0100 MATERIALS

MS 0101: Plan the future: Innovations in advanced cementitious materials and sustainability  
Linfei Li and Jianqiang Wei

MS 0102: Geometries & design: Opportunities for sustainable construction  
Ann Sychterz, Mija Hubler, Jiaolong Zhang, Ali Ghahremani and Yao Wang

MS 0103: Mechanics of granular materials: Modeling and characterization  
Dawa Seo, Nitin Daphalapurkar and Darby Jon Luscher

MS 0104: Mechanics of wood and wood-based materials  
Markus Lukacevic, Eric Landis, Sebastian Pech and Josef Füssl

MS 0105: Mechanics of soft synthetic and biological materials: Theory, simulation, and experiment  
Berkin Dortdivanlioglu and Aditya Kumar

MS 0106: Advances in modeling of material damage and fracture  
Lampros Svolos, Aditya Kumar, Mostafa Mobasher, Georgios Moutsanidis, Alessandro Fascetti, Ravindra Duddu and Haim Waisman

MS 0107: Multiscale organization, mechanics and physics of layer-like, fibrous materials and related structures  
Pedro Miguel Jesus de Sousa Godinho

MS 0108: Using pavement mechanics to develop pavement materials with less environmental impact  
Erdem Coleri and Shane Underwood

MS 0109: Modeling of materials with interfaces and scales using physics-based and machine-learning methods  
Xiang Zhang, Pinlei Chen, Timothy Truster, Soheil Soghrati, Ravindra Duddu, Reza Abedi

MS 0110: Characterization and modeling of physical processes in porous materials across scales  
Mostafa Mobasher, Pania Newell, Sara Abdei, Manolis Vevakis, Giuseppe Buscarnera, Jean-Michel Pereira and Yanni Chen

MS 0111: Cementitious materials: Experiments and modeling across the scales  
Bernhard Pichler, Christian Hellmich, Günther Meschke, Gilles Pijaudier-Cabot and Franz-Josef Ulm

MS 0112: Small scale phenomena in sustainable & complex materials  
Nishant Garg and Claire White

MS 0113: Advances and applications of elasticity within applied mechanics  
Euclides Mesquita, John Brigham, Dumont Ney, Evgueni Filipov and Sonia Mogilevskaya
| MS 0114: | **Phase change materials (PCMs)-based multifunctional architected construction composites**  
Qingxu Jin and Hongyan Ma |
| MS 0115: | **Molecular scale modeling and experimentation**  
Dinesh Katti, Sinan Keten, Nima Rahbar, Rouzbeh Shahsavari, Kalpana Katti, Steve Cranford and Wenjie Xia |
| MS 0116: | **Pavement mechanics for digital twin of roadway infrastructure**  
Hao Wang, Michael Kaliske and Linbing Wang |
| MS 0117: | **Mechanics and physics of granular materials**  
Alessandro F. Rotta Loria, Ryan Hurley and Marcial Gonzalez |
| MS 0118: | **Physics informed machine learning for pavement mechanics**  
Egemen Okte |
| MS 0119: | **On the mechanics of road and paving materials in the cold, Nordic, and Arctic Regions**  
Augusto Cannone Falchetto, Shane Underwood and Di Wang |
| MS 0120: | **Architected materials**  
Pablo Zavattieri, Josephine Carstensen, Tian "Tim" Chen, Evgueni Filipov, Nilesh Mankame, Reza Moini, Jochen Mueller, Jordan Raney, David Restrepo, Mazdak Tootkaboni, X. Shelly Zhang and Yunlan Zhang |
| MS 0121: | **Contributions of high-performing lightweight materials to sustainable development and infrastructure resilience of engineering systems**  
Fariborz Tehrani |
| MS 0122: | **Modeling and characterization of brittle and quasibrittle fracture**  
Wen Luo, Jia-Liang Le, Marco Salviato and Kedar Kirane |
| MS 0123: | **Multiscale behavior of damage and healing mechanics**  
Oliver Giraldo-Londoño, Poh Leong Hien, Glaucio H. Paulino, George Z. Voyiadjis, Jiann-Wen Ju and Lizhi Sun |
| MS 0124: | **Physics informed machine learning (PIML) for mechanics of porous media**  
Dakshina Valiveti, Yanhua Yuan and Xiao-Hui Wu |
| MS 0125: | **Discrete models for the simulation of infrastructure materials**  
Gianluca Cusatis, Giovanni Di Luzio, Mohammed Alnaggar, Madura Pathirage and Jan Elias |
| MS 0126: | **Mechanics and modeling of pavement structures and materials**  
Ramez Hajj, Shane Underwood and Hao Wang |
0200  STRUCTURES AND INFRASTRUCTURE

MS 0201:  Failure and function in structural stability applications
Hayder Rasheed, Stylianos Yiatros, Noël Challamel, C. W. Lim and Ahmer Wadee

MS 0202:  New challenges in instabilities of shell structures
Frederic Bumbieler, Hamid Zahrouni and Mohamad Jrad

MS 0203:  Recent advances in hybrid simulation and real-time hybrid simulation
Wei Song and Richard Christenson

MS 0204:  Design and additive manufacturing of engineering structures and materials
Xiaojia Shelly Zhang, Josephine Carstensen, Emily Sanders and Reza Moini

MS 0205:  Origami/kirigami inspired structures and metamaterials
Evgueni Filipov, John Brigham, Rafael Ruiz, Mark Schenk and Martin Walker

MS 0206:  Biological and biologically inspired materials and structures
Dinesh Katti and Christian Hellmich

MS 0207:  Data-driven methods and research for physical testing in structural engineering
Zhidong Zhang, Hannah Blum, Hyeyoung Koh, Cristopher Moen and Benjamin Schafer

MS 0208:  Meshfree, peridynamic, and particle methods: Advancements and applications
Sheng-Wei Chi, Jiun-Shyan Chen, John Foster, Mike Hillman and Pablo Seleson

MS 0209:  Advanced engineering concepts, designs, and technologies for aerospace and extraterrestrial applications
Ramesh Malla, Robert Mueller, Kris Zacny and Hongyu (Nick) Zhou

MS 0210:  Assessing human-infrastructure interactions and their performance
Fernando Moreu, Haeyoung Noh, Ken Loh and Rodrigo Sarlo

MS 0211:  Advances on life-cycle of structures and infrastructure systems
Fabio Biondini and Dan Frangopol

MS 0212:  Repair and assessment of deteriorating critical infrastructure
Christine Lozano and Hussam Mahmoud

MS 0213:  4M (modeling of multiphysics-multiscale-multifunctional) engineering materials and structures
Yong-Rak Kim, Chung Song, Huiming Yin, Qiming Wang, Xiaoyu Song and Congrui Jin

MS 0214:  Finite element modeling and simulation of train derailments and their role in assessing tank car safety
Paul Gharzouzi, Leandro Iannacone, Paolo Gardoni, Steven Kirkpatrick, Chen-Yu Lin, Todd Treichel and Christopher Barkan
0300  NDE, SHM AND STRUCTURAL CONTROL

MS 0301:  Smart IoT sensors and artificial intelligence for civil infrastructure monitoring
Yuguang Fu and Jian Li

MS 0302:  Analysis of heritage structures: Tools and methods for assessing unknowns in historic monuments and structures
Rebecca Napolitano, Linda Seymour, Branko Glisic and Admir Masic

MS 0303:  Innovations and advances in passive, active, and semi-active structural control
Nicholas Wierschem and Scott Harvey

MS 0304:  Advances in bridge health monitoring: Data-driven and machine learning methods, indirect monitoring, crowdsourced mobile sensing
Debarshi Sen, Basuraj Bhowmik and Shamim Pakzad

MS 0305:  Structural identification and damage detection
Eleni Chatzi, Costas Papadimitriou and Babak Moaveni

MS 0306:  Recent advances in sensing, SHM, and automated inspections for infrastructure condition assessment: Toward actionable solutions
Mohamad Alipour, Hoon Sohn, Brian Eick and Francisco Peña

MS 0307:  Recent advances in mechanical energy harvesting and its applications in structural health monitoring and control
Mohsen Amjadian and Chao Sun

MS 0308:  Advances in vibration and structural control
Aly Mousaad Aly

MS 0309:  Leveraging structural sensing and monitoring for informed decision-making, mitigation, and post-event management
Milad Roohi, Yashar Eftekhar Azam, Kalil Erazo, Doeun Choe and Eleonora Tronci

MS 0310:  New trends in vibration control and energy harvesting: Modeling and analysis of innovative materials and structures at micro- and macro-scale
Francesco Paolo Pinnola, Gioacchino Alotta and Alberto Di Matteo

MS 0311:  Eco-friendly systems, devices, and metamaterials for structural vibration control
Konstantinos Kalfas and Nicolo' Vaiana

MS 0312:  Seismic isolation: Theoretical advancements, experimental insights, and innovative applications
Dimitrios Konstantinidis and Michalis Vassiliou

MS 0313:  Complex dynamics and vibration control of infrastructure exposed to single/multiple hazards
Chao Sun, Mariantonieta Soto and Lin Chen
MS 0314: Advancing infrastructure management through structural health monitoring: A value of information perspective
Leandro Iannacone, Pier Francesco Giordano, Paolo Gardoni and Maria Pina Limongelli

0400 DESIGN AND OPTIMIZATION

MS 0401: Topology optimization: From algorithmic developments to applications
Mazdak Tootkaboni, Josephine Carstensen, Jamie Guest and Xiaojia Shelly Zhang

MS 0402: Emerging topology and shape optimization techniques in computational design of materials and structures
Ahmad Najafi

0500 GEOMECHANICS

MS 0501: Computational geomechanics
Qiushi Chen, Craig Foster, Xiaoyu Song, Shabnam Semnani, Fushen Liu and Ronaldo Borja

MS 0502: Advances in geomechanics and geophysics for modern sub-surface technology and natural hazard
Ghassan Shahin, John Rudnicki and Giuseppe Buscarnera

0600 Fluid Mechanics

MS 0601: Advances in fluid-structure interaction
Aly Mousaad Aly

MS 0602: Computational fluid dynamics (CFD) and fluid-structure interaction (FSI): Method development and applications
Jinhui Yan, Georgios Moutsanidis, Dimitrios Kalliontzis, Mostafa Momen, Muhammad Hajj, Barbara Simpson and Jennifer Franck

0700 HAZARD MODELING

MS 0701: Advanced analysis for earthquake engineering: 8th edition
Kevin Wong, Steven McCabe and Ting Lin

MS 0702: Understanding and managing the wildfire problem
Negar Elhami-Khorasani, Hamed Ebrahimian, Hussam Mahmoud and Erica Fischer

MS 0703: Tropical cyclone induced winds, surge-wave, flooding and impacts on infrastructure systems
Chao Sun, Grace Yan and Celalettin Ozdemir

MS 0704: Advances in modeling wind and its effects on the built environment
Catherine Gorle, Marco Giometto and Teng Wu
Advanced in wind engineering: From atmospheric boundary-layer processes to resilient built environments
Aly Mousaad Aly

Natural hazard assessment with monitoring, modeling, and uncertainty quantification
Yichuan Zhu, Hui Wang and Weibing Gong

AI, MACHINE LEARNING AND DATA-DRIVEN METHODS

Advances in computer vision, deep learning and artificial intelligence for structural health monitoring and inspections
Mohammad Jahanshahi and Vedhus Hoskere

Machine learning applications in wind engineering
Pedro Fernández-Cabán, Sungmoon Jung and Haifeng Wang

Data-scarce modeling in engineering mechanics: Probabilistic learning, information maximization & transfer learning
Audrey Olivier, Michael Shields, Hadi Meidani and Lori Graham-Brady

Data-driven approaches to engineering mechanics
Fatemeh Pourahmadian, John Brigham, Alessandro Fascetti, Evgueni Filipov and Tom Seidl

Machine learning and its applications in civil and mechanical engineering
Aly Mousaad Aly

High-dimensional data analytics and machine learning in engineering mechanics
Arvin Ebrahimkhanlou and Joel Harley

Advancements of data-driven methods in computational mechanics
Nikolaos Napoleon, Jiun-Shyan Chen, Qizhi He and WaiChing Sun

STOCHASTIC MECHANICS

Computational methods for stochastic engineering dynamics
Ketson dos Santos, Vasileios Fragkoulis, Ioannis Kougioumtzoglou, Antonina Pirrota and Athanasios Pantelous

Analytical, numerical and experimental modeling of complex dynamical systems under deterministic and stochastic inputs
Kalil Erazo and Alberto Di Matteo
1000  PROBABILISTIC MODELING: UNCERTAINTY QUANTIFICATION AND PROPAGATION AND DIGITAL TWINS

MS 1001:  Computational statistics for natural hazards engineering: Advances in uncertainty quantification, surrogate modeling, and dimension reduction for performance-based design of structures and systems
Dimitris Giovanis, Alexandros Taflanidis, Seymour Spense and Michael Shields

MS 1002:  Uncertainty characterization and propagation in complex nonlinear structures
Meng-Ze Lyu, Zhiheng Wang and Jian-Bing Chen

MS 1003:  Surrogate modeling for uncertainty quantification, optimization, and statistical inference in engineering applications
Min Li, Abdollah Shafieezadeh, Gaofeng Jia, Bruno Sudret and Alexandros Taflanidis

MS 1004:  Multi-fidelity methods and machine learning for uncertainty propagation, inference, and optimization
Negin Alemazkoor and Ruda Zhang

MS 1005:  Probabilistic, physics-guided, and multi-fidelity generative modeling for uncertainty quantification
Agnimitra Dasgupta, Roger Ghanem, Sanjay Govindjee and Assad Oberai

MS 1006:  Uncertainty quantification and machine learning for design, optimization, and inference in multiscale systems
Zhiheng Wang, Lizhi Sun, Jiun-Shyan (J.S.) Chen and Roger Ghanem

MS 1007:  Integration of physics-based models with data for identification, monitoring, estimation, and uncertainty quantification
Hamed Ebrahimian, Babak Moaveni, Haeyoung Noh and Yang Wang

MS 1008:  Infrastructure assessment automation with robotics, deep learning and digital twins
Vedhus Hoskere, Mohammad Jahanshahi, Jian Li and Wei Song

MS 1009:  Toward data-driven approaches for uncertainty quantification and propagation
Subhayan De, Patrick Brewick, Kundan Goswami and Alireza Doostan

MS 1010:  Addressing uncertainties in infrastructure risk management
Alessandro Contento, Jessica Boakye, Roberto Guidotti, Leandro Iannacone, Fabrizio Nocera and Aditya Pandei

MS 1011:  Probabilistic assessment, data-driven inference and optimization for decision-making under uncertainty
Charalampos Andriotis, Konstantinos Papakonstantinou, George Deodatis, Mariyam Amir and Pablo Morato

MS 1012:  Probabilistic learning, stochastic optimization, and digital twins
Amir H Gandomi, Christian Soize and Roger Georges Ghanem
1100  RISK, RELIABILITY AND RESILIENCE

MS 1101:  Towards resilient coastlines: Advancements and new approaches
Teng Wu, Maria Koliou and Katerina Kyprioti

MS 1102:  Objective resilience: Harnessing emerging technologies for enhancing infrastructure and community resilience
Milad Roohi and ZhiQiang Chen

MS 1103:  Climate change, extreme weather events, and infrastructure resiliency
Mostafa Momen, Marco Giometto, Dimitrios Kalliontzis and Jinhui Yan

MS 1104:  Resilience of coastal structures, systems, and community subjected to hazards
Wei Zhang, Jamie Padgett, Andre Barbosa, Katerina Kyprioti, Claudia Reis and William Hughes

MS 1105:  Civil infrastructure in a changing climate: From nonstationary risk assessment to developing adaptation strategies
Eun Jeong Cha, Abdollah Shafieezadeh, Michele Barbato and Alex Taflanidis

MS 1106:  Objective resilience: Multi-scale resilience measures for electric power networks in climatic hazards
Alice Alipour, Abdollah Shafieezadeh and Paolo Bocchini

MS 1107:  Objective resilience: Computational advancements for performance-based engineering and resilience assessment of communities
Alice Alipour and Paolo Gardoni

MS 1108:  Towards resilient communities: Improvements in natural hazard risk assessment using data-driven methods
Jize Zhang and Katerina Kyprioti

MS 1109:  Resilience-based seismic design and analysis of across-fault infrastructures
Longjun Xu, Paolo Gardoni and Guochen Zhao

MS 1110:  Advances in resilience analytics and sustainable infrastructure: Bridging theory and practice
Arghavan Louhghalam, Negin Alemazkoor, Mohammadjavad Abdolhosseini Qomi, Mazdak Tootkaboni and Abdollah Shafieezadeh

MS 1111:  Reliability analysis and rare event probability estimation
Kostas Papakonstantinou, Ziqi Wang, Shanyin Tong, Iason Papaioannou and Som Dhulipala

MS 1112:  Bridge structural reliability and truck loads
Gongkang Fu
MS 1113: AI-enhanced probabilistic reliability assessment
Hrishikesh Sharma

MS 1114: Advances in regional hazard modeling and risk assessment
Sang-ri Yi, Aakash B Satish, Carmine Galasso and Alexandros Taflanidis

MS 1115: Advancing artificial intelligence for probabilistic models and reliability analyses as a language of science
Do-Eun Choe and Milad Roohi

1200 INDUSTRY AND PRACTICE

MS 1201: Industry challenges in engineering mechanics
Michael Hillman, Rudraprasad Bhattacharyya, Kundan Goswami and Gourab Ghosh

1300 NOVEL METHODS IN ENGINEERING MECHANICS

MS 1301: Novel methods in engineering mechanics
Xiaojia Shelly Zhang

1400 NOVEL METHODS AND APPLICATIONS IN PROBABILISTIC MECHANICS, MODELING AND RELIABILITY

MS 1401: PMC - General session
Paolo Gardoni