2020 SIAM/CAIMS HAPPENING VIRTUALLY: 2nd Joint Annual Meeting (times listed are EDT)

Conference Program

Virtual Conference: Select sessions will occur virtually. Dates and times of these sessions will be posted as details become available. **Presentation times are Eastern Daylight Time (EDT).** Sessions accepted for presentation during the original conference dates but NOT occurring virtually will appear at the bottom of the program.

Monday, July 6	
8:00 AM - 5:00 AM	CP1 Contributed Presentation and Poster Hall (Available July 6 through July 17, 2020)
8:00 AM - 9:00 AM	Student Days: Student Orientation
9:00 AM - 11:00 AM Concurrent Sessions	MS1 Applied and Computational Discrete Algorithms - Part I of II
	MS2 Nonlocal PDEs: Qualitative Properties and Asymptotic Behaviour - Part I of II
	MS3 Portfolio and Transaction Optimization
10:00 AM - 11:00 AM	MS4 Projection-Based Model Order Reduction for Partial Differential Equations - Part I of II
11:00 AM - 11:15 AM	Opening Remarks
11:15 AM - 12:15 PM	SP1 I. E. Block Community Lecture: Mathematics Meets Origami Erik Demaine, *Massachusetts Institute of Technology, U.S.*
12:15 PM - 1:00 PM	IP1 Nonlinear Aggregation-Diffusion Equations: Gradient Flows, Free Energies and Phase Transitions José A. Carrillo, *University of Oxford, United Kingdom*
2:00 PM - 4:00 PM Concurrent Sessions	MS5 Applied and Computational Discrete Algorithms - Part II of II
	MS6 Nonlocal PDEs: Qualitative Properties and Asymptotic Behaviour - Part II of II
	MS7 Projection-Based Model Order Reduction for Partial Differential Equations - Part II of II
	MS8 Reinforcement Learning and Behavioral Modeling
	MS9 Tutorial on Emerging Research Areas: Accessible Introductions to Recent Innovations
4:00 PM - 5:00 PM	Student Days: Student Orientation
5:00 PM - 5:45 PM	IP2 Partial Differential Equations Meet Deep Learning: Old Solutions for New Problems and Vice Versa Lars Ruthotto, *Emory University, U.S.*
Tuesday, July 7	
9:00 AM - 11:00 AM	PD1 Live Industry Panel: Career Opportunities & Experiences in Industry & Business
11:00 AM - 2:00 PM	Career Fair
12:00 PM - 1:00 PM	CAIMS AGM
2:00 PM - 4:00 PM	PD2 Live Industry Panel: From Applied Mathematicians to Entrepreneurs
5:00 PM - 6:00 PM	MT1 Generalization Theory in Machine Learning
Wednesday, July 8	
9:00 AM - 11:00 AM Concurrent Sessions	MS10 Advances in Time-Stepping Methods - Part I of II

	MS11 Control Problems in Natural Resource Management	
	MS12 Delay Equations for Structured Dynamics: Theory, Numerics and Applications	
	MS13 Recent Advances in Numerical Methods for Wave Equations	
11:00 AM - 11:45 AM	JP1 Joint Speaker with the SIAM Conference on Imaging Science - Optimal Transport for Machine Learning Gabriel Peyré, *CNRS and École Normale Supérieure, Paris, France*	
12:00 PM - 12:45 PM	IP3 On Optimality Conditions for Nonsmooth Functions Andrea Walther, *Humboldt University Berlin, Germany*	
1:00 PM - 2:00 PM	Student Days: Student Chapter Mixer	
2:00 PM - 4:00 PM Concurrent Sessions	MS14 Advances in Time-Stepping Methods - Part II of II	
	MS15 AWM Workshop: Mathematics of Materials - Part I of II	
	MS16 Developments in Machine Learning: Foundations and Applications - Part I of III	
	MS17 Numerical Methods for Differential Equations with Discontinuities	
	MS18 The Intersection of Optimal Control and Machine Learning - Part I of III	
5:00 PM - 5:45 PM	IP4 2019 CAIMS Research Prize: Threshold Parameters in Ecology and Epidemiology Pauline van den Driessche, *University of Victoria, Canada*	

Thursday, July 9

9:00 AM - 11:00 AM Concurrent Sessions	MS20 Extending Vesicle and Membrane Models	
	MS21 Nonsmooth Dynamical Systems	
	MS22 The Intersection of Optimal Control and Machine Learning - Part II of III	
11:00 AM - 11:45 AM	SP2 Theodore von Kármán Prize Lecture: Mathematics, Mechanics and Materials: The Case Study of Liquid Crystal Elastomers Kaushik Bhattacharya, *California Institute of Technology, U.S.*	
12:00 PM - 12:45 PM	IP5 Gelation, Self-Similarity and Oscillations in Smoluchowski's Classical Coagulation Equation Barbara Niethammer, *University of Bonn, Germany*	
1:00 PM - 2:00 PM	NSERC Information Session	
2:00 PM - 4:00 PM Concurrent Sessions	MS23 AWM Workshop: Mathematics of Materials - Part II of II	
	MS24 Developments in Machine Learning: Foundations and Applications - Part II of III	
	MS26 From PDE Solutions to Multi-Particle Interaction Systems: Reduction, Dynamics, and New Phenomena - Part I of II	
	MS27 The Intersection of Optimal Control and Machine Learning - Part III of III	
5:00 PM - 5:45 PM	IP6 Structure and Scale Interactions in Wall Turbulence: A Modal Puzzle Beverley McKeon, *California Institute of Technology, U.S.*	

Friday, July 10

9:00 AM - 11:00 AM Concurrent Sessions	MS28 Control Theory for Complex and Hybrid Dynamical Systems - CANCELLED	
	MS29 Finance and Climate Change	
	MS30 Modelling the Development of Bacterial Populations	
	MS31 Nonlinear Approximation: Theory and Applications in Computational Mathematics - Part I of II	
	MS32 Numerical Computation of Special Functions	
9:00 AM - 11:30 AM	MS33 Vortex Dynamics, Vortex-Body Interactions, and Free Boundary Problems - Part I of I	

11:00 AM - 12:00 PM	**SP3 John von Neumann Prize Lecture: Rational Functions** L. N. Trefethen, *Oxford University, United Kingdom*
12:00 PM - 12:45 PM	**IP7 Modeling and Analysis of Wave Structure Interactions** David Lannes, *University of Bordeaux, France*
2:00 PM - 4:00 PM Concurrent Sessions	**MS34 AWM Workshop: Poster Presenters**
	MS35 Developments in Machine Learning: Foundations and Applications - Part III of III
	MS36 From PDE Solutions to Multi-Particle Interaction Systems: Reduction, Dynamics, and New Phenomena - Part II of II
	MS37 Nonlinear Approximation: Theory and Applications in Computational Mathematics - Part II of II

Monday, July 13

9:00 AM - 11:00 AM Concurrent Sessions	**MS38 Generalized Monge-Ampere Equations in Illumination Optics - Part I of II**
	MS39 Mathematical Modeling of Ocular Dynamics - Part I of II
	MS40 Mathematics for Biochemistry, Biochemistry for Mathematics - Part I of III
	MS41 Recent Advances in Numerical Methods for ODEs & PDEs - Part I of II
12:00 PM - 12:45 PM	**IP8 2020 CAIMS Cecil Graham Doctoral Dissertation Award: Multicomponent, Multiphase Thermodynamics with Interfacial Curvature** Nadia Shardt, *University of Alberta, Canada*
2:00 PM - 4:00 PM Concurrent Sessions	**MS42 Mathematical Modeling of Ocular Dynamics - Part II of II**
	MS43 Mathematics for Biochemistry, Biochemistry for Mathematics - Part II of III
	MS44 Recent Advances in Numerical Methods for ODEs & PDEs - Part II of II
5:00 PM - 5:45 PM	**IP9 Elements of An Effective Ecosystem of Math Libraries for Exascale** Ulrike Meier Yang, *Lawrence Livermore National Laboratory, U.S.*

Tuesday, July 14

9:00 AM - 11:00 AM Concurrent Sessions	**MS45 Advances in High-Performance Mathematical Software for Emerging Architectures - Part II of II**
	MS46 Developing Workforce in 21st Century Applied Mathematics - Part I of II
	MS47 Generalized Monge-Ampere Equations in Ilumination Optics - Part II of II
	MS48 Mathematics Applied to Biochemical Problems - Part III of III
9:00 AM - 12:00 PM	**MS49 Orthogonal Polynomials, Random Matrices and Asymptotic Methods**
12:00 PM - 12:45 PM	**IP10 Multi-Applications of Multi-Orthogonality** Andrei Martinez-Finkelshtein, *Baylor University, U.S. and University of Almeria, Spain*
2:00 PM - 4:00 PM Concurrent Sessions	**MS50 Advances in High-Performance Mathematical Software for Emerging Architectures - Part I of II**
	MS51 Multiscale Data Science Inspired by Biological and Physical Systems - Part I of II
	MS52 Recent Advances in Numerical Methods for PDEs with Applications - Part I of II
	MS53 Recent Advances in Scientific Computing

Wednesday, July 15

9:00 AM - 11:00 AM Concurrent Sessions	**MS54 Developing Workforce in 21st Century Applied Mathematics - Part II of II**

	MS55 Mesoscale Membrane Modeling - Part I of IV
	MS56 Optimal Control, Optimization and Games - CANCELLED
	MS57 Portfolio Selection
	MS58 Recent Advances in Numerical Methods for PDEs with Applications - Part II of II
9:00 AM - 11:30 AM	MS59 2020 NSF-SIAM Minisymposium on the NSF Program Designing Materials to Revolutionize and Engineer our Future - Part I of III
12:00 PM - 12:45 PM	IP11 Equilibrium Measures for Nonlocal Interaction Energies: The Role of Anisotropy Maria Giovanna Mora, *University of Pavia, Italy*
2:00 PM - 4:00 PM Concurrent Sessions	MS60 2020 NSF-SIAM Minisymposium on the NSF Program Designing Materials to Revolutionize and Engineer our Future - Part II of III
	MS61 Machine Learning and in Silico Drug Discovery
	MS62 Mesoscale Membrane Modeling - Part II of IV
	MS63 Multiscale Data Science Inspired by Biological and Physical Systems - Part II of II
	MS64 Ordered Structures in Variational Problems and PDEs and Their Applications - Part I of II
5:00 PM - 5:45 PM	IP12 2020 CAIMS-Fields Industrial Mathematics Award: Geometric Variational Methods: A Jackhammer and a Dental Tool for Your Problem-Solving Needs Vakhtang Putkaradze, *ATCO and University of Alberta, Canada*

Thursday, July 16

9:00 AM - 11:00 AM Concurrent Sessions	MS65 2020 NSF-SIAM Minisymposium on the NSF Program Designing Materials to Revolutionize and Engineer our Future - Part III of III
	MS66 Mesoscale Membrane Modeling - Part IV of IV
	MS67 Ordered Structures in Variational Problems and PDEs and Their Applications - Part II of II
	MS68 The Mathematics of Sparse Recovery and Machine Learning - Part I of II
12:00 PM - 12:45 PM	IP13 Solving Eigenvalue Problems in High Dimension Jianfeng Lu, *Duke University, U.S.*
1:00 PM - 2:00 PM	Workshop Celebrating Diversity (WCD) Luncheon
2:00 PM - 4:00 PM Concurrent Sessions	MS69 Data-Driven Methods and Models
	MS70 Mesoscale Membrane Modeling - Part III of IV
	MS71 Stochastic and Mean-Field Games
	MS72 The Mathematics of Sparse Recovery and Machine Learning - Part II of II
5:00 PM - 5:45 PM	IP14 Dynamics Without a Phase Space Arnd Scheel, *University of Minnesota, Minneapolis, U.S.*

Friday, July 17

9:00 AM - 11:00 AM Concurrent Sessions	MS Student Days: Undergraduate Research Presentations - Part I of II
	MS73 Agent-Based Modelling Approaches in Biological and Social Systems - Part I of II
	MS74 Asymptotic Methods in Portfolio Optimization
	MS75 Mathematics and Computation of Financial Technology
	MS76 Modeling and Analysis in Ecology and Social Dynamics - Part I of II
	MS77 Systems Modeling with Academic and Biopharma Industry Applications - Part I of II
12:00 PM - 12:45 PM	IP15 Accelerated Expansion in Biological Invasions Vincent Calvez, *Université Claude Bernard Lyon 1, France*

2:00 PM - 3:00 PM	MS Student Days: Undergraduate Research Presentations - Part II of II	
2:00 PM - 4:00 PM Concurrent Sessions	MS78 Agent-Based Modelling Approaches in Biological and Social Systems - Part II of II	
	MS79 Energy, Renewables and Environmental Finance	
	MS80 Modeling and Analysis in Ecology and Social Dynamics - Part II of II	
	MS81 Systems Modeling with Academic and Biopharma Industry Applications - Part II of II	
5:00 PM - 5:45 PM	IP16 Computational Challenges in Game Theoretic Models for Energy Production & Cryptocurrency Mining Ronnie Sircar, *Princeton University, U.S.*	
5:45 PM - 6:00 PM	Closing Remarks	
-	PP Accepted Contributed Posters	
-	MS Student Days: Student Chapter Presentations - Part I of II	
-	MS Student Days: Student Chapter Presentations - Part II of II	
-	MS Student Days: Student Paper Prize Winner Presentations	
-	MS Student Days: An Informal Meeting with the Invited Speakers	
-	MS Quantitative Methods in the Life Sciences	
-	MS Multi-Phenomena Phenomena - Part II of II	
-	MS Modelling with Fractional PDEs: Numerical Analysis and Applications - Part I of II	
-	MS Modelling with Fractional PDEs: Numerical Analysis and Applications - Part II of II	
-	MS Quantum Linear Algebra	
-	MS Preparing Faculty to Prepare Students for Tomorrow's Workforce	
-	MS Mathematical Modeling in Physiology and Medicine - Part I of II	
-	MS Mathematical Modeling in Physiology and Medicine - Part II of II	
-	MS Data-Driven Modelling for Assessment of Health and Drug Design	
-	MS Infectious Disease Modeling: From Within-Host to Between-Host - Part I of II	
-	MS Infectious Disease Modeling: From Within-Host to Between-Host - Part II of II	
-	MS Deep Learning in Finance	
-	MS Advances in Mathematical Ecology and Evolution - Part I of II	
-	MS Advances in Mathematical Ecology and Evolution - Part II of II	
-	MS Viscoelastic Fluid Mechanics: A Minisymposium in Honor of Renardy & Renardy - Part III of IV	
-	MS Viscoelastic Fluid Mechanics: A Minisymposium in Honor of Renardy & Renardy - - Part IV of IV	
-	MS Analysis and Simulations in Biofluid and Biomechanical Models	
-	MS A Deep Look at Neural Networks with Applications in Scientific Machine Learning - Part I of II	
-	MS A Deep Look at Neural Networks with Applications in Scientific Machine Learning - Part II of II	
-	MS Modeling Complex Systems and Multiscale Problems in Mathematical Biology - Part I of II	
-	MS Modeling Complex Systems and Multiscale Problems in Mathematical Biology - Part II of II	
-	MS Viscoelastic Fluid Mechanics: A Minisymposium in Honor of Renardy & Renardy - Part I of IV	

-	MS Viscoelastic Fluid Mechanics: A Minisymposium in Honor of Renardy & Renardy - Part II of IV	
-	MS Multi-Phenomena Phenomena - Part I of II	
-	MS Recent Advances in Numerical Methods for Multiscale Multiphysics Problems - Part I of II	
-	MS Recent Advances in Numerical Methods for Multiscale Multiphysics Problems - Part II of II	
-	MS Uncertainty Quantification for Geophysical Problems	
-	MS Fast Kernel Methods for Integral Equations - Part I of II	
-	MS Fast Kernel Methods for Integral Equations - Part II of II	
-	MS Vortex Dynamics, Vortex-Body Interactions, and Free Boundary Problems - Part II of II	
-	MS High Performance Numerical Linear Algebra - Part I of II	
-	MS High Performance Numerical Linear Algebra - Part II of II	
-	MS Integral Equation-Based Methods for the Simulation of Time-Dependent Systems - Part I of II	
-	MS Integral Equation-Based Methods for the Simulation of Time-Dependent Systems - Part II of II	
-	MS AWM Workshop Panel: Perspectives and Advice from Women in Applied Mathematics	
-	MS New Quantitative Approaches to Understanding Leukemia	
-	MS Orthogonal Polynomials, Integrable Systems and Combinatorics - Part I of II	
-	MS Orthogonal Polynomials, Integrable Systems and Combinatorics - Part II of II	
-	MS Nonlinear Elliptic & Parabolic PDEs in Materials Science: A Minisymposium in Honor of Professor Patricia Bauman - Part I of IV	
-	MS Nonlinear Elliptic & Parabolic PDEs in Materials Science: A Minisymposium in Honor of Professor Patricia Bauman - Part II of IV	
-	MS Nonlinear Elliptic & Parabolic PDEs in Materials Science: A Minisymposium in Honor of Professor Patricia Bauman - Part III of IV	
-	MS Nonlinear Elliptic & Parabolic PDEs in Materials Science: A Minisymposium in Honor of Professor Patricia Bauman - Part IV of IV	
-	MS Recent Development in Modelling and Analysis of Epidemics - Part I of II	
-	MS Recent Development in Modelling and Analysis of Epidemics - Part II of II	
-	MS Basic Hypergeometric Series and q-Orthogonal Polynomials	
-	MS Backward Stochastic Differential Equations and Investment	
-	MS Optimal Transport and Applications in Finance and Economics	
-	MS Recent Advances in the Control of Partial Differential Equations - Part I of II	
-	MS Recent Advances in the Control of Partial Differential Equations - Part II of II	
-	MS Mean Field Games in Mathematical Finance	
-	MS Interplay between Mathematical Biology and Linear Algebra - Part I of II	
-	MS Interplay between Mathematical Biology and Linear Algebra - Part II of II	
-	MS Time Consistency and Model Uncertainty in Finance	
-	MS Disease Transmission and Control under Biological, Environmental and	

	Data Complexities	
-	MS Mesh Free Methods for Multi Physics Simulations: Developments and Applications	
-	MS Orthogonal Polynomials and Random Matrices	
-	MS Symbolic Computation and Special Functions - Part I of II	
-	MS Symbolic Computation and Special Functions - Part II of II	
-	MS Theoretical and Computational Multiscale Rheology	
-	MS Mathematical Modelling Approaches in Industrial Applications	
-	MS AWM Workshop: Ignite	
-	MS Mathematical Advances in Batteries - Part I of II	
-	MS Mathematical Advances in Batteries - Part II of II	
-	MS Making Finite Elements Great Again: Theory, Implementation, and Enabling Technologies - Part I of II	
-	MS Making Finite Elements Great Again: Theory, Implementation, and Enabling Technologies - Part II of II	
-	MS Beyond Active Fluids - Part I of II	
-	MS Beyond Active Fluids - Part II of II	
-	MS Infectious Diseases Modeling at the Interface of Ecology and Epidemiology	
-	MS High Scale Eigenvalue Computation for Data Science - Part I of II	
-	MS High Scale Eigenvalue Computation for Data Science - Part II of II	
-	MS Recent Advances in Tracer Transport at Small Scales	
-	MS19 Emerging Approaches for Analysis and Control of Stochastic, High Dimensional Dynamical Systems - Part I of II - CANCELLED	
-	MS25 Emerging Approaches for Analysis and Control of Stochastic, High Dimensional Dynamical Systems - Part II of II - CANCELLED	
-	CP CSFD: Turbulence	
-	CP Accepted Contributed Lectures	
-	CP CSFD: Analytical and Computational Methods	
-	CP CSFD: Instabilities	
-	CP CSFD: Miscellaneous	
-	CP CSFD: Non-Newtonian Flows	
-	CP CSFD: Viscous Flows	
-	CP CSFD: Waves	

AN20 Home 2020	Program	Speaker Index	Hotel & Transportation	Registration