

Sessions at the Joint Mathematics Meetings

January 6–9, 2021 • Happening Virtually

SIAM Invited Address

SIAM Coordinating Committee for the Joint Mathematics Meetings

Ricardo Cortez (Chair)

Tulane University

Maria Emelianenko

George Mason University

Malgorzata Peszynska

Oregon State University



Thaleia Zariphopoulou

is the holder of the Presidential Chair of Mathematics and the V.F. Neuhaus Professorship of Finance at the University of Texas at Austin. Previously, she was the Laun Professor at the University of Wisconsin, Madison

and from 2009-2012, the first holder of the statutory Oxford-Man Chair in Quantitative Finance at the Mathematical Institute, University of Oxford.

She is an associate faculty member of the Oxford-Man Institute of Quantitative Finance and holds a Visiting Professorship at the Mathematical Institute, University of Oxford. She is also a visiting member of the FDT Research Center, IEOR Department, Columbia University.

Her area of expertise is Financial Mathematics, Quantitative Finance and Stochastic Optimization. She has published extensively in the areas of investments and valuation in incomplete markets, and introduced novel approaches to indifference valuation, risk measures and dynamic utilities.

She has served very actively the community of Financial Mathematics. She sits on the editorial board of eleven academic journals and research monograph series, and she is the Editor of the SIAM Series in Financial Mathematics. She has served in various prize committees and panels. She has also been the Vice-Chair (2007-2010) of the SIAC Activity Group in Financial Mathematics and Engineering, and has served as Vice-President (2004-2006) and President (2006-2008) of the Bachelier Finance Society.

In 2012, she was elected SIAM Fellow and in 2014, she was an invited speaker at the International Congress of Mathematicians in Seoul.

Human-machine Interaction Models and Stochastic Optimization

Thaleia Zariphopoulou

University of Texas at Austin

Thursday, January 7, 2021, 11:10 a.m.–12:00 p.m.

ABSTRACT

I will introduce a family of human-machine interaction (HMI) models in optimal asset allocation, risk management and portfolio choice (robo-advising). Modeling difficulties stem from the limited ability to quantify the human's risk preferences and describe their evolution, but also from the fact that the stochastic environment, in which the machine optimizes, adapts to real-time incoming information that is exogenous to the human. Furthermore, the human's risk preferences and the machine's states may evolve at different scales. This interaction creates an adaptive cooperative game with both asymmetric and incomplete information exchange between the two parties.

As a result, challenging questions arise on, among others, how frequently the two parties should communicate, what information can the machine accurately detect, infer and predict, how the human reacts to exogenous events, how to improve the inter-linked reliability between the human and the machine, and others. Such HMI models give rise to new, non-standard optimization problems that combine adaptive stochastic control, stochastic differential games, optimal stopping, multi-scales and learning.

Minisymposia at the Joint Mathematics Meetings

The program for this meeting will occur in Mountain Standard Time (MST).

SIAM Minisymposium on Recent Advances in Financial Mathematics and Engineering

Organizer: Igor Cialenco, *Illinois Institute of Technology*
Wednesday, January 6, 2021, 8:00–10:55 a.m.

SIAM Minisymposium on Using Mathematical Models in Epidemiology and Medicine to Outwit Diseases

Organizer: Abdul-Aziz Yakubu, *Howard University*
Wednesday, January 6, 2021, 2:15–6:00 p.m.

SIAM Minisymposium on Equilibrium and Games in Financial Mathematics

Organizer: Kim Weston, *Rutgers University*
Thursday, January 7, 2021, 8:00–11:00 a.m.

SIAM Minisymposium on Supporting Workforce Preparation with Mathematical Modeling

Organizer: Katie Kavanagh, *Institute for STEM Education*
Thursday, January 7, 2021, 1:00–4:10 p.m.

SIAM Minisymposium on New Frontiers in Computational Mathematics

Organizer: Maria Cameron, *University of Maryland*
Friday, January 8, 2021, 8:00–10:55 a.m.

SIAM Minisymposium on Complex Fluids in Living Systems

Organizers: Lorena Bociu, *North Carolina State University* and
Giovanna Guidoboni, *University of Missouri*
Friday, January 8, 2021, 1:00–6:00 p.m.

SIAM Minisymposium on Mathematics of Machine Learning in Finance

Organizer: Martin Larsson, *Carnegie Mellon University*
Saturday, January 9, 2021, 8:00 a.m.–12:00 p.m.

SIAM Minisymposium on Advances in Manifold Learning and Applications

Organizers: Tyrus Berry, *George Mason University* and
Ryan Vaughn, *George Mason University*
Saturday, January 9, 2021, 1:00–5:30 p.m.

MAA-AMS-SIAM

Gerald and Judith Porter Public Lecture

Turning Cancer Discoveries into Effective Treatments with the Aid of Mathematical Modeling

Trachette Jackson
University of Michigan

Saturday, January 9, 2021, 3:00–3:50 p.m.

Joint Sessions

MAA-SIAM-AMS

Hrabowski-Gates-Tapia-McBay Lecture

Organizer: Carrie Diaz Eaton, *Bates College*
Speaker: Erica Graham, *Bryn Mawr*

Wednesday, January 6, 2021, 9:00–9:45 a.m.

MAA-SIAM-AMS

Hrabowski-Gates-Tapia-McBay Panel

Organizer: Carrie Diaz Eaton, *Bates College*

Wednesday, January 6, 2021, 9:50–10:30 a.m.

AMS-MAA-SIAM Special Session on

Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, I

Organizers: Darren A. Narayan, *Rochester Institute of Technology*,
Christopher O'Neil, *San Diego State University*, Khang Tran, *California
State University Fresno*, Mark David Ward, *Purdue University*, and
John Wierman, *The Johns Hopkins University*

Thursday, January 7, 2021, 8:00–11:50 a.m.

AMS-MAA-SIAM Special Session on

Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, II

Organizers: Darren A. Narayan, *Rochester Institute of Technology*,
Christopher O'Neil, *San Diego State University*, Khang Tran, *California
State University Fresno*, Mark David Ward, *Purdue University*, and
John Wierman, *The Johns Hopkins University*

Thursday, January 7, 2021, 1:00–3:50 p.m.

AMS-MAA-SIAM Special Session on

Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, III

Organizers: Darren A. Narayan, *Rochester Institute of Technology*,
Christopher O'Neil, *San Diego State University*, Khang Tran, *California
State University Fresno*, Mark David Ward, *Purdue University*, and
John Wierman, *The Johns Hopkins University*

Friday, January 8, 2021, 8:00–10:50 a.m.

AMS-MAA-SIAM Special Session on

Research in Mathematics by Undergraduates and Students in Post-Baccalaureate Programs, IV

Organizers: Darren A. Narayan, *Rochester Institute of Technology*,
Christopher O'Neil, *San Diego State University*, Khang Tran, *California
State University Fresno*, Mark David Ward, *Purdue University*, and
John Wierman, *The Johns Hopkins University*

Friday, January 8, 2021, 1:00–5:50 p.m.



Society for Industrial and
Applied Mathematics

siam@siam.org · siam.org

Join SIAM at siam.org/joinsiam