Week 1, July 3 – 7, 2023

Sunday, July 2nd
6:30 – 8:30pm  Registration mixer with refreshments
WeatherTech Café in the C4C
Beer and Wine Will Be Served

Monday, July 3rd
8:30 – 9:00     Organizers
Welcome and School Introduction
9:00 – 10:30   David Huse
Thermalization and many-body localization
10:30 – 11:00 Coffee break – questions / interaction with speaker
11:00 – 12:30 Anushya Chandran
Driven quantum dynamics
12:30 – 13:45 Lunch
14:00 – 15:30 Sagar Vijay
Random Quantum Circuits
15:30 – 16:30 Participant Introductions

Tuesday, July 4th
9:00 – 10:30  David Huse
Thermalization and many-body localization
10:30 – 11:00 Coffee Break
11:00 – 12:30 Anushya Chandran
Driven quantum dynamics
12:30 – 13:45 Lunch
14:00 – 15:30 Frank Pollmann
Numerical methods & quantum many-body dynamics
Detailed Schedule  All lectures are in Duane Physics Room G130

**Wednesday, July 5th**

9:00 – 10:30  Sagar Vijay  
*RANDOM QUANTUM CIRCUITS*

10:30 – 11:00  Coffee Break

11:00 – 12:30  Frank Pollmann  
*Numerical methods & quantum many-body dynamics*

12:30 – 13:45  Lunch

14:00 – 15:30  David Huse  
*Thermalization and many-body localization*

**Thursday, July 6th**

9:00 – 10:30  David Huse  
*Thermalization and many-body localization*

10:30 – 11:00  Coffee Break

11:00 – 12:30  Frank Pollmann  
*Hilbert-space fragmentation and constrained quantum dynamics*

12:30 – 13:45  Lunch

14:00 – 15:30  Anushya Chandran  
*Driven quantum dynamics*

18:30 – 18:55  Poster Blurbs I  
*Duane G130*

19:00 – 22:00  Poster Session I  
*11th Floor Commons Room*

**Friday, July 7th**

9:00 – 10:30  Sagar Vijay  
*Random Quantum Circuits*

10:30 – 11:00  Coffee Break

12:30 – 13:45  Lunch

14:00 – 15:30  Andy Lucas  
*Lieb-Robinson bounds*

15:30 – 17:00  What have we learned? Q/A and Panel Discussions

19:00 – 21:30  Catered dinner  
*11th Floor Commons Room, Gamow Tower*
Week 2, July 10 – 14, 2023

<table>
<thead>
<tr>
<th>Monday, July 10th</th>
<th>Romain Vasseur</th>
<th>Measurement-driven entanglement phase transitions</th>
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<tbody>
<tr>
<td>9:00 – 10:30</td>
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<tr>
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<td>Coffee Break</td>
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<td>Marko Znidaric</td>
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<td>Tarun Grover</td>
<td>Mixed-state quantum many-body entanglement</td>
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<td>11:00 – 12:30</td>
<td>Ehud Altman</td>
<td>Measurements &amp; decoherence in quantum many-body systems</td>
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<td>12:30 – 13:45</td>
<td>Lunch</td>
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<tr>
<td>14:00 – 15:30</td>
<td>Sarang Gopalakrishnan</td>
<td>“Learnability” phase transitions in quantum dynamics</td>
</tr>
<tr>
<td>18:00-20:30</td>
<td>Dessert on Flagstaff Mountain</td>
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<tr>
<td>6:00pm – 8:30</td>
<td>Busses leave south of C4C at 6pm</td>
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2023 Boulder School for Condensed Matter and Materials Physics

Non-Equilibrium Quantum Dynamics  July 3 – July 28, 2023
Detailed Schedule  All lectures are in Duane Physics Room G130

Thursday, July 13th

9:00 – 10:30  Tarun Grover
Mixed-state quantum many-body entanglement

10:30 – 11:00  Coffee Break

11:00 – 12:30  Ehud Altman
Measurements & decoherence in quantum many-body systems

12:30 – 13:45  Lunch

14:00 – 15:30  Sarang Gopalakrishnan
"Learnability" phase transitions in quantum dynamics

15:30 – 15:55  Poster Blurbs II
Duane G130

19:00 – 22:00  Poster Session II
11th Floor Commons Room, Gamow Tower

Friday, July 14th

9:00 – 10:30  Ehud Altman
Measurements & decoherence in quantum many-body systems

10:30 – 11:00  Coffee Break

11:00 – 12:30  Sarang Gopalakrishnan
"Learnability" phase transitions in quantum dynamics

12:30 – 13:45  Lunch

14:00 – 15:30  Marko Znidaric
Transport in quantum spin chains

15:30 – 17:00  What have we learned? Q/A and Panel Discussions
## Week 3, July 17 – 21, 2023

### Monday, July 17th

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<tr>
<th>Time</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>9:00 – 10:30</td>
<td>Victor Albert</td>
<td>Introduction to quantum error-correction</td>
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<td>10:30 – 11:00</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 – 12:30</td>
<td>Liang Jiang</td>
<td>Bosonic quantum codes and applications</td>
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<td>12:30 – 13:45</td>
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<td>14:00 – 15:30</td>
<td>Victor Albert</td>
<td>Introduction to quantum error-correction</td>
</tr>
<tr>
<td>19:00 – 20:00</td>
<td>Public Lecture: Giulia Semeghini</td>
<td>Duane Physics G1B20</td>
</tr>
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### Tuesday, July 18th

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<tr>
<td>9:00 – 10:30</td>
<td>Aleksander Kubica</td>
<td>From topological to quantum LDPC codes</td>
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<td>10:30 – 11:00</td>
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<tr>
<td>14:00 – 15:30</td>
<td>Giulia Semeghini</td>
<td>Quantum simulation with Rydberg atoms</td>
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### Wednesday, July 19th

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<td>14:00 – 15:30</td>
<td>Giulia Semeghini</td>
<td>Quantum simulation with Rydberg atoms</td>
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Thursday, July 20th

9:00 – 10:30  
**Aleksander Kubica**  
*From topological to quantum LDPC codes*

10:30 – 11:00  
Coffee Break

11:00 – 12:30  
**Victor Albert**  
*Introduction to quantum error-correction*

12:30 – 13:45  
Lunch

14:00 – 15:30  
**Giulia Semeghini**  
*Quantum simulation with Rydberg atoms*

15:30 – 15:55  
**Poster Blurbs III**  
*Duane G130*

19:00 – 22:00  
**Poster Session III**  
*11th Floor Commons Room*

Friday, July 21st

9:00 – 10:30  
**Aleksander Kubica**  
*From topological to quantum LDPC codes*

10:30 – 11:00  
Coffee Break

11:00 – 12:30  
**Vedika Khemani**  
*Seminar: Eigenstate order and time crystals*

12:30 – 13:45  
Lunch

14:00 – 15:30  
**Vedika Khemani**  
*Seminar: Measurement-induced entanglement and teleportation on a noisy quantum processor*

15:30 – 16:00  
**What have we learned?** Q/A and Panel Discussions
Week 4, July 24 - July 28, 2023

Monday, July 24th
9:00 – 10:30  Steven Girvin  
Superconducting qubits and quantum simulation  
10:30 – 11:00 Coffee Break  
11:00 – 12:30 Zlatko Minev  
Quantum error mitigation  
12:30 – 13:45 Lunch  
14:00 – 15:30 Crystal Noel  
Trapped-Ion quantum computers

Tuesday, July 25th
9:00 – 10:30  Steven Girvin  
Superconducting qubits and quantum simulation  
10:30 – 11:00 Coffee Break  
11:00 – 12:30 Zlatko Minev  
Quantum error mitigation  
12:30 – 13:45 Lunch  
14:00 – 15:30 Crystal Noel  
Trapped-Ion quantum computers

Wednesday, July 26th
9:00 – 10:30  Immanuel Bloch  
Ultracold atom quantum simulators  
10:30 – 11:00 Coffee Break  
11:00 – 12:30 Steven Girvin  
Superconducting qubits and quantum simulation  
12:30 – 13:45 Lunch  
14:00 – 15:30 Zlatko Minev  
Quantum error-mitigation
### Thursday, July 27th

<table>
<thead>
<tr>
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<td>Crystal Noel</td>
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### Friday, July 28th

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<td></td>
<td>Coffee Break</td>
</tr>
<tr>
<td>11:00 – 12:30</td>
<td></td>
<td>*What have we learned? Discussions, Goodbyes: Q/A and Panel</td>
</tr>
</tbody>
</table>

Discussions