

Tensor Methods and Emerging Applications to the Physical and Data Sciences Culminating Retreat

Monday June 7, 2021

- 7:59 *Note: This Culminating Retreat is open only to TM2021 long program participants.*
- 8:00 *Session Chair: Elina Robeva (UBC)*
- 8:00–8:05 *Welcome & Opening Remarks*
- 8:05–8:45 *Tensor Working Group #1: Algorithms - Report and Discussion (Aravindan Vijayaraghavan, Kevin Stubbs and Jianfeng Lu)*
- 8:45–9:00 *Open discussion or break (non-organized)*
- 9:00–9:45 *Tensor Working Group #4: Quantum/White Paper - Report and Discussion (Rohit Goswami)*
- 9:45–10:00 *Open discussion or break (non-organized)*
- 10:00–10:40 *Project #2 - Tensor Network States, Part 1 (in Physics Language): Thomas Barthel, Amy Huang and JM Landsberg*
- 10:40–10:55 *Open discussion or break (non-organized)*
- 10:55–11:15 *Project #2 - Tensor Network States, Part 2 (in Math Language): Amy Huang, Thomas Barthel and JM Landsberg*
- 11:15–11:30 *Open discussion or break (non-organized)*



Tuesday June 8, 2021

- 8:00 *Session Chair: Anna Seigal (Oxford)*
- 8:00–8:45 *Tensor Working Group #3: High Dimensional - Report and Discussion (Gero Friesecke/Jianfeng Lu)*
- 8:45–9:00 *Open discussion or break (non-organized)*
- 9:00–9:30 **Claudia De Lazzari** (University of Trento)
Work in progress: Non-Linear Conjugate Gradient method on the reduced parameter space of MPS with open boundary conditions
- 9:30–9:45 *Open discussion or break (non-organized)*
- 9:45–10:35 **Shmuel Friedland** (University of Chicago)
Classical and Quantum Optimal Transport problems for Matrices and Tensors IPAM workshop IV: Efficient Tensor Representations for Learning and Computational Complexity
- 10:35–10:50 *Open discussion or break (non-organized)*
- 10:50–11:20 **Gero Friesecke** (Technische Universität München)
Some theoretical challenges in tensor network methods for high-dimensional approximation
- 11:20–11:50 *Social (half) Hour*

Wednesday June 9, 2021

- 8:00 *Session Chair: Gero Friesecke (TU Munich)*
- 8:00–8:45 *Tensor Working Group #2: Data Science - Report and Discussion (Neriman Tokcan)*
- 8:45–9:00 *Open discussion or break (non-organized)*
- 9:00–9:20 **Luca Chiantini** (Università di Siena)
Hot Topics Session (with Ben Lovitz, Fedya Petrov and Pierpaola Santarsiero)
- 9:20–9:35 *Open discussion or break (non-organized)*
- 9:35–10:00 *Project #1 - Representations of anti-symmetric functions for many-body physics and their underlying geometry, Part 1 (in Physics Language): JM Landsberg and Jianfeng Lu*
- 10:00–10:15 *Open discussion or break (non-organized)*
- 10:15–10:40 *Project #1 - Representations of anti-symmetric functions for many-body physics and their underlying geometry, Part 2 (in Math Language): JM Landsberg and Jianfeng Lu*
- 10:40–10:45 *Break*

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10:45–11:15 *TM2021 Long Program Graduation Ceremony*

11:15–11:30 *Closing Remarks (Jianfeng Lu)*

11:30 *Conclusion*