

Monday, September 26

Plenary Keynote 1	
8:30am - 9:15am	Prith Banerjee CTO, Ansys Inc. <i>Using Artificial Intelligence in Engineering Simulation</i>
Plenary Keynote 2	
9:15am - 10:00am	Wing Kam Liu Walter P. Murphy Professor, Northwestern University <i>Hierarchical Deep Learning Neural Network (HiDeNN)-FEM-AI for Process Design and Performance Prediction of Material Systems</i>
Session 1: Machine Learning. Chairs: Jay Pathak, Xiaonan Wang	
10:15am - 10:30am	Saneiki Fujita*, Reika Nomura, Yu Otake, Shunichi Koshimura, Shuji Moriguchi, Kenjiro Terada Tohoku University <i>Optimization of Gauge Configuration for Forecast of Tsunami Waveform</i>
10:30am - 10:45am	Yuxi Xie*, Dandan Lyu, Yong Guo, Haoyan Wei, Wei Hu, C.T. Wu Ansys, Inc <i>Data-driven Multiscale Modeling for Polycrystalline Metals and its Applications to Cold Forging Analysis</i>
10:45am - 11:00am	Xiaonan Wang*, Rajani Jayaseelan, Jobie Greken, Guoyu Lin Ansys Inc <i>Artificial intelligence in the material coefficient evaluation workflow</i>
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 <i>Solving Chip Thermal Problems with Complex Power Maps Using Deep Learning Models</i>
Session 2: Multi-scale Computation. Chairs: Masato Nishi, Arkaprabha Sengupta	
10:15am - 10:30am	Haoyang Li, Javier A. Avecillas-Leon, C. Armando Duarte* University of Illinois at Urbana-Champaign Nathan Shauer FECFAU-Universidade Estadual de Campinas <i>A Non-Intrusive Iterative Generalized Finite Element Method for Multiscale Coupling of 3-D Solid and Shell Modes</i>
10:30am - 10:45am	Deepankar Pal*, Grama Bhashyam Ansys, Inc. <i>Some Integrated Tools for Crystalline Multiscale Studies</i>
10:45am - 11:00am	Yong Guo*, Dandan Lyu, Yuxi Xie, Haoyan Wei, C.T. Wu Ansys, Inc. <i>Multiscale Analysis of Metal Machining Using SPG Method with Micromechanics-based Material Property from Crystal Plasticity Deep Material Network</i>
11:00am - 11:15am	Dandan Lyu*, Wei Hu, Xiaofei Pan, Sandeep Medikonda, Ashutosh Srivastava, C.T. Wu Ansys, Inc. <i>ISPG Method and Geometric Multiscale Modeling of LS-DYNA for Electronics Solder Reflow and Shock Wave Analysis</i>
Session 3: Extreme Events. Chairs: Youcai Wu, Bo Ren	
10:15am - 10:30am	Zhen Chen*, Alaa Elsis, Hani Salim University of Missouri Andrew Bowman U.S. Army Engineer Research and Development Center <i>Integrating FEM and MPM for Objective Evaluation of Blast/Impact-resistant Design</i>

10:30am - 10:45am	Youcai Wu* , Dominic Wilmes , Joe Magallanes Karagozian & Case <i>FEMFRE – An Enhanced Meshfree Solid Dynamics Code for Modeling High Strain Rate Deformations</i>
10:45am - 11:00am	Bo Ren* , C. T. Wu Ansys Inc <i>The Peridynamics Model in Ls-Dyna and Its Industrial Applications</i>
Session 4: Composite Material. Chairs: Shinya Hayashi, Xiaofan Zhang	
11:30am - 11:45am	Elisa Budyn* Ecole Normale Supérieure Paris-Saclay Ryan Ross , Ana Chee , Rylan Martin , David Karwo , James Williams Rush University Eric Schmidt University of Illinois at Chicago <i>A Bone-on-chip to Track Human Bone and Disk Formation</i>
11:45am - 12:00pm	Denis Düsseldorf* , Pablo Jiménez Recio , Marc Alexander Schweitzer , Jon Gosse , Doug Neill University of Bonn, Germany <i>Optimal Basis Functions for Laminated Composites with a Partition of Unity Method</i>
12:00pm - 12:15pm	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. <i>Intelligent Nonlinear Multiscale Simulation of Injection-molded Short-Fiber-Reinforced Composites</i>
12:15pm - 12:30pm	Pablo Jiménez Recio* , Denis Düsseldorf , Marc Alexander Schweitzer University of Bonn and Fraunhofer SCAI Jon Gosse , Doug Neill Computing Engineering Software <i>Mixed-Dimensional Analysis of Laminated Plates and Shells with a Partition of Unity Method</i>
Session 5: Topology Optimization. Chairs: Kenjiro Terada, Junji Kato	
11:30am - 11:45am	Willem Roux* , Imtiaz Gandikota , Guilian Yi Ansys, Inc. <i>Worst-case Topology Optimization</i>
11:45am - 12:00pm	Ryohei Katsumata* , Koji Nishiguchi , Hiroya Hoshiba , Junji Kato Nagoya University Tokimasa Shimada Kobe University <i>Large-scale Transient Flow Topology Optimization Using Building-cube Method</i>
12:00pm - 12:15pm	Nari Nakayama* , Hao Li , Pierre Jolivet , Kozo Furuta , Shinji Nishiwaki , Kazuhiro Izui Kyoto University <i>Multi-material Level set-based Topology Optimization for Maximization of the Fundamental Eigenfrequency</i>
Session 6: Fluid-Structure Interaction. Chairs: Georgios Moutsanidis, Christian Peco	
11:30am - 11:45am	Georgios Moutsanidis* , Mohammad Naqib Rahimi Stony Brook University SPH Framework for Modeling Fracture in Fluid-Structure Interaction Simulations

11:45am - 12:00pm	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 <i>Unified Eulerian Formulation for Large-scale Combine Fluid-Solid Behavior in Biomaterials</i>
12:00pm - 12:15pm	Koji Nishiguchi* , Shusuke Takeuchi , Ryohei Katsumata , Tokimasa Shimada , Hiroya Hoshiba , Junji Kato Nagoya University <i>Eulerian Finite Volume Formulation for The interaction of Visco-Hyperelastic Structure and Airflow</i>
12:15pm - 12:30pm	Hao Chen* Ansys, Inc. <i>Recent Advances in LS-DYNA ALE/FSI</i>
Semi-Plenary Keynote 1	
1:30pm - 2:00pm	Charbel Farhat Vivian Church Off Professor, Stanford University <i>Discrete-Event-Free Embedded Boundary Methods for Multidisciplinary Design Analysis and Optimization</i>
Semi-Plenary Keynote 2	
2:00pm - 2:30pm	J. S. Chen William Prager Chair Professor, UCSD <i>A Discretization-Independent Neural Network Enrichment of Meshfree Approximations for Modeling Strain Localization</i>
Session 7: Emergent and New Applications. Chairs: Howard Tu, Christopher Long	
2:45pm - 3:00pm	Howard Tu* , Taylor Kranbuhl Rochester Institute of Technology Gerbrand Ceder University of California at Berkeley <i>Electro-Chemo-Mechanics in the Application of Solid State Batteries</i>
3:00pm - 3:15pm	Anupam Mishra, Yanbao Ma* UC Merced <i>A Novel Particle Based Method for Generating Isotropic Unstructured Mesh</i>
3:15pm - 3:30pm	Xoapfei Pan* , Dandan Lyu , Wei Hu , Jingxiao Xu , C.T. Wu Ansys, Inc. <i>Introduction of Implicit Incompressible Smoothed Particla Galerkin Method for Solder Reflow Analysis</i>
3:30pm - 3:45pm	Xinhai Zu* Ansys, Inc. <i>Challenges in Sheet Stamping Simulation</i>
3:45pm - 4:00pm	Sandeep Medikonda* , Ashutosh Srivastava , Micah Hernandez , Trang Nguyen , Chris South , Inaki Caldichoury , Pierre L'Eplattenier Ansys, Inc. <i>Magnetic Latching: Numerical Analysis and Experimental Validation</i>
Session 8: Geoscience and Natural Disasters. Chairs: Sheng-Wei Chi, Shuji Moriguchi	

2:45pm - 3:00pm	Kara Peterson* , Svetoslav Nikolov, Dan Bolintineanu Sandia National Lab Adrian Turner Los Alamos National Lab <i>Modeling Arctic Sea Ice with a Discrete Element Model</i>
3:00pm - 3:15pm	Shabnam Semnani UC San Diego <i>Machine Learning Surrogate Modeling of Geomaterials for Finite Element Analysis</i>
3:15pm - 3:30pm	Kumpei Tsuji* , Yusuke Saeki, Shujiro Fujioka, Mitsuteru Asai Kyushu University <i>A Hybrid ISPH-DEM Coupling Simulation for Estimating Internal Erosion in Soil</i>
3:30pm - 3:45pm	Shaoyuan Pan* , Reika Nomura, Shuji Moriguchi, Kenjiro Terada Tohoku University Shinsuke Takase Hachinohe Institute of Technology <i>A 2D-3D Coupling Strategy for MPM-FEM Hybrid Analysis of Landslide-Induced Tsunamis</i>
3:45pm - 4:00pm	Nilo Lemuel Dolojan* , Shuji Moriguchi, Masakazu Hashimoto, Nguyen Xuan Tinh, Hitoshi Tanaka, Kenjiro Terada Tohoku University <i>Simulating Landslide and Flood Hazard Distributions Caused by Heavy Rainfall</i>
Session 9: Damage and Fracture. Chairs: Kei Saito, Guoyu Lin	
2:45pm - 3:00pm	Kei Saito* JSOL Corporation Ninshu Ma, Hidekazu Murakawa Osaka University <i>New Approach to Evaluation of Singular Stress Field of Cracks in Various Loading Conditions</i>
3:00pm - 3:15pm	Ahmad Chihadeh* , Michael Kaliske Technische Universität Dresden, Germany <i>Eigerosion Approach for Fracture Modeling of Reinforced Materials in the Material Point Method Framework</i>
3:15pm - 3:30pm	Mark Hobbs* , Tim Dodwell, Hussein Rappel University of Exeter Gabriel Hattori, John Orr University of Cambridge <i>An Examination of the Statistical Size Effect in Quasi-brittle Materials Using a Bond-based Peridynamic Model</i>
3:30pm - 3:45pm	Guoyu Lin* , James Zuo, Shanhu Li, Kaan Ozenc, Dhiraj Singh, Jasem Ahmed Ansys Inc <i>General Automatic 3D Crack Growth Simulation</i>
3:45pm - 4:00pm	Mohammad Naqib Rahimi* , Georgios Moutsanidis Stony Brook University, Institute for Advanced Computational Science <i>SPH Framework for Hyperbolic Phase Field Modeling of Brittle Fracture</i>
Session 10: Additive Manufacturing. Chairs: Gregory Wagner, Haoliang Yu	
4:15pm - 4:30pm	Gregory Wagner* , Zhongsheng Sang, Arash Samaei Northwestern University <i>A Numerical Method for Simulation of Multicomponent Metal Additive Manufacturing</i>
4:30pm - 4:45pm	Wentao Yan* National University of Singapore <i>High-fidelity Modeling of Metal Additive Manufacturing: From Powder and Molten Pool Dynamics to Thermal Stresses</i>

4:45pm - 5:00pm	Haoliang Yu*, Chong Teng Ansys Inc <i>An Overview of Directed Energy Deposition (DED) Simulation Capabilities in Ansys</i>
5:00pm - 5:15pm	N.E. Hodge*, M. Puso, Jr. Lawrence Livermore National Laboratory <i>Model Efficiency Gains via Improved Representation of the Spatiotemporal Scales in Laser Powder Bed Fusion</i>
Session 11: Semiconductor and Electronics. Chairs: Ashok Alagappan, Sandeep Medikonda	
4:15pm - 4:30pm	Ashok Alagappan Ansys Inc <i>Novel Approach to Prediction of IC (Integrated Circuit) Reliability at System Level</i>
4:30pm - 4:45pm	Yi-Hao Chen*, Ling Zhang, Han-Hsiang Cheng, Federico Duque Gomez Ansys Inc <i>Microscopic to Macroscopic Modelling of Optical Defect Inspection System</i>
4:45pm - 5:00pm	Amogh Shejwal*, Ashutosh Srivastava, Sandeep Medikonda Ansys Inc <i>A Comprehensive Overview on Modeling and Analysis of Flex PCB Techniques and Industry Requirements</i>
5:00pm - 5:15pm	Siva Sai Kishore Palli*, Venkata Rama Satya Pradeep Vempaty, Qijia Chen, Chris Sim, Harry Singh Micron Technology <i>Ejector Tool Design Optimization for Thin Dies During Die Attach</i>
Session 12: Novel Numerical Methods. Chairs: Mike Puso, Karel Matous	
4:15pm - 4:30pm	Karel Matous*, Cale Harnish University of Notre Dame Luke Dalessandro Indiana University Daniel Livescu Los Alamos National Lab <i>A Multiresolution Adaptive Wavelet Method for Nonlinear Partial Differential Equations</i>
4:30pm - 4:45pm	Uwe Schramm*, Victor Apanovitch Altair <i>CAD-based Meshfree Solver for Rapid Assembly Analysis</i>
4:45pm - 5:00pm	Mike Puso*, Jerome Solberg Lawrence Livermore National Laboratory <i>A Dual Pass Mortar Approach for Unbiased Constraints and Self-contact</i>
5:00pm - 5:15pm	Jannik Michels*, Marc Alexander Schweitzer University of Bonn <i>PUM for Kirchhoff Shells</i>

Tuesday, September 27

Plenary Keynote 3	
8:30am - 9:15am	<p>Alexander Staroselsky Raytheon Technologies Research Center <i>Microstructure-Sensitive Thermomechanical Material Processing Simulation Capability</i></p>
Plenary Keynote 4	
9:15am - 10:00am	<p>Stewart Silling Sandia National Laboratories <i>Peridynamics and Its Applications</i></p>
Session 13: Machine Learning. Chairs: Reika Nomura, Haiyang He	
10:15am - 10:30am	<p>Kenta Tozato*, Shuji Moriguchi, Yu Otake, Anawat Suppasri, Kenjiro Terada Tohoku University Shinsuke Takase Hachinohe Institute of Technology Michael R. Motley University of Washington <i>Probabilistic Optimal Facilities Placement Using Surrogate Models of 3D Tsunami Simulation</i></p>
10:30am - 10:45am	<p>Lalit Ghule*, Rishikesh Ranade, Jay Pathak Ansys Inc <i>NLP-inspired Teacher Forcing Technique to Train Deep Learning Models for Dynamical Systems</i></p>
10:45am - 11:00am	<p>Kuanshi Zhong*, Gergoary G. Deierlein Stanford University Javier G. Navarro University of Colorado, Boulder Sanjay Govindjee University of California, Berkeley <i>Surrogate Modeling of Earthquake Response of Structures Using Probabilistic Learning on Manifolds</i></p>
11:00am - 11:15am	<p>Ran Ma*, Nikolaos Vlassis, WaiChing Sun Columbia University Puhan Zhao, Tommy Sewell University of Missouri <i>Transfer Learning for Finite-strain Anisotropic Hyperelasticity and Its Application to Monoclinic Energetic Materials</i></p>
Session 14: Multi-scale Computation. Chairs: Alexander Staroselsky, Deepankar Pal	
10:15am - 10:30am	<p>Masato Nishi*, Hitoshi Oura, Kei Saito, Toshiro Amaishi JSOL Corporation <i>Multi-Scale Material Characterization: from Macroscopic Reverse Engineering to Mesoscopic Numerical Approaches</i></p>
10:30am - 10:45am	<p>Yosuke Yamanaka*, Seishiro MATSUBARA, Yuki SADO, Hiroaki SAKATA, Yoshiaki KAWAGOE, Tomonaga OKABE, Shuji MORIGUCHI, Kenjiro TERADA Tohoku university <i>Two-scale Thermo-Chemo-Mechanical Analysis of Fiber Reinforced Plastic Subject to Curing Process</i></p>
10:45am - 11:00am	<p>Bryce Mazurowski*, C. Armando Duarte University of Illinois at Urbana-Champaign <i>A Generalized Finite Element Method for Multiscale Modeling of Composite Materials</i></p>
11:00am - 11:15am	<p>Tung-Huan Su*, Jimmy Gaspard Jean, Szu-Jui Huang, Chuin-Shan Chen National Taiwan University <i>A GNN-DMN Method for Unified Material Database of Heterogeneous Materials</i></p>

Session 15: Novel Numerical Methods. Chairs: Paul Kuberry, Alexander Idesman	
10:15am - 10:30am	Shaofan Li University of California, Berkeley <i>Cohesive Bond-based Peridynamics</i>
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 <i>Optimal Local Truncation Error Method for Solution of PDEs on Irregular Domains and Interfaces with Optimal Accuracy and Unfitted Cartesian Meshes</i>
11:00am - 11:15am	Silvia Ehrmann*, Bram Metsch Fraunhofer SCAI <i>Grey-box Algebraic Multigrid for Industrial Applications</i>
Session 16: Composite Material. Chairs: Denis Düsseldorf, Pablo Jiménez Recio	
11:30am - 11:45am	Mojtaba Aliasghar-Mamaghani*, Ioannis Koutromanos, Carin Roberts-Wollmann, Matthew Hebdon Virginia Polytechnic Institute and State University <i>Finite Element Analysis of Chloride Ingress in Prestressed Concrete Bridge Girders</i>
11:45am - 12:00pm	Xiaofan Zhang*, Somnath Ghosh, Shravan Kotha, Jinlei Shen Johns Hopkins University <i>Data-driven and Machine Learning Methods for Parametrically Upscaled Damage Models for Woven Composites</i>
12:00pm - 12:15pm	Shinya Hayashi* JSOL Corporation C.T. Wu, Wei Hu, Yong Guo, Xiaofei Pan, Hao Chen Ansys, Inc. <i>New Simulation Technology for Compression Molding Using Discontinuous Long Fiber Reinforced Plastics</i>
Session 17: Topology Optimization. Chairs: Willem Roux, Guilian Yi	
11:30am - 11:45am	Naoyuki Ishida*, Hao Li, Tsuguo Kondoh, Kozo Furuta, Kazuhiro Izui, Shinji Nishiwaki Kyoto University <i>Topology Optimization Using Level-set Method for a Microfluidic Static Mixer</i>
11:45am - 12:00pm	Junji Kato Nagoya University <i>Stabilized Topology Optimization Considering Dynamic Finite Strain Structural Response</i>
12:00pm - 12:15pm	Keisuke Takaara*, Hiroya Hoshiba, Koji Nishiguchi, Junji Kato Nagoya University Shinsuke Takase Hachinohe institute of technology <i>Topology Optimization for Transient Thermal-fluid Problems</i>
Session 18: Novel Numerical Methods. Chairs: Yongyi Zhu, Yanbao Ma	
11:30am - 11:45am	Yongyi Zhu*, Yong-cheng Liu, Jeff Beisheim Ansys Inc <i>A Method of Splitting Large Contact Pairs in an Implicit Finite Element Analysis for Distributed-Memory Parallel Environment</i>

11:45am - 12:00pm	Michael Hillman* Penn State/Karagozian & Case <i>My Six-Year Journey in Academia: Developing Novel Meshfree Methods in the Hillman Lab</i>
12:00pm - 12:15pm	Jike Han*, Shuji Moriguchi, Kenjiro Terada Tohoku University, JAPAN Yuichi Shintaku University of Tsukuba, JAPAN <i>Crack Phase-field Model Introducing Explicit Crack Surfaces</i>
Semi-Plenary Keynote 3	
1:30pm - 2:00pm	Pavel Bochev Sandia National Laboratories <i>The Amazing Powers of Generalized Moving Least-Squares</i>
Semi-Plenary Keynote 4	
2:00pm - 2:30pm	Marc Alexander Schweitzer University of Bonn and Fraunhofer SCAI <i>PUMA - A Rapid Enriched Simulation Framework Based on a Partition of Unity Approach</i>
Session 19: Additive Manufacturing. Chairs: Wentao Yan, Alaa Olleak	
2:45pm - 3:00pm	Alaa Olleak*, Albert To University of Pittsburgh <i>Enabling Part-Scale Scanwise Thermal Process Simulation of LPBF Using Matrix-free FEM, Adaptive Remeshing, and GPU Computing</i>
3:00pm - 3:15pm	Chen Fan*, Wentao Yan National University of Singapore <i>Coupled CFD-FEM Modeling of Air-liquid-solid Phase Transformation in Material Deposition Process</i>
3:15pm - 3:30pm	Lukas Troska*, Marc Alexander Schweitzer Universität Bonn and Fraunhofer Institute <i>Adaptive Parametric Enrichments for Laser Powder Bed Fusion in the Partition of Unity Method</i>
Session 20: Geoscience and Natural Disasters. Chairs: Kara Peterson, Shabnam Semnani	
2:45pm - 3:00pm	Sheng-Wei Chi*, Sindhu Suta, Craig Foster University of Illinois at Chicago <i>Numerical Modeling of Phase Transformation Induced Material Fracture and Crack Propagation</i>
3:00pm - 3:15pm	Yusuke Saeki*, Shujiro Fujioka, Kumpei Tsuji, Mitsuteru Asai Kyushu University <i>A Class of Higher Order Derivative Models in the Smoothed Particle Hydrodynamics</i>
3:15pm - 3:30pm	Soma Hidano Tohoku University <i>Semi-implicit MPM for Large Deformation in Unsaturated Soil</i>
3:30pm - 3:45pm	Shuji Moriguchi*, Kenjiro Terada Tohoku University Daiki Watanabe Toyo Engineering Corporation <i>A Numerical Study on the Contribution of Particle Size Distribution to Run-out Distance of Granular Flow</i>
Session 21: Novel Numerical Methods. Chairs: N. Sukumar, Ying Li	
2:45pm - 3:00pm	Joseph Bishop Sandia National Laboratories <i>A Hybrid Mesh-based/Element-free Approach for Analysis on Geometrically Complex Domains Without Defeaturing</i>

3:00pm - 3:15pm	N. Sukumar* UC Davis Ankit Srivastava IIT Chicago <i>Exact Imposition of Boundary Conditions with Distance Functions in Physics-Informed Neural Networks to Solve PDEs</i>
3:15pm - 3:30pm	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 <i>Extraction and Code Generation for Unfitted Finite Element Analysis</i>