siam 2025 | Conference on Computational Science and Engineering

March 3–7, 2025 • Fort Worth, Texas, U.S.

Held jointly with:

SIAM International Meshing Roundtable Workshop 2025 (IMR25)
March 3–6, 2025 • Fort Worth Texas, U.S.

All events will take place at either the Fort Worth Convention Center (FWCC) •1201 Houston Street, Fort Worth, Texas, 76102
OR
The Omni Fort Worth Hotel (Omni) • 1300 Houston Street, Fort Worth, Texas, 76102

Online Program and Mobile App

Attendees are encouraged to visit the following to view the Online Program Schedules
via the Mobile App or by visiting these links:

CSE25 *https://meetings.siam.org/program.cfm?CONFCODE=CSE25*
IMR25 *https://internationalmeshingroundtable.com/imr33/program/*

The Mobile App and Online Program Schedules contain the most up-to-date information.
A searchable abstract document for CSE25 is also posted.

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https://internationalmeshingroundtable.com/imr33/

Monday, March 3

8:30 a.m. – 9:15 a.m.
IP1 Strong Stability Preserving Methods for Evolution of Hyperbolic Pdes
Sigal Gottlieb, University of Massachusetts, Dartmouth, U.S.
Ballroom AB, FWCC

9:45 a.m. – 11:25 am
MS8 Leveraging Co-Design on Emerging Supercomputers Part I of II
111, FWCC
MS10 Contemporary Data Assimilation: Methods, Models, and Applications Part I of II
113, FWCC
MS11 Reduced Order Modeling for Parametric Flow Problems Part I of II
201A, FWCC
MS13 Recent Advances in Scientific Machine Learning and Digital Twins Part I of II
201C, FWCC
MS22 Advancing Scientific Software Stewardship through CASS Working Groups
110B, FWCC

11:40 a.m. – 12:55 p.m.
PD1 Fair and Responsible AI
Ballroom AB, FWCC

1:00 p.m. – 2:00 p.m.
IMR25 Plenary 1: Neural Approaches to Computing Cross Fields for Quad Mesh Generation
Wenping Wang, Texas A&M University, U.S.
104, FWCC

1:10 p.m. – 1:40 p.m.
SP1 SIAG/CSE Best Paper Prize Lecture: Tensor-Tensor Algebra for Optimal Representation and Compression of Multiway Data
Elizabeth Newman, Emory University, U.S.
Ballroom AB, FWCC

1:40 p.m. – 2:10 p.m.
SP2 SIAG/CSE Early Career Prize Lecture: Solving High-Dimensional Partial Differential Equations using Deep Learning: Original Insights and Recent Progress
Jiequn Han, Flatiron Institute, U.S.
Ballroom AB, FWCC

2:25 p.m. – 4:05 p.m.
MS39 Leveraging Co-Design on Emerging Supercomputers Part II of II
111, FWCC
MS43 Learning to Learn: New Trends in Scientific Machine Learning Part I of II
Sundance 4, Omni
MS46 Recent Advances in Scientific Machine Learning and Digital Twins Part II of II
201C, FWCC

Monday, March 3

MS48 Uncertainty Quantification in Scientific Machine Learning Part I of II
Fort Worth Ballroom 8, Omni
MS49 Generative AI for Extreme Events in Physical Systems: Methods & Applications Part I of II
202C, FWCC
MS50 Machine Learning Algorithms for Material Models Part I of II
202D, FWCC

2:45 p.m. – 4:05 p.m.
IMR25 Panel Discussion 1: Meshing and AI
104, FWCC

4:35 p.m. – 5:05 p.m.
SP3 Ivo & Renata Babuška Prize Lecture
Omar Ghattas, University of Texas at Austin, U.S.
Ballroom AB, FWCC

5:05 p.m. – 5:35 p.m.
SP4 James H. Wilkinson Prize in Numerical Analysis and Scientific Computing: Mixed Precision Numerical Linear Algebra
Erin C. Carson, Charles University, Czech Republic
Ballroom AB, FWCC

5:35 p.m. – 6:05 p.m.
SP5 SIAM/ACM Prize in Computational Science & Engineering: deal.II Project
Daniel Arndt, Oak Ridge National Laboratory, U.S.
Ballroom AB, FWCC

Tuesday, March 4

8:30 a.m. – 9:15 a.m.
IP2 To the Exascale and Beyond: Computing Challenges in Hpc
Kate Clark, NVIDIA, U.S.
Ballroom AB, FWCC

9:45 a.m. – 11:25 a.m.
MT3 Understanding Generative AI: the Core Concepts
109, FWCC
MS67 Assessing and Quantifying Model Reliability Through Model-form Uncertainty Quantification Part I of II
111, FWCC
MS69 Mathematics of Digital Twins Part I of II
113, FWCC
MS76 Uncertainty Quantification in Scientific Machine Learning Part II of II
Fort Worth Ballroom 8, Omni
MS77 Generative AI for Extreme Events in Physical Systems: Methods & Applications Part II of II
202C, FWCC

Tuesday, March 4

MS78 Machine Learning Algorithms for Material Models Part II of II
202D, FWCC

11:40 a.m. – 12:55 p.m.
PD2 Forward Looking
Ballroom AB, FWCC

1:10 p.m. – 1:55 p.m.
IP3 Virtual Lungs in Respiratory Medicine: Multiscale Pulmonary Models and Clinical Applications
Daniel Hurtado, Pontificia Universidad Católica de Chile, Chile
Ballroom AB, FWCC

1:10 p.m. – 2:10 p.m.
IMR25 Plenary 2: Control Nets and Meshes for Geometry and Engineering Analysis
Jorg Peters, University of Florida, U.S.
104, FWCC

2:10 p.m. – 3:50 p.m.
MT11 BE Tutorial: Hands On HPC Crash Course Part I
202A, FWCC
MS99 Emerging Machine-Learning Methods in Geoscience Applications Part I of II
Sundance 4, Omni
MS111 Next-Generation Techniques in Topological Data Analysis and PDE Post-Processing
Stockyards 1, Omni

4:20 p.m. – 6:00 p.m.
MS112 Introducing the Consortium for the Advancement of Scientific Software (CASS) Part II of II
102, FWCC
MS121 Emerging Machine-Learning Methods in Geoscience Applications Part II of II
Sundance 4, Omni
MS124 Trajectories in Scientific Machine Learning Part I of II
201C, FWCC
MS132 Computational Algorithms For Data Assimilation and Inverse Problems Part I of II
204A, FWCC

8:00 p.m. – 10:00 p.m.
PP1 Poster Presentations and Dessert Reception
Ballroom C, FWCC

Wednesday, March 5

8:15 a.m. – 9:15 a.m.
IMR25 Plenary 3: Field Based Computation for Vector 3D Printing
Charlie Wang, University of Manchester, United Kingdom
104, FWCC

8:30 a.m. – 9:15 a.m.
IP4 Physics-Based Model Reduction in the Age of Digital Twins
Karen Veroy-Grepl, Technische Universiteit Eindhoven, The Netherlands
Ballroom AB, FWCC

9:45 a.m. – 11:25 a.m.
MT14 BE Tutorial: Intro to GPU Programming
202A, FWCC
MS134 Digital Twins in Science and Engineering: Transformative Applications and Emerging Technologies Part I of II
102, FWCC
MS142 Machine Learning with Applications in Chemical and Materials Sciences Part II of II
110B, FWCC
MS146 Scientific Machine Learning for Stable Prediction of Dynamical Systems Part I of II
114, FWCC
MS150 Trajectories in Scientific Machine Learning Part II of II
201C, FWCC
MS151 Quantum Algorithms for Scientific Computing Part I of II
Fort Worth Ballroom 3, Omni
MS152 Nonlocal Models in Computational Science and Engineering Part I of II
Fort Worth Ballroom 8, Omni

11:40 a.m. – 12:55 p.m.
PD3 Entrepreneurship
Ballroom AB, FWCC

1:10 p.m. – 1:55 p.m.
IP5 What Happens to a Dream Deferred? Chasing Language-Based Parallel Programming for HPC and AI
Damian W. Rouson, Lawrence Berkeley National Laboratory, U.S.
Ballroom AB, FWCC

2:10 p.m. – 3:50 p.m.
PD6 Plenary Spotlight II
Sundance 6, Omni
MT6 Data-Driven Reduced Modeling in the Time and Frequency Domains: Fundamentals, Best Practices, and Implementation Part I of II
109, FWCC
MS160 Digital Twins in Science and Engineering: Transformative Applications and Emerging Technologies Part II of II
102, FWCC

Wednesday, March 5

MS167 Advances in Algorithms for Extreme Events in Science and Engineering Part I of II
110B, FWCC
MS172 Scientific Machine Learning at Scale Part I of II
201A, FWCC
MS175 Quantum Algorithms for Scientific Computing Part II of II
Fort Worth Ballroom 3, Omni
MS176 Nonlocal Models in Computational Science and Engineering Part II of II
Fort Worth Ballroom 8, Omni
MS219 Predictive Disease Modeling and Simulations for Decision-making Part II of II
Sundance 3, Omni

4:20 p.m. – 6:00 p.m.
MT7 Data-Driven Reduced Modeling in the Time and Frequency Domains: Fundamentals, Best Practices, and Implementation Part II of II
Fort Worth Ballroom 4, Omni
MS190 Advances in Algorithms for Extreme Events in Science and Engineering Part II of II
110B, FWCC
MS203 Machine Learning for Computational Solid Mechanics Part I of II
203C, FWCC

6:15 p.m. – 7:00 p.m.
SIAG/CSE Business Meeting
Complimentary beer and wine will be served
Sundance 3, Omni

Thursday, March 6

8:30 a.m. – 9:15 a.m.
IP6 Computational Modelling of Coupled Thermo-Poro-Elastic Deformation of Fractured Rocks in the Context of the Energy Transition
Adriana Paluszny, Imperial College London, United Kingdom
Ballroom AB, FWCC

9:45 a.m. – 11:25 a.m.
MT8 PETSc the Portable Extensible Toolkit for Scientific Computations
109, FWCC
MT15 BE Tutorial: Optimizing GPU performance
202A, FWCC
MS227 Generative Models for Scientific Applications Part II of II
203A, FWCC
MS229 Machine Learning for Computational Solid Mechanics Part II of II
203C, FWCC

Thursday, March 6

1:10 p.m. – 1:55 p.m.
IP7 Artificial Intelligence: Applications in Scientific and Domain-Rich Fields
Julia Ling, Google X, Mountain View, U.S.
Ballroom AB, FWCC

2:20 p.m. – 3:50 p.m.
MT4 Fast Direct Solvers for Elliptic PDEs Part I of II
112, FWCC
MT9 BE: Accessible High-Performance Computing Using the Julia Language
109, FWCC
MS244 Computational Methods in Environmental Fluid Mechanics Part II of II
201A, FWCC
MS247 Data-Driven Uncertainty Quantification Algorithms and Applications Part I of II
Fort Worth Ballroom 3, Omni

4:20 p.m. – 6:00 p.m.
MS259 Scientific Machine Learning for Biological Mechanics Models from Medical Data
106, FWCC
MS264 Advancements in Data Driven Seismic Imaging
113, FWCC
MS268 Sample-efficient Bayesian and Sequential Decision-making under Uncertainty for Complex Systems Part I of II
201B, FWCC
MS270 Data-Driven Uncertainty Quantification Algorithms and Applications Part II of II
Fort Worth Ballroom 3, Omni

Friday, March 7

8:30 a.m. – 9:15 a.m.
IP8 Randomized Linear Algebra in Scientific Computing
Daniel Kressner, École Polytechnique Fédérale de Lausanne, Switzerland
Ballroom AB, FWCC

9:30 a.m. – 11:00 a.m.
MS280 Uncertainty Quantification and Surrogate Models
Sundance 2, Omni
MS288 Energy Research and Forecasting (ERF): A New Performance-Portable Atmospheric Modeling Code
201B, FWCC
MS294 Sparse Matrix and Tensor Algorithms and Their Applications Part I of II
Fort Worth Ballroom 5, Omni

Friday, March 7

MS295 FASTMATH Advances in Simulation, Optimization, and Surrogate Modeling for Scientific Applications Part I of II
110A, FWCC

MS299 Generative Machine Learning Approaches for Science and Engineering Part I of II
Fort Worth Ballroom 8, Omni

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11:40 a.m. – 1:20 p.m.

MS305 Filling Scientific Domain Gaps with Quality Machine Learning Benchmarks
Sundance 1, Omni

MS309 FASTMATH Advances in Simulation, Optimization, and Surrogate Modeling for Scientific Applications Part II of II
110A, FWCC

MS314 Integrating Simulations and Statistical/Machine Learning for Evaluation of Quantities-of-Interest
201B, FWCC

Abbreviation Key
IP = Invited Plenary Speaker
MP = Miniposteria
MS = Minisymposium
MT = Minitutorial
PD = Panel Discussion
PP = Poster Session
SP = Special Lecture

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