

ML4Q Summer School on Quantum Error Correction

Bonn, 23 – 27 September 2024

Venue: Bethe Center for Theoretical Physics, Wegelerstraße 10, 53115 Bonn

Day 1 (23/9)	
09:00 – 09:45	Arrival and Registration
09:45 – 10:15	Welcome Note & Introduction to the ML4Q QEC School
10:15 – 12:00	Lecture: <i>Introduction to fault tolerant error correction (part 1)</i> Markus Müller
12:00 – 14:00	Lunch break
14:00 – 15:45	Lecture: <i>Logical Qubit Quantum Algorithms (part 1)</i> Michael Gullans
15:45 – 16:15	Coffee break
16:15 – 18:00	Lecture: <i>Introduction to fault tolerant error correction (part 2)</i> Markus Müller

Day 2 (24/9)	
08:45 – 10:30	Lecture: <i>Logical Qubit Quantum Algorithms (part 2)</i> Michael Gullans
10:30 – 11:00	Coffee break
11:00 – 12:00	Jens Eisert: <i>Avenues for quantum error correction and mitigation.</i>
12:00 – 14:00	Lunch break
14:00 – 15:45	Lecture: <i>Continuous variable codes (part 1)</i> Christophe Vuillot
16:30 – 18:30	Poster session

Day 3 (25/9)	
08:45 – 10:30	Lecture: <i>Continuous variable codes (part 2)</i> Christophe Vuillot
10:30 – 11:00	Coffee break
11:00 – 12:00	Natalie Brown: <i>Quantum error correction at Quantinuum: Pushing the boundaries of fault-tolerant computing.</i>
12:00 – 14:00	Lunch break
14:00 – 18:00	Social activities (TBA)

Day 4 (26/9)	
08:30 – 09:30	Giulia Ferrini: <i>Simulatable architectures of quantum computers and magic measures with the Gottesman-Kitaev-Preskill code.</i>
09:30 – 10:30	Barbara Terhal: <i>Lowering Connectivity Requirements For QEC Using Morphing Circuits.</i>
10:30 – 11:00	Coffee break
11:00 – 12:00	Nicolas Delfosse: <i>Low-cost noise reduction for Clifford circuits.</i>
12:00 – 14:00	Lunch break
14:00 – 15:30	Young Talks (20 +10): 14:00 – 14:30 Matthew Steinberg: <i>Recent Developments in Holographic Quantum Error Correction.</i> 14:30 – 15:00 Friederike Butt: <i>Fault-tolerant code switching protocols for near-term quantum processors.</i> 15:00 – 15:30 Bence Hetényi: <i>Creating entangled logical qubits in the heavy-hex lattice.</i>
15:30 – 16:00	Coffee break
16:00 – 18:00	Discussion session
19:00 – 21:00	Summer School Dinner at Tuscolo

ML⁴Q MATTER AND LIGHT FOR QUANTUM COMPUTING

Day 5 (27/9)	
09:00– 10:00	Johannes Zeiher: <i>Quantum computing with neutral-atom arrays.</i>
10:00 – 10:30	Young Talk- Josias Old: <i>The XYZ ruby code: Making a case for a three-colored graphical calculus for quantum error correction in spacetime.</i>
10:30 – 11:00	Coffee break
11:00 – 12:00	Simon Trebst: <i>TBA</i>
12:00 – 12:15	Closing remarks

