

Workshop II: Dynamics of Density Operators

Monday April 28, 2025

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 8:55–9:00 *Welcome and Opening Remarks*
- 9:00 *Session Chair: Tryphon Georgiou (University of California Irvine)*
- 9:00–9:50 **Eric Carlen** (Rutgers University)
On the rate of approach to steady state for some Lindblad evolutions equations arising in statistical mechanics.
- 10:00–10:15 *Break*
- 10:15–11:05 **Dániel Virosztek** (Alfréd Rényi Institute)
Optimal transport by quantum channels: non-quadratic problems, metric properties, and isometries
- 11:15–11:30 *Break*
- 11:30–12:20 **Dima Shlyakhtenko** (University of California, Los Angeles (UCLA))
Transport in free probability theory
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Oliver Tse (Eindhoven University of Technology)*
- 2:30–3:20 **Di Fang** (Duke University)
How Mathematical Analysis can help better understand quantum algorithms
- 3:30–4:00 *Break*
- 4:00–4:50 **Roy Araiza** (University of Illinois at Urbana-Champaign)
Lipschitz Cost of Quantum Channels on von Neumann Algebras
- 5:00–5:15 *Lightning Poster Round*
- 5:00–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday April 29, 2025

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Jean-Claude Zambrini (University of Lisbon)*
- 9:00–9:50 **Rocco Duvenhage** (University of Pretoria)
Quadratic Wasserstein distance between quantum dynamical systems
- 10:00–10:15 *Break*

(Tuesday schedule continued on next page)



(Tuesday schedule continued from previous page)

- 10:15–11:05 **Melchior Wirth** (Institute of Science and Technology Austria (IST Austria))
Completely positive maps and the V-transform
- 11:15–11:30 *Break*
- 11:30–12:20 **Katy Craig** (University of California, Santa Barbara (UCSB))
Vector Valued Optimal Transport: From Dynamic to Kantorovich Formulations
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Katy Craig (University of California, Santa Barbara (UCSB))*
- 2:30–3:20 **Franca Hoffmann** (California Institute of Technology)
Covariance-Modulated Optimal Transport Geometry
- 3:30–4:00 *Break*
- 4:00–4:50 **Andrew Jordan** (Chapman University)
Continuous quantum measurements : The most likely path with pre- and post-selection

Wednesday April 30, 2025

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Roy Araiza (University of Illinois at Urbana-Champaign)*
- 9:00–9:50 **Jean-Claude Zambrini** (University of Lisbon)
Integrability of Hamilton-Jacobi-Bellman equation. (J.C. Zambrini, with Qiao Huang)
- 10:00–10:15 *Break*
- 10:15–11:05 **Francois Golse** (École Polytechnique)
Wasserstein Distance and the Observability Problem in Quantum Mechanics
- 11:15–11:30 *Break*
- 11:30–12:20 **David Andrew Jekel** (University of Copenhagen)
Relating entropy and Wasserstein distance in free probability
- 12:20–12:30 *Group Photo*
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Rocco Duvenhage (University of Pretoria)*
- 2:30–3:20 **Wilfrid Gangbo** (University of California, Los Angeles (UCLA))
Viscosity solutions in non-commutative variables
- 3:30–4:00 *Break*
- 4:00–5:00 *Core Working Group Presentations*

Thursday May 1, 2025

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Dima Shlyakhtenko (University of California Los Angeles (UCLA))*
- 9:00–9:50 **Karol Zyczkowski** (Jagiellonian University)
Transformations of classical and quantum states and discrete dynamics in the set of quantum measurements
- 10:00–10:15 *Break*
- 10:15–11:05 **Dmitry Vorotnikov** (University of Coimbra)
Matrix-valued problems reminiscent of optimal transport and their applications to PDEs
- 11:15–11:30 *Break*
- 11:30–12:20 **Peixue Wu** (Institute for Quantum Computing)
From non-commutative optimal transport to limitations of quantum simulations.
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Marius Junge (University of Illinois at Urbana-Champaign)*
- 2:30–3:20 **Ralph Sabbagh** (University of California, Irvine (UCI))
On the Weyl symbols of Gaussian semigroups
- 3:30–4:00 *Break*
- 4:00–5:00 *Core Working Group Presentations*

Friday May 2, 2025

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session Chair: Eric Carlen (Rutgers University)*
- 9:00–9:50 **Marius Junge** (University of Illinois at Urbana-Champaign)
Why Ricci curvature (almost) failed us in noncommutative dynamics.
- 10:00–10:15 *Break*
- 10:15–11:05 **Haonan Zhang** (University of South Carolina)
On the Ricci curvature lower bounds for quantum Markov semigroups
- 11:15–11:30 *Break*
- 11:30–12:20 **Aaron Palmer** (University of California, Los Angeles (UCLA))
Non-Commutative Optimal Control and Viscosity Solutions

