At-a-Glance Schedule

siam 2024

Conference on Mathematical Aspects of Materials Science

May 19–23, 2024

Sheraton Pittsburgh Hotel at Station Square
Pittsburgh, Pennsylvania, U.S.

Online Program and Mobile App

Attendees are encouraged to visit
https://www.siam.org/conferences/cm/program/program-and-abstracts/ms24-program-abstracts
to view the Online Program Schedule.

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

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Saturday, May 18

4:00 p.m. – 6:00 p.m.
Registration
Grand Station Ballroom 3 Foyer

Sunday, May 19

7:00 a.m. – 5:30 p.m.
Registration
Grand Station Ballroom 3 Foyer

7:45 a.m. – 8:00 a.m.
Opening Remarks
Grand Station Ballroom 1-2

8:00 a.m. – 8:45 a.m.
IP1 Thin Film Fluid Dynamics Problems with Applications in Materials Science
Linda Cummings, New Jersey Institute of Technology, U.S.
Grand Station Ballroom 1-2

8:45 a.m. – 9:15 a.m.
Coffee Break
Grand Station Ballroom 3-5

9:15 a.m. – 11:15 a.m.
Concurrent Sessions
MS1 Advances in Mathematical and Numerical Techniques for Electronic Structure Calculations - Part I of III
Grand Station Ballroom 1-2
MS2 Mechanics and Physics of Growth in Soft and Hard Materials - Part I of III
Haselton 1 & 2
MS3 Emergent Properties in Metamaterials and Extreme Wave-phenomena: Analysis, Design, Modeling - Part I of III
Woodlawn 1
MS4 Defects in Complex Materials: Interplay between Theory and Computation - Part I of III
Pointsview
MS5 Transforming Materials and Structures - Part I of IV
Ellwood 1
MS6 Machine-learning-enabled Materials' Design - Part I of III
Edenburg
MS7 Theoretical and Applied Aspects of Nonlocal Models - Part I of III
Stoops Ferry
MS8 Advances in Probabilistic Methods for Uncertainty Quantification of Complex Systems - Part I of III
Brighton 1
MS9 Advances in Variational Methods and Applications to Materials - Part I of III
Brighton 2
MS10 Optimal Transport: Theory and Applications
Brighton 3
MS11 Interaction of Solid Mechanics and Mathematics: Modelling, Analysis and Applications - Part I of II
Brighton 4

11:15 a.m. – 12:45 p.m.
Lunch Break

12:45 p.m. – 1:30 p.m.
PD1 Funding Opportunities in the Division of Mathematical Sciences
Grand Station Ballroom 1-2

1:30 p.m. – 1:45 p.m.
Intermission

1:45 p.m. – 3:45 p.m.
Concurrent Sessions
MS12 Advances in Mathematical and Numerical Techniques for Electronic Structure Calculations - Part II of III
Grand Station Ballroom 1-2
MS13 Mechanics and Physics of Growth in Soft and Hard Materials - Part II of III
Haselton 1 & 2
MS14 Emergent Properties in Metamaterials and Extreme Wave-phenomena: Analysis, Design, Modeling - Part II of III
Woodlawn 1
MS15 Defects in Complex Materials: Interplay between Theory and Computation - Part II of III
Pointsview
MS16 Transforming Materials and Structures - Part II of IV
Ellwood 1
MS17 Machine-learning-enabled Materials' Design - Part II of III
Edenburg
MS18 Theoretical and Applied Aspects of Nonlocal Models - Part II of III
Stoops Ferry
MS19 Advances in Probabilistic Methods for Uncertainty Quantification of Complex Systems - Part II of III
Brighton 1
MS20 Advances in Variational Methods and Applications to Materials - Part II of III
Brighton 2
CP1 Wave Mechanics
Brighton 3
CP2 Microstructural Mechanics
Brighton 4

3:45 p.m. – 4:15 p.m.
Coffee Break
Grand Station Ballroom 3-5

4:15 p.m. – 6:15 p.m.
Concurrent Sessions
MS21 Advances in Mathematical and Numerical Techniques for Electronic Structure Calculations - Part III of III
Grand Station Ballroom 1-2
MS22 Mechanics and Physics of Growth in Soft and Hard Materials - Part III of III
Haselton 1 & 2
MS23 Emergent Properties in Metamaterials and Extreme Wave-phenomena: Analysis, Design, Modeling - Part III of III
Woodlawn 1
MS24 Defects in Complex Materials: Interplay between Theory and Computation - Part III of III
Pointsview
MS25 Transforming Materials and Structures - Part III of IV
Ellwood 1
MS26 Machine-learning-enabled Materials' Design - Part III of III
Edenburg
MS27 Theoretical and Applied Aspects of Nonlocal Models - Part III of III
Stoops Ferry
MS28 Advances in Probabilistic Methods for Uncertainty Quantification of Complex Systems - Part III of III
Brighton 1
MS29 Advances in Variational Methods and Applications to Materials - Part III of III
Brighton 2
MS30 CANCELLED-Multiphase and Multiscale Systems in Materials Science: Analysis and Simulation
Brighton 3
MS31 Interaction of Solid Mechanics and Mathematics: Modelling, Analysis and Applications - Part II of II
Brighton 4

6:15 p.m. – 6:30 p.m.
Intermission

6:30 p.m. – 8:30 p.m.
PP1 Reception and Poster Session
Reflections

Monday, May 20

Monday, May 20 Monday, May 20

7:00 a.m. – 6:15 p.m.
Registration
Grand Station Ballroom 3 Foyer

8:00 a.m. – 8:45 a.m.
IP2 Liquid Crystal Polymeric Networks: Modeling, Approximation, and Computation
Ricardo Nochetto, University of Maryland, College Park, U.S.
Grand Station Ballroom 1-2

8:45 a.m. – 9:30 a.m.
IP3 Characterizations of Symmetric Polyconvexity and Applications in Geometrically Linear Theory of Elasticity
Anja Schlomerkemper, Universität Würzburg, Germany
Grand Station Ballroom 1-2

9:30 a.m. – 10:00 a.m.
Coffee Break
Grand Station Ballroom 3-5

10:00 a.m. – 12:00 p.m.
Concurrent Sessions
MS32 Nonequilibrium Quantum Dynamics and Applications - Part I of IV
Haselton 1 & 2
MS33 Transforming Materials and Structures - Part IV of IV
Ellwood 1
MS34 Accelerating Analysis and Design of Complex Materials via Novel Numerical Methods and Machine Learning Techniques - Part I of II
Brighton 4
MS35 Computational and Analytical Advances in Nonlocal Modeling - Part I of II
Brighton 3
MS36 Material Design Supported by the NSF DMREF Program - Part I of II
Grand Station Ballroom 1-2
MS37 Mathematical and Computational Aspects of Multiscale Materials Structures: Advances and New Trends - Part I of III
Brighton 2
MS38 Analysis and Modeling of Gradient Flows with Multiscale Effects - Part I of III
Edenburg
MS39 The Statistical Nature of Metallic Material Deformation Leading to Damage Events - Part I of III
Stoops Ferry
MS40 Analysis, Homogenization, and Spectral Problems in Materials Science - Part I of V
Brighton 1
MS41 Programmable Assembly: Inverse Design of Materials from Discrete Components - Part I of V
Pointsview
MS42 Emerging Trends in Multiscale Modeling, Analysis and Simulation of Problems in Materials Science - Part I of IV
Woodlawn 1

12:00 p.m. – 1:30 p.m.
Lunch Break

1:30 p.m. – 2:15 p.m.
IP4 Defects at Grain Boundaries: at the Frontiers of Variational Analysis for Material Defects
Adriana Garroni, Universita di Roma "La Sapienza," Italy
Grand Station Ballroom 1-2

2:30 p.m. – 4:30 p.m.
Concurrent Sessions
MS43 Nonequilibrium Quantum Dynamics and Applications - Part II of IV
Haselton 1 & 2
MS44 Mechanical Metamaterials: Recent Advances in Modeling, Computation, and Experiment - Part I of IV
Ellwood 1
MS45 Accelerating Analysis and Design of Complex Materials via Novel Numerical Methods and Machine Learning Techniques - Part II of II
Brighton 4
MS46 Computational and Analytical Advances in Nonlocal Modeling - Part II of II
Brighton 3
MS47 Material Design Supported by the NSF DMREF Program - Part II of II
Grand Station Ballroom 1-2
MS48 Mathematical and Computational Aspects of Multiscale Materials Structures: Advances and New Trends - Part II of III
Brighton 2
MS49 Analysis and Modeling of Gradient Flows with Multiscale Effects - Part II of III
Edenburg
MS50 The Statistical Nature of Metallic Material Deformation Leading to Damage Events - Part II of III
Stoops Ferry
CP3 Phase-Field Methods
Brighton 1
CP4 Mechanics of Functional Materials
Ellwood 1

4:30 p.m. – 5:00 p.m.
Coffee Break
Grand Station 3-5

5:00 p.m. – 7:00 p.m.
Concurrent Sessions
MS51 Nonequilibrium Quantum Dynamics and Applications - Part III of IV
Haselton 1 & 2
MS52 Mechanical Metamaterials: Recent Advances in Modeling, Computation, and Experiment - Part II of IV
Ellwood 1
MS53 Machine Learning's Role in Uncovering Insights from Heterogeneous Materials Data - Part I of II
Grand Station Ballroom 1-2
MS54 Mathematical and Computational Aspects of Multiscale Materials Structures: Advances and New Trends - Part III of III
Brighton 2
MS55 Analysis and Modeling of Gradient Flows with Multiscale Effects - Part III of III
Edenburg
MS56 The Statistical Nature of Metallic Material Deformation Leading to Damage Events - Part III of III
Stoops Ferry
MS57 Analysis, Homogenization, and Spectral Problems in Materials Science - Part II of V
Brighton 1
MS58 Programmable Assembly: Inverse Design of Materials from Discrete Components - Part II of V
Poinsview
MS59 Emerging Trends in Multiscale Modeling, Analysis and Simulation of Problems in Materials Science - Part II of IV
Woodlawn 1
MS60 Variational and Geometric Methods for Curvature and Elasticity - Part I of II
Brighton 4
MS61 Recent Advances and New Trends in Phase Field Modeling - Part I of III
Brighton 3

Tuesday, May 21

7:00 a.m. – 4:15 p.m.
Registration
Grand Station Ballroom 3 Foyer

8:00 a.m. – 8:45 a.m.
IP5 Integral Systems for Electron Kinetic Transport Mean Field Theory Problems Applied to Plasmas in Solid States and Soft Condensed Matter
Irene M. Gamba, University of Texas, U.S.
Grand Station Ballroom 1-2

8:45 a.m. – 9:30 a.m.
IP6 Quantum-accurate Large-Scale Atomistic Simulation of Materials with LAMMPS and FitSNAP*
Aidan Thompson, Sandia National Laboratories, U.S.
Grand Station Ballroom 1-2

Tuesday, May 21

9:45 a.m. – 10:15 a.m.
Coffee Break
Grand Station Ballroom 3-5

10:00 a.m. – 12:00 p.m.
Concurrent Sessions
MS62 Nonequilibrium Quantum Dynamics and Applications - Part IV of IV
Haselton 1 & 2
MS63 Mechanical Metamaterials: Recent Advances in Modeling, Computation, and Experiment - Part III of IV
Elwood 1
MS64 Machine Learning's Role in Uncovering Insights from Heterogeneous Materials Data - Part II of II
Grand Station Ballroom 1-2
MS65 Analysis, Homogenization, and Spectral Problems in Materials Science – Part III of V
Brighton 1
MS66 Programmable Assembly: Inverse Design of Materials from Discrete Components - Part III of V
Pointsview
MS67 Emerging Trends in Multiscale Modeling, Analysis and Simulation of Problems in Materials Science - Part III of IV
Woodlawn 1
MS68 Variational and Geometric Methods for Curvature and Elasticity - Part II of II
Brighton 4
MS69 Recent Advances and New Trends in Phase Field Modeling - Part II of III
Brighton 3
MS70 Topological Soft Matter - Part I of III
Woodlawn 1
MS71 Reduced Modeling and Computations in Mathematical Materials Science - Part I of III
Edenburg
MS72 Using Uncertainty Quantification to Improve Learning in Atomistic Modeling
Brighton 2

12:00 p.m. – 1:30 p.m.
Lunch Break

1:30 p.m. – 2:15 p.m.
IP7 Advances in Massively Parallel Electronic Structure Calculations Based on High-Order Finite Difference Approaches
Leeor Kronik, Weizmann Institute of Science, Israel
Grand Station Ballroom 1-2

2:45 p.m. – 3:15 p.m.
Coffee Break
Grand Station Ballroom 3-5

Tuesday, May 21

2:45 p.m. – 4:45 p.m.
Concurrent Sessions
MT1 Multi-Modal Data Driven and Physics-Informed Machine Learning with Uncertainty for Materials Applications
Woodlawn 1
MS73 Advances in Modeling and Simulations for 2D Quantum Materials - Part I of II
Brighton 4
MS74 Mechanical Metamaterials: Recent Advances in Modeling, Computation, and Experiment - Part IV of IV
Ellwood 1
MS75 Thin Structures: at the Intersection of Analysis, Numerics, and Physics - Part I of IV
Ellwood 1
MS76 Role of Numerics and Optimization in Materials Science - Part I of III
Edenburg
MS77 Analysis, Homogenization, and Spectral Problems in Materials Science - Part IV of V
Brighton 1
MS78 Programmable Assembly: Inverse Design of Materials from Discrete Components - Part IV of V
Pointsview
MS79 Emerging Trends in Multiscale Modeling, Analysis and Simulation of Problems in Materials Science - Part IV of IV
Woodlawn 1
MS80 Mechanics of Defects in Hard and Soft Materials - Part I of IV
Haselton 1 & 2
MS81 Recent Advances and New Trends in Phase Field Modeling - Part III of III
Brighton 3
CP5 Mechanics of Soft and Fluidic Systems
Brighton 2

Wednesday, May 22

7:00 a.m. – 4:15 p.m.
Registration
Grand Station Ballroom 3 Foyer

8:00 a.m. – 8:45 a.m.
IP8 Surrogate Modeling in Multiscale Computing
Jaroslaw Knap, U.S. Army Research Laboratory, U.S.
Grand Station Ballroom 1-2

8:45 a.m. – 9:30 a.m.
IP9 A New Class of Numerical Methods with Computational Intelligence for Materials Processing and Layered Additive Manufacturing
Arif Masud, University of Illinois Urbana-Champaign
Grand Station Ballroom 1-2

Wednesday, May 22

9:45 a.m. – 10:15 a.m.
Coffee Break
Grand Station 3-5

10:00 a.m. – 12:00 p.m.
Concurrent Sessions
MS82 Advances in Modeling and Simulations for 2D Quantum Materials - Part II of II
Brighton 2
MS83 Thin Structures: at the Intersection of Analysis, Numerics, and Physics - Part II of IV
Grand Station Ballroom 1-2
MS84 Role of Numerics and Optimization in Materials Science - Part II of III
Edenburg
MS85 Analysis, Homogenization, and Spectral Problems in Materials Science - Part V of V
Brighton 1
MS86 Programmable Assembly: Inverse Design of Materials from Discrete Components - Part V of V
Pointsview
MS87 Mechanics of Defects in Hard and Soft Materials - Part II of IV
Haselton 1 & 2
MS88 Topological Soft Matter - Part II of III
Woodlawn 1
MS89 Analytical and Computational Methods in Models of Soft Matter - Part I of III
Brighton 3
MS90 Reduced Modeling and Computations in Mathematical Materials Science - Part II of III
Ellwood 1
MS91 Computational Methods and Machine Learning Accelerated Algorithms for Phase-Field Modeling - Part I of II
Stoops Ferry
MS92 Computational Geometry and Graph Theory for Crystalline Materials - Part I of II
Brighton 4

12:15 p.m. – 2:00 p.m.
Lunch Break

1:30 p.m. – 2:15 p.m.
IP10 Boundary Defects in Liquid Crystals
Lia Bronsard, McMaster University, Canada
Grand Station Ballroom 1-2

2:45 p.m. – 3:15 p.m.
Coffee Break
Grand Station Ballroom 3-5

2:45 p.m. – 4:45 p.m.
Concurrent Sessions
MT2 Numerical and Mathematical Aspects of Nonlocal Models for Fracture
Brighton 1

Wednesday, May 22

MS93 Thin Structures: at the Intersection of Analysis, Numerics, and Physics - Part III of IV
Grand Station Ballroom 1-2
MS94 Role of Numerics and Optimization in Materials Science - Part III of III
Edenburg
MS95 Mechanics of Defects in Hard and Soft Materials - Part III of IV
Haselton 1 & 2
MS96 Topological Soft Matter - Part III of III
Woodlawn 1
MS97 Analytical and Computational Methods in Models of Soft Matter - Part II of III
Brighton 3
MS98 Reduced Modeling and Computations in Mathematical Materials Science - Part III of III
Ellwood 1
MS99 Computational Methods and Machine Learning Accelerated Algorithms for Phase-Field Modeling - Part II of II
Stoops Ferry
MS100 Light and Matter - Part I of II
Pointsview
MS101 Mathematical Modeling of Microstructural Materials - Part I of II
Brighton 2
CP6 Data Driven and Related Methods
Brighton 4

4:45 p.m. – 5:00 p.m.
Intermission

5:00 p.m. – 6:00 p.m.
SIAG/MS Business Meeting.
Complimentary beer and wine will be served.
Grand Station Ballroom 1-2

Thursday, May 23

7:30 a.m. – 1:30 p.m.
Registration
Grand Station Ballroom 3 Foyer

8:00 a.m. – 8:45 a.m.
IP11 Homogenization for Soft Composite Materials
Pedro Ponte Castaneda, University of Pennsylvania, U.S.
Grand Station Ballroom 1-2

8:45 a.m. – 9:30 a.m.
IP12 Title Not Available at Time of Publication
Glaucio Paulino, Princeton University, U.S.
Grand Station Ballroom 1-2

9:45 a.m. – 10:15 a.m.
Coffee Break
Grand Station Ballroom 3-5

10:00 a.m. – 12:00 p.m.
Concurrent Sessions
MS102 Thin Structures: at the Intersection of Analysis, Numerics, and Physics - Part IV of IV
Grand Station Ballroom 1-2
MS103 Mechanics of Defects in Hard and Soft Materials - Part IV of IV
Haselton 1 & 2
MS104 Analytical and Computational Methods in Models of Soft Matter - Part III of III
Brighton 3
MS105 Mathematical Modeling of Microstructural Materials - Part II of II
Brighton 2
MS106 Variational Methods in Material Science
Ellwood 1
MS107 Computational Geometry and Graph Theory for Crystalline Materials - Part II of II
Brighton 4
MS108 Light and Matter - Part II of II
Pointsview
CP7 Nanoscale Mechanics
Brighton 1
CP8 Other Topics
Woodlawn 1

12:00 p.m. – 1:30 p.m.
Lunch Break

1:30 p.m. – 1:45 p.m.
Closing Remarks
Grand Station Ballroom 1-2

1:45 p.m. – 2:30 p.m.
IP13 Intelligentsia of Nano-Architected Hierarchical Materials
Julia Greer, California Institute of Technology, U.S.
Grand Station Ballroom 1-2

ABBREVIATION KEY
CP = Contributed Presentation Session
IP = Invited Plenary Speaker
MS = Minisymposium
MT = Minitutorial
PD = Panel Discussion
PP = Poster Session

Thank you to our FUNDING AGENCY

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- Biennial conference
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— Jed Brown, SIAM Member, University of Colorado

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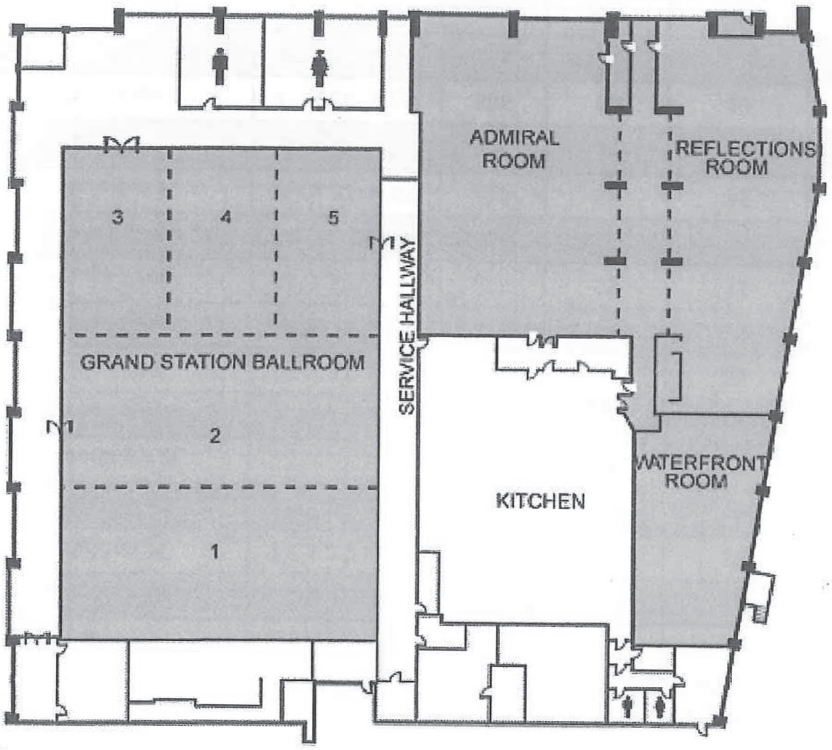
5/23

Sheraton Pittsburgh Hotel at Station Square Floor Plan



First Floor

Second Floor