Monday, September 26

Plenary Keynote 1	
8:30am - 9:15am	**Prith Banerjee** CTO, Ansys Inc. *Using Artificial Intelligence in Engineering Simulation*
Plenary Keynote 2	
9:15am - 10:00am	**Wing Kam Liu** Walter P. Murphy Professor, Northwestern University *Hierarchical Deep Learning Neural Network (HiDeNN)-FEM-AI for Process Design and Performance Prediction of Material Systems*
Session 1: Machine Learning	
10:15am - 10:30am	**Saneiki Fujita*, Reika Nomura, Yu Otake, Shunichi Koshimura, Shuji Moriguchi, Kenjiro Terada** Tohoku University *Optimization of Gauge Configuration for Forecast of Tsunami Waveform*
10:30am - 10:45am	**Yuxi Xie*, Dandan Lyu, Yong Guo, Haoyan Wei, Wei Hu, C.T. Wu** Ansys Inc *Data-driven Multiscale Modeling for Polycrystalline Metals and its Applications to Cold Forging Analysis*
10:45am - 11:00am	**Xiaonan Wang*, Rajani Jayaseelan, Jobie Greken, Guoyu Lin** Ansys Inc *Artificial intelligence in the material coefficient evaluation workflow*
11:00am - 11:15am	**Haiyang He*, Jay Pathak, Norman Chang, Rishikesh Ranade, Stephen Pan, Jimin Wen, Haoliang Jiang, Lalit Ghule, Akhilesh Kumar, David Geb, Saeed Asgari, Mehdi Abarham** Ansys Inc *Solving Chip Thermal Problems with Complex Power Maps Using Deep Learning Models*
Session 2: Multi-scale Computation	
10:15am - 10:30am	**Somnath Ghosh*, Shravan Kotha, Jinlei Shen, Xiaofan Zhang** Johns Hopkins University *Machine Learning-enabled Data-Driven Methods in Multiscale Constitutive and Damage Modeling of Metals and Composites*
10:30am - 10:45am	**Alexander Staroselsky*, Luke Borkowski, Masoud Anahid** Raytheon Technologies Research Center **Wei Hu** Ansys Inc *Microstructure-Sensitive Thermomechanical Material Processing Simulation Capability*
10:45am - 11:00am	**Deepankar Pal*, Grama Bhashyam** Ansys Inc *Some Integrated Tools for Crystalline Multiscale Studies*
11:00am - 11:15am	**Tarun Gangwar*, Dominik Schillinger** Technical University of Darmstadt, Germany *Concurrent material and structure optimization of elastoplastic multiphase hierarchical structures*
Session 3: Extreme Events	
10:15am - 10:30am	**WaiChing Sun*, Ran Ma** Columiba University **Catalin Picu** Renselaer Polyechnic Institute **Tommy Sewell** University of Missouri *MPM Simulation of Hypersonic Shock-induced Pore Collapse in Crystalline Energetic Materials*

10:30am - 10:45am	**Zhen Chen*, Alaa Elsisi, Hani Salim** University of Missouri **Andrew Bowman** U.S. Army Engineer Research and Development Center Integrating FEM and MPM for Objective Evaluation of Blast/Impact-resistant Design
10:45am - 11:00am	**Youcai Wu*, Dominic Wilmes, Joe Magallanes** Karagozian & Case *FEMFRE – An Enhanced Meshfree Solid Dynamics Code for Modeling High Strain Rate Deformations*
11:00am - 11:15am	**Martin Berzins** University of Utah *An Introduction to Spatial Error Estimation of The Material Point Method*
Session 4: Composite Material	
11:30am - 11:45am	**Denis Düsseldorf*, Pablo Jiménez Recio, Marc Alexander Schweitzer, Jon Gosse, Doug Neill** University of Bonn, Germany *Optimal Basis Functions for Laminated Composites with a Partition of Unity Method*
11:45am - 12:00pm	**Pablo Jiménez Recio*, Denis Düsseldorff, Marc Alexander Schweitzer** University of Bonn & Fraunhofer SCAI **Jon Gosse, Doug Neill** Computing Engineering Software *Mixed-dimensional Analysis of Laminated Plates and Shells with a Partition of Unity Method*
12:00pm - 12:15pm	**Valeriy Buryachenko** Micromechanics & Composites LLC *Peridynamic Micromechanics of Composites*
12:15pm - 12:30pm	**Haoyan Wei*, C. T. Wu, Wei Hu, Yong Guo, Dandan Lyu, Tung-Huan Su, Kai Wang, Philip Ho** Ansys Inc **Hitoshi Oura, Masato Nishi, Sean Wang** JSOL Corporation **Tadashi Naito** Honda Motor Co., Ltd **Joseph Lin, Leo Shen** CoreTech System Co., Ltd. *Intelligent Nonlinear Multiscale Simulation of Injection-molded Short-Fiber-Reinforced Composites*
Session 5: Topology Optimization	
11:30am - 11:45am	**Willem Roux*, Imtiaz Gandikota, Guilian Yi** Ansys Inc *Worst-case Topology Optimization*
11:45am - 12:00pm	**Ryohei Katsumata*, Koji Nishiguchi, Hiroya Hoshiba, Junji Kato** Nagoya University **Tokimasa Shimada** Kobe University *Large-scale Transient Flow Topology Optimization Using Building-cube Method*
12:00pm - 12:15pm	**Nari Nakayama*, Hao Li, Pierre Jolivet, Kozo Furuta, Shinji Nishiwaki, Kazuhiro Izui** Kyoto University *Multi-material Level set-based Topology Optimization for Maximization of the Fundamental Eigenfrequency*
Session 6: Semiconductor and Electronics	
11:30am - 11:45am	**Siva Sai Kishore Palli*, Venkata Rama Satya Pradeep Vempaty, Qijia Chen, Chris Sim, Harry Singh** Micron Technology *Ejector Tool Design Optimization for Thin Dies During Die Attach*

11:45am - 12:00pm	**Ashok Alagappan** Ansys Inc *Novel Approach to Prediction of IC (Integrated Circuit) Reliability at System Level*
12:00pm - 12:15pm	**Yi-Hao Chen*, Ling Zhang, Han-Hsiang Cheng, Federico Duque Gomez** Ansys Inc *Microscopic to Macroscopic Modelling of Optical Defect Inspection System*
12:15pm - 12:30pm	**Xiaofei Pan*, Dandan Lyu, Wei Hu, Jingxiao Xu, C.T. Wu** Ansys Inc *Introduction of Implicit Incompressible Smoothed Particle Galerkin Method for Solder Reflow Analysis*
Semi-Plenary Keynote 1	
1:30pm - 2:00pm	**Blair Carlson** General Motors *Applications and Needs of FEMs in Automotive Manufacturing*
Semi-Plenary Keynote 2	
2:00pm - 2:30pm	**J. S. Chen** William Prager Chair Professor, UCSD *A Discretization-Independent Neural Network Enrichment of Meshfree Approximations for Modeling Strain Localization*
Session 7: Emergent and New Applications	
2:45pm - 3:00pm	**Howard Tu*, Taylor Kranbuhl** Rochester Institute of Technology **Gerbrand Ceder** University of California at Berkeley *Electro-Chemo-Mechanics in the Application of Solid State Batteries*
3:00pm - 3:15pm	**Christopher Long*, Duan Zhang** Los Alamos National Laboratory **Abdel Alsardi** Virginia Polytechnical Institute *Sparse Structure Deformation and the Isogeometric MPM .*
3:15pm - 3:30pm	**Abdelraham Alsardi*, Alba Yerro** Virginia Tech **Christopher Long** Los Alamos National Laboratory *Earthquake Soil Dynamics Using Isogeometric Material Point Method*
3:30pm - 3:45pm	**Yong Guo*, Dandan Lyu, Yuxi Xie, Haoyan Wei, C. T. Wu** Ansys Inc *Multiscale Analysis of Metal Machining Using SPG Method with Micromechanics-based Material Property from Crystal Plasticity Deep Material Network*
3:45pm - 4:00pm	**Elisa Budyn*,** Ecole Normale Superieur Paris-Saclay **Ryan Ross, Ana Chee, Rylan Martin, David Karwo, James Williams** Rush University **Eric Schmidt** University of Illinois at Chicago *A Bone-on-chip to Track Human Bone and Disk Formation*
Session 8: Geoscience and Natural Disasters	
2:45pm - 3:00pm	**Kara Peterson*, Svetoslav Nikolov, Dan Bolintineanu** Sandia National Lab **Adrian Turner** Los Alamos National Lab *Modeling Arctic Sea Ice with a Discrete Elemenet Model*
3:00pm - 3:15pm	**Shabnam Semnani** UC San Diego *Machine Learning Surrogate Modeling of Geomaterials for Finite Element Analysis*

3:15pm - 3:30pm	**Kumpei Tsuji*, Yusuke Saeki, Shujiro Fujioka, Mitsuteru Asai** Kyushu University *A Hybrid ISPH-DEM Coupling Simulation for Estimating Internal Erosion in Soil*
3:30pm - 3:45pm	**Shaoyuan Pan*, Reika Nomura, Shuji Moriguchi, Kenjiro Terada** Tohoku University **Shinsuke Takase** Hachinohe institute of Techonlogy *A 2D-3D Coupling Strategy for MPM-FEM Hybrid Analysis of Landslide-induced Tsunamis*
3:45pm - 4:00pm	**Nilo Lemuel Dolojan*, Shuji Moriguchi, Masakazu Hashimoto, Nguyen Xuan Tinh, Hitoshi Tanaka, Kenjiro Terada** Tohoku University *Simulating Landslide and Flood Hazard Distributions Caused by Heavy Rainfall*
Session 9: Damage and Fracture	
2:45pm - 3:00pm	**Kei Saito*** JSOL Corporation **Ninshu Ma, Hidekazu Murakawa** Osaka University *New Approach to Evaluation of Singular Stress Field of Cracks in Various Loading Conditions*
3:00pm - 3:15pm	**Ahmad Chihadeh*, Michael Kaliske** Technische Universität Dresden, Germany *Eigenerosion Approach for Fracture Modeling of Reinforced Materials in the Material Point Method Framework*
3:15pm - 3:30pm	**Mark Hobbs*, Tim Dodwell, Hussein Rappel** University of Exeter **Gabriel Hattori, John Orr** University of Cambridge *An Examination of the Statistical Size Effect in Quasi-brittle Materials Using a Bond-based Peridynamic Model*
3:30pm - 3:45pm	**Guoyu Lin*, James Zuo, Shanhu Li, Kaan Ozenc, Dhiraj Singh, Jasem Ahmed** Ansys Inc *General Automatic 3D Crack Growth Simulation*
3:45pm - 4:00pm	**Mohammad Naqib Rahimi*, Georgios Moutsanidis** Stony Brook University, Institute for Advanced Computational Science *SPH Framework for Hyperbolic Phase Field Modeling of Brittle Fracture*
Session 10: Additive Manufacturing	
4:15pm - 4:30pm	**Gregory Wagner*, Zhongsheng Sang, Arash Samaei** Northwestern University *A Numerical Method for Simulation of Multicomponent Metal Additive Manufacturing*
4:30pm - 4:45pm	**Adrian Lew*, Gradey Wang, Eric Darve** Stanford University *Optimal Path Planning for LPBF as an Equality Generalized Traveling Salesperson Problem*
4:45pm - 5:00pm	**Wentao Yan** National University of Singapore *High-fidelity Modeling of Metal Additive Manufacturing: From Powder and Molten Pool Dynamics to Thermal Stresses*
5:00pm - 5:15pm	**Haoliang Yu*, Chong Teng** Ansys Inc *An Overview of Directed Energy Deposition (DED) Simulation Capabilities in Ansys*
Session 11: Fluid-Structure Interaction	
4:15pm - 4:30pm	**Georgios Moutsanidis*, Mohammad Naqib Rahimi** Stony Brook University *SPH Framework for Modeling Fracture in Fluid-Structure Interaction Simulations*

4:45pm - 5:00pm	**Koji Nishiguchi*, Shusuke Takeuchi, Ryohei Katsumata, Tokimasa Shimada, Hiroya Hoshiba, Junji Kato** Nagoya University *Eulerian Finite Volume Formulation for The interaction of Visco-Hyperelastic Structure and Airflow*
5:00pm - 5:15pm	**Christian Peco*** Penn State **T. Shimada** RIKEN Center for Computational Science, Kobe, Japan **M. Tsubokura** Computational Science, Kobe University, Japan **K. Nishiguchi** Nagoya University, Japan **S. Okazawa** University of Yamanashi, Japan *Unified Eulerian Formulation for Large-scale Combined Fluid-Solid Behavior in Biomaterials*
Session 12: Novel Numerical Methods	
4:15pm - 4:30pm	**Haoyang Li, Javier A. Avecillas-Leon, C. Armando Duarte*** University of Illinois at Urbana-Champaign **Nathan Shauer** FECFAU-Universidade Estadual de Campinas *A Non-intrusive Iterative Generalized Finite Element Method for Multiscale Coupling of 3-D Solid and Shell Models*
4:30pm - 4:45pm	**Uwe Schramm*, Victor Apanovitch** Altair *CAD-based Meshfree Solver for Rapid Assembly Analysis*
4:45pm - 5:00pm	**Karel Matous*, Cale Harnish** University of Notre Dame **Luke Dalessandro** Indiana University **Daniel Livescu** Los Alamos National Lab *A Multiresolution Adaptive Wavelet Method for Nonlinear Partial Differential Equations*
5:00pm - 5:15pm	**Jannik Michels*, Marc Alexander Schweitzer** University of Bonn *PUM for Kirchhoff Shells*
5:15pm - 5:30pm	**Mike Puso, Jerome Solberg** Lawrence Livermore National Laboratory *A Dual Pass Mortar Approach for Unbiased Constraints and Self-contact*

Tuesday, September 27

Plenary Keynote 3	
8:30am - 9:15am	**Charbel Farhat** Vivian Church Hoff Professor, Stanford University *Discrete-Event-Free Embedded Boundary Methods for Multidisciplinary Design Analysis and Optimization*
Plenary Keynote 4	
9:15am - 10:00am	**Stewart Silling** Sandia National Laboratories *Peridynamics and Its Applications*
Session 13: Machine Learning	
10:15am - 10:30am	**Kenta Tozato*, Shuji Moriguchi, Yu Otake, Anawat Suppasri, Kenjiro Terada** Tohoku University **Shinsuke Takase** Hachinohe Institute of Technology **Michael R. Motley** University of Washington *Probabilistic Optimal Facilities Placement Using Surrogate Models of 3D Tsunami Simulation*
10:30am - 10:45am	**Tung-Huan Su*** National Taiwan University *A GNN-DMN Method for Unified Material Database of Heterogeneous Materials*
10:45am - 11:00am	**Lalit Ghule*, Rishikesh Ranade, Jay Pathak** Ansys Inc *NLP-inspired Teacher Forcing Technique to Train Deep Learning Models for Dynamical Systems*
Session 14: Multi-scale Computation	
10:15am - 10:30am	**Yonggang Zheng*, Hongwu Zhang** Dalian University of Technology **Mengkai Lu** Ningbo University *Extended Multiscale Finite Element Methods for the Strain Localization and Crack Propagation Problems*
10:30am - 10:45am	**Masato Nishi*, Hitoshi Oura, Kei Saito, Toshiro Amaishi** JSOL Corporation *Multi-Scale Material Characterization: from Macroscopic Reverse Engineering to Mesoscopic Numerical Approaches*
10:45am - 11:00am	**Yosuke Yamanaka*, Seishiro MATSUBARA, Yuki SADO, Hiroaki SAKATA, Yoshiaki KAWAGOE, Tomonaga OKABE, Shuji MORIGUCHI, Kenjiro TERADA** Tohoku university *Two-scale Thermo-Chemo-Mechanical Analysis of Fiber Reinforced Plastic Subject to Curing Process*
11:00am - 11:15am	**Bryce Mazurowski*, C. Armando Duarte** University of Illinois at Urbana-Champaign *A Generalized Finite Element Method for Multiscale Modeling of Composite Materials*
Session 15: Novel Numerical Methods	
10:15am - 10:30am	**Shaofan Li** University of California, Berkeley *Cohesive Bond-based Peridynamics*
10:30am - 10:45am	**Paul Kuberry*, Christopher Eldred, Chad Sockwell** Sandia National Laboratories Generating High-order Hodge Stars for Non-Uniform Mesh Discretizations Using Generalized Moving Least Squares

10:45am - 11:00am	**Alexander Idesman** Texas Tech University *Optimal Local Truncation Error Method for Solution of PDEs on Irregular Domains and Interfaces with Optimal Accuracy and Unfitted Cartesian Meshes*
11:00am - 11:15am	**Lihua Wang** Tongji University *A Highly Efficient and Accurate Lagrangian-Eulerian Stabilized Collocation Method (LESCM) for the Fluid-Structure Interaction Problems with Free Surface Flow*
Session 16: Composite Material	
11:30am - 11:45am	**Masaaki Nishikawa*, Naoki Matsuda, Masaki Hojo** Kyoto University **Kohei Yamada** Industrial Technology Center of Fukui Prefecture **Masato Nishi** JSOL Corporation *Materials, Process, and Performance Simulations for Thin-Ply Based CFRP Composites*
11:45am - 12:00pm	**Togo Mizuta*, Masaaki Nishikawa, Naoki Matsuda, Masaki Hojo** Kyoto University **Masato Nishi** JSOL Corporation *Performing Analysis of Thermoplastic CFRP Prepag Tapges Considering Temperature Dependence Using a Coupled Structural Thermal Analysis*
12:00pm - 12:15pm	**Shinya Hayashi*** JSOL Corporation **C.T. Wu, Wei Hu, Yong Guo, Xiaofei Pan, Hao Chen** Ansys Inc *New Simulation Technology for Compression Molding Using Discontinuous Long Fiber Reinforced Plastics*
12:15pm - 12:30pm	**Valeriy Buryachenko** Micromechanics & Composites LLC *Self-consistent Clustering Analysis in Peridynamic Micromechanics of Composites*
Session 17: Topology Optimization	
11:30am - 11:45am	**Naoyuki Ishida*, Hao Li, Tsuguo Kondoh, Kozo Furuta, Kazuhiro Izui, Shinji Nishiwaki** Kyoto University *Topology Optimization Using Level-set Method for a Microfluidic Static Mixer*
11:45am - 12:00pm	**Junji Kato** Nagoya University *Stabilized Topology Optimization Considering Dynamic Finite Strain Structural Response*
12:00pm - 12:15pm	**Keisuke Takaara*, Hiroya Hoshiba, Koji Nishiguchi, Junji Kato** Nagoya University **Shinsuke Takase** Hachinohe institute of technology *Topology Optimization for Transient Thermal-fluid Problems*
Session 18: Novel Numerical Methods	
11:30am - 11:45am	**Jennifer E. Fromm*, Ru Xiang, Han Zhao, David Kamensky** University of California, San Diego **Nils Wunsch, Kurt Maute, John A. Evans** University of Colorado Boulder *Extraction and Code Generation for Unfitted Finite Element Analysis*
11:45am - 12:00pm	**Anupam Mishra*, Yanbao Ma** University of California, Merced *A Novel Particle Based Method for Generating Isotropic Unstructured Mesh*

12:00pm - 12:15pm	**Yongyi Zhu*, Yong-cheng Liu, Jeff Beisheim** Ansys Inc *A Method of Splitting Large Contact Pairs in an Implicit Finite Element Analysis for Distributed-Memory Parallel Environment*
12:15pm - 12:30pm	**Jike Han*, Shuji Moriguchi, Kenjiro Terada** Tohoku University, JAPAN **Yuichi Shintaku** University of Tsukuba, JAPAN *Crack Phase-field Model Introducing Explicit Crack Surfaces*
Semi-Plenary Keynote 3	
1:30pm - 2:00pm	**Pavel Bochev** Sandia National Laboratories *The Amazing Powers of Generalized Moving Least-Squares*
Semi-Plenary Keynote 4	
2:00pm - 2:30pm	**Marc Alexander Schweitzer** University of Bonn and Fraunhofer SCAI *PUMA - A Rapid Enriched Simulation Framework Based on a Partition of Unity Approach*

Session 19: Additive Manufacturing	
2:45pm - 3:00pm	**Alaa Olleak*, Albert To** University of Pittsburgh *Enabling Part-Scale Scanwise Thermal Process Simulation of LPBF Using Matrix-free FEM, Adaptive Remeshing, and GPU Computing*
3:00pm - 3:15pm	**Chen Fan*, Wentao Yan** National University of Singapore *Coupled CFD-FEM Modeling of Air-liquid-solid Phase Transformation in Material Deposition Process*
3:15pm - 3:30pm	**Lukas Troska*, Marc Alexander Schweitzer** Universität Bonn and Fraunhofer Institute *Adaptive Parametric Enrichments for Laser Powder Bed Fusion in the Partition of Unity Method*
Session 20: Geoscience and Natural Disasters	
2:45pm - 3:00pm	**Sheng-Wei Chi*, Sindhu Suta, Craig Foster** University of Illinois at Chicago *Numerical Modeling of Phase Transformation Induced Material Fracture and Crack Propagation*
3:00pm - 3:15pm	**Xiaoyu Song*, Menon Shashank** University of Florida *Computational Large-deformation Peridynamics for Dynamic Failure in Unsaturated Porous Media*
3:15pm - 3:30pm	**Yusuke Saeki*, Shujiro Fujioka, Kumpei Tsuji , Mitsuteru Asai** Kyushu University *A Class of Higher Order Derivative Models in the Smoothed Particle Hydrodynamics*
3:30pm - 3:45pm	**Soma Hidano** Tohoku University *Semi-implicit MPM for Large Deformation in Unsaturated Soil*
3:45pm - 4:00pm	**Shuji Moriguchi*, Kenjiro Terada** Tohoku University **Daiki Watanabe** Toyo Engineering Corporation *A Numerical Study on the Constribution of Particle Size Distribution to Run-out Distance of Granular Flow*
Session 21: Novel Numerical Methods	

2:45pm - 3:00pm	**Joseph Bishop** Sandia National Laboratories *A Hybrid Mesh-based/Element-free Approach for Analysis on Geometrically Complex Domains Without Defeaturing*
3:00pm - 3:15pm	**N. Sukumar*** UC Davis **Ankit Srivastava** IIT Chicago *Exact Imposition of Boundary Conditions with Distance Functions in Physics-Informed Neural Networks to Solve PDEs*
3:15pm - 3:30pm	**Michael Hillman** Penn State *My Six-Year Journey in Academia: Developing Novel Meshfree Methods in the Hillman Lab*
3:30pm - 3:45pm	**Adnan Ebrahem*, René R. Hiemstra, Dominik Schillinger** Technische Universität Darmstadt **Stein K. F. Stoter** Eindhoven University of Technology *Modeling of Growth Using an Immersed Finite Element Method*
3:45pm - 4:00pm	**Silvia Ehrmann*, Bram Metsch** Fraunhofer SCAI *Grey-box Algebraic Multigrid for Industrial Applications*