

Entropy Inequalities, Quantum Information and Quantum Physics

Monday February 8, 2021

- 7:55 *SESSION CHAIR: Eric Carlen*
- 7:55–8:00 *Welcome & Opening Remarks: Dean Miguel García-Garibay (Dean of Physical Sciences, UCLA) and Dima Shlyakhtenko (Director, IPAM)*
- 8:00–8:35 **Frank Verstraete** (Ghent University)
Topological entanglement entropy and topological symmetries in tensor networks
- 8:45–9:20 **Haonan Zhang** (Institute of Science and Technology Austria (IST Austria))
How far can we go with Lieb's concavity theorem and Ando's convexity theorem?
- 9:30–9:45 *Break*
- 9:45–10:05 **Michael Kastoryano** (Amazon)
Classical restrictions of MPS are Gibbsian
- 10:15–10:35 **Melchior Wirth** (Institute of Science and Technology Austria (IST Austria))
From Entropic Curvature Bounds to Logarithmic Sobolev Inequalities
- 10:45–11:00 *Break*
- 11:00–11:20 **Mario Berta** (Imperial College London)
Characterising quantum correlations of fixed dimension
- 11:30–11:50 **Haojian Li** (University of Illinois at Urbana-Champaign)
Matrix-valued Sobolev type inequalities
- 12:00–12:30 *Lightning Poster Presentations: Matthias Caro, Victoria Chayes, Shanna Dobson, Michael Maroun, Jinzhao Wang and Henrik Wilming*

Tuesday February 9, 2021

- 8:00 *SESSION CHAIR: Nilanjana Datta*
- 8:00–8:35 **Anna Vershynina** (University of Houston)
Quasi-relative entropy: the closest separable state and the reversed Pinsker inequality
- 8:45–9:20 **Angela Capel** (Technische Universität München)
The modified logarithmic Sobolev inequality for quantum spin systems via approximate tensorization
- 9:30–9:45 *Break*

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- 9:45–10:05 **Cambyse Rouze** (Technische Universität München)
Spectral methods for entropic contraction coefficients.
- 10:15–10:35 **Omar Fawzi** (École Normale Supérieure de Lyon)
New quantum Rényi divergences and applications
- 10:45–11:00 *Break*
- 11:00–11:20 **Kristan Temme** (IBM Research)
A rigorous and robust quantum speed-up in supervised machine learning
- 11:30–11:50 **Mark Wilde** (Louisiana State University)
Recoverability for optimized quantum f -divergences

Wednesday February 10, 2021

- 8:00 *SESSION CHAIR: Marius Junge*
- 8:00–8:35 **Giacomo De Palma** (Massachusetts Institute of Technology)
The quantum Wasserstein distance of order 1
- 8:45–9:20 **Andreas Winter** (Universitat Autònoma de Barcelona)
Entropy inequalities beyond strong subadditivity
- 9:30–9:45 *Break*
- 9:45–10:05 **Matthias Christandl** (University of Copenhagen)
Fault-tolerant Coding for Quantum Communication
- 10:15–10:35 **Michael Walter** (Universiteit van Amsterdam)
Quantum Brascamp-Lieb Dualities
- 10:45–11:00 *Break*
- 11:00–11:20 **Tristan Benoist** (Toulouse Mathematics Institute (CNRS))
Vanishing of entropy production and quantum detailed balance
- 11:30–11:50 **Eric Ricard** (Université de Caen)
Some inequalities related to functional calculus

Thursday February 11, 2021

- 8:00 *SESSION CHAIR: Andreas Winter*
- 8:00–8:35 **David Perez-Garcia** (Universidad Complutense de Madrid)
Sobolev-type Inequalities in Position Based Cryptography
- 8:45–9:05 **Robert König** (Technical University of Munich)
Oscillator-to-oscillator codes do not have a threshold
- 9:15 *SESSION CHAIR: Eric Carlen*
- 9:15–9:30 *Break*
- 9:30–9:50 **Hamza Fawzi** (University of Cambridge)
Sum-of-squares proofs of logarithmic Sobolev inequalities on finite Markov chains
- 10:00–10:20 **Tryphon Georgiou** (University of California, Irvine (UCI))
Schroedinger bridges: classical and quantum
- 10:30 *SESSION CHAIR: Nilanjana Datta*
- 10:30–10:45 *Break*
- 10:45–11:05 **David Sutter** (IBM Zürich Research Laboratory)
A chain rule for the quantum relative entropy

