

# QEC Summer School Schedule

As of July 24 subject to change.

## Week 1

QEC Foundations  
Bosonic Code Foundations  
Programming QEC Decoders

Time	Activity	Location/Room	Mon 4	Tue 5	Wed 6	Thr 7	Fri 8	Sat 9	Sun 10
7:00AM - 8:55AM	Breakfast	Biddle Mansion - Winter Palace/West Terrace	Students Arrive	Breakfast					Study/Off Breakfast: 7:00AM - 9:30AM Lunch: 12:00PM - 1:30PM Dinner: 6:00PM - 9:00PM
9:00AM - 10:30AM	Lecture I	New York		Meet @ 8:45AM for First Day Logistics QEC Foundations Steve Flammia, AWS	Programming QEC Decoders James Wootton, IBM Quantum	Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	QEC Foundations Steve Flammia, AWS	
10:30AM - 11:00AM	Morning Tea Break	Atrium Lobby		Morning Tea Break					
11:00AM - 12:30PM	Lecture II	New York		Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	QEC Foundations Steve Flammia, AWS	QEC Foundations Steve Flammia, AWS	Programming QEC Decoders James Wootton, IBM Quantum	Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	
12:30PM - 1:25PM	Lunch	Biddle Mansion - Winter Palace/West Terrace		Lunch					
1:30PM - 2:00PM	Q&A Sessions	New York		Q&A Session QEC Foundations Steve Flammia, AWS	Q&A Session Programming QEC Decoders James Wootton, IBM Quantum	Q&A Session Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	Q&A Session Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	Q&A Session QEC Foundations Steve Flammia, AWS	
2:00PM - 2:30PM		New York		Q&A Session Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	Q&A Session QEC Foundations Steve Flammia, AWS	Q&A Session QEC Foundations Steve Flammia, AWS	Q&A Session Programming QEC Decoders James Wootton, IBM Quantum	Q&A Session Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	
2:30PM - 4:30PM	Unstructured Time	N/A		Unstructured Time/ Office Hours with Admin Team for on-site support	Unstructured Time	Unstructured Time	Unstructured Time	Unstructured Time	
4:30PM - 5:00PM	Open Problems, Student Talks, Crazy Ideas	New York		Unstructured Time		Open Problems - Part I QEC Foundations Steve Flammia, AWS	Introduction to QEC Framework @ 4:00PM  Drew Vandeth, IBM Quantum	Open Problems - Part II Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	
5:00PM - 5:30PM						Open Problems - Part I Bosonic Code Foundations Shruti Puri, Yale University Arne Grimsmo, AWS	Crazy Ideas Session IDA Rules Drew Vandeth, IBM Quantum	Open Problems - Part II QEC Foundations Steve Flammia, AWS	
5:30PM - 6:00PM	Unstructured Time	N/A		Unstructured Time					
6:00PM - 6:55PM	Dinner	Biddle Mansion - Winter Palace/West Terrace	4th of July Event @ Duke Terrace	Opening Dinner @ Mary Duke Ballroom  Opening Remarks Zaira Nazario, IBM Research	Dinner	Social Event: Women in Quantum Social & Dinner	Dinner		
7:00PM - 8:00PM	Guest Lectures/Social Time	New York		Keynote Speaker, Daniel Gottesman, UMD Mary Duke Ballroom		@ West Terrace	Guest Lecture Liang Jiang, The University of Chicago	Unstructured Time	
8:00PM - 9:00PM	Social	Atrium Lobby		Speaker Social	Speaker Social		Speaker Social		

# QEC Summer School Schedule

As of July 24 subject to change.

Week 2									
Fault Tolerance - Logistical Gates Experimental QEC - Bosonic Codes Programming QEC Decoders									
Time	Activity	Location/Room	Mon 11	Tue 12	Wed 13	Thr 14	Fri 15	Sat 16	Sun 17
7:00AM - 8:55AM	Breakfast	Winter Palace	Breakfast					Breakfast: 7:00AM - 9:30AM @Winter Palace  Lunch: 11:00AM - 11:15AM <i>Lunch will be a boxed lunch provided in the Atrium</i>  <b>Hudson River Cruise</b> Bus Departs: 11:30AM Cruise: 1:00PM - 4:30PM  Dinner: 6:00PM - 9:00PM @ Cellar 49 (Lower level of Biddle Mansion)	Study/Off  Breakfast: 7:00AM - 9:30AM @Winter Palace  Lunch: 12:00PM - 1:30PM @Winter Palace  Dinner: 6:00PM - 9:00PM @ Cellar 49 (Lower level of Biddle Mansion)
9:00AM - 10:30AM	Lecture I	New York	Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Programming QEC Decoders James Wootton, IBM Quantum	Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University	Experimental QEC - Bosonic Codes Alec Eickbusch, Yale University Volodymyr Sivak, Yale University	Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum		
10:30AM - 11:00AM	Morning Tea Break	Atrium Lobby	Morning Tea Break						
11:00AM - 12:30PM	Lecture II	New York	Experimental QEC - Bosonic Codes Michel Devoret, Alec Eickbusch, & Volodymyr Sivak, Yale University	Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Programming QEC Decoders James Wootton, IBM Quantum	Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University		
12:30PM - 1:25PM	Lunch	Winter Palace	Lunch						
1:30PM - 2:00PM	Q&A Sessions	New York	Q&A Session Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Q&A Session Programming QEC Decoders James Wootton, IBM Quantum	Q&A Session Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University	Q&A Session Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University	Q&A Session Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum		
2:00PM - 2:30PM		New York	Q&A Session Experimental QEC - Bosonic Codes Michel Devoret, Alec Eickbusch, & Volodymyr Sivak, Yale	Q&A Session Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Q&A Session Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum	Q&A Session Programming QEC Decoders James Wootton, IBM Quantum	Q&A Session Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University		
2:30PM - 4:30PM	Unstructured Time	N/A	Unstructured Time						
4:30PM - 5:00PM	Open Problems, Student Talks, Crazy Ideas	New York	Student Talks	Student Talks	Open Problems - Part I Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University	Crazy Ideas Session	Open Problems - Part II Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum		
5:00PM - 5:30PM			Sajant Anand Xanda Kolesnikow Daniel Miller Peter-Jan Derks	Timo Hillmann Armands Strikis Aur�lie Denys Kaavya Sahay	Open Problems - Part I Fault Tolerance - Logical Gates Ben Brown, IBM Quantum Daniel Litinski, PsiQuantum		Open Problems - Part II Experimental QEC - Bosonic Codes Alec Eickbusch & Volodymyr Sivak, Yale University		
5:30PM - 6:00PM	Unstructured Time	N/A	Unstructured Time						
6:00PM - 6:55PM	Dinner	Winter Palace	Dinner						
7:00PM - 8:00PM	Guest Lectures/Social Time	New York	Guest Lecture Chen Wang, UMass Amherst	Unstructured Time	Unstructured Time	Unstructured Time	Guest Lecture Guanyu Zhu, IBM Quantum		
8:00PM - 9:00PM	Social	Atrium Lobby	Speaker Social				Speaker Social		

# QEC Summer School Schedule

As of July 24 subject to change.

## Week 3

QEC Decoding  
Experimental QEC - Trapped Ions  
Programming QEC Simulations

Time	Activity	Location/Room	Mon 18	Tue 19	Wed 20	Thr 21	Fri 22	Sat 23	Sun 24
7:00AM - 8:55AM	Breakfast	Winter Palace/West Terrace	Breakfast @ Library and the Music Room (Rooms before Winter Palace)			Breakfast		Breakfast: 7:00AM - 9:30AM @ Winter Palace  <b>Social Event: Scavenger Hunt 10AM - 12PM Riverview Room</b>  Lunch: 12:00PM - 1:30PM @ Winter Palace  Dinner: 6:00PM - 9:00PM @ Library and the Music Room (Rooms before Winter Palace)	Study/Off  Breakfast: 7:00AM - 9:30AM @ Winter Palace  Lunch: 12:00PM - 1:30PM @ Winter Palace  Dinner: 6:00PM - 9:00PM @ Library and the Music Room (Rooms before Winter Palace)
9:00AM - 10:30AM	Lecture I	New York	QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield	Programming QEC Simulations Andrew Cross, IBM Quantum	Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield		
10:30AM - 11:00AM	Morning Tea Break	Atrium Lobby	Morning Tea Break						
11:00AM - 12:30PM	Lecture II	New York	Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield	QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield	Programming QEC Simulations Andrew Cross, IBM Quantum	Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum		
12:30PM - 1:25PM	Lunch	Winter Palace/West Terrace	Lunch @ Library and the Music Room (Rooms before Winter Palace)			Lunch			
1:30PM - 2:00PM	Q&A Sessions	New York	Q&A Session QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield	Q&A Session Programming QEC Simulations Andrew Cross, IBM Quantum	Q&A Session Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	Crazy Ideas Session	Q&A Session QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield		
2:00PM - 2:30PM		New York	Q&A Session Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	Q&A Session QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield	Q&A Session QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield		Q&A Session Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum		
2:30PM - 4:30PM	Unstructured Time	N/A	Unstructured Time		Unstructured Time				
4:30PM - 5:00PM	Open Problems, Student Talks, Crazy Ideas	New York	Student Talks @ 4:00PM	Student Talks @ 4:00PM	Unstructured Time	Q&A Session Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	Open Problems - Part II QEC Decoding Christopher Chubb, ETH Zurich Earl Campbell, Riverlane & University of Sheffield		
5:00PM - 5:30PM			Felix Thomsen Friederike Butt Varun Seshadri Marco Ballarin Basudha Srivastava Mark Webster	Arthur Pesah Julian Ding David Scheer Georgia Nixon Ohad Lib Ross Shillito	Open Problems - Part I Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum	Q&A Session Programming QEC Simulations Andrew Cross, IBM Quantum	Open Problems - Part II Experimental QEC - Trapped Ions Ken Brown, Duke University Ciaran Ryan-Anderson, Quantinuum		
5:30PM - 6:00PM	Unstructured Time	N/A	Unstructured Time						
6:00PM - 6:55PM	Dinner	Winter Palace/West Terrace	Dinner	Dinner @ Winter Palace	Dinner	Social Event: Diversity Panel @ Mary Duke Ballroom (A)	Dinner		
7:00PM - 8:00PM	Guest Lectures/Social Time	New York	Guest Lecture Aleksander Kubica, AWS	Unstructured Time	Guest Lecture Michael Vasmer, Perimeter Institute	Dinner @ Winter Palace	Guest Lecture Leo DiCarlo, TU Delft		
8:00PM - 9:00PM	Social	Atrium Lobby	Speaker Social		Speaker Social	Unstructured Time	Speaker Social		

# QEC Summer School Schedule

As of July 24 subject to change.

## Week 4

LDPC Codes  
Experimental QEC - Superconducting Qubits  
Programming QEC Simulations

Time	Activity	Location/Room	Mon 25	Tue 26	Wed 27	Thr 28	Fri 29	Sat 30	Sun 31
7:00AM - 8:55AM	Breakfast	Winter Palace/West Terrace	Breakfast		Breakfast @ Winter Palace	Breakfast @ Winter Palace <b>Lecture begins at 8:30AM</b> Experimental QEC - Superconducting Qubits <b>Maika Takita, IBM Quantum</b> Antonio Córcoles, IBM Quantum <u>Andreas Wallraff, ETH Zurich</u>	Breakfast	Breakfast: 7:00AM - 9:30AM @ Winter Palace  Lunch: 12:00PM - 1:30PM @ Winter Palace	Students Depart  Breakfast: 7:00AM - 9:30AM
9:00AM - 10:30AM	Lecture I	New York	LDPC Codes Nikolas Breuckmann, UCL <b>Nicolas Delfosse, Microsoft</b>	Programming QEC Simulations Andrew Cross, IBM Quantum	Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich	<b>Lecture begins at 10:00AM</b> Programming QEC Simulations Andrew Cross, IBM Quantum	LDPC Codes <b>Nikolas Breuckmann, UCL</b> Nicolas Delfosse, Microsoft		
10:30AM - 11:00AM	Morning Tea Break	Atrium Lobby	Morning Tea Break				Morning Tea Break		
11:00AM - 12:30PM	Lecture II	New York	Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum <b>Andreas Wallraff, ETH Zurich</b>	LDPC Codes <b>Nikolas Breuckmann, UCL</b> Nicolas Delfosse, Microsoft	LDPC Codes Nikolas Breuckmann, UCL <b>Nicolas Delfosse, Microsoft</b>	<b>Bus leaves at 11:45AM</b>	Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum <b>Andreas Wallraff, ETH Zurich</b>		
12:30PM - 1:25PM	Lunch	Winter Palace/West Terrace	Lunch		Lunch @ Winter Palace	Social Event: IBM Research BBQ & Lab Tour at IBM Yorktown	Lunch		
1:30PM - 2:00PM	Q&A Sessions	New York	Q&A Session LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft	Q&A Session Programming QEC Simulations Andrew Cross, IBM Quantum	Q&A Session Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich		Q&A Session LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft		
2:00PM - 2:30PM		New York	Q&A Session Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich	Q&A Session LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft	Q&A Session LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft		Q&A Session Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich		
2:30PM - 4:30PM	Unstructured Time	N/A New York	Unstructured Time		Unstructured Time		Unstructured Time		
4:30PM - 5:00PM	Open Problems, Student Talks, Crazy Ideas	New York	Student Talks @ 4:00PM  Matt McEwen Joshua Ramette Arkin Tikku Paul Herringer	Student Talks @ 4:00PM  Nathan Lacroix Zohar Schwartzman-Nowik Daniel Solis Boris Varbanov Shraddha Singh Alex Townsend-Teague	Capacities for Correcting Quantum Errors Vikesh Siddhu, IBM Quantum		Open Problems - Part II LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft		
5:00PM - 5:30PM					Open Problems - Part I Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich		Open Problems - Part II Experimental QEC - Superconducting Qubits Maika Takita & Antonio Córcoles, IBM Quantum Andreas Wallraff, ETH Zurich		
5:30PM - 6:00PM	Unstructured Time	N/A	Unstructured Time		Open Problems - Part I LDPC Codes Nikolas Breuckmann, UCL Nicolas Delfosse, Microsoft	Unstructured Time			
6:00PM - 6:55PM	Dinner	Winter Palace/West Terrace	Dinner		Dinner @ Winter Palace	Dinner @ Winter Palace	Team Building: 6:00PM - 7:30PM @ West Terrace  Dinner: 7:30PM - 9:00PM @Winter Palace	Closing Dinner & Keynote Speaker Sergey Bravyi, IBM Quantum @ Carriage House	
7:00PM - 8:00PM	Guest Lectures/Social Time	New York	Guest Lecture Anirudh Krishna, Stanford University	Unstructured Time	Guest Lecture, Ted Yoder, IBM Quantum	Unstructured Time			
8:00PM - 9:00PM	Social	Atrium Lobby	Speaker Social		Speaker Social				