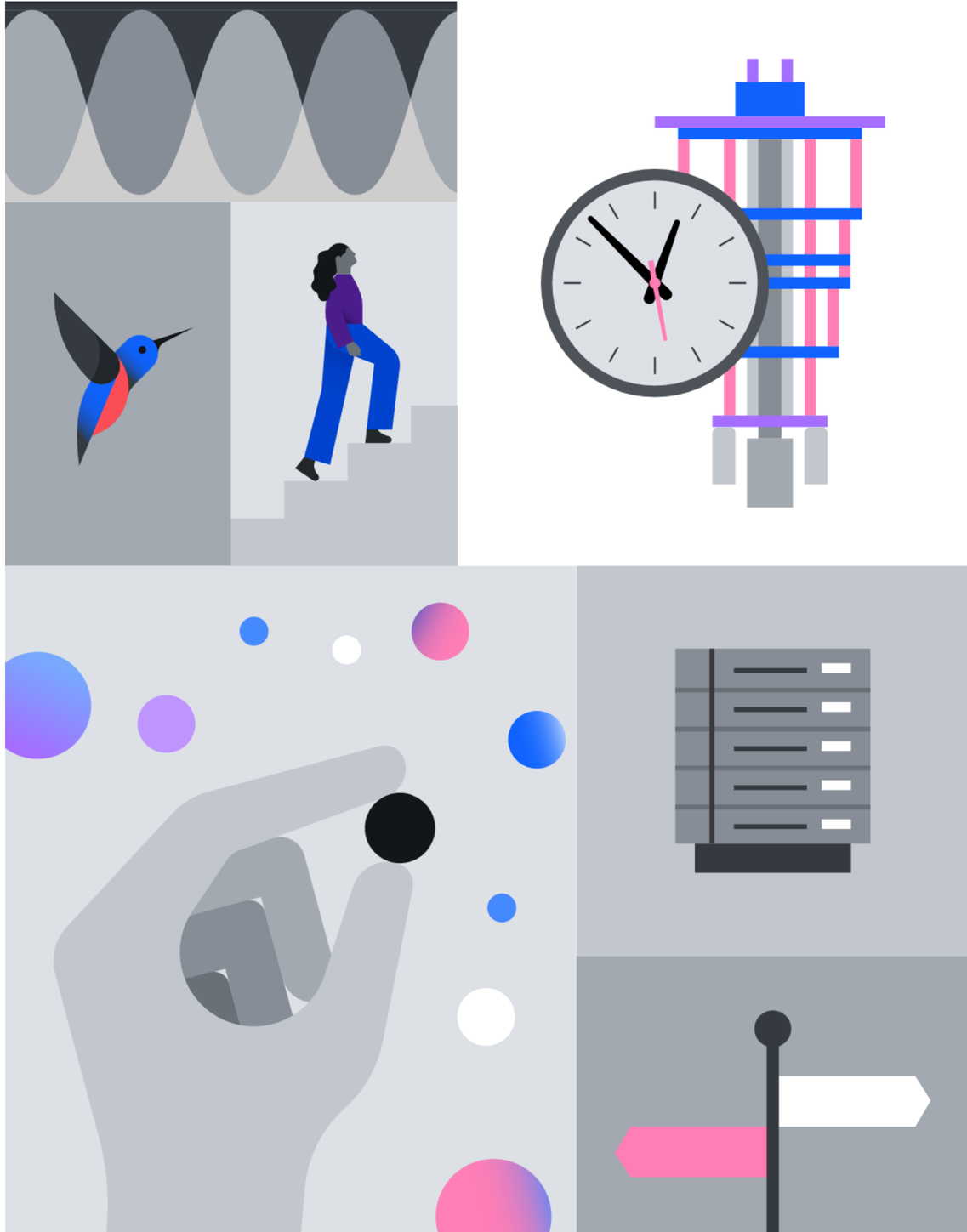
Qiskit Global Summer School 2025

The Past, Present, and Future of Quantum Computing

Attendee Guide

#QGSS25



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IMPORTANT!

Please make sure and use Google Chrome for headache-free course access.

QUICKLINKS

Key Locations

Discord Server

Labs

[Discord will be live on July 1st and Labs will be live starting July 7th]

We appreciate your support in keeping this experience for registered attendees only and welcome your feedback and suggestions for any improvements. Please do not share the lecture and lab materials outside 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, while also helping industry professionals refresh and sharpen their skills. This year's *sixth-annual* summer school celebrates the International Year of Quantum, inviting participants to explore the evolution of quantum technologies — from foundational concepts to recent breakthroughs — and we'll also offer a fascinating glimpse at the fast-approaching future of fault-tolerant quantum computing.

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 are 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 #QGSS25.

- Visit the Qiskit YouTube Channel
  - Introduction to Qiskit
  - How to Install Qiskit
  - Hello World
  - Primitives

Additional Resources

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

Qiskit Global Summer School 2025

Week 1 Schedule

JULY 7
Monday

8:00 AM ET
QGSS Welcome!

8:30 AM ET
Foundations of Quantum Mechanics
Speaker: Olivia Lanes

10:00 AM ET
Live Q&A with Olivia Lanes

12:00 PM ET
Lab 1: Recreating Famous Experiments at Home with James Weaver & Sophy Shin

JULY 8
Tuesday

8:00 AM ET
Introduction to Quantum Simulation
Speaker: Kaelyn Ferris

10:00 AM ET
Live Q&A with Kaelyn Ferris

12:00 PM ET
Feynman's Dream: Simulating Nature with Quantum Machines
Speaker: John Preskill (Caltech)

JULY 9
Wednesday

8:00 AM ET
Foundational Quantum Algorithms Part I
Speaker: John Watrous

10:00 AM ET
Foundational Quantum Algorithms Part II
Speaker: John Watrous

12:00 PM ET
Live Q&A with Christopher Porter

JULY 10
Thursday

8:00 AM ET
The Evolution and Future of IBM Quantum Hardware
Speaker: Holger Haas

10:00 AM ET
Live Q&A with Holger Haas

12:00 PM ET
The Physical Realization of Qubits
Speaker: David DiVincenzo (RWTH Aachen)

2:00 PM ET
Lab 2: Cutting Through the Noise with Alberto Maldonado Romo & Jorge Martinez

JULY 11
Friday

8:00 AM ET
Practical Quantum Algorithms
Speaker: Joana Fraxanet Morales

9:30 AM ET
Practical Quantum Techniques
Speaker: Joana Fraxanet Morales

11:00 AM ET
Live Q&A with Joana Fraxanet Morales

12:00 PM ET
Quantum Computers on the Cloud
Speaker: Jerry Chow (IBM Quantum)

Qiskit Global Summer School 2025

Week 2 Schedule

JULY 14
Monday

8:00 AM ET
Quantum Benchmarking
Speaker: Andre He & Majo Lozano

10:00 AM ET
Low-overhead Error Detection with Spacetime Codes
Speaker: Ali Javadi

12:00 PM ET
Live Q&A with Andre He, Majo Lozano, & Ali Javadi

JULY 15
Tuesday

8:00 AM ET
Accurate Quantum Computing in the Utility Era
Speaker: Abhinav Kandala

10:00 AM ET
A Deep Dive into Sample-Based Quantum Diagonalization Methods
Speaker: Javier Robledo Moreno

12:00 PM ET
Live Q&A with Abhinav Kandala & Javier Robledo Moreno

2:00 PM ET
Lab 3: Creating Good Results Together with Yuri Kobayashi & Kifumi Numata

JULY 16
Wednesday

8:00 AM ET
The History of Quantum Error Correction
Speaker: Barbara Terhal (TU Delft)

10:00 AM ET
Basics of Quantum Error Correction Part I
Speaker: John Watrous

12:00 PM ET
Basics of Quantum Error Correction Part II
Speaker: John Watrous

2:00 PM ET
Live Q&A with Andrew Cross

JULY 17
Thursday

8:00 AM ET
Towards Fault-tolerant Quantum Computing with IBM qLDPC Codes
Speaker: Patrick Rall

10:00 AM ET
Live Q&A with Patrick Rall

12:00 PM ET
PANEL: Careers in Quantum
moderated by Sanskriti Deva

2:00 PM ET
Lab 4: Toward Fault-Tolerance with Sophy Shin, Tomas Jochym-O'Connor, & Sebastian Brandhofer

JULY 18
Friday

10:00 AM ET
PANEL: The Future of Quantum Computing
moderated by Olivia Lanes

Lecturers

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
IBM Quantum

Javier Robledo Moreno
Research Scientist

Joana Fraxanet Morales
Quantum Algorithm Engineer

Holger Haas
Staff Research Scientist

Andre He
Quantum Hardware Developer

Majo Lozano
Quantum Hardware Engineer

Patrick Rall
Research Scientist

Kaelyn Ferris
IBM Quantum Researcher

Abhinav Kandala
Manager, Quantum Capabilities and Demonstration

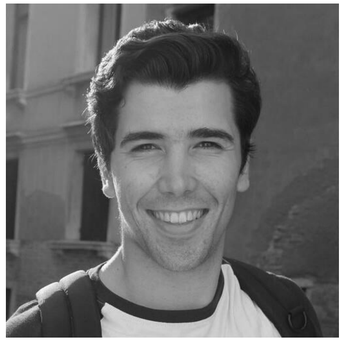
Ali Javadi
Principal Research Scientist

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.

Yuri Kobayashi
Asia Pacific Lead, IBM Quantum Workforce & Education

Sophy Shin
Quantum Strategist, Workforce & Education



Jorge Martinez
EMEA Workforce & Education Intern

Alberto Maldonado Romo
Quantum Computational Scientist

Kifumi Numata
Japan Workforce & Education Lead

James Weaver
Quantum Developer Advocate

Tomas Jochym-O'Connor
Research Staff Member, Quantum Computing

Sebastian Brandhofer
Quantum Compiler Researcher

Panelists

Our expert speakers from around the world include industry leading researchers and developers in Quantum Computing. You'll hear from them in our *Careers in Quantum* and *The Future of Quantum Computing* panels.

Chiara Decaroli
Oxford Ionics

Farai Mazhandu
Africa Quantum Consortium

Sanskriti Deva
IBM Quantum

Dorit Aharonov
QEDMA

Celia Merzbacher
SRI International

Sarah Sheldon
IBM Quantum

Travis Humble
Oak Ridge National Laboratory

Distinguished Speakers

This year's program will feature four distinguished speakers sharing their insights on a variety of quantum computing topics. We are so excited to welcome them to the Qiskit Global Summer School!

John Preskill
Richard P. Feynman Professor of Theoretical Physics & Director of the Institute for Quantum Information and Matter at Caltech

David DiVincenzo
Professor of Theoretical Physics and Director of the Institute for Theoretical Nanoelectronics

Barbara Terhal
Professor in the Department of Electrical Engineering, Mathematics, and Computer Science (EEMCS) at Delft University of Technology (TU Delft & Staff member at QuTech)

Jerry Chow
IBM Fellow and Director of Quantum Systems at IBM Quantum

Programming

The program will include 18 in-depth lectures, 2 panel discussions, and 4 core graded laboratory exercises. As part of this special edition for the International Year of Quantum, we are also offering 4 community labs, as well as 8 functions labs (premium clients of the IBM Quantum Network only).

The schedule is not fixed, aside from final lab submission deadlines, and **all students can participate on the timeline that works best for them**. Sessions will all be recorded and available for live participation and post viewing.

Students should anticipate a minimum time commitment of 35 hours for the full Summer School, but we recommend planning on 45 hours of participation, allowing for additional time for discussion and collaboration with other students.

Lectures & Panels

- Live Q&A will be hosted following the lectures - questions can be asked live in the chat for each session
- Be an active audience member - take notes!

Labs

- Labs will be available starting July 7th
- Lab 0 will be available on Discord the week prior, to help you set up for subsequent exercises
- Labs will demonstrate lecture material with hands-on exercises on quantum programming using Qiskit

Lab Access & Information

Labs will be available here starting July 7th.

Labs will demonstrate lecture material with hands-on exercises on quantum programming using Qiskit, with an estimated time to complete of 1-3 hours per lab. Exploratory exercises are not graded, but all exercises count toward final completion.

Participation and the completion of at least one CORE lab are required to receive a **certificate of participation** from the Summer School. To achieve a passing grade and acquire a **badge of Quantum Excellence**, you must complete **ALL four core labs** and their respective exercises.

IBM Quantum Account

We will be using the upgraded IBM Quantum Platform on IBM Cloud for grading and submission of lab exercises. If you haven't yet migrated, please follow this migration guide to register an account on the new platform.

For QGSS, please create an instance using the Open Plan, which includes 10 minutes of free QPU time per month.

Note: Creating a new account currently requires a credit card for verification purposes. However, to avoid any charges while participating in QGSS, be sure to select the Open Plan, which offers limited free usage. QPU-based exercises are optional — completing them is not required to finish the labs or earn the QGSS badge.

We are actively working on launching a 30-day free trial that will not require a credit card. More information will be shared during the week of July 1st. Please check this page for updates — you'll also receive an email notification once the new registration option is available.

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

In order to access the channels in the Discord, all students must select the “Join here” button in the welcome channel. This button will confirm your status as a student in the Summer School.

Study Groups will form and collaborate in the text and video channels, and mentors will be able to see active groups to 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 at
ibm.biz/QGSS25-Support

Directly connect with us for troubleshooting and support for code of conduct violations.

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 23rd (12:00 PM EDT)**

You must complete at least one core lab to receive a Certificate of Participation.
ALL four core labs must be completed 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 filled with IBMers to help answer questions throughout the weekdays of the Summer School course. Students are also strongly encouraged to set up or join a “study group” to foster group-work and build connections throughout the program.

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 and application exercise.

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

On Discord, you can also report anonymous Code of Conduct violations or offensive/inappropriate content by creating a ticket at **ibm.biz/QGSS25-Support**

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

How many students are in the Qiskit Global Summer School?
There are about 8,000 students registered for the 2025 Summer School.

Can my friend/student/colleague be added to the Summer School or Discord?
No, unfortunately the event is at capacity, but all materials will be shared following the conclusion of the event.

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.

For more and up-to-date FAQs, particularly around technical access and the cloud migration please click here.

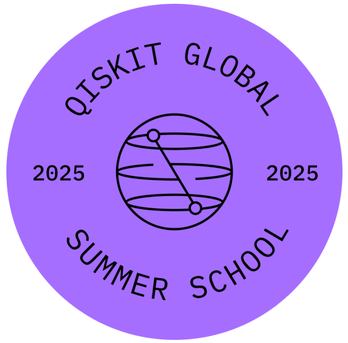
FAQs

IMPORTANT !!

Please make sure to use Google Chrome for headache-free course access.

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.



Guidelines

- Reach out in designated channel(s)
- Allow 1-2 business days for support
- Avoid multiple requests/spam
- Avoid direct messages 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 reply times.

Get Started!

1. Read Attendee Guide
2. Review Pre-Requisites
3. Access IBM Quantum
   - Follow instructions
4. Join Discord
   - Follow instructions