

Sessions at the Joint Mathematics Meetings (JMM 2025)

January 8–11, 2025 • Seattle, Washington

SIAM Coordinating Committee for the Joint Mathematics Meetings

Ernesto Prudencio (Chair)
Sandia National Laboratories

Rebecca Morrison
University of Colorado Boulder

Suzanne Shontz
University of Kansas

SIAM Invited Address

Scientific Machine Learning for Accelerated Discovery and Innovation: A Program Manager's Perspective

Steven Lee, *Department of Energy – Office of Science*

Friday, January 10, 2025, 11:00 a.m. – 12:05 p.m.

Ballroom 6E, Seattle Convention Center

ABSTRACT

For the exciting field of Scientific Machine Learning (SciML), a Program Manager's perspective is offered regarding developments and progress originating from our Department of Energy SciML workshop and report in 2018. The transformative potential of SciML for accelerated discovery and innovation is highlighted. We will also move beyond its technical details to examine the broader landscape of research programs and initiatives in AI for science and technology. The presentation aims to provide a high-level overview for those seeking to understand the strategic importance and future directions of Scientific Machine Learning.



Steven Lee is a Department of Energy Program Manager in Advanced Scientific Computing Research (DOE/ASCR). His main areas of ASCR expertise and responsibilities are in co-leading the Applied Mathematics program and the Scientific Discovery through Advanced Computing (SciDAC) Institutes program. At the federal interagency level, he is a co-chair for the Artificial Intelligence R&D Working Group and a co-chair for the Digital Twins R&D Fast-Track Action Committee for developing a national strategic plan. Many of Steven's recent leadership activities in foundational and cross-cutting R&D stem from organizing the 2018 ASCR Basic Research Needs workshop and report on Scientific Machine Learning: Core Technologies for AI.

Special Events

SIAM Panel on Shedding Light on Opportunities for Applied Mathematicians in Industry and Government

Organizer: **Sharon Arroyo**, *The Boeing Company* • **Nessy Tania**, *Pfizer*

Thursday, January 9, 2025, 8:30 – 10:00 a.m. • Room 603, Seattle Convention Center

Curious about careers outside of academia? Come get an insider's view about BIG (Business, Industry, Government), exciting, impactful careers. This discussion will feature panelists who will share their experiences and insights working as applied mathematicians in a variety of BIG careers.

SIAM Reception on Industrial Math Modeling

Thursday, January 9, 2025, 7:00 – 9:00 p.m. • Redwood Room, Sheraton Grand Seattle

A big part of SIAM's mission is to build community around the application of mathematical modeling, analysis, and computation to real-world problems. Join us in celebrating the many ways that mathematical modeling has improved our lives, and learn more about SIAM's collaborative efforts to build a workforce dedicated to mathematical modeling in industry, including programs such as the MathWorks Math Modeling (M3) Challenge, Preparation for Industrial Careers in Mathematical Sciences (PIC Math) in collaboration with MAA, Graduate Student Mathematical Modeling Camp (GSMMC), Mathematical Problems in Industry (MPI) Workshop, Math Modeling Hub (in collaboration with COMAP and NCTM), and BIG Math Network.

SIAM Minisymposia and Joint Session details on reverse.

Society for Industrial and Applied Mathematics (SIAM) is a Level A Partner of the JMM. SIAM sponsors several events including an invited speaker, several minisymposia, and a reception. The program for this meeting will occur in Pacific Standard Time (PST).

SIAM Minisymposia

SIAM Minisymposium on Computational Advances in Solving the Electronic Structure Problem for Complex Materials

Organizers:

James Chelikowsky, *University of Texas*

Vikram Gavini, *University of Michigan*

Jin Qian, *Lawrence Berkeley Laboratory*

Wednesday, January 8, 2025, 8:00 a.m. – 12:00 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Modern Uncertainty Quantification in Theory and in Practice

Organizers:

Amy Braverman, *Jet Propulsion Laboratory (Caltech)*

Wednesday, January 8, 2025, 1:00 – 6:00 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Scientific Machine Learning: Recent Advances and Future Directions

Organizer:

Steven Lee, *Department of Energy -- Office of Science*

Panagiotis Stinis, *Pacific Northwest National Laboratory*

Session I: Thursday, January 9, 2025, 8:00 a.m. – 12:00 p.m.

Session II: Thursday, January 9, 2025, 1:00 – 5:00 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Mathematical Perspectives on Generative Modeling

Organizers:

Jimmie Adriaola, *Arizona State University*

Benjamin Zhang, *Brown University*

Session I: Friday, January 10, 2025, 8:00 – 11:00 a.m.

Session II: Friday, January 10, 2025, 1:00 – 3:00 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Reduced Order Models for Convection-Dominated Flows: Modeling, Analysis, and Simulation

Organizers:

Jorge Reyes, *Virginia Tech*

Ping-Hsuan Tsai, *Virginia Tech*

Traian Iliescu, *Virginia Tech*

Session I: Friday, January 10, 2025, 8:00 – 11:00 a.m.

Room 3A, Seattle Convention Center

Session II: Friday, January 10, 2025, 3:30 – 5:30 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Mathematical Foundations of Climate and Earth System Modeling

Organizers:

Irina Tezaur, *Sandia National Laboratories*

Chris Eldred, *Sandia National Laboratories*

Chris Vogl, *Lawrence Livermore National Laboratory*

Friday, January 10, 2025, 1:00 – 6:00 p.m.

Room 3A, Seattle Convention Center

SIAM Minisymposium on Navigating the Future of Higher Education: The Role of AI in Teaching, Research, and Extension

Organizers:

Alvaro Alfredo Ortiz Lugo, *University of Cincinnati*

Rafael Alberto Méndez-Romero, *Universidad del Rosario*

Saturday, January 11, 2025, 8:00 a.m. – 12:00 p.m.

Room 2B, Seattle Convention Center

SIAM Minisymposium on Geometric Mechanics Formulations and Structure- Preserving Discretizations for Models of Physical Systems

Organizers:

Chris Eldred, *Sandia National Laboratories*

Jonas Actor, *Sandia National Laboratories*

Anthony Gruber, *Sandia National Laboratories*

Brian Tran, *Los Alamos National Laboratories*

Saturday, January 11, 2025, 1:00 – 6:00 p.m.

Room 2B, Seattle Convention Center

Joint Sessions

AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs

Organizers:

Darren A. Narayan, *Rochester Institute of Technology*

Mark Daniel Ward, *Purdue University*

Patricia Cahn, *Smith College*

Khang Duc Tran, *California State University, Fresno*

Christopher O'Neil, *San Diego State University*

Session I: Thursday, January 9, 2025, 8:00 a.m. – 12:00 p.m.

Session II: Thursday, January 9, 2025, 1:00 – 5:00 p.m.

Session III: Saturday, January 11, 2025: 8:00 a.m. – 12:00 p.m.

Session IV: Saturday, January 11, 2025: 1:00 – 6:00 p.m.

Skagit 1, Seattle Convention Center

MAA-SIAM-AMS Hrabowski-Gates-Tapia-McBay Lecture

Speaker:

Victor H. Moll, *Tulane University*

Friday, January 10, 2025, 9:00 – 10:00 a.m. (followed by panel ending at 10:50 a.m.)

Ballroom 6E, Seattle Convention Center

AMS-ASA-SIAM Special Session on Mathematics of Deep Learning: A High-Dimensional Probability Perspective

Organizers:

Zhichao Wang, *University of California San Diego*

Denny Wu, *New York University*

Ioana Dumitriu, *University of California San Diego*

Tony Chiang, *Pacific Northwest National Lab*

Saturday, January 11, 2025, 8:00 a.m. – 12:00 p.m.

Yakima 2, Seattle Convention Center

JPBM Communications Award Lecture

Speaker:

Eugenia Cheng, *School of the Art Institute of Chicago*

Saturday, January 11, 2025, 10:50 – 11:55 a.m.

Ballroom 6E, Seattle Convention Center

MAA-AMS-SIAM Gerald and Judith Porter Public Lecture

Speaker:

Ravi D. Vakil, *Stanford University*

Saturday, January 11, 2025, 2:15 – 3:20 p.m.

Ballroom 6E, Seattle Convention Center



Society for Industrial and
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