

## Transport and Mixing in Complex and Turbulent Flows

### Monday January 11, 2021

- 7:55      *SESSION CHAIR: Charles Doering (University of Michigan)*
- 7:55–8:00      *Welcome & Opening Remarks: Dean Miguel García-Garibay (Dean of Physical Sciences, UCLA) and Dima Shlyakhtenko (Director, IPAM)*
- 8:00–8:25      **Basile Gallet** (Commissariat à l'Énergie Atomique (CEA))  
*Can convective heat transport be more efficient than the so-called 'ultimate' regime?*
- 8:35–9:00      **Giovanni Fantuzzi** (Imperial College London)  
*Bounds on mean vertical heat transport in convection driven by internal heating*
- 9:10–9:25      *Break*
- 9:25–9:50      **Megan Davies Wykes** (University of Cambridge)  
*Mixing by plumes in boxes*
- 10:00–10:25      **Bartosz Protas** (McMaster University)  
*Maximum Amplification of Enstrophy in Navier-Stokes Flows and the Hydrodynamic Blow-Up Problem*
- 10:35–10:50      *Break*
- 10:50–11:15      **Ian Tobasco** (University of Illinois at Chicago)  
*Branching patterns in the optimal design of heat transport*
- 11:25–11:50      **David Goluskin** (University of Victoria)  
*Classical  $1/3$  scaling of heat transport by steady Rayleigh–Bénard convection*
- 12:00–12:15      *Lightning Poster Round*
- 12:15–1:00      *Virtual Poster Session*

### Tuesday January 12, 2021

- 8:00      *SESSION CHAIR: Anna Mazzucato (Pennsylvania State University)*
- 8:00–8:25      **Gianluca Crippa** (University of Basel)  
*Strong convergence of the vorticity for the 2D Euler Equations in the inviscid limit*
- 8:35–9:00      **Christian Seis** (Westfälische Wilhelms Universität Münster)  
*Estimates on the rates of enhanced dissipation and mixing*
- 9:10–9:25      *Break*

*(Tuesday schedule continued on next page)*



*(Tuesday schedule continued from previous page)*

- 9:25–9:50 **Camilla Nobili** (University of Hamburg)  
*Bounds on mixing norms for advection diffusion equations*
- 10:00–10:25 **Alexander Kiselev** (Duke University)  
*Mixing polynomial roots by differentiation*
- 10:35–11:30 *Break*
- 11:30–11:55 **Yao Yao** (Georgia Institute of Technology)  
*Small scale formations in the incompressible porous media equation*
- 12:05–12:30 **Gautam Iyer** (Carnegie Mellon University)  
*Dissipation Enhancement, Mixing and Blow-up Suppression*
- 12:40–12:55 *Break*
- 12:55–1:20 **Theodore Drivas** (Princeton University)  
*Anomalous dissipation for passive scalars*
- 1:30–1:55 **Steve Brunton** (University of Washington)  
*Machine Learning for Fluid Mechanics*

### Wednesday January 13, 2021

- 8:00 *SESSION CHAIR: Colm-cille Caulfield (University of Cambridge)*
- 8:00–8:25 **Jörg Schumacher** (Technische Universität Ilmenau)  
*Supergranule aggregation for constant heat flux-driven turbulent convection*
- 8:35–9:00 **Rich Kerswell** (University of Cambridge)  
*Exhausting the background approach for bounding the heat flux in Rayleigh Benard convection*
- 9:10–9:25 *Break*
- 9:25–9:50 **Sergei Chernyshenko** (Imperial College)  
*Extension of QSQH theory to all velocity components*
- 10:00–10:25 **John Wettlaufer** (Yale University)  
*Roughing It — The Role of Boundary Roughness in high Rayleigh Number Convection*
- 10:35–10:50 *Break*
- 10:50–11:15 **Andrej Zlatos** (University of California, San Diego (UCSD))  
*On Universal Mixers*
- 11:25–11:50 **Greg Chini** (University of New Hampshire)  
*Mixing Hot and Cold with Sound*

## Thursday January 14, 2021

- 8:00 *SESSION CHAIRS: Anna Mazzucato, Colm-cille Caulfield*
- 8:00–8:25 **Genta Kawahara** (Osaka University)  
*Ultimate heat transfer in turbulent permeable-channel flow*
- 8:35–9:00 **Alexandra Tzella** (University of Birmingham)  
*How jets and vortices influence the speed of propagation of plankton blooms: an idealised view*
- 9:10–9:25 *Break*
- 9:25–9:50 **Jacob Bedrossian** (University of Maryland)  
*Almost-sure exponential mixing in stochastic fluid mechanics and Batchelor-regime passive scalar turbulence*
- 10:00–10:25 **Jean-Luc Thiffeault** (University of Wisconsin-Madison)  
*On mix-norms and the rate of decay of correlations*
- 10:35–10:50 *Break*
- 10:50–11:15 **Leslie Smith** (University of Wisconsin-Madison)  
*Fast-Slow Coupling in Atmospheric Flows with Water*
- 11:25–11:50 **Janet Scheel** (Occidental College)  
*High Rayleigh Number Convection in a Slender Cylinder for Prandtl Number of 1*

