At-A-Glance Schedule

Annual Meeting
July 11-15, 2022 • Pittsburgh, PA, U.S.

SIAM Conference on
Applied Mathematics Education
July 11-12, 2022 • Pittsburgh, PA, U.S.

SIAM Conference on the
Life Sciences
July 11-14, 2022 • Pittsburgh, PA, U.S.

SIAM Conference on
Mathematics of Planet Earth
July 13-15, 2022 • Pittsburgh, PA, U.S.

Unless otherwise noted, all events will take place at the David L. Lawrence Convention Center (DLCC)
1000 Fort Duquesne Boulevard, Pittsburgh, PA 15222 U.S.

Scan to access the Pathable virtual platform.
### Sunday, July 10

- **4:00 p.m. – 8:00 p.m.**
  - Badge Pick-Up and Information Desk
  - Ballroom Gallery - 3rd Floor

- **5:00 p.m. – 6:00 p.m.**
  - Student Days: Orientation
  - Room 306/307

- **6:00 p.m. – 8:00 p.m.**
  - Welcome Reception
  - South Terrace - 3rd Floor

### Monday, July 11

#### MS13 Trends and New Results in Deterministic Models of Biochemical Interaction Networks - Part I of III
- **304**

#### CP1 Topology, Combinatorics, and Applied Linear Algebra
- **319**

#### CP2 Stochastic Analysis and Rare Events
- **320**

#### CP3 Evolution of Fronts
- **321**

- **9:30 a.m. – 4:30 p.m.**
  - Exhibit Hall Open
  - Ballroom Gallery - 3rd Floor

- **10:30 a.m. – 10:45 a.m.**
  - Coffee Break
  - Ballroom Gallery - 3rd Floor

- **10:45 a.m. – 11:45 a.m.**
  - Opening Remarks
  - Spirit of Pittsburgh A - 3rd Floor

- **11:00 a.m. – 11:45 a.m.**
  - IP1 Probability, Sports, and Public Policy
  - Anette "Peko" Hosoi, Massachusetts Institute of Technology, U.S.
  - Spirit of Pittsburgh A - 3rd Floor

- **11:45 a.m. – 12:30 p.m.**
  - JP1 Joint Plenary with the SIAM Conference on Applied Mathematics Education (ED22)
  - Building Mathematical Communities of Students, Faculty, and the Public to Create Pathways from K-12 to Graduate Programs
  - Cristina Villalobos, University of Texas, Rio Grande Valley
  - Spirit of Pittsburgh A - 3rd Floor

- **12:30 PM - 2:00 PM**
  - MGB-SIAM EC Fellows Luncheon
  - (by invitation)
  - 323

- **12:30 p.m. – 2:00 p.m.**
  - Lunch Break
  - *attendees on their own*

- **2:00 p.m. – 2:45 p.m.**
  - IP2 Machine Learning Frameworks for Discovering Biophysical Signatures in 3D Shapes and Images
  - Lorin Crawford, Microsoft Research, U.S.
  - Spirit of Pittsburgh A - 3rd Floor

- **2:45 p.m. – 3:30 p.m.**
  - SP1 AWM-SIAM Sonia Kovalevsky Lecture: Two of my Favorite Problems
  - Anne Greenbaum, University of Washington, U.S.
  - Spirit of Pittsburgh A - 3rd Floor

### Monday, July 11

- **3:30 p.m. – 4:00 p.m.**
  - Coffee Break
  - Ballroom Gallery - 3rd Floor

- **4:00 p.m. – 6:00 p.m.**
  - Concurrent Sessions
  - MS14 Advances in Variational Methods and Applications to Materials and Machine Learning - Part II of V
  - 408

- **4:00 p.m. – 8:00 p.m.**
  - Student Days: Undergraduate Research Presentations - Part II of III
  - 317

- **5:00 p.m. – 6:00 p.m.**
  - Recent Advances in Peridynamics Materials
  - Lorin Crawford, Microsoft Research, U.S.
  - Spirit of Pittsburgh A - 3rd Floor

- **5:00 p.m. – 6:00 p.m.**
  - Recent Advances in Computational Mathematics of Transforming Structures and (Meta-)Materials - Part II of V
  - 316

- **6:00 p.m. – 8:00 p.m.**
  - Recent Advances in Peridynamics Materials Modeling and Analysis - Part II of III
  - 317

- **6:00 p.m. – 8:00 p.m.**
  - Journals Editors-in-Chief Meeting
  - Westin Hotel – Somerset West

- **6:15 p.m. – 7:15 p.m.**
  - Industry Panel
  - Spirit of Pittsburgh A - 3rd Floor
### Monday, July 11

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>7:15 a.m.</td>
<td>Graduate Student Reception and Industry Reception</td>
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<td>Allegheny Overlook - 3rd Floor</td>
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### Tuesday, July 12

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<tr>
<td>7:00 a.m.</td>
<td>Student Days: Student Chapter Meeting with SIAM Leadership (by invitation)</td>
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<td>301-303</td>
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<tr>
<td>8:00 a.m.</td>
<td>Badge Pick-Up and Information Desk</td>
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<td>Ballroom Gallery - 3rd Floor</td>
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<tr>
<td>8:30 a.m.</td>
<td>Concurrent Sessions</td>
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<tr>
<td></td>
<td>MS27 Advances in Variational Methods and Applications to Materials and Machine Learning - Part III of V</td>
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<td>408</td>
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<td></td>
<td>MS28 Data-Driven Models and Machine Learning Strategies for Complex Dynamical Systems - Part I of II</td>
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<td>MS29 Mathematics of Transforming Structures and (Meta-)Materials - Part III of V</td>
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<td></td>
<td>MS30 Nonlinear Viscous Flow: Numerical Methods and Applications - Part I of III</td>
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<td>MS31 NSF-SIAM Minisymposium on the NSF Program Designing Materials to Revolutionize and Engineer our Future - Part I of III</td>
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<td>MS32 Recent Advances in Machine Learning for Multiscale System - Part I of III</td>
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<td>MS33 Recent Advances in Peridynamics Materials Modeling and Analysis - Part III of III</td>
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<td>MS34 Recent Advances in Stochastic Portfolio Theory - Part I of II</td>
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<td>MS35 Signature Methods in Finance - Part II of II</td>
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<td>MS36 Student Days: Student Chapter Presentations - Part I of II</td>
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<td>310/311</td>
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<td>MS37 Student Days: Undergraduate Research Presentations - Part III of III</td>
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<td>MS38 Synthetic Methods for Financial Time Series - Part I of II</td>
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<td></td>
<td>MS39 Trends and New Results in Deterministic Models of Biochemical Interaction Networks - Part III of III</td>
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<tr>
<td>9:30 a.m.</td>
<td>MS40 Workshop Celebrating Diversity (WCD): Point Processes Techniques and Probabilistic Methods to Model Different COVID-19 Aspects</td>
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<td>CP7 Ginzburg Landau Theory</td>
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<td>CP8 Markov Chains and Processes</td>
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<tr>
<td>11:00 a.m.</td>
<td>MS41 Advances in Variational Methods and Applications to Materials and Machine Learning - Part IV of V</td>
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<tr>
<td>10:30 a.m.</td>
<td>MS42 Data-Driven Models and Machine Learning Strategies for Complex Dynamical Systems - Part II of II</td>
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<tr>
<td>11:45 a.m.</td>
<td>MS43 Low Rank Methods for Big Data - Part III of III</td>
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<tr>
<td>12:30 p.m.</td>
<td>MS44 Mathematics of Transforming Structures and (Meta-)Materials - Part IV of V</td>
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<tr>
<td>2:30 p.m.</td>
<td>MS45 Model Reduction and Stochastic Simulation of Multi-Scale Dynamic Problems - Part III of III</td>
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<tr>
<td>3:30 p.m.</td>
<td>MS46 Moment Closures and Computational Methods for Kinetic Models - Part II of II</td>
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<tr>
<td>4:00 p.m.</td>
<td>MS47 Numerical Methods for Nonequilibrium Systems - Part II of II</td>
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<tr>
<td>4:30 p.m.</td>
<td>MS48 Presentations by LGBTQ Mathematicians - Part II of II</td>
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<tr>
<td>6:30 p.m.</td>
<td>MS49 Recent Advances in Computational Geosciences - Part III of III</td>
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<tr>
<td>7:45 p.m.</td>
<td>MS50 Recent Advances in Machine Learning for Multiscale System - Part II of III</td>
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<tr>
<td>8:00 p.m.</td>
<td>MS51 Recent Advances in Stochastic Portfolio Theory - Part II of II</td>
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<tr>
<td>9:00 p.m.</td>
<td>MS52 Student Days: Student Chapter Presentations - Part II of II</td>
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<td>310/311</td>
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<tr>
<td>10:00 a.m.</td>
<td>MS53 Recent Advances in Immersed Boundary Simulations - Part II of II</td>
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<tr>
<td>11:00 a.m.</td>
<td>MS54 Recent Advances in Multi-Scale Dynamic Problems - Part III of III</td>
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<td>11:30 a.m.</td>
<td>MS55 Recent Advances in Stochastic Portfolio Theory - Part II of II</td>
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<tr>
<td>4:00 p.m.</td>
<td>MS56 Recent Advances in Variational Methods and Applications to Materials and Machine Learning - Part IV of V</td>
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<tr>
<td>6:30 p.m.</td>
<td>MS57 Recent Advances in Stochastic Portfolio Theory - Part II of III</td>
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<tr>
<td>7:00 p.m.</td>
<td>MS58 Recent Advances in Stochastic Portfolio Theory - Part II of III</td>
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<tr>
<td>7:30 p.m.</td>
<td>MS59 Recent Advances in Stochastic Portfolio Theory - Part II of III</td>
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<tr>
<td>8:00 p.m.</td>
<td>MS60 Recent Advances in Stochastic Portfolio Theory - Part II of III</td>
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<tr>
<td>9:00 p.m.</td>
<td>MS61 Recent Advances in Stochastic Portfolio Theory - Part II of III</td>
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### Wednesday, July 13

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<tr>
<td>8:00 a.m.</td>
<td>Badge Pick-Up and Information Desk</td>
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<td>Ballroom Gallery - 3rd Floor</td>
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**Schedule:**
- **Monday, July 11**
- **Tuesday, July 12**
- **Wednesday, July 13**
Wednesday, July 13

8:30 a.m. – 10:30 a.m.
Concurrent Sessions
MS53 Advances in Variational Methods and Applications to Materials and Machine Learning - Part V of V 
408
MS54 Fast Direct Solvers for the Solution of Integral and Differential Equations - Part I of III 
412
MS55 Machine Learning for Inverse Problems and Dynamical Systems - Part I of II 
304
MS56 Mathematics of Transforming Structures and (Meta-)Materials - Part V of V 
316
MS57 Nonlinear Viscous Flow: Numerical Methods and Applications - Part II of III 
409
MS58 NSF-SIAM Minisymposium on the NSF Program Designing Materials to Revolutionize and Engineer our Future - Part II of III 
305
MS59 Recent Advances in Machine Learning for Multiscale System - Part III of III 
321
MS60 Recent Advances in Numerical Algorithms for Systems Modeled by PDEs - Part I of IV 
410
MS61 Signatures, Kernels, and Applications - Part I of III 
317
MS62 Stochastic Control with Applications to Finance - Part I of III 
315
MS63 Student Days: Student Paper Prize Winner Presentations 
310/311
MS64 Synthetic Methods for Financial Time Series - Part II of II 
407
MS65 Tutorials for Students: Accessible Introductions to Active Research Areas 
318
MS66 Workshop Celebrating Diversity (WCD): Mathematical Modeling for Social Good 
411
CP12 Mathematical Biology 
319
CP13 Applications of Fluid Mechanics 
320
9:30 a.m. – 4:30 p.m.
Exhibit Hall Open 
Ballroom Gallery - 3rd Floor
10:30 a.m. – 11:00 a.m.
Coffee Break 
Ballroom Gallery - 3rd Floor
11:00 a.m. – 11:45 a.m.
IP5 AMS Invited Presentation 
Andrew Blumberg, University of Texas, U.S. 
Spirit of Pittsburgh A - 3rd Floor
11:45 a.m. – 12:30 p.m.
JP2 Joint Plenary Speaker with the SIAM Conference on the Life Sciences: Machine Learning and Sparse Modeling for Scientific Discovery, with Examples in Fluid Mechanics 
Steven Brunton, University of Washington, U.S. 
Spirit of Pittsburgh A - 3rd Floor
12:30 p.m. – 1:30 p.m.
Editorial Board Meeting - Classics Book Series 
Westin Hotel – Somerset West
12:30 p.m. – 2:00 p.m.
Workshop Celebrating Diversity (WCD): Luncheon (by invitation) 
301
12:30 p.m. – 2:00 p.m.
Lunch Break 
attended on their own
2:00 p.m. – 3:00 p.m.
SP3 Past President’s Address 
Lisa J. Fauci, Tulane University, U.S. 
Spirit of Pittsburgh A - 3rd Floor
3:00 p.m. – 3:30 p.m.
SP4 W. T. and Idalia Reid Prize Lecture: Control and Machine Learning 
Enrique Zuazua, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany 
Spirit of Pittsburgh A - 3rd Floor
3:30 p.m. – 4:00 p.m.
Coffee Break 
Ballroom Gallery - 3rd Floor
4:00 p.m. – 6:00 p.m.
Concurrent Sessions
MS67 Fast Direct Solvers for the Solution of Integral and Differential Equations - Part II of III 
412
MS68 Low-Rank Structured Data Analysis: Models and Algorithms 
310/311
MS69 Machine Learning for Inverse Problems and Dynamical Systems - Part II of II 
304
MS70 Mathematical Modelling and Simulation of Biological Field Effect Transistors 
408
MS71 Mathematics of FinTech 
316
MS72 Model Reduction for Chemically Reacting Flows: Challenges, Advances, and Benchmarks 
409

Wednesday, July 13

Thursday, July 14

8:00 a.m. – 4:30 p.m.
Badge Pick-Up and Information Desk 
Ballroom Gallery - 3rd Floor
8:30 a.m. – 10:30 a.m.
Concurrent Sessions
MS81 Geometric Variational Problems and their Applications - Part I of II 
305
MS82 Inclusive Teaching in Applied Mathematics 
408
### Thursday, July 14

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<th>Session</th>
<th>Title</th>
<th>Location</th>
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<tbody>
<tr>
<td>11:45 a.m. – 12:30 p.m.</td>
<td>JP3 Joint Plenary Speaker with the SIAM Conference on Mathematics of Planet Earth (MPE22)</td>
<td>Spirit of Pittsburgh A - 3rd Floor</td>
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<tr>
<td>12:30 p.m. – 2:00 p.m.</td>
<td>Lunch Break</td>
<td>attendees on their own</td>
</tr>
<tr>
<td>2:00 p.m. – 2:45 p.m.</td>
<td>IP7 Finite Dimensional Approximations of Hamilton-Jacobi-Bellman Equations in Spaces of Probability Measures and Stochastic Optimal Control of Particle Systems</td>
<td>Spirit of Pittsburgh A - 3rd Floor</td>
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<tr>
<td>2:45 p.m. – 3:00 p.m.</td>
<td>Intermission</td>
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<tr>
<td>3:00 p.m. – 3:30 p.m.</td>
<td>SP6 Julian Cole Lectureship: Strong Localized Perturbation theory for the Analysis of Localized Solutions to Some Nonlinear Diffusive Systems</td>
<td>Spirit of Pittsburgh A - 3rd Floor</td>
</tr>
<tr>
<td>3:30 p.m. – 4:00 p.m.</td>
<td>Coffee Break</td>
<td>Ballroom Gallery - 3rd Floor</td>
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<tr>
<td>4:00 p.m. – 6:00 p.m.</td>
<td>Concurrent Sessions</td>
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<td>Coffee Break</td>
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<tr>
<td>4:00 p.m. – 6:00 p.m.</td>
<td>Concurrent Sessions</td>
<td>Ballroom Gallery - 3rd Floor</td>
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### Friday, July 15

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<th>Session</th>
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<tbody>
<tr>
<td>8:00 a.m. – 3:30 p.m.</td>
<td>Badge Pick-Up and Information Desk</td>
<td>Ballroom Gallery - 3rd Floor</td>
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<tr>
<td>8:30 a.m. – 10:30 a.m.</td>
<td>Concurrent Sessions</td>
<td>Ballroom Gallery - 3rd Floor</td>
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### Additional Events

- **MS101** Recent Advances in Finite Element Methods for Coupled Systems - Part I of II
- **MS102** Recent Advances in Numerical Algorithms for Systems Modeled by PDEs - Part IV of IV
- **MS103** Scientific Machine Learning for Complex Inverse Problems - Part II of II
- **MS104** Stability and Modeling in Non-Newtonian Flows - Part I of III
- **MS105** Student Days: An Informal Meeting with the Co-chairs and Invited Speakers
- **CP17** Multiphysical and Multiscale Models
- **MS106** Women in the Mathematics of Materials: Recent Advances in Modeling and Numerical Methods - Part II of II
- **MS107** Advanced Numerical Methods for Partial Differential Equations - Part II of III
- **MS108** Computational Frameworks for Nonlinear Transport with Applications in Bioseparations - Part I of II
- **MS109** Graph and Matrix Ordering and Coarsening
- **MS110** Kernel-Based Approximation Methods - Part II of II
- **MS111** Liquid Crystals and Beyond: Physics, Biology, and Topology - Part II of III
- **MS112** Liquid Crystals, Elastomers and Beyond - In Memory of Mark Warner - Part I of II
### Friday, July 15

**MS113** Matrix Functions, Operator Functions, and Related Approximation Methods - Part II of III  
304

**MS114** Recent Advances in Eigenvalue Problems - Part I of II  
305

**MS115** Recent Advances in Finite Element Methods for Coupled Systems - Part II of III  
411

**MS116** Recent Developments in Mathematical Analysis and Numerics for Incompressible Flow and Related Problems - Part II of II  
310/311

**MS117** Recent Developments in Modeling and Computations of Kinetic Theory - Part I of II  
316

**MS118** Signatures, Kernels, and Applications - Part III of III  
317

**MS119** Stability and Modeling in Non-Newtonian Flows - Part II of III  
407

**MS120** Stochastic Modeling and Simulation Methods in Biology and Chemistry - Part I of II  
318

**CP18** Surface and Defect Dynamics  
319

**CP19** Surface and Defect Dynamics  
320

**9:00 a.m. – 11:00 a.m.**  
Human Resources Committee  
Westin Hotel - Cambria East

**10:30 a.m. – 11:00 a.m.**  
Coffee Break  
Ballroom Gallery - 3rd Floor

**11:00 a.m. – 11:45 a.m.**  
IP8 Optimization and Learning with Zeroth-Order Stochastic Oracles  
Stefan Wild, Argonne National Laboratory, U.S.  
Spirit of Pittsburgh A - 3rd Floor

**11:00 a.m. – 12:00 p.m.**  
Financial Management Committee Meeting - Part I  
Westin Hotel - Cambria West

**11:45 a.m. – 12:30 p.m.**  
IP9 How Mathematics Enables Science: A Theoretical Biologist’s Experience  
Wilfred Ndifon, African Institute for Mathematical Sciences, Rwanda  
Spirit of Pittsburgh A - 3rd Floor

**12:00 p.m. – 1:00 p.m.**  
Financial Management Committee Lunch  
Westin Hotel - Butler East

**12:30 p.m. – 1:45 p.m.**  
Lunch Break  
attendees on their own

**1:00 p.m. – 3:00 p.m.**  
Financial Management Committee Meeting - Part II  
Westin Hotel - Cambria West

**1:45 p.m. – 2:00 p.m.**  
Closing Remarks  
Spirit of Pittsburgh A – 3rd Floor

**2:00 p.m. – 2:45 p.m.**  
IP10 Invited Presentation  
Rebecca Willett, University of Chicago, U.S.  
Spirit of Pittsburgh A - 3rd Floor

**2:45 p.m. – 3:15 p.m.**  
Coffee Break  
Ballroom Gallery - 3rd Floor

**3:15 p.m. – 5:15 p.m.**  
Concurrent Sessions

**MS121** Advanced Numerical Methods for Partial Differential Equations - Part III of III  
408

**MS122** Advances on Computational Methods for Fractional Partial Differential Equations - Part II of II  
409

**MS123** Computational Frameworks for Nonlinear Transport with Applications in Bioseparations - Part II of II  
410

**MS124** Liquid Crystals and Beyond: Physics, Biology, and Topology - Part III of III  
315

**MS125** Liquid Crystals, Elastomers and Beyond - In Memory of Mark Warner - Part II of II  
321

**MS126** Matrix Functions, Operator Functions, and Related Approximation Methods - Part III of III  
304

**MS127** Mean-Field Games in Mathematical Finance  
412

**MS128** Recent Advances in Eigenvalue Problems - Part II of II  
305

**MS129** Recent Advances in Finite Element Methods for Coupled Systems - Part III of III  
411

**MS130** Recent Developments in Modeling and Computations of Kinetic Theory - Part II of II  
316

**MS131** Stability and Modeling in Non-Newtonian Flows - Part III of III  
407

**MS132** Stochastic Modeling and Simulation Methods in Biology and Chemistry - Part II of II  
318

**4:00 p.m. – 7:00 p.m.**  
Board of Trustees Executive Session  
Westin Hotel - Butler

### Saturday, July 16

**9:00 a.m. – 4:00 p.m.**  
Board of Trustees Regular Session  
Westin Hotel – Butler

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### Key to abbreviations and symbols

- **CP** = Contributed Presentation Session
- **IP/JP** = Invited/Joint Plenary Speaker
- **MS** = Minisymposium
- **PP/MP** = Poster Session
- **SP** = Special Lecture

---

This conference is in hybrid format.

Times listed are Eastern Time (UTC-4).  
All technical sessions and the Business Meetings will be accessible to both In-Person and Virtual registrants. Other events are for In-Person registrants.

Unless otherwise noted,  
MS presentations are 25 minutes plus an additional 5 minutes for discussion.  
CP presentations are 15 minutes plus an additional 5 minutes for discussion.

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**Key to abbreviations and symbols**

- **=** Business Meeting
- **=** Coffee Break
- **=** Refreshments Served
- **=** Desserts Served
- **=** Poster Session
- **=** Contributed Presentation Session
- **=** Invited/Joint Plenary Speaker
- **=** Minisymposium
- **=** Poster Session
- **=** Special Lecture
Visit the Exhibits

David L. Lawrence Convention Center
Third Floor—Ballroom Level

Exhibit Hours

Monday, July 11 9:30 a.m. to 4:30 p.m.
Tuesday, July 12 9:30 a.m. to 4:30 p.m.
Wednesday, July 13 9:30 a.m. to 4:30 p.m.
Thursday, July 14 9:30 a.m. to 4:30 p.m.

Booth Exhibitors

American Mathematical Society (AMS) ......................... Booth #1
Association for Women in Mathematics (AWM) ................. Booth #7
DE GRUYTER ................................................................. Booth #6
SIAM ................................................................. Booth #9, 10, 11, 12
Springer ................................................................. Booth #8

Exhibitor list is current as of June 9, 2022.
Coffee breaks will be served in the exhibit hall.
### Sunday, July 10

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>4:00 p.m.</td>
<td>Badge Pick-Up and Information Desk</td>
<td>Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>Welcome Reception</td>
<td>South Terrace - 3rd Floor</td>
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### Monday, July 11

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<thead>
<tr>
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<tbody>
<tr>
<td>2:00 p.m.</td>
<td>IP2 Research on Learning and Teaching University Mathematics: Where We Are and Where We Might Go Next</td>
<td>Spirit of Pittsburgh A – 3rd Floor</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>2022 SIAM Annual Meeting (AN22): AWM-SIAM Sonia Kovalevsky Lecture - Anne Greenbaum, University of Washington, U.S.</td>
<td>Spirit of Pittsburgh A – 3rd Floor</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Coffee Break</td>
<td>Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>Intermission</td>
<td>Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>7:15 p.m.</td>
<td>2022 SIAM Annual Meeting (AN22): Industry Panel</td>
<td>Spirit of Pittsburgh A – 3rd Floor</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Lunch Break</td>
<td>Spirit of Pittsburgh A – 3rd Floor</td>
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### Tuesday, July 12

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:00 p.m.</td>
<td>Badge Pick-Up and Information Desk</td>
<td>Ballroom Gallery - 3rd Floor</td>
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</table>

### Concurrent Sessions

**MT1** Introduction to COMAP’s Certificate in Modeling (CiM) Program for Educators – Part I of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS1** Extracurricular Training in Industrial Mathematics
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS2** NSF RTG Programs in Applied Mathematics and Data Science - Part I of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS3** Panel: STEM Up NY Noyce: Program Values and Why Focus on Rural/Urban Juxtaposition?
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS4** Mathematical Modeling Initiatives: An International Perspective
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**CP1** Student-Engaged Teaching and Learning
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS5** Building Mathematical Communities from K-12 to Academia
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS6** Panel: QuantCrit: Thinking Critically about Quantification Methods for Teaching and Social Research
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS7** Panel: NSF RTG Programs in Applied Mathematics and Data Science - Part II of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS8** Project-Based Mathematical Modeling, Research, and Teacher Education - Part I of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS9** History of Science and Mathematics in Applied Maths Courses
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS10** Advancing Racial Equity in Applied Mathematics - Part I of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**IP3** Education, Data, and Social Justice
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS11** Teaching on the Interface of Quantitative Sciences and the Life Sciences
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS12** Innovative Approaches to Undergraduate Research Mentorship - Part I of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS13** Project-Based Mathematical Modeling, Research, and Teacher Education - Part II of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**IP4** Closing Remarks and Presentation: Toward a Culturally Relevant and Historically Responsive Data Science
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS14** Supporting Teaching and Learning Differential Equations Through Modeling
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**IP5** Research on Learning and Teaching University Mathematics: Where We Are and Where We Might Go Next
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

**MS15** Advancing Racial Equity in Applied Mathematics - Part II of II
- **Time:** 4:00 p.m. – 6:00 p.m.
- **Location:** Ballroom Gallery - 3rd Floor

### Other Events

- **Badge Pick-Up and Information Desk:**
  - **Time:** 4:00 p.m. – 8:00 p.m.
  - **Location:** Ballroom Gallery - 3rd Floor

- **Welcome Reception:**
  - **Time:** 6:00 p.m. – 8:00 p.m.
  - **Location:** South Terrace - 3rd Floor

- **Coffee Breaks:**
  - **Time:** Multiple sessions throughout the day
  - **Location:** Ballroom Gallery - 3rd Floor

- **Lunch Breaks:**
  - **Time:** 12:30 p.m. – 2:00 p.m.
  - **Location:** Attendees on their own

- **Prizes and Awards Luncheon:**
  - **Time:** 12:30 p.m. – 2:30 p.m.
  - **Location:** Ballroom Gallery - 3rd Floor

- **Coffee Breaks:**
  - **Time:** Multiple sessions throughout the day
  - **Location:** Ballroom Gallery - 3rd Floor
Tuesday, July 12

**MS16** Innovative Approaches to Undergraduate Research Mentorship - Part II of II  
404

**MS17** Project-Based Learning  
403

**MS18** Modes of Reasoning About Proof in College Classrooms  
402

**CP2** Data and Computing Pedagogy  
406

6:00 p.m. – 6:15 p.m.  
Intermission

6:15 p.m. – 7:15 p.m.  
2022 SIAM Annual Meeting (AN22): SIAM Business Meeting  
Spirit of Pittsburgh A – 3rd Floor  
Complimentary beer and wine will be served

7:15 p.m. – 7:45 p.m.  
2022 SIAM Annual Meeting (AN22): Fellows Reception  
South Terrace - 3rd Floor

8:00 p.m. – 10:00 p.m.  
Poster Session & Dessert Reception  
(AN22 and LS22 posters will be presented)  
West Atrium - 3rd Floor

**Hold the Dates!**

August 20–25, 2023  
10th International Congress on Industrial and Applied Mathematics (ICIAM 2023)  
Tokyo, Japan

July 19–23, 2024  
2024 SIAM Annual Meeting (AN24)  
Spokane, Washington, U.S.

**This conference is in hybrid format**

Times listed are Eastern Time (UTC-4). All technical sessions and the Business Meetings will be accessible to both In-Person and Virtual registrants. Other events are for In-Person registrants. Unless otherwise noted, MS presentations are 25 minutes plus an additional 5 minutes for discussion. CP presentations are 15 minutes plus an additional 5 minutes for discussion.

**Key to abbreviations and symbols**

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- **MS** = Minisymposium  
- **PP/MP** = Poster Session  
- **SP** = Special Lecture
A great way to get involved!
Collaborate and interact with mathematicians and applied scientists whose work involves discrete mathematics.

Benefits of SIAG/ED membership:
• Membership in SIAG/ED’s SIAM Engage online community
• Additional $15 discount on registration for the SIAM Conference on Applied Mathematics Education (excludes student)
• Electronic communications about recent developments in your specialty
• Eligibility for candidacy for SIAG/ED office
• Participation in the selection of SIAG/ED officers

2021–22 SIAG/ED Officers
Chair: Emek Kose, Frederick National Laboratory for Cancer Research, U.S.
Vice Chair: Haley Yople, Carthage College, U.S.
Program Director: Mario Banuelos, California State University, Fresno, U.S.
Secretary: Shelley B. Rohde Poole, Metropolitan State University of Denver, U.S.

Benefits of SIAG/LS membership:
• Free electronic subscription to SIAM Journal on Applied Dynamical Systems
• Membership in SIAG/LS’s SIAM Engage online community
• Additional $15 discount on registration at the SIAM Conference on Life Sciences (excludes student)
• Electronic communications about recent developments in your specialty
• Eligibility for candidacy for SIAG/LS office
• Participation in the selection of SIAG/LS officers

2021–22 SIAG/LS Officers
Chair: Krešimir Josić, University of Houston, U.S.
Vice Chair: Dean Bottino, Takeda Pharmaceuticals, U.S.
Program Director: Nick Cogan, Florida State University, U.S.
Secretary: Alexandra Jilkine, University of Notre Dame, U.S.

Benefits of SIAG/MPE membership:
• Membership in SIAG/MPE’s SIAM Engage online community
• Additional $15 discount on registration for the SIAM Conference on Mathematics of Planet Earth (excludes student)
• Electronic communications about recent developments in your specialty
• Eligibility for candidacy for SIAG/MPE office
• Participation in the selection of SIAG/MPE officers

2021–22 SIAG/MPE Officers
Chair: Katherine Evans, Oak Ridge National Laboratory, U.S.
Vice-chair: Carrie Manore, Los Alamos National Laboratory, U.S.
Secretary: Olga Vasilieva, Universidad del Valle, Colombia
Program Director: Jessica Matthews, National Oceanic and Atmospheric Administration, U.S.
Students:
Participate in your profession by getting involved with SIAM!

- Free and discounted memberships, conference registrations, and publications
- Free membership in two specialized activity groups—networks of professionals within applied math and computational science that organize conferences and newsletters, award prizes, and often post job and fellowship opportunities in the SIAM Engage Online Community
- Student travel awards to SIAM conferences
- Student chapters — get involved or start one at your school
- Publish in *SIAM Undergraduate Research Online* (SIURO) — share research and experience the journal review process
- Free resources about career options in applied math and computational science at siam.org/careers
- Career advice in *SIAM News*
- Prizes to award excellence
- Participate in Gene Golub SIAM Summer School (G2S3)

“SIAM is important because professional organizations are vital in bringing up students and early career scientists. Making connections and providing a coherent and consistent community that meets throughout the year is an invaluable thing. Publishing is important too, so SIAM journals are an excellent venue for in-depth work.”
— Jed Brown, SIAM Member, University of Colorado

Take advantage of SIAM programs, resources, and opportunities for involvement! Learn more: siam.org/students
<table>
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<tr>
<td><strong>Monday, July 11</strong></td>
<td>10:45 a.m. – 11:45 a.m.</td>
<td>MS16 Molecular Biosciences: Modeling and Simulation of Ion Channel Transport - Part II of II 333</td>
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<tr>
<td></td>
<td>IP1 Opening Remarks and Presentation: Multi-scale Modeling can Unravel Mysteries about the Immune Response and Treatment in Tuberculosis</td>
<td>MS17 Biological and Bioinspired Fluids and Structures - Part II of III 335</td>
</tr>
<tr>
<td></td>
<td>Denise E. Kirschner, University of Michigan, Medical School, U.S.</td>
<td>MS18 Development and Calibration of Multiscale Models for Complex Biological Systems - Part I of II 336</td>
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<td><em>Spirit of Pittsburgh B - 3rd Floor</em></td>
<td>CP3 Fluid Dynamics and PDEs II 334</td>
</tr>
<tr>
<td></td>
<td>11:45 a.m. – 12:30 p.m.</td>
<td>CP4 Epidemiology 327</td>
</tr>
<tr>
<td></td>
<td>SIAM Conference on Applied Mathematics Education (ED22) and SIAM Annual Meeting (AN22) Joint Plenary Speaker</td>
<td><strong>Tuesday, July 12</strong></td>
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<td>Cristina Villalobos, University of Texas, Rio Grande Valley</td>
<td><strong>Tuesday, July 12</strong></td>
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<tr>
<td>4:00 p.m. – 8:00 p.m.</td>
<td>12:30 p.m. – 2:00 p.m.</td>
<td>8:00 a.m. – 4:30 p.m.</td>
</tr>
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<td>Badge Pick-Up and Information Desk</td>
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<tr>
<td><em>Ballroom Gallery - 3rd Floor</em></td>
<td><em>attendees on their own</em></td>
<td><strong>MS19 Molecular Biosciences: Modeling for Sequence and Structure-Based Molecular Analysis</strong> - Part I of II 324</td>
</tr>
<tr>
<td>6:00 p.m. – 8:00 p.m.</td>
<td>2:00 p.m. – 2:45 p.m.</td>
<td><strong>MS20 Data-Driven Neural Modeling</strong> - Part II of II 325</td>
</tr>
<tr>
<td>Welcome Reception</td>
<td>IP2 Mathematical-based Microbiome Analytics for Clinical Translation</td>
<td><strong>MS21 Mathematical Models of Diabetes and Clinical Applications (On behalf of Arthur Sherman’s 70th Birthday)</strong> - Part I of II 326</td>
</tr>
<tr>
<td><em>South Terrace - 3rd Floor</em></td>
<td>Krasimira Tsaneva-Atanasova, University of Exeter, United Kingdom</td>
<td><strong>MS22 Mathematical Modeling of Embryonic Heart Physiology and Pathophysiology</strong> 327</td>
</tr>
<tr>
<td><strong>Monday, July 11</strong></td>
<td>2:45 p.m. – 3:30 p.m.</td>
<td><strong>MS23 Modeling Immune-Checkpoint Inhibition to Improve Immuno-Oncology</strong> - Part I of II 328</td>
</tr>
<tr>
<td></td>
<td>2022 SIAM Annual Meeting (AN22): AWM-SIAM Sonia Kovalevsky Lecture</td>
<td><strong>MS24 Dynamical Transitions in Nodes and Networks</strong> - Part I of II 329</td>
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<td>Anne Greenbaum, University of Washington, U.S.</td>
<td><strong>Concurrent Sessions</strong></td>
</tr>
<tr>
<td>7:15 a.m. – 11:45 a.m.</td>
<td>3:30 p.m. – 4:00 p.m.</td>
<td><strong>MS1</strong> Mathematical Biosciences: Advances in Molecular Property and Structure Predictions - Part I of II 324</td>
</tr>
<tr>
<td></td>
<td>Coffee Break</td>
<td><strong>MS2</strong> Neurodynamics: Investigations of Memory, Plasticity, Epilepsy, and Alzheimer’s 325</td>
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<tr>
<td><strong>Concurrent Sessions</strong></td>
<td><em>Ballroom Gallery - 3rd Floor</em></td>
<td><strong>MS3</strong> Advances in Inflammatory Modeling: Cell to Body Level Responses - Part I of II 326</td>
</tr>
<tr>
<td>MS1</td>
<td>4:00 p.m. – 6:00 p.m.</td>
<td><strong>MS4</strong> Mathematical Modeling of Intracellular Environment - Part I of II 329</td>
</tr>
<tr>
<td><strong>MS2</strong></td>
<td><strong>Concurrent Sessions</strong></td>
<td><strong>MS5</strong> Deterministic and Stochastic Models in Ecology and Epidemiology - Part I of II 330</td>
</tr>
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<td></td>
<td><strong>MT1 Koopman Operator Methods for Analysis &amp; Design of Synthetic and Natural Gene Networks</strong></td>
<td><strong>MS6</strong> Biological Oscillations: From Genes to Populations - Part I of II 331</td>
</tr>
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<td><strong>MS18 Development and Calibration of Multiscale Models for Complex Biological Systems</strong> - Part I of II 336</td>
<td><strong>MS7</strong> Molecular Biosciences: Modeling and Simulation of Ion Channel Transport - Part I of II 333</td>
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<td><strong>MS19 Molecular Biosciences: Modeling for Sequence and Structure-Based Molecular Analysis</strong> - Part I of II 324</td>
<td><strong>MS8</strong> Biological and Bioinspired Fluids and Structures - Part I of III 335</td>
</tr>
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<td><strong>MS20 Data-Driven Neural Modeling</strong> - Part II of II 325</td>
<td><strong>MS9</strong> Symmetry, Robustness and Entropy in Living Systems - Part I of II 336</td>
</tr>
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<td></td>
<td><strong>MS21 Mathematical Models of Diabetes and Clinical Applications (On behalf of Arthur Sherman’s 70th Birthday)</strong> - Part I of II 326</td>
<td><strong>CP1</strong> Medicine 328</td>
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<td><strong>MS22 Mathematical Modeling of Embryonic Heart Physiology and Pathophysiology</strong> 327</td>
<td><strong>CP2</strong> Fluid Dynamics and PDEs I 334</td>
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<td><strong>MS23 Modeling Immune-Checkpoint Inhibition to Improve Immuno-Oncology</strong> - Part I of II 328</td>
<td><strong>10:30 a.m. – 10:45 a.m.</strong></td>
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<td><strong>MS10 Molecular Biosciences: Advances in Molecular Property and Structure Predictions</strong> - Part II of II 324</td>
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<td><strong>MS14 Novel Approaches in Compartmental Models of Disease</strong> 330</td>
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<td><strong>CP3 Fluid Dynamics and PDEs II</strong> 334</td>
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<td><strong>CP4 Epidemiology</strong> 327</td>
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<td><strong>Concurrent Sessions</strong></td>
<td><strong>MS21 Mathematical Models of Diabetes and Clinical Applications (On behalf of Arthur Sherman’s 70th Birthday)</strong> - Part I of II 326</td>
<td><strong>MS21 Mathematical Models of Diabetes and Clinical Applications (On behalf of Arthur Sherman’s 70th Birthday)</strong> - Part I of II 326</td>
</tr>
<tr>
<td>MS1</td>
<td><strong>MS22 Mathematical Modeling of Embryonic Heart Physiology and Pathophysiology</strong> 327</td>
<td><strong>MS22 Mathematical Modeling of Embryonic Heart Physiology and Pathophysiology</strong> 327</td>
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<td><strong>MS23 Modeling Immune-Checkpoint Inhibition to Improve Immuno-Oncology</strong> - Part I of II 328</td>
<td><strong>MS23 Modeling Immune-Checkpoint Inhibition to Improve Immuno-Oncology</strong> - Part I of II 328</td>
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<td><strong>MS24 Dynamical Transitions in Nodes and Networks</strong> - Part I of II 329</td>
<td><strong>MS24 Dynamical Transitions in Nodes and Networks</strong> - Part I of II 329</td>
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### Tuesday, July 12

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<tr>
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<tbody>
<tr>
<td>10:30 a.m. – 11:00 a.m.</td>
<td>Coffee Break. Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>11:00 a.m. – 11:45 a.m.</td>
<td>IP3 Data-driven Mathematical Models for Malaria Response. Jennifer Flegg, University of Melbourne, Australia. <em>Spirit of Pittsburgh B - 3rd Floor</em></td>
</tr>
<tr>
<td>11:45 a.m. – 12:30 p.m.</td>
<td>IP4 Leader, Follower, and Intermediate: Modeling Collective Cancer Invasion. Yi Jiang, Georgia State University, U.S. <em>Spirit of Pittsburgh B - 3rd Floor</em></td>
</tr>
<tr>
<td>12:30 p.m. – 2:30 p.m.</td>
<td>Prizes and Awards Luncheon (ticketed event; separate fee applies). 301-303</td>
</tr>
<tr>
<td>2:30 p.m. – 3:30 p.m.</td>
<td>2022 SIAM Annual Meeting (AN22): John von Neumann Prize. Leah Edelstein-Keshet, University of British Columbia, Canada. <em>Spirit of Pittsburgh B - 3rd Floor</em></td>
</tr>
<tr>
<td>3:30 p.m. – 4:00 p.m.</td>
<td>Coffee Break. Ballroom Gallery - 3rd Floor</td>
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<tr>
<td>4:00 p.m. – 6:00 p.m.</td>
<td>Concurrent Sessions. MS30 Molecular Biosciences: Modeling for Sequence and Structure-Based Molecular Analysis - Part II of II. 324</td>
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### Tuesday, July 12

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<td>MS25 Deterministic and Stochastic Models in Ecology and Epidemiology - Part II of II. 330</td>
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<tr>
<td>MS26 Dynamics and Perturbations of Circadian Rhythms and Sleep Cycling - Part I of II. 331</td>
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<tr>
<td>MS28 Biological and Bioinspired Fluids and Structures - Part III of III. 335</td>
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<tr>
<td>MS29 Symmetry, Robustness and Entropy in Living Systems - Part II of II. 336</td>
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<td>CP5 Ecology, Evolution and Genetics I. 333</td>
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<td>MS31 Mathematical Models of Diabetes and Clinical Applications (On behalf of Arthur Sherman’s 70th Birthday) - Part II of II. 326</td>
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<td>MS34 Dynamical Transitions in Nodes and Networks - Part II of II. 329</td>
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<td>MS35 Advances in Epidemiology - Part I of III. 330</td>
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<tr>
<td>MS36 Dynamics and Perturbations of Circadian Rhythms and Sleep Cycling - Part II of II. 331</td>
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<tr>
<td>MS37 Mathematical Frameworks for Understanding Plant Behavior. 333</td>
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<tr>
<td>MS38 Modeling Blood Flow, Oxygen Transport, and Red Blood Cell Dynamics - Part II of III. 334</td>
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<tr>
<td>MS39 Cell Motility and Migration: Mathematical Modeling, Simulation, and Analysis - Part I of II. 335</td>
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<tr>
<td>MS40 Development and Calibration of Multiscale Models for Complex Biological Systems - Part II of II. 336</td>
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<tr>
<td>MS41 Combining Topological, Data-Driven, and Modeling Perspectives for Complex Biological Systems - Part I of II. 324</td>
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<tr>
<td>MS42 Mechanisms of Sensory Coding in Neuronal Networks. 325</td>
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<tr>
<td>MS43 Mathematically Modeling Endocrine, Neuroendocrine and Neuronal Systems - Part I of II. 326</td>
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<tr>
<td>MS44 Cardiac Modeling – From Single Cell Electrophysiology to Arrhythmia Formation - Part I of II. 328</td>
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<tr>
<td>MS45 Molecular Bioscience: Recent Advances of Membrane Modeling, Computation, and Application - Part I of II. 329</td>
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<tr>
<td>MS46 Advances in Epidemiology - Part II of III. 330</td>
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<tr>
<td>MS47 Stochastic Patterns in Biology. 331</td>
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<tr>
<td>MS49 Cell Motility and Migration: Mathematical Modeling, Simulation, and Analysis - Part II of II. 335</td>
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<tr>
<td>CP6 Neuroscience I. 325</td>
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<td>CP7 Life Sciences. 327</td>
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<tr>
<td>CP8 Ecology, Evolution and Genetics I. 333</td>
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<tr>
<td>CP9 Disease Modeling I. 336</td>
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<tr>
<td>8:00 a.m. – 4:30 p.m.</td>
<td>Badge Pick-Up and Information Desk. Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>8:30 a.m. – 10:30 a.m.</td>
<td>Concurrent Sessions. MS41 Combining Topological, Data-Driven, and Modeling Perspectives for Complex Biological Systems - Part I of II. 324</td>
</tr>
<tr>
<td>10:30 a.m. – 11:00 a.m.</td>
<td>Coffee Break. Ballroom Gallery - 3rd Floor</td>
</tr>
<tr>
<td>11:00 a.m. – 11:45 a.m.</td>
<td>IP5 The Noisy Homunculus. Brent Doiron, University of Chicago, U.S. <em>Spirit of Pittsburgh B - 3rd Floor</em></td>
</tr>
<tr>
<td>11:45 a.m. – 12:30 p.m.</td>
<td>JP1 Joint Plenary Speaker with the 2022 SIAM Annual Meeting (AN22): Machine Learning and Sparse Modeling for Scientific Discovery, with Examples in Fluid Mechanics. Steven Brunton, University of Washington, U.S. <em>Spirit of Pittsburgh A - 3rd Floor</em></td>
</tr>
<tr>
<td>12:30 p.m. – 2:00 p.m.</td>
<td>Lunch Break. Attendees on their own</td>
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</table>
Wednesday, July 13

2:00 p.m. – 3:00 p.m.
2022 SIAM Annual Meeting (AN22): Past President’s Address
Lisa Fauci, Tulane University, U.S.
Spirit of Pittsburgh A - 3rd Floor

3:00 p.m. – 3:30 p.m.
2022 SIAM Annual Meeting (AN22): W. T. and Idalia Reid Prize
Enrique Zuazua, University FAU of Erlangen-Nuremberg, Germany
Spirit of Pittsburgh A - 3rd Floor

3:30 p.m. – 4:00 p.m.
Coffee Break
Ballroom Gallery - 3rd Floor

4:00 p.m. – 6:00 p.m.
Concurrent Sessions

**MS50** Combining Topological, Data-Driven, and Modeling Perspectives for Complex Biological Systems - Part II of II
324

**MS51** Neural Firing Rates, Masses and Fields: Modeling Neural Network Dynamics
325

**MS52** Mathematically Modeling Endocrine, Neuroendocrine and Neuronal Systems - Part II of II
326

**MS53** Pathophysiological Modeling of Soft-Tissue Organs Deformation and Growth
327

**MS54** Cardiac Modeling – From Single Cell Electrophysiology to Arrhythmia Formation - Part II of II
328

**MS55** Molecular Bioscience: Recent Advances of Membrane Modeling, Computation, and Application - Part II of II
329

**MS56** Advances in Epidemiology - Part III of III
330

**MS57** Modeling Biological and Social Systems Using Evolutionary Game Theory - Part I of III
331

**MS58** Colorful Patterns and Complex Ecology due to the Plant Pigments Anthocyanins
333

**MS59** Molecular Biosciences: Multiscale Modeling of Complex Systems - Part I of III
334

**MS60** Mathematical Modeling of Blood Clotting and Applications - Part I of III
335

**MS61** CANCELLED - Mathematical Modeling and Numerical Methods for Complex Interface Problems in Life Science - Part II of III

6:00 p.m. – 6:15 p.m.
Intermission

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Wednesday, July 13

6:15 p.m. – 7:15 p.m.
2022 SIAM Annual Meeting (AN22): I. E. Block Community Lecture
Kristin Lauter, Facebook AI Research, U.S.
Spirit of Pittsburgh A - 3rd Floor

7:15 p.m. – 8:45 p.m.
2022 SIAM Annual Meeting (AN22): Community Reception
Rooftop

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Thursday, July 14

8:00 a.m. – 4:30 p.m.
Badge Pick-Up and Information Desk
Ballroom Gallery - 3rd Floor

8:30 a.m. – 10:30 a.m.
Concurrent Sessions

**MT2** Data-Driven Mathematical Modeling
324

**MS62** Quantitative Approaches for Studying Sickle Cell Disease - Part I of II
326

**MS63** Understanding Spatiotemporal Dynamics and Complex Systems in Multi-Scale Biological Processes - Part I of II
327

**MS64** Cardiac Modeling – Specialized Single Cell Models, from Subcellular Dynamics to Personalized Medicine - Part I of II
328

**MS65** Multiscale Oscillations in Biological Systems - Part I of II
329

**MS66** Mathematical Models in Epidemiology and Medicine - Part I of II
330

**MS67** Modeling Biological and Social Systems Using Evolutionary Game Theory - Part II of III
331

**MS68** Mathematical Modeling to Understanding Chemotactic Behavior of Flagellated Bacteria - Part I of II
333

**MS69** Molecular Biosciences: Multiscale Modeling of Complex Systems - Part II of III
334

**MS70** Mathematical Modeling of Blood Clotting and Applications - Part II of III
335

**MS71** Stochastic Models for Complex Decision Making
336

**CP10** Neuroscience II
325

10:30 a.m. – 11:00 a.m.
Coffee Break
Ballroom Gallery - 3rd Floor

11:00 a.m. – 11:45 a.m.
**IP6** Data Driven Uncertainty Quantification, Validation, and Credibility of Multiscale Models of Cardiac Electrophysiology
Richard Gray, U.S. Food and Drug Administration, U.S.
Spirit of Pittsburgh B - 3rd Floor

11:45 a.m. – 12:15 p.m.
**SP1** Activity Group on the Life Sciences Early Career Prize Lecture - Model Order Reduction of Limit Cycle Oscillators Far Beyond the Weakly Perturbed Limit
Dan Wilson, University of Tennessee, Knoxville, U.S.
Spirit of Pittsburgh B - 3rd Floor

12:15 p.m. – 2:00 p.m.
Lunch Break
attendees on their own

2:00 p.m. – 2:50 p.m.
**IP7** Closing Remarks and Invited Presentation
Iain D. Couzin, Max Planck Institute of Animal Behavior and University of Konstanz, Germany
Spirit of Pittsburgh B - 3rd Floor

3:00 p.m. – 3:30 p.m.
2022 SIAM Annual Meeting (AN22): Julian Cole Lectureship
Michael Jeffrey Ward, University of British Columbia, Canada
Spirit of Pittsburgh B - 3rd Floor

3:30 p.m. – 4:00 p.m.
Coffee Break
Ballroom Gallery - 3rd Floor

4:00 p.m. – 6:00 p.m.
Concurrent Sessions

**MS72** Quantitative Approaches for Studying Sickle Cell Disease - Part II of II
326

**MS73** Understanding Spatiotemporal Dynamics and Complex Systems in Multi-Scale Biological Processes - Part II of II
327

**MS74** Cardiac Modeling – Specialized Single Cell Models, from Subcellular Dynamics to Personalized Medicine - Part II of II
328

**MS75** Multiscale Oscillations in Biological Systems - Part II of II
329
Thursday, July 14

**MS76** Mathematical Models in Epidemiology and Medicine - Part II of II
330

**MS77** Modeling Biological and Social Systems Using Evolutionary Game Theory - Part III of III
331

**MS78** Mathematical Modeling to Understanding Chemotactic Behavior of Flagellated Bacteria - Part II of II
333

**MS79** Molecular Biosciences: Multiscale Modeling of Complex Systems - Part III of III
334

**MS80** Mathematical Modeling of Blood Clotting and Applications - Part III of III
335

**MS81** CANCELLED - Mathematical Modeling and Numerical Methods for Complex Interface Problems in Life Science - Part III of III

**CP11** Data Driven Modeling
324

**CP12** Disease Modeling II
325

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**This conference is in hybrid format**

Times listed are Eastern Time (UTC-4).
All technical sessions and the Business Meetings will be accessible to both In-Person and Virtual registrants. Other events are for In-Person registrants.

Unless otherwise noted, MS presentations are 25 minutes plus an additional 5 minutes for discussion.
CP presentations are 15 minutes plus an additional 5 minutes for discussion.

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**Key to abbreviations and symbols**

- **B** = Business Meeting
- **C** = Coffee Break
- **R** = Refreshments Served
- **D** = Desserts Served
- **P** = Poster Session
- **CP** = Contributed Presentation Session
- **IP/JP** = Invited/Joint Plenary Speaker
- **MS** = Minisymposium
- **PP/MP** = Poster Session
- **SP** = Special Lecture
CALL FOR SIAM Prize NOMINATIONS

2023 Prizes

AWM-SIAM Sonia Kovalevsky Lecture
George Pólya Prize for Mathematical Exposition
Germund Dahlquist Prize
James H. Wilkinson Prize for Numerical Software
John von Neumann Prize
Peter Henrici Prize
Ralph E. Kleinman Prize
SIAM/ACM Prize in Computational Science and Engineering
SIAM Student Paper Prizes
W.T. and Idalia Reid Prize

Why Nominate Someone?

- Recognize and reward outstanding accomplishments
- Bring honor and prestige to your department or place of work
- Demonstrate the importance of your field to students, research funders, and the scientific community at large

SUBMIT A NOMINATION TODAY
go.siam.org/prizes-nominate

Open dates and deadlines may vary, visit siam.org/deadline-calendar for details.
Tuesday, July 12

8:00 a.m. – 4:30 p.m.
Badge Pick-Up and Information Desk
Ballroom Gallery - 3rd Floor

6:15 p.m. – 7:15 p.m.
2022 SIAM Annual Meeting (AN22):
SIAM Business Meeting
Spirit of Pittsburgh A - 3rd Floor
Complimentary beer and wine will be served

7:15 p.m. – 8:15 p.m.
SIAG/MPE Welcome Reception
406 Foyer

4:30 p.m. – 6:00 p.m.
Poster Session & Dessert Reception (AN22 and LS22 posters will be presented)
West Atrium - 3rd Floor

Wednesday, July 13

8:00 a.m. – 12:30 p.m.
IP2 Climate Modeling in the Age of Machine Learning
Laure Zanna, Courant Institute of Mathematical Sciences, New York University, U.S.

3:00 p.m. – 3:30 p.m.
2022 SIAM Annual Meeting (AN22): W. T. and Idalia Reid Prize
Enrique Zuazua, University FAU of Erlangen-Nuremberg, Germany
Spirit of Pittsburgh A - 3rd Floor

3:30 p.m. – 4:00 p.m.
Coffee Break
Ballroom Gallery - 3rd Floor

3:00 p.m. – 6:00 p.m.
Concurrent Sessions
MS4 Applications of Machine Learning Methods to Geophysical Fluid Dynamics and Climate
406
MS5 Temperature and Climatic Impacts on Disease Dynamics, Transmission and Spread
405
MS6 Tipping Phenomena: Nonlinear Theory and Climate Applications - Part I of III
404
MS7 TIES (The International Environmetrics Society) and SIAM-MPE: Connecting to Solve Multidisciplinary Environmental Problems
403
MS8 New Advances in Developing Subgrid-Scale Closures and Reducing Model Errors - Part I of III
402
CP2 Seismic Patterns
401

6:00 p.m. – 6:15 p.m.
Intermission

6:15 p.m. – 7:15 p.m.
2022 SIAM Annual Meeting (AN22): I. E. Block Community Lecture
Kristin Lauter, Facebook AI Research, U.S.
Spirit of Pittsburgh A - 3rd Floor

Thursday, July 14

8:00 a.m. – 4:30 p.m.
Badge Pick-Up and Information Desk
Ballroom Gallery - 3rd Floor

8:00 a.m. – 10:30 a.m.
Concurrent Sessions
MS9 Sea Ice Modeling and Data Assimilation - Part I of II
406
MS10 Statistical Models and Learning Methods in Wildfire Science - Part I of II
405
MS11 Tipping Cascades in Natural Systems: Theory and Applications - Part II of II
404
MS12 The Road to Equitably Mitigate Harmful Impacts of Traffic-Related Pollution*
403
MS13 Deterministic and Stochastic Thermal Ocean/Atmosphere Modeling - Part I of II
402
CP3 Data Science
401

10:30 a.m. – 11:00 a.m.
Coffee Break
Ballroom Gallery - 3rd Floor

11:00 a.m. – 11:45 a.m.
JP3 Viability Theory for Computing Tradeoffs in Sustainability Issues
Pedro Gajardo, Universidad Tecnica Federico Santa Maria, Chile
406

11:45 a.m. – 12:30 p.m.
JP1 Joint Plenary Speaker with the 2022 SIAM Annual Meeting (AN22): How Machine Learning Can Improve Projections of Future Climate
Emily Shuckburgh, University of Cambridge, United Kingdom
Spirit of Pittsburgh A - 3rd Floor

12:30 p.m. – 2:00 p.m.
Lunch Break
attendees on their own
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<td>2:00 p.m. – 2:45 p.m.</td>
<td><strong>MS21</strong> Mathematical and Computational Perspectives in Marine Biogeochemistry and the Ocean’s Carbon Cycle - Part I of II 403</td>
<td><strong>MS27</strong> New Advances in Developing Subgrid-Scale Closures and Reducing Model Errors - Part III of III 402</td>
</tr>
<tr>
<td><strong>IP4</strong> Data Driven Stochastic Models of Geophysical Flows Terence O’Kane, CSIRO, Australia 406</td>
<td><strong>MS22</strong> Deterministic and Stochastic Thermal Ocean/Atmosphere Modeling - Part II of II 402</td>
<td><strong>CP6</strong> Ecology 401</td>
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<tr>
<td>3:00 p.m. – 3:30 p.m.</td>
<td><strong>CP5</strong> Dynamical Systems 401</td>
<td><em>Extended Session</em></td>
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<tr>
<td>2022 SIAM Annual Meeting (AN22): Julian Cole Lectureship Michael Jeffrey Ward, University of British Columbia, Canada Spirit of Pittsburgh A - 3rd Floor</td>
<td>10:30 a.m. – 11:00 a.m.</td>
<td>Coffee Break Ballroom Gallery - 3rd Floor</td>
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<tr>
<td>3:30 p.m. – 4:00 p.m.</td>
<td><strong>SP1</strong> Closing Remarks and SIAM Activity Group on Mathematics of Planet Earth Prize Lecture: Mathematics for the Climate Crisis Valerio Lucarini, University of Reading, United Kingdom 406</td>
<td>11:00 a.m. – 11:50 a.m.</td>
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<tr>
<td>Coffee Break Ballroom Gallery - 3rd Floor</td>
<td>12:00 p.m. – 12:30 p.m.</td>
<td><strong>SIAG/MPE Business Meeting</strong> 406</td>
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<td>4:00 p.m. – 6:00 p.m.</td>
<td><strong>MS21</strong> Mathematical and Computational Perspectives in Marine Biogeochemistry and the Ocean’s Carbon Cycle - Part I of II 403</td>
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<td><strong>CP6</strong> Ecology 401</td>
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<tr>
<td><strong>MT2</strong> Statistical Methods for Analyzing Climate Extremes 403</td>
<td><strong>MS25</strong> Tipping Phenomena: Nonlinear Theory and Climate Applications - Part III of III 404</td>
<td><em>Extended Session</em></td>
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<tr>
<td><strong>MS14</strong> Dynamics and Computation in Atmospheric Modeling - Part I of II 406</td>
<td><strong>MS24</strong> Geometric Structure-Preserving Numerical Methods for Geophysical Fluid Dynamics - Part II of II 405</td>
<td><strong>CP6</strong> Ecology 401</td>
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<td><strong>MS15</strong> Geometric Structure-Preserving Numerical Methods for Geophysical Fluid Dynamics - Part I of II 405</td>
<td><strong>MS26</strong> Mathematical and Computational Perspectives in Marine Biogeochemistry and the Ocean’s Carbon Cycle - Part II of II 403</td>
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<tr>
<td><strong>MS16</strong> Tipping Phenomena: Nonlinear Theory and Climate Applications - Part II of III 404</td>
<td><strong>MS27</strong> New Advances in Developing Subgrid-Scale Closures and Reducing Model Errors - Part III of III 402</td>
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<tr>
<td><strong>MS17</strong> New Advances in Developing Subgrid-Scale Closures and Reducing Model Errors - Part II of III 402</td>
<td><strong>CP6</strong> Ecology 401</td>
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<tr>
<td><strong>CP4</strong> Environmental Resource Management 401</td>
<td><em>Extended Session</em></td>
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**Key to abbreviations and symbols**

- **IP/JP** = Invited/Joint Plenary Speaker
- **MS** = Minisymposium
- **PP/MP** = Poster Session
- **SP** = Special Lecture

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CP presentations are 15 minutes plus an additional 5 minutes for discussion.
Data science is a fast moving and rapidly expanding research area, and SIAM is dedicated to providing ways to get involved. Here’s how:

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This SIAM book series covers the mathematical, computational, and scientific aspects of data science, and publishes high-impact research monographs, in-depth essays on emerging trends, tutorials with a broad reach, state-of-the-art surveys, scholarly research retrospectives, and textbooks. The series is seeking proposals for new books — contact SIAM’s acquisitions department to discuss your ideas. Visit bookstore.siam.org to submit a proposal.

Learn more about data science and how you can get involved: [siam.org/Research-Areas/Data-Science](siam.org/Research-Areas/Data-Science)