ID 756: Insights on Hyperparameter Importance in Crack Segmentation DCNNs Author(s): Carlos Canchila*, Shanglian Zhou, Wei Song
	11:00 - 11:20	ID 753: Autonomous Crack Sealing Robot for Infrastructure Maintenance using Reinforcement Learning Author(s): Joshua Genova*, Subin Varghese, Vedhus Hoskere
MS309: Modeling of Materials with Interfaces and Scales Using Physics-Based and Machine-Learning Methods. Chair(s): Timothy Truster		
EH 247 - Sweet Auburn	10:00 - 10:20	ID 861: On the modeling of interfaces with resultant-based formulations in composite materials Author(s): Ghadir Haikal*
	10:20 - 10:40	ID 193: Prediction of Kink Bands and Splitting in Multidirectional Double-edge Notch Compression Specimens Author(s): Alexander Faupel*, Caglar Oskay
	10:40 - 11:00	ID 705: Shape Dependence of Diffusion Creep Behavior in Polycrystalline Materials with Two Strength-Contrasting Phases Author(s): Heechen Cho*
	11:00 - 11:20	ID 423: A Combined Variational Multiscale and Phase Field Approach for Coupled Thermomechanical Problems with Interface Separation, Crack Propagation, and Heat Transport Author(s): Pinlei Chen*, Wan Wan
	11:20 - 11:40	ID 400: The Effect of Disorder on the Dynamic Properties of One-Dimensional Metamaterials Author(s): Ali Heidari Shirazi*, Reza Abedi
MS604: Recent Advances in Response Modification Devices and Strategies. Chair(s): Nicos Makris and Kostas Kalfas		
EH 266 - Summerhill	10:00 - 10:20	ID 325: Design and component testing of pressurized sand-dampers: Effects of the design parameters Author(s): Konstantinos Kalfas*, Nicos Makris
	10:20 - 10:40	ID 505: Seismic Response of Core Wall Building with Force-Limiting Connections Author(s): Kyoungyeon Lee*, Georgios Tsampras
	10:40 - 11:00	ID 506: Structural connection with predetermined discrete variable friction forces for high-performance earthquake-resistant buildings Author(s): Kaixin Chen*, Georgios Tsampras
	11:00 - 11:20	ID 558: Scaled Experimental Investigation of the Sensitivity of Strongback Performance to Location of Supplemental Dampers and Stiffness Irregularities Author(s): Sima Abolghasemi*, Nicholas Wierschem, Mark Denavit
	11:20 - 11:40	ID 752: Multi-Hazard Analysis of Multi-Story Frames with Viscoelastic Semi-Rigid Connections Author(s): Alessandro Palmeri*, Mariateresa Lombardo
	11:40 - 12:00	ID 616: Real-time Hybrid Simulation of a CLT Rocking Wall System equipped with Pressurized Sand Dampers for Seismic Hazard Mitigation Author(s): Liang Cao*, Kostas Kalfas, Nicos Makris, James Ricles
MS608: Analysis and Prediction of Wind Effects on the Built Environment. Chair(s): Teng Wu		
SC 3252 - Techwood	10:00 - 10:20	ID 172: Advancements in the Physical Simulation of Atmospheric Surface Layer Flows using Synthetic Turbulence Modulation in a Large Boundary Layer Wind Tunnel Author(s): Ryan Catarelli*, Yutiwadee Pinyochotiwong, Forrest Masters, Brian Phillips, Tai-An Chen, Jennifer Bridge, Kurtis Gurley
	10:20 - 10:40	ID 891: Large-Scale Open-Jet Testing to Meet Field Pressures on a Flat-Roof Building Author(s): Aly Mousaad Aly*, Faiaz Khaled

SC 3252 - Techwood	10:40 - 11:00	ID 527: Investigating the Accuracy of Wind Tunnel Simulations for Wind Profiles over Heterogeneous Terrain: A Comparison Study with Field Measurements Author(s): Sejin Kim*, Nasrollah Alinejad, Sungmoon Jung, Pedro Fernández-Cábán
	11:00 - 11:20	ID 608: Assessment of Wind Hazard Mitigation on a Tall Building equipped with Performance Control Devices using 3D Real-Time Aeroelastic Hybrid Simulation Author(s): Liang Cao*, Haitham Ibrahim, Thomas Marullo, James Erwin, James Ricles, Amal Elawady, Arindam Chowdhury
	11:20 - 11:40	ID 858: Comparison of LES and wind tunnel tests of wind loads on a low-rise building in an urban area. Author(s): Themistoklis Vargiomezis*, Catherine Gorlé
	11:40 - 12:00	ID 697: Comparison of full-scale measurements and large-eddy simulations of wind pressures on a high-rise building. Author(s): Jack Hochschild, Catherine Gorle*
MS101: Mechanics, Physics, and Chemistry for Sustainable and Resilient Civil, Energy, and Bio-related Infrastructures and Materials - In Honor of the NAE Recognition of Prof. Franz-Josef Ulm. Chair(s): Mohammad Javad Abdolhosseini Qomi		
IC 105	10:00 - 10:20	ID 225: Leapfrog in Fracture and Damage Mechanics inspired by Gap Test and Curvature-Resisting Sprain Energy Author(s): Zdeněk Bažant*, Houlin Xu, A. Abdullah Dönmez, Anh Nguyen, Yupeng Zhang
	10:20 - 10:40	ID 126: Are Configurational Forces Real Forces Author(s): Roberto Ballarini*, Gianni Royer-Carfagni
	10:40 - 11:00	ID 886: Multi-scale Toughness via Scratch Testing: From QuasiBrittle to Ductile Materials Author(s): Ange-Therese Akono*
	11:00 - 11:20	ID 780: Enhance Structures' Resilience with Particle Physics: a Statistical Approach of Quasi-Static Brittle Fracture. Author(s): Ariel Attias*, Franz-Josef Ulm
	11:20 - 11:40	ID 537: A Machine-learning approach to development of Microtexture-Effective Property relationship Author(s): Xuejing Wang, Mazdak Tootkaboni, Arghavan Louhghalam*
	11:40 - 12:00	ID 973: Fluctuation-based fracture and healing of materials and structures in the semi-grand canonical ensemble Author(s): Nima Rahbar*

12:00 – 13:00 Lunch · Exhibition Hall & John Lewis Student Center 3rd floor hallway

12:00 – 13:00 Industry-Student Mixer · EH 127 – Midtown I

13:00 – 14:00 Plenary Lecture · Ferst Center for the Arts
Decision-Oriented Sensitivity Analysis with Applications to Engineering Mechanics
Daniel Straub, Ph.D., Technical University of Munich (Germany)

Friday, June 9, Afternoon Sessions, 14:15 – 15:55

MS702: Characterization and modeling of physical processes in porous materials across scales. Chair(s): Pania Newell		
IC 109	14:15 - 14:35	ID 862: Computation of per atom strain in classical molecular dynamics simulations Author(s): Ranganathan Parthasarathy*, Andrew Mikhacil
	14:35 - 14:55	ID 953: Surface and size effect in nanoporous materials Author(s): Gilles Pijaudier-Cabot*, Dono Toussaint, Gyorgy Hantal, Romain Vermorel
IC 109	14:55 - 15:15	ID 974: Phase-Field Fracture Modeling Informed by Molecular Dynamics Simulation for Investigating Hierarchical Porous Structures Author(s): Pania Newell*, Bang He
MS707: Mechanics of Nonconventional Granular Materials. Chair(s): Wencheng Jin		
EH 126 - Midtown IV	14:15 - 14:35	ID 372: Topological Interlocking Materials with Tunable Mechanical Properties Author(s): Ziran Zhou*, Tracy Lu, Anna Gorgogianni, Chiara Daraio, Jose Andrade
	14:35 - 14:55	ID 719: What is shape? Characterizing particle morphology with genetic algorithms and deep generative models Author(s): Robert Buarque de Macedo*, Slavish Monfared, Konstantinos Karapiperis, Jose Andrade

MS305: Quasibrittle Fracture of Heterogenous Composites: Modeling and Characterization.		
Chair(s): Kedar Kirane		
SC 3294 - Castleberry	14:15 - 14:35	ID 132: Size effect and failure behavior of woven composites under biaxial flexure Author(s): Felix Liu, Kedar Kirane*
	14:35 - 14:55	ID 177: Multi-scale characterization of mode-II interlaminar fracture in scaled stitched resin-infused composites using digital image correlation Author(s): Jakob Black*, Wayne Huberty, Christopher Bounds, Han-Gyu Kim
	14:55 - 15:15	ID 346: Size Effect on Random Structural Strength of Prenotched Quasibrittle Structures Author(s): Jia-Liang Le*, Jan Eliáš
	15:15 - 15:35	ID 774: Use of characteristics method for fragmentation analysis of 1D heterogeneous quasi-brittle materials Author(s): Reza Abedi*, Giang Hyunh
MS806: Small Scale Phenomena in Sustainable & Complex Materials.		
Chair(s): Nishant Garg and Claire White		
IC 215	14:15 - 14:35	ID 784: Influence of Gypsum on Tricalcium Silicate in Blended System: in situ X-ray Total Scattering Study Author(s): Hyeonseok Jee*, Chirayu Kothari, Nishant Garg
	14:35 - 14:55	ID 812: FROM SMALL SCALE FRACTURE TESTS TO OPEN METROLOGY Author(s): Christos Athanasiou*
	14:55 - 15:15	ID 884: Using Nanomaterials to Improve the Performance of Recycled Aggregate Concrete Author(s): Nathaniel Buettner*, Ange-Therese Akono
	15:15 - 15:35	ID 899: Tracking Spatiotemporal Evolution of Cementitious Carbonation via Raman Imaging Author(s): Nishant Garg*
MS311: Phase-field models of fracture.		
Chair(s): Aditya Kumar		
EH 203 - Highlands	14:15 - 14:35	ID 708: Working towards a modular, fully-coupled phase field fracture model integrating elasticity, plasticity, and damage Author(s): Chiraag Nataraj*, Andrew Stershic
	14:35 - 14:55	ID 147: Phase-field modelling of fatigue fracture in anisotropic aluminium sheets Author(s): Martha Kalina*, Markus Kästner
	14:55 - 15:15	ID 267: A thermodynamical phase field fracture modeling of concrete structures Author(s): Sina Abrari Vajari*, Matthias Neuner, Christian Linder
	15:15 - 15:35	ID 502: A Phase field model for anisotropic incompressible materials at finite strains Author(s): Wenyuan Xue*, Prajwal Kammardi Arunachala, Sina Abrari Vajari, Christian Linder
	15:35 - 15:55	ID 222: Role of strength and toughness in the indentation problem Author(s): Aditya Kumar*, Oscar Lopez-Pamies
MS308: Machine Learning in Mechanics, Materials, and Structures.		
Chair(s): Kai Guo		
IC 103	14:15 - 14:35	ID 807: Artificial language and machine learning-integrated approach for understanding and designing concrete with consideration of physiochemical properties Author(s): Soroush Mahjoubi*, Rojyar Barhemat, Weina Meng, Yi Bao
	14:35 - 14:55	ID 896: Optimization of vascular structure of self-healing concrete using generative deep neural network (GDNN) Author(s): Zhi Wan*, Yading Xu, Ze Chang, Branko Šavija
MS313: 7th Mini-Symposium on 4M (Modeling of Multiphysics-Multiscale-Multifunctional) Engineering Materials and Structures.		
Chair(s): Chung Song and Yong-Rak Kim		
EH 270 - Inman Park	14:15 - 14:35	ID 646: The Green's function based thermoelastic analysis of spherical geothermal tanks in a semi-infinite domain Author(s): Chunlin Wu, Tengxiang Wang, Huiming Yin*
	14:35 - 14:55	ID 183: Optical Properties of Topological Semimetals MX (M = Ti, Zr, Hf, and X = S, Se, Te) Family by DFT Approach Author(s): Sami Ullah*, Sikandar Khan, Firoz Khan
	14:55 - 15:15	ID 571: A GID-OpenSEES framework for the structural fire analysis of reinforced concrete structures Author(s): Anand Kumar*, P. Ravi Prakash, Mohamed Anwar Orabi
	15:15 - 15:35	ID 860: Digital Twin of Foamed Concrete toward Design and Development of High Performance Building Envelope Author(s): S.H. Chu*, J.M. Zhang, H.M. Yin
	15:35 - 15:55	ID 90: Experimental Investigation on Enhancing Tube Energy Absorption Capacity by Orifice Effect Author(s): Farhad Farzaneh*, Sungmoon Jung

MS606: Wildfire Engineering: Research and practice in wildland and wildland-urban-interface. Chair(s): Hamed Ebrahimi		
EH 222 - Buckhead	14:15 - 14:35	ID 544: An Integrated Network Approach for Managing Wildfire Risk to Communities Author(s): Hussam Mahmoud*, Akshat Chulahwat
	14:35 - 14:55	ID 672: A Preliminary Analysis of the Wildfire Hazard in Oklahoma Author(s): Richard Campos*, P. Scott Harvey, Kanthasamy Muralaetharan
	14:55 - 15:15	ID 806: Artificial Intelligence-based wildfire community risk assessment considering physical and social impacts Author(s): Abdur Rasheed*, Do-Eun Choe
	15:15 - 15:35	ID 910: Long term slope stability after the 2019 Williams Flats wildfire Author(s): Mustafa Demir, Idil Deniz Akin*
MS603: Machine Learning Applications in Wind Engineering. Chair(s): Sungmoon Jung and Pedro Fernández-Cabán		
EH 123 - Midtown II	14:15 - 14:35	ID 387: Physics-Informed Deep Learning for Wind Load Identification on Nonlinear Structures Author(s): Haifeng Wang*
	14:35 - 14:55	ID 394: Prediction of Wind Profile in Heterogeneous Terrain using Artificial Neural Network Author(s): Zihan Mahmood Nahian*, Lee-Sak An*, Sungmoon Jung
	14:55 - 15:15	ID 507: Data-driven Modeling of Urban Wind Field Using Conditional Generative Adversarial Networks Author(s): yue dong*, yanlin guo
MS315: Meshfree, Peridynamic, and Particle Methods: Contemporary Methods and Applications. Chair(s): Mike Hillman, Pablo Seleson and Sheng-Wei Chi		
EH 142 - Midtown III	14:15 - 14:35	ID 822: A Coupled Lagrangian and Semi-Lagrangian RKPM with Smooth Contact for Penetration Problems Author(s): Ryan Schlinkman*, Jonghyuk Baek, Frank Beckwith, Stacy Nelson, Jiun-Shyan Chen
	14:35 - 14:55	ID 317: Simulation of vehicle impact with barriers based on the Discrete Element Method Author(s): Abinet K. Habtemariam*, Kai Fischer, Luis Brunnabend, Alexander Stolz
	14:55 - 15:15	ID 647: Investigation of Damage and Crack Propagation in Quasi-Brittle Materials via Peridynamics Author(s): Semsi Rakici*, Bora Pulatsu, Ece Erdogmus
MS217: Infrastructure Health Condition Evaluation Using Emerging Sensor and AI Technologies. Chair(s): Yichang (James) Tsai and Mohamad Alipour		
EH 122 - Midtown V	14:15 - 14:35	ID 368: Machine Learning with Microtexture Feature Extraction for Automated Pavement Raveling Classification Author(s): Haolin Wang*, Yi-Chang (James) Tsai
	14:35 - 14:55	ID 713: Optimized Correlation Between Mean Profile Depth and Pavement Friction Author(s): Pavan Chandrasekar*, Yichang James Tsai
	14:55 - 15:15	ID 292: A Generalized digital image correlation Using Attention-based Deep Learning Architecture to Extract Full-field Subpixel Displacement Measurements from Limited Data Using Transfer Learning Author(s): Mehrdad Shafiei Dizaji*, Devin Harris*
MS612: Mechanics and Impacts of Wind-borne Debris. Chair(s): Gregory Kopp		
SC 3245 - Northside	14:15 - 14:35	ID 550: A physics-based approach to estimate wind speed from wind-borne debris flight trajectory Author(s): Daniel Yahya*, David Roueche, Franklin Lombardo, Guangzhao Chen
	14:35 - 14:55	ID 745: An AI-based framework for damage estimation of hurricane-impacted residential communities through CFD simulations Author(s): Sejin Kim*, Fei Ding, Seymour Spence

MS615: Assessing Human-Infrastructure Interactions and their Performance.		
Chair(s): Mahsa Sanei and Elijah Wyckoff		
EH 241 - Old Fourth Ward	14:15 - 14:35	ID 800: Gait Speed Estimations Using the Change of Amplitude of Vibration Signals Author(s): Jean Michel Franco Lozada*, Yohanna MejiaCruz*, Juan M. Caicedo*, Zhaoshuo Jiang
	14:35 - 14:55	ID 823: Exploring Interaction Methods for Human Machine Collaboration in Bridge Inspection via Augmented Reality Author(s): Alan Smith*, Eric Bianchi, Kyle Tanous, Joseph Gabbard, Rodrigo Sarlo
	14:55 - 15:15	ID 936: Enhanced Human Interfaces for Rebar Inspection using RGBD-equipped UAV – Field Application Author(s): Mahsa Sanei*, Ali Mohammad khorasani, Fernando Moreu
	15:15 - 15:35	ID 935: Enhancing the Blind-with-Buildings Interaction Using a Digital Controller with Augmented Auditory Feedback Author(s): Kaveh Malek*, Fernando Moreu
MS204: Machine learning innovations towards long-term safety, performance, and serviceability assessment of civil infrastructure.		
Chair(s): Mauricio Pereira		
SC 3249 - Peachtree	14:15 - 14:35	ID 316: Structural Dynamics Learning using a Supervised Variational Auto-Encoder (SVAE) Author(s): Kiran Bacsa*, Wei Liu, Eleni Chatzi
	14:35 - 14:55	ID 649: Prediction of long-term time-dependent behavior in prestressed concrete structures Author(s): Mauricio Pereira*, Branko Glisic
	14:55 - 15:15	ID 671: Machine Learning Algorithm to Predict Axial Stress in Continuous Welded Rails Author(s): Matthew Belding*, Alireza Enshacian, Piervincenzo Rizzo
	15:15 - 15:35	ID 732: Machine Learning- Based Virtual Buoys Model for Live Prediction of Wave Height Author(s): Eleonora Maria Tronci, Matteo Vitale, Therese Patrosio*, Seixas Aldrich, Anela Bajric, Babak Moaveni, Usman Khan
MS206: Infrastructure assessment automation with robotics, deep learning and digital twins.		
Chair(s): Jian Li and Vedhus Hoskere		
SC 1216 - Piedmont	14:15 - 14:35	ID 329: An image-based modeling-to-simulation framework for hazard vulnerability assessment of unreinforced masonry structures Author(s): Mohammad Abu-Haifa*, Seung Jae Lee
	14:35 - 14:55	ID 547: Monitoring Infrastructure using Augmented Reality in a Network of Microrobots with Visual Data Analysis Author(s): Alireza Fath*, Nicholas Hanna, Yi Liu, Scott Tanch, Tian Xia, Dryver Huston
	14:55 - 15:15	ID 865: Bridge Deck Underside Condition Assessments with UAS Acoustic Sensor Author(s): Damien Garland, Tian Xia, Dryver Huston*
MS309: Modeling of Materials with Interfaces and Scales Using Physics-Based and Machine-Learning Methods.		
Chair(s): Pinlei Chen		
EH 247 - Sweet Auburn	14:15 - 14:35	ID 639: Self-limited dynamics and patio-temporal complexity of crustal seismicity enabled by elasto-plastic fracture mehanics Author(s): Ahmed Elbanna*, Md Shumon Mia, Mohamed Abdelmeguid
	14:35 - 14:55	ID 625: Peridynamics with stochastic bond strengths for determination of final failure in composite laminates Author(s): Ernest Ytuarte*, Hossam Ragheb, Adam Sobey, Stephanie TerMaath
	14:55 - 15:15	ID 791: Characterizing the elasto-adhesive length of polymeric materials Author(s): A. Derya Bakiler, Berkin Dortdivanlioglu*
MS608: Analysis and Prediction of Wind Effects on the Built Environment.		
Chair(s): Marco Giovanni Giometto		
SC 3252 - Techwood	14:15 - 14:35	ID 783: CFD-enabled surrogate modeling of self-excited forces for single-box deck bridges Author(s): Sumit Verma, Miguel Cid Montoya*, Ashutosh Mishra
	14:35 - 14:55	ID 693: An LES-based neural network multi-fidelity framework for wind loading predictions. Author(s): Mattia Fabrizio Ciarlatani*, Themistoklis Vargiomezis, Catherine Gorle

PERFORMANCE BEYOND EXPECTATION

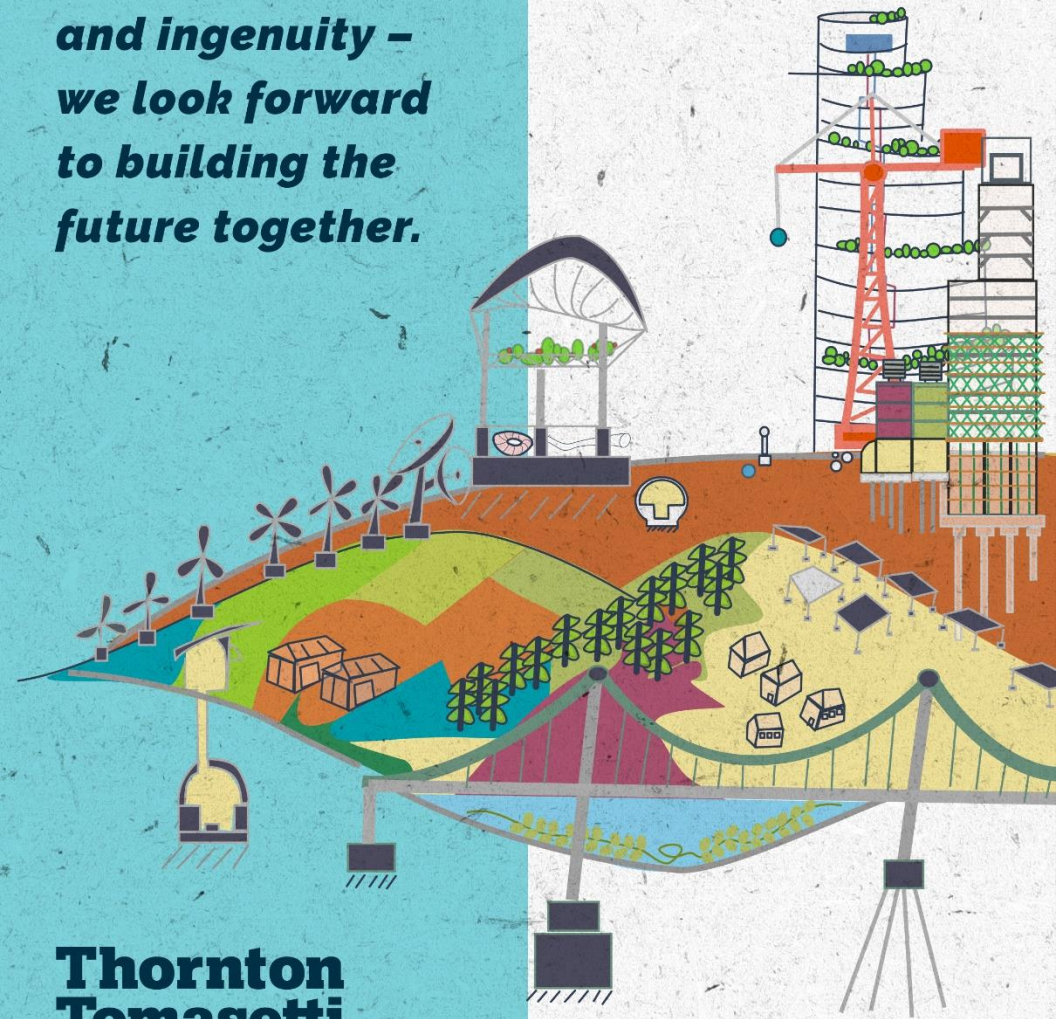
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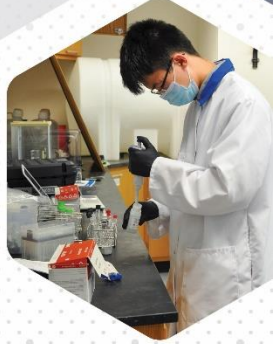
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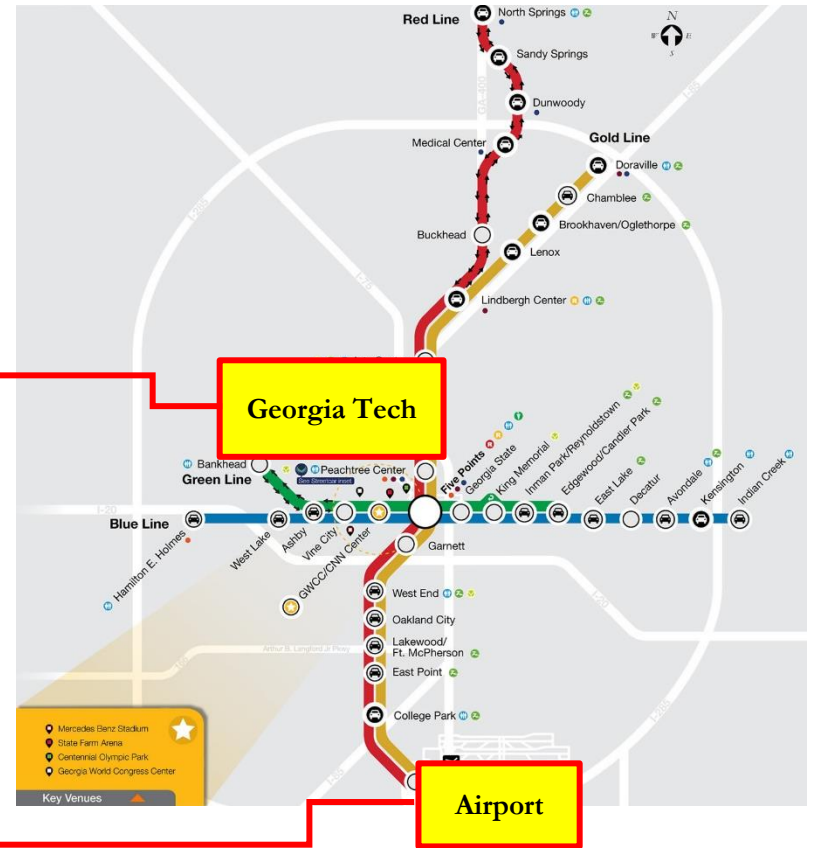
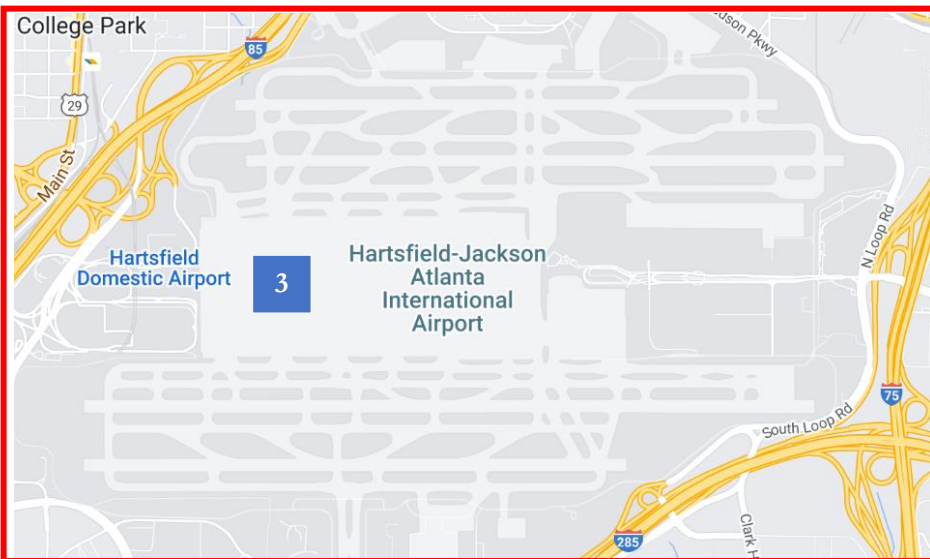
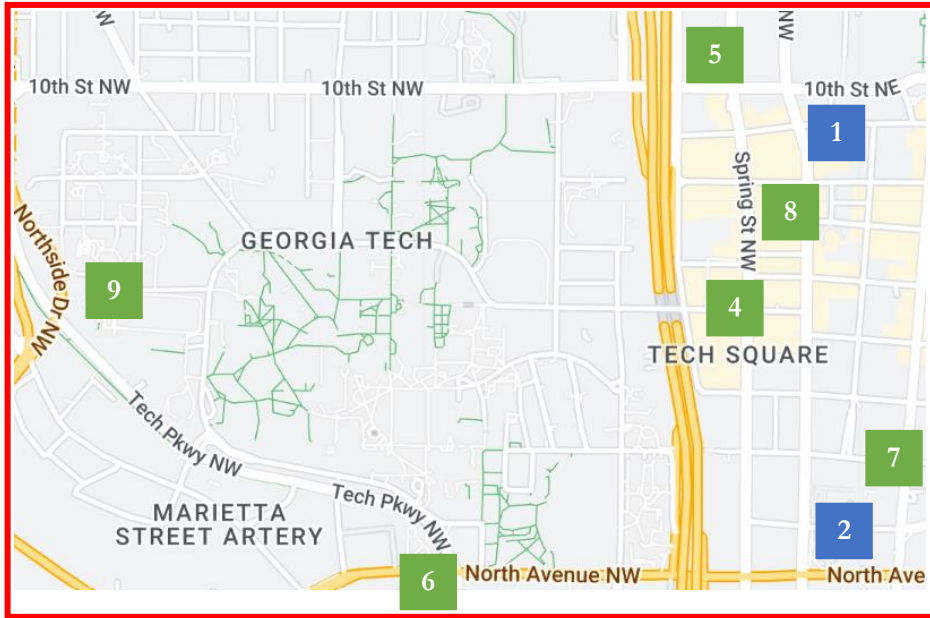
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1. Midtown Station
2. North Avenue Station
3. Airport Station

<https://www.itsmarta.com/train-stations-and-schedules.aspx>

Lodging

4. Georgia Tech Hotel and Conference Center
5. Hilton Garden Inn
6. Hampton Inn
7. Hotel Indigo
8. Renaissance
9. Maulding Hall Dorm Rooms

Exhibition Hall

Second Floor



Exhibition Hall (EH)

	Room No.
<i>Buckhead</i>	222
<i>Cabbagetown Boardroom</i>	272
<i>Centennial</i>	242
<i>Highlands</i>	203
<i>Home Park</i>	226
<i>Inman Park</i>	270
<i>Kirkwood</i>	273
<i>Little Five Points</i>	268
<i>Midtown I</i>	127
<i>Midtown II</i>	123
<i>Midtown III</i>	142
<i>Midtown IV</i>	126
<i>Midtown V</i>	122
<i>Old Fourth Ward</i>	241
<i>Summer Hill</i>	266
<i>Sweet Auburn</i>	247

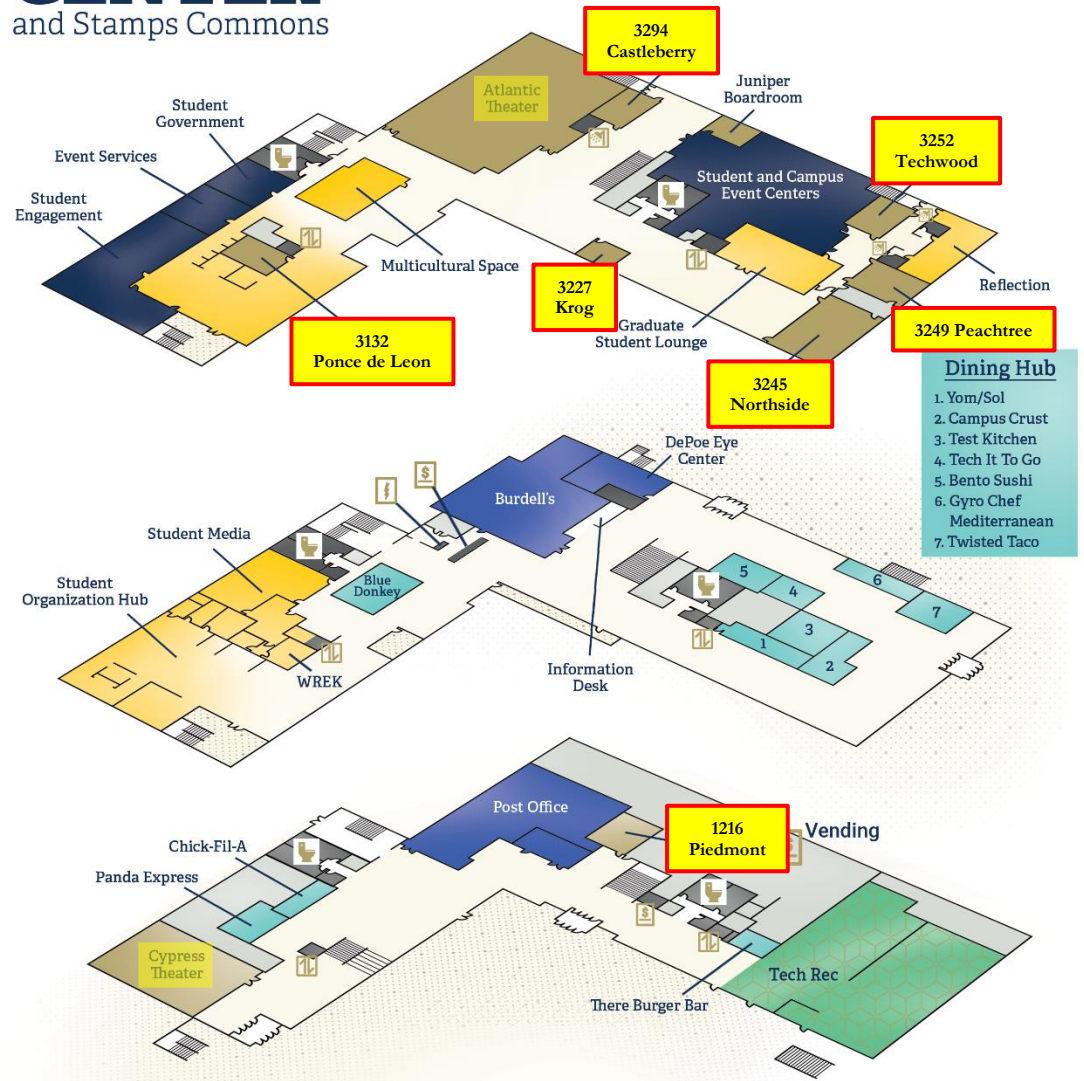
Exhibition Hall

First Floor



GT Student and Campus Event Centers

The John Lewis
STUDENT CENTER
 and Stamps Commons



John Lewis Student Center (SC)

	Room No.
<i>Castleberry</i>	3294
<i>Krog Boardroom</i>	3227
<i>Northside</i>	3245
<i>Peachtree</i>	3249
<i>Piedmont</i>	1216
<i>Ponce de Leon Boardroom</i>	3132
<i>Techwood</i>	3252

GT Student and Campus Event Centers

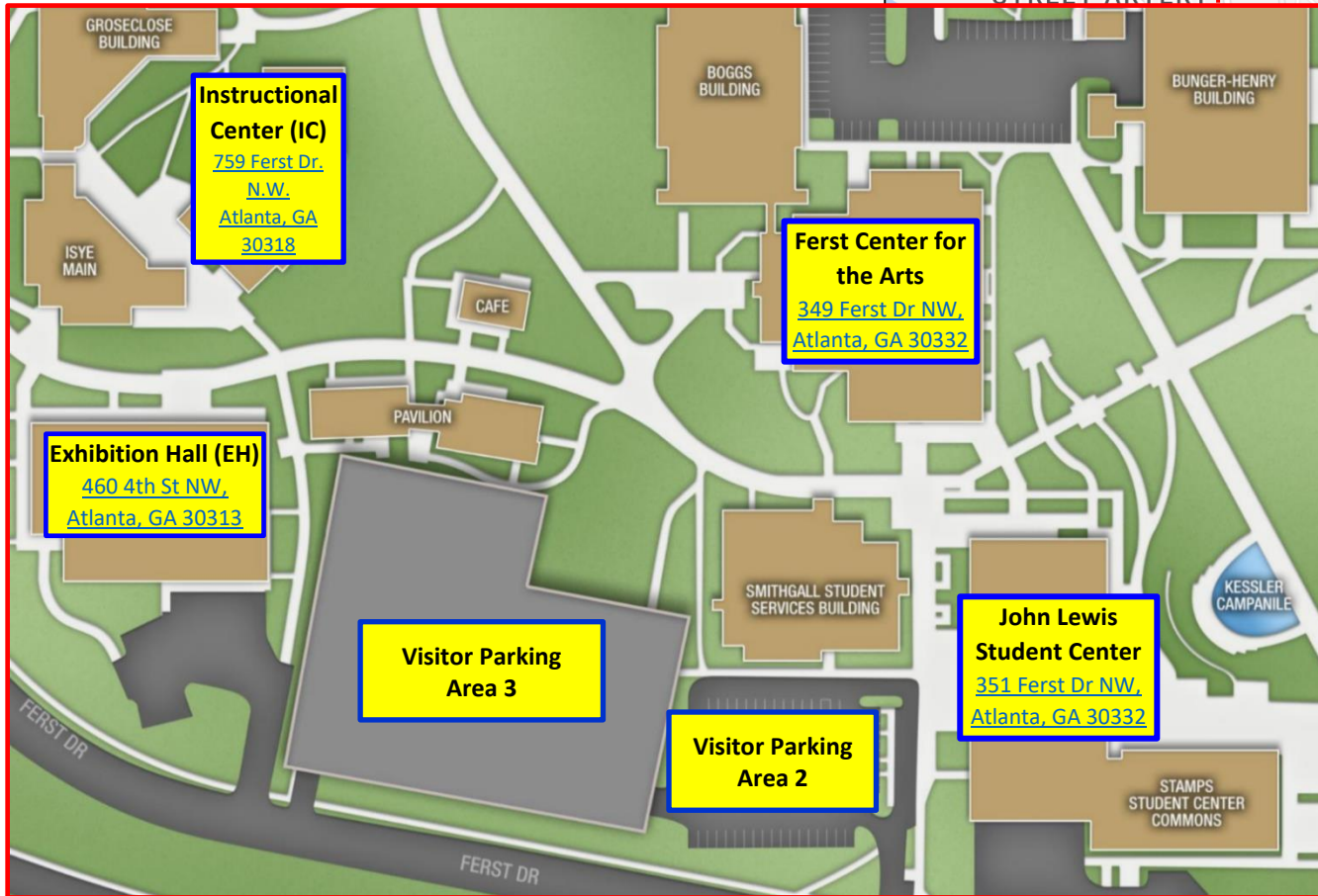
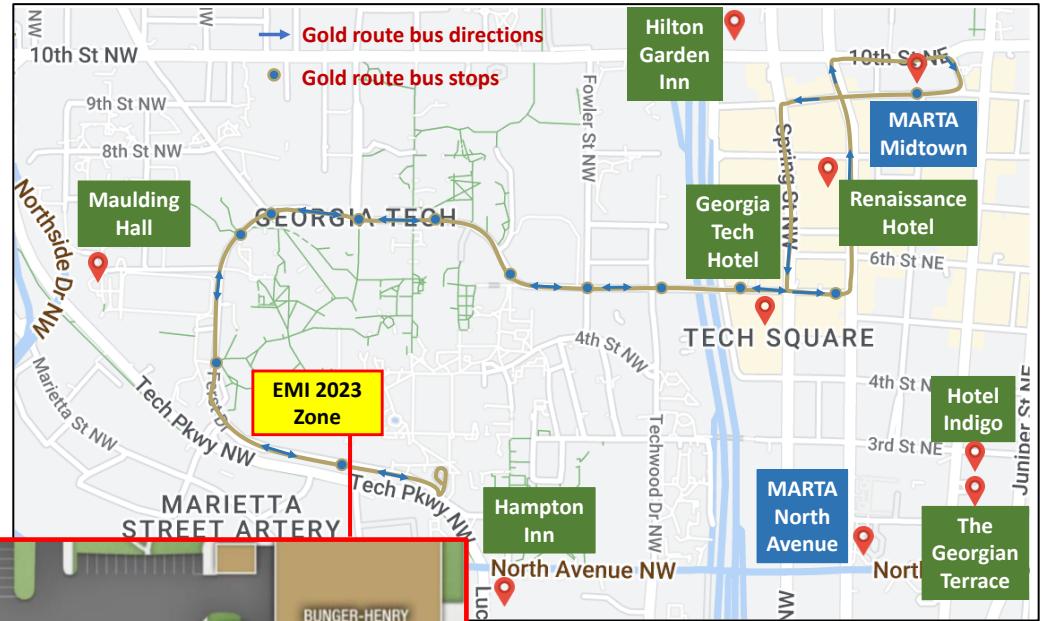
Reservable Space	Student Activity	Tech Rec (also reservable)	Lounge	Facility Support	Elevator	Restrooms	Shower/Ablution
Offices	Dining (concepts TBD)	Retail Service	Porch	Back of House	Can be Reserved	Microwave	Vending

Notes

Lined writing area consisting of 20 horizontal lines.

Campus Map

- The Gold Route of GT campus bus – Stinger runs between the MARTA Midtown Station and the EMI 2023 zone:
<https://www.pts.gatech.edu/shuttles/stinger/>
- GT visitor parking: www.pts.gatech.edu/parking/visitor-parking
- MARTA: <https://www.itsmarta.com/train-stations-and-schedules.aspx>





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