

Tensor Networks

Monday February 5, 2024

- 8:00–8:55 *Check-in/Breakfast (hosted by IPAM)*
- 8:55–9:00 *Welcome and Opening Remarks*
- 9:00 *Session Chair: Alessandra Bernardi*
- 9:00–10:15 **Joseph Landsberg** (Texas A&M University - College Station)
Geometry of tensor networks and tensor invariants
- 10:15–10:45 *Break*
- 10:45–11:45 **Benjamin Villalonga** (Google Quantum AI)
Benchmarking NISQ and QEC experiments with tensor networks
- 12:00–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Joseph Landsberg*
- 2:30–3:20 **Roman Orus** (Donostia International Physics Center)
News on tensor Networks for machine learning and quantum computing simulation.
- 3:30–4:00 *Break*
- 4:00–4:50 **Mathias Oster** (RWTH Aachen University)
Solving High-Dimensional Optimal Control Problems with Empirical Tensor Train Approximation
- 5:00–5:15 *Lighting Poster Session*
- 5:15–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday February 6, 2024

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Roman Orus*
- 9:00–9:50 **Yuehaw Khoo** (University of Chicago)
High-dimensional PDEs, tensor-network, and convex optimization:
- 10:00–10:15 *Break*
- 10:15–11:05 **Chia-Yu Chang** (Texas A&M University - College Station)
Border subrank of tensors
- 11:15–11:30 *Break*

(Tuesday schedule continued on next page)



(Tuesday schedule continued from previous page)

- 11:30–12:20 **Liza Rebrova** (Princeton University)
Memory-efficient modewise measurements for tensor compression and recovery
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Dy Fang*
- 2:30–3:20 **Ion Nechita** (Centre National de la Recherche Scientifique (CNRS))
Monogamy of highly symmetric states
- 3:30–4:00 *Break*
- 4:00–4:50 **Steve White** (University of California, Irvine (UCI))
The strange energy spectrum of approximate matrix product ground states

Wednesday February 7, 2024

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Alessandra Bernardi*
- 9:00–9:50 **Elisa Ercolessi** (Università di Bologna)
Hybrid Variational Algorithms for Classical and Quantum Complex Systems
- 10:00–10:15 *Break*
- 10:15–11:05 **Feng Pan** (National University of Singapore)
Arbitrary Tensor Network Algorithm: Theory, Methods and Applications
- 11:15–11:30 *Break*
- 11:30–12:20 **Jingmei Qiu** (University of Delaware)
Low rank Time integrators for solving time-dependent PDEs
- 12:30–12:45 *Group Photo*
- 12:45–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Norbert Schuch*
- 2:30–3:20 **Di Fang** (Duke University)
Numerical Analysis for Hamiltonian Simulation and Hamiltonian Learning
- 3:30–4:00 *Break*
- 4:00–4:50 **Jeroen Zuiddam** (University of Amsterdam)
Discreteness of asymptotic tensor ranks

Thursday February 8, 2024

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Steve White*
- 9:00–9:50 **Carolin Wille** (University of Cambridge)
Topological Dualities from Matchgate Tensor Networks
- 10:00–10:15 *Break*
- 10:15–11:05 **Fabian Faulstich** (Rensselaer Polytechnic Institute)
Tailoring coupled cluster theory with matrix product states
- 11:15–11:30 *Break*
- 11:30–12:20 **Alessandra Bernardi** (Università di Trento)
Defective tensor network varieties
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *Session Chair: Thomas Barthel*
- 2:30–3:20 **Grigoris Paouris** (Texas A&M University - College Station)
Small ball probabilities for simple random tensors and applications to smoothed analysis of tensor decompositions
- 3:30–4:00 *Break*
- 4:00–4:50 *Open Problem Session*

Friday February 9, 2024

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *Session Chair: Ion Nechita*
- 9:00–9:50 **Norbert Schuch** (University of Vienna)
Tensor networks and the negative sign problem
- 10:00–10:15 *Break*
- 10:15–11:05 **Thomas Barthel** (Duke University)
Quantum simulation of condensed matter using Trotterized entanglement renormalization

