

International Conference on Multiscale Modeling and Simulation based on Physics and Data

Thursday April 25, 2024

- 8:00–8:50 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Welcome and Opening Remarks*
- 9:00 *Session Chair: Thomas Hou (California Institute of Technology)*
- 9:00–9:25 **Bjorn Engquist** (University of Texas at Austin)
Milestoning in Molecular Dynamics
- 9:30–9:55 **David Levermore** (University of Maryland)
Global Dynamics for the Kompaneets Equation
- 10:00–10:15 *Break*
- 10:15–10:40 **Stanley Osher** (University of California, Los Angeles (UCLA))
Towards Large Scientific Learning Models with In-Context Operator Networks (ICON)
- 10:45–11:10 **Hongkai Zhao** (Duke University)
Numerical understanding of neural networks: from representation to learning dynamics
- 11:15–11:30 *Break*
- 11:30–11:55 **Dale Pullin** (California Institute of Technology)
Vortex sheet motion following curvature singularity formation
- 12:00–12:25 **Yannis Kevrekidis** (Defense Sciences Office at DARPA/ John Hopkins University)
The Right Space
- 12:30–2:00 *Lunch (on your own)*
- 2:00 *Session Chair: Christian Ratsch (Institute for Pure and Applied Mathematics)*
- 2:00–2:25 **Laure Zanna** (Courant Institute of Mathematical Sciences)
Multiscale Climate Modeling in the Era of AI
- 2:30–2:55 **Yunan Yang** (Cornell University)
Adjoint Monte Carlo Methods for Kinetic Equation Constrained Optimization
- 3:00–3:30 *Birthday Presentation & Group Photo*
- 3:30–4:30 *Poster Session*
- 4:30–5:45 *Panel Discussion, Chaired by Tony Chan*
- 6:00–9:00 *Banquet (Optimist Room - Luskin Conference Center)*



Friday April 26, 2024

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: John Lowengrub (University of California, Irvine (UCI))*
- 9:00–9:25 **Jack Xin** (University of California, Irvine (UCI))
Particle and Game Theoretic Methods for Multiscale and High Dimensional Problems.
- 9:30–9:55 **Bill Morokoff** (Axioma)
Dynamic Risk Modeling for Multi-Asset Class Portfolios
- 10:00–10:15 *Break*
- 10:15–10:40 **Thomas Hou** (California Institute of Technology)
Potentially singular behavior of 3D incompressible Navier-Stokes equations
- 10:45–11:10 **Michael Siegel** (New Jersey Institute of Technology)
Finite-time singularity formation in the generalized Constantin-Lax-Majda equation with dissipation
- 11:15–11:30 *Break*
- 11:30–11:55 **Andrea Bertozzi** (University of California, Los Angeles (UCLA))
Energy Minimizing Surface Tension Configurations for Microparticles
- 12:00–12:25 **Liliana Borcea** (University of Michigan)
Enhanced wave transmission in random media with mirror symmetry
- 12:30–2:00 *Lunch (on your own)*
- 2:00 *Session Chair: Michael Siegel (New Jersey Institute of Technology)*
- 2:00–2:25 **Lorenzo Pareschi** (Heriot-Watt University)
Gradient-based Monte Carlo methods for hyperbolic and kinetic equations
- 2:30–2:55 **John Lowengrub** (University of California, Irvine (UCI))
Bilevel Local Operator Learning for PDE inverse problems
- 3:00–3:30 *Break*
- 3:30–3:55 **Lee Ricketson** (Lawrence Livermore National Laboratory)
*Implicit, asymptotic-preserving and energy-conserving time integration for charged particles in plasmas with arbitrary magnetization**
- 4:00–4:25 **Xiaofan Li** (Illinois Institute of Technology)
Finite Difference Approximation with ADI Scheme for Two-dimensional Keller-Segel Equations

