

Qiskit Global Summer School 2024

The Path to Utility

Attendee Guide

#QGSS24

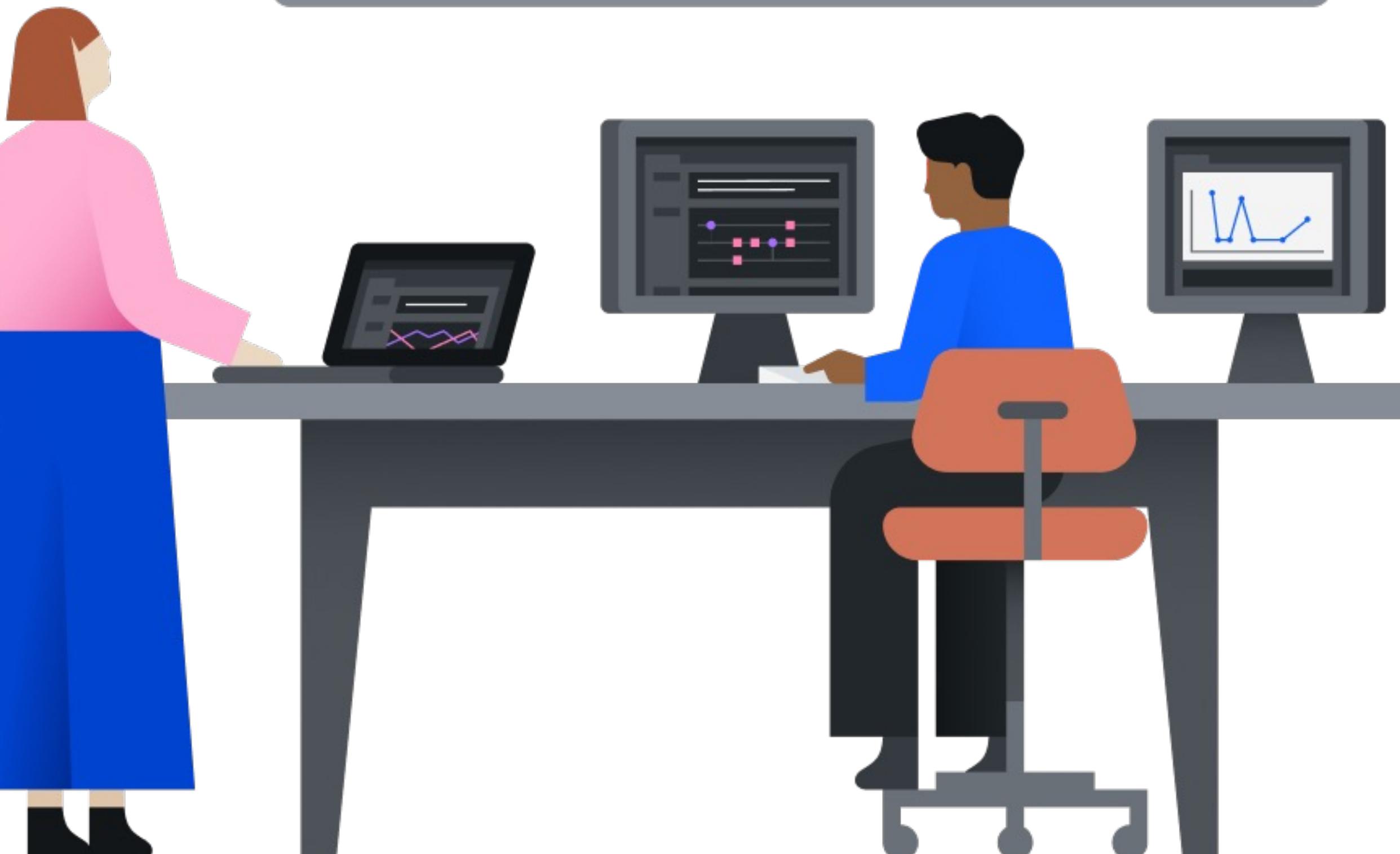
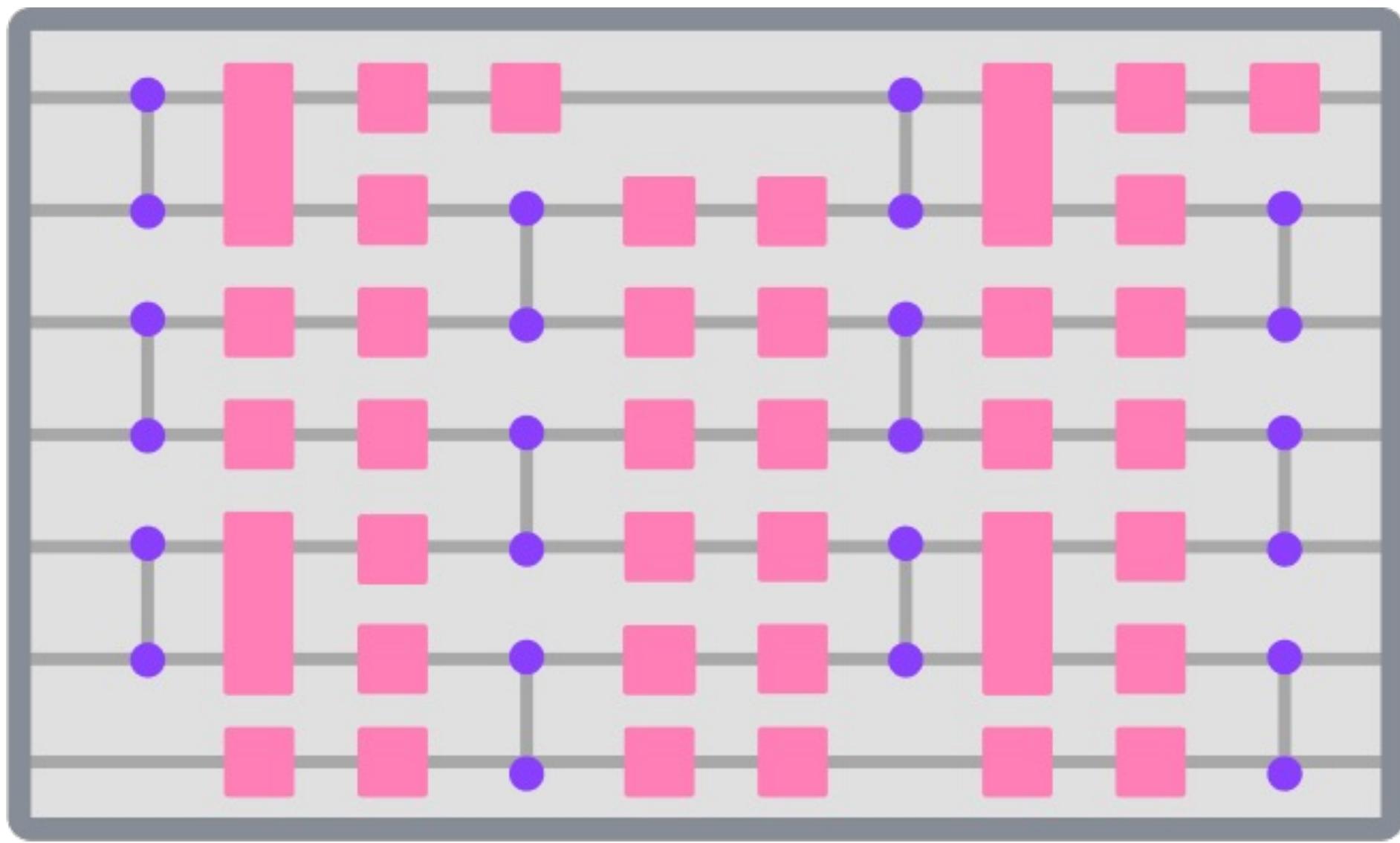


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IMPORTANT!

Please make sure and use [Google Chrome](#) for headache-free course access.

QUICKLINKS

Key Locations

[Discord Server](#)

[Lab Portal](#)

[Live starting July 19]

We appreciate your support in keeping this experience for registered attendees only, and welcome your feedback and suggestions for any improvement. Please do not share the lecture and lab materials outside the attendees of the Qiskit Global Summer School.

About The Summer School



The Qiskit Global Summer School is a two-week intensive summer program designed to empower the quantum researchers and developers of tomorrow with the know-how to explore the world of quantum computing, as well as refresh and sharpen the industry professional's skills. This year's *fifth-annual* summer school will prepare participants for the imminent era of quantum utility. Using hands on examples, the syllabi will guide students through areas of near-term practical importance.

Please read through this Attendee Guide to find answers about the structure, setup, agenda, and resources that accompany the Summer School. This is not a passive course - active participation is key to making it a success. Grab a notebook and a pen, and find your favorite chair. The Qiskit Global Summer School is just about here.

Resources



Pre-Requisites

Minimal prerequisites have been required for the Qiskit Global Summer School. To follow this year's course, you will need to understand the basics of quantum computing and be familiar with Qiskit. Below are necessary resources to prepare yourself for #QGSS24.

- Visit the [Qiskit Youtube Channel](#)
 - [Introduction to Qiskit](#)
 - [How to Install Qiskit](#)
 - [Hello World](#)
 - [Primitives](#)
- Learn the “Basics of Quantum Information” with John Watrous on the [Learning Platform](#)

Additional Resources

Suggested readings will be [provided in Discord](#) & more resources are available online at learning.quantum.ibm.com!

Lectures and Lab Creators

Our expert speakers from around the world include industry leading researchers and developers in Quantum Computing – representing the pioneering work of IBM and IBM Quantum.



Olivia Lanes
Global Lead, IBM Quantum
Advocacy and Education



John Watrous
Technical Director of Education,
IBM Quantum



Abby Mitchell
IBM Quantum Developer
Advocate



Kevin Sung
IBM Quantum Researcher
and Software Developer



Chris Wood
IBM Quantum Senior
Research Scientist



Matt Treinish
IBM Quanutm Open
Source Software Engineer



Kaelyn Ferris
IBM Quantum Researcher



Pedro Rivero
IBM Quantum Algorithm
Engineering Technical
Lead



Lectures and Lab Creators

Our expert speakers from around the world include industry leading researchers and developers in Quantum Computing – representing the pioneering work of IBM and IBM Quantum.



Antonio Córcoles

Head of Quantum + HPC,
Principal Research



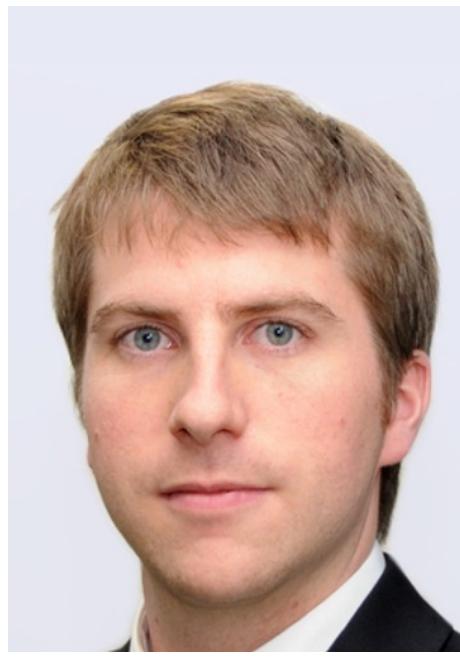
Sebastian Brandhofer

IBM Quantum Compiler Researcher



Samantha Barron

IBM Quantum Software
Developer



Daniel Egger

IBM Quantum Senior
Research Scientist



Meltem Tolunay

IBM Quantum Research
Staff Member



Mario Motta

IBM Quantum Senior
Research Scientist



Haimeng Zhang

IBM Quantum Algorithm
Engineer



Abdullah Ash Saki

IBM Quantum Enabling
Researcher



Qiskit Global Summer School 2024

Week 1 Schedule

JULY 15

Monday

9:00 AM EDT

Global Summer School
Welcome & Kickoff

11:00 AM EDT

Introduction to Qiskit
Speaker: Abby Mitchell

1:00 PM EDT

Introduction Qiskit Runtime
Primitives V2
Speaker: Chris Wood

3:00 PM EDT

Live Q&A Session with Abby
Mitchell and Chris Wood

JULY 16

Tuesday

11:00 AM EDT

Quantum Circuit
Compilation with Qiskit
Speaker: Matthew Treinish

1:00 PM EDT

Lab 1: Transpilation:
Generating Efficient
Hardware-Compliant
Quantum Circuits
Sebastian Brandhofer

3:00 PM EDT

Live Q&A Session with
Matthew Treinish

JULY 17

Wednesday

11:00 AM EDT

Hardware Noise: Modeling
and Characterization
Speaker: Haimeng Zhang

1:00 PM EDT

Live Q&A Session with
Haimeng Zhang

3:00 PM EDT

Lab 2: Hardware Noise
Samantha Barron

JULY 18

Thursday

11:00 AM EDT

Execution on Noisy
Quantum Hardware:
Fighting Errors Before Fault
Tolerance
Speaker: Pedro Rivera

1:00 PM EDT

Live Q&A Session with
Pedro Rivera

3:00 PM EDT

Lab 3: Execution on Noisy
Quantum Hardware via
Qiskit Runtime
Pedro Rivera

JULY 19

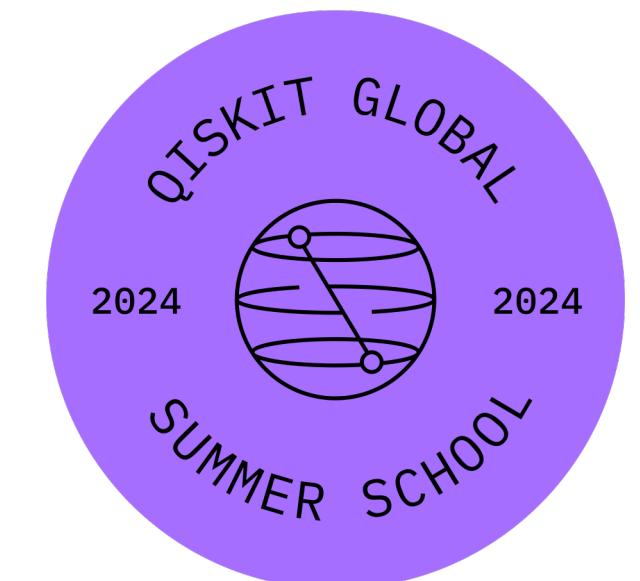
Friday

11:00 AM EDT

Circuit Cutting with
Antonio Córcoles

1:00 PM EDT

Live Q&A Session with
Antonio Córcoles



Qiskit Global Summer School 2024

Week 2 Schedule

JULY 22

Monday

11:00 AM EDT

Mapping Problems to
Qubits

Speaker: Kevin Sung

1:00 PM EDT

Live Q&A Session with
Kevin Sung

JULY 23

Tuesday

11:00 AM EDT

Quantum Combinatorial
Optimization

Speaker: Daniel Egger

1:00 PM EDT

TBD

JULY 24

Wednesday

11:00 AM EDT

Hamiltonian Dynamics:
Applications and
Simulation

Speaker: Mario Motta

1:00 PM EDT

Live Q&A Session with
Mario Motta

3:00 PM EDT

Lab 4: Simulating Nature
at Utility Scale
Kaelyn Ferris

JULY 25

Thursday

11:00 AM EDT

Quantum Machine
Learning

Speaker: Meltem Tolunay

1:00 PM EDT

Live Q&A Session with
Meltem Tolunay

JULY 26

Friday

11:00 AM EDT

Closing Ceremony/ Panel
Speakers: Various



Labs and Lectures



The school will include 10 in-depth lectures and 4 live graded laboratory exercises. There will be live Q&A sessions, and our team of quantum computing experts will provide hands-on mentorship throughout the school. **Participation and the completion of at least one lab are required to receive a certificate of participation from the Summer School**, with optional activities available to enhance your Summer School experience.

The schedule is not fixed, aside from final lab submission deadlines, and **all students can participate on the schedule that works best for them**.

Lectures and lab sessions will all be recorded and available for live participation and post viewing, as well as the daily Q&A sessions.

Students should anticipate a minimum time commitment of 25 hours for the full Summer School, but we recommend planning on 35 hours of participation, with additional time for discussion and collaboration with other students.

Lectures

- Live Q&A will be hosted each day following the lectures - questions can be asked live or [submitted on Discord](#)
- Be an active audience member - take notes along with the lecturers!

Labs

- [Lab portal](#) will be live by July 16th.
- Demonstrating lecture material with hands-on exercises on quantum programming using Qiskit
- Pre-recorded session is accompanied by problem set exercise

Lab Access & Information



Labs will be available in the IBM Quantum platform starting July 16.

Each lab is made up of multiple exercises, with an estimated time to complete of 1-3 hours per lab. Exploratory exercises are not graded, but all exercises count toward final completion.

To achieve a passing grade and acquire a badge of Quantum Excellence, you must complete **ALL four labs** and their respective exercises.

A screenshot of the IBM Quantum Challenges interface. At the top, it says "Qiskit Global Summer School 2024: The Path to Utility". Below that, it shows the challenge period: "Jul 15, 2024 at 9:00 AM (local) – Jul 26, 2024 at 11:59 PM (local)". A "Sign in to IBM Quantum using your IBMID" button is present. The main area features a dark-themed graphic with a trophy icon and a person interacting with a quantum circuit diagram. The text "IBM Quantum without verification" is overlaid at the bottom right.

Access & Verification

In order to access the channels in the discord, all students must select the “Join here” button in the [welcome channel on discord](#). This button will confirm your status as a student in the Summer School. As long as your IBM Quantum ID is the same email you registered with, you will have full access to the lab portal and all related Discord channels within 24 hours of confirming your status.

Make sure and log out of your account and re-login, refreshing your browser, once you are verified. This is a required final step in order to have access to lab exercises.

A screenshot of the IBM Quantum Challenges interface, similar to the one above but with a different URL. It shows "Qiskit Global Summer School 2024: The Path to Utility" and the challenge period. The "Progress" section indicates "0 of 4 completed". The "Your challenge stats" section says "Complete exercises to see your stats compared to other participants". Below, it lists "Lab 1", "Lab 2", "Lab 3", and "Lab 4", each with a progress bar. Lab 2 is highlighted with a blue dot. The text "Lab 2 Building Your Own Noise Model" is shown with a description of the lab's purpose. The text "IBM Quantum WITH verification" is overlaid at the bottom right.

Discord will be used for all Summer School event communications, updates, study groups, lab work, Q&A, and more.

Study Groups will form and collaborate in the text/video channel places, and mentors will be able to see active groups and join to provide lab guidance and support.

CORE Channels

#welcome

Get started here for first steps when you join the server.

#announcements

Follow this channel for all live announcements and updates.

#code-of-conduct

Review the IBM Quantum Community Code of Conduct and other guidelines - thank you for supporting an inclusive and welcoming community throughout the course!

ESSENTIAL Features

Create a ticket in #submit-a-ticket

Directly connect with our mentors and support for code of conduct violations.



As you join the Discord and Summer School...



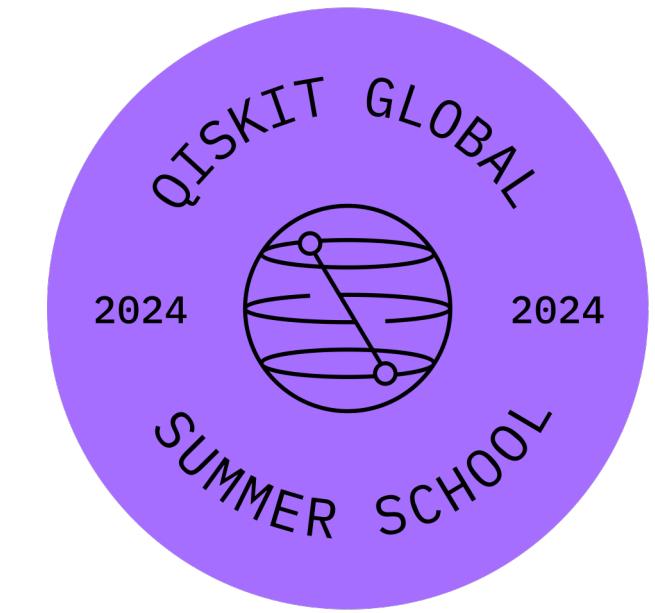
[Join Discord](#)

[Create IBM
Account](#)

[Verify
Yourself](#)

And that's it!!

Certificates and Badges



Lab work will be assigned throughout the Summer School as Jupyter notebook exercises. The notebooks must be completed and submitted following the Summer School **no later than Wednesday, July 31st (11:59 PM EDT)** with ALL four labs complete in order to receive a **badge of Quantum Excellence**.

IMPORTANT NOTE! You have the option to submit your notebook multiple times - only the highest score will contribute to your cumulative average.

Support & Collaboration

Channels will be available that will be filled with IBMers and mentors to answer questions throughout the weekdays of the Summer School course. Students are also strongly recommended to set up or join a “study group” to foster group-work and building connections throughout the school.

Labs will not be reviewed during the lecture(s), so take the time to sit down and review your work. For the best experience, work with your study group to view lab session content & application exercise.

Pass/ Fail Certification

You cannot reduce your score by submitting multiple times - only the highest score is kept. All lab work exercises must be completed and received no later than 11:59 PM EDT on Wednesday, July 31st.

Students must complete all four labs across notebook submissions to get the badge of Quantum Excellence.

IBM Quantum Community Code of Conduct



In our collective mission to continue to promote and encourage an inclusive and welcoming global quantum community, the IBM Quantum Community Code of Conduct is available for download and review [here](#).

We appreciate everyone's support in this mission and ask that any observed code of conduct violations or inappropriate behavior are reported [here](#).

[Read Code of Conduct]

Live Moderation & Incident Reporting

In Discord, you can also submit anonymous Code of Conduct violations or offensive/inappropriate content using this command in any channel:

[Create a ticket in #submit-a-ticket](#)

Will the lectures and labs be recorded? Is live-participation required?
Yes, all lectures, labs, and Q&As will be recorded! You can join live or watch the content on-demand.

Will the Summer School content be available later in the year?
As in past years, all Summer School content and materials will be re-packaged after the Summer School concludes.

How many students are in the Summer School?
There are just over 6,000 students registered for the 2024 Qiskit Global Summer School.

Can my friend/student/colleague be added to the Summer School or Discord?
No.

Can I download/share this content?
Not yet - the team will share all of this (and more!) as an update to the Qiskit Youtube channel later this year.

IMPORTANT !!
Please make sure and use [Google Chrome](#) for headache-free course access.

FAQS

We are here to help!
Please follow these
guidelines to ensure the
most timely and efficient
support, and don't hesitate
to ask any questions.

- Reach out in designated channel(s)
- Allow 1 business day for support
- Avoid multiple requests/spam
- Avoid Direct Message or emails
- Avoid submitting same request in multiple locations

Discord
[#general-support](#)

For any general support questions or support requests.

Email
Quantum.Events@us.ibm.com

Requests involving personal or sensitive information may have longer replay times.



Let's Get Started

1. Join Discord

2. Verify Yourself

3. Join Kick Off

