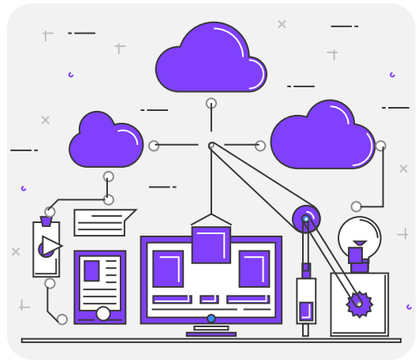
QISKIT GLOBAL SUMMER SCHOOL

JULY 20 - 31

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



Welcome to the first-ever Qiskit Global Summer School hosted by IBM Quantum. We are excited to have you join us for a 2-week dive into quantum computing through daily lectures and lab sessions, as well as a vibrant community set up for you to meet other students and collaborate together to solve problems. Through education and open science, we aim to build and shape a diverse, equitable, and inclusive quantum workforce. We're thrilled to have you join us on this journey.

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 class - whether you're in lectures only, or also participating in the lab sessions, we need your engagement to make it a success. Grab a notebook and a pen, and find your favorite chair. The Qiskit Global Summer School is just about here.

INDEX

LINKS

Join the the Discord Server

Read the Textbook

Share the Website

Follow Qiskit on Twitter

SUMMER SCHOOL SYLLABUS

July, 20 Monday

WELCOME & OPENING REMARKS
Presenter: Scott Crowder, Liz Durst

QUBITS & QUANTUM STATES, CIRCUITS, MEASUREMENTS
Lecturer: Elisa Baumer

ASSOCIATED TEXTBOOK READING
Sections 1.1 - 3.2

Afternoon Lab Lead: Abe Asfaw

July, 21 Tuesday

WRITING & RUNNING QUANTUM
Programs with Textbook Quantum Algorithms
Lecturer: Elisa Baumer

ASSOCIATED TEXTBOOK READING
Sections 3.4-3.6, 3.10

Afternoon Lab Lead: Abe Asfaw

July, 22 Wednesday

SHOR'S ALGORITHM I
The Quantum Fourier Transform and Quantum Phase Estimation
Lecturer:Abe Asfaw

ASSOCIATED TEXTBOOK READING
Sections 3.7-3.8

Afternoon Lab Lead: Abe Asfaw

July, 23 Thursday

SHOR'S ALGORITHM II
Going From Factoring to Period-finding and Writing the Program
Lecturer:Abe Asfaw

ASSOCIATED TEXTBOOK READING
Section 3.9

Afternoon Lab Lead: Abe Asfaw

July, 24 Friday

QUANTUM ERROR CORRECTION
via Repetition Codes
Lecturer: James Wootton

ASSOCIATED TEXTBOOK READING
Section 5.1

Afternoon Lab Lead: James Wootton

July, 27 Monday

SUPERCONDUCTING QUBITS I
Quantizing a Harmonic Oscillator, Josephson Junctions
Lecturer: Zlatko Minev

ASSOCIATED TEXTBOOK READING:
Sections 6.3

Afternoon Lab Lead: Nick Bronn

July, 28 Tuesday

SUPERCONDUCTING QUBITS II
Readout and Circuit QED, Calibrating a Qubit Frequency and Readout
Lecturer: Zlatko Minev

ASSOCIATED TEXTBOOK READING:
Sections 6.1, 6.4

Afternoon Lab Lead: Nick Bronn

July, 29 Wednesday

QUANTUM CHEMISTRY I
Going from Problem Description to Qubit Hamiltonian for H_2 and LiH
Lecturer: Antonio Mezzacapo

ASSOCIATE TEXTBOOK READING:
Section 4.1.2 + additional reading

Afternoon Lab Lead: Antonio Mezzacapo

July, 30 Thursday

QUANTUM CHEMISTRY II
Solving qubit Hamiltonian for H_2 and LiH using VQE
Lecturer: Abhinav Kandala

ASSOCIATE TEXTBOOK READING:
Section 4.1.2 + additional reading

Afternoon Lab Lead: Abhinav Kandala

CAREER PANEL JULY 31

Join us for an exciting Career Panel session with industry-leading speakers and their insights on how to start your career in quantum.

ABOUT LECTURES

Duration: 3 hours (with breaks)
Curriculum starts with quantum fundamentals and leads all the way to quantum chemistry
Q&A available during lecture (use the question feature on Crowdcast!)
Be an active audience member - take notes along with the lecturers!

THE FUN DOESN'T END WITH THE SUMMER SCHOOL...

AUGUST 5, 2020

QISKIT SUMMER SCHOOL FINAL PROJECT! *(OPTIONAL)*

Now that you know about quantum.... What's next? What can you do with it? Level up summer school learnings and recent education with the Final Project. Develop an expanded quantum understanding by working on a unique challenge with the insights from your teammates and recent learnings to guide you along the way.

AUGUST 15, 2020

APPLY TO BECOME A QISKIT ADVOCATE!

The Qiskit community is comprised of some of the best minds in all of quantum. There's even a program, the Qiskit Advocates, for top-notch contributors and members to apply and join. Qualified people must pass a test showing their knowledge, and also link to different ways they've contributed to the community at large. Learn more about the program from Junye Huang's blog post here.

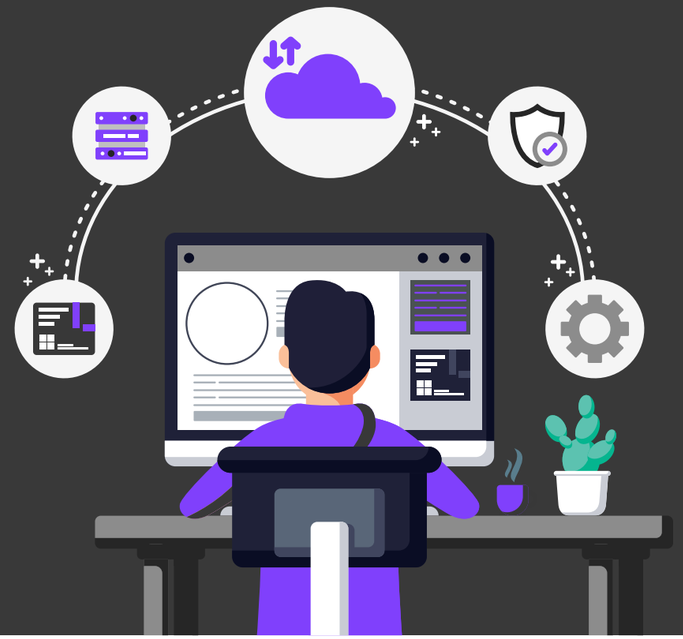
ABOUT DISCORD

Discord will be used for all Qiskit Global Summer School event communications, updates, study groups, lab work, Q&A, and more. Students will be able to "raise their hand" to get support - notifying mentors directly!

GET SET UP IN THREE EASY STEPS!

1. Download Discord and Join the Summer School Server
2. Catch up on #Announcements, try out commands in #Sandbox, and review important information in #Welcome!
3. Have Fun! Learn lots! Qiskit on!

RESOURCES



QISKIT INTERACTIVE TEXTBOOK

[For supplemental information, guidance, and exercises]

Whether you are learning, teaching, or contributing - the Qiskit Textbook is an incredible resource available to all. Check out some of the exercises and advanced lessons to level up your own skills before (and during!) the Summer School!

1 Learn About & Install Qiskit

Keep on learning about Qiskit and install before the Summer School. From high-level technical learnings to exciting connections in the community!

Tip!

Use the YouTube tutorial for install help - or check out this documentation!

2 Qiskit Slack Community

Become a part of the connected and ever-growing community of Qiskitters on Slack.

3 IBM Quantum Experience

Create your IBM ID and have full access to learn, develop, and run quantum programs on real quantum computers via this cloud platform.

Tip!

Check out the IBM Quantum Experience beginners guide to get started!

4 Learn at Khan Academy

The prerequireisties for the summer school are Basic Probability, Matrix Multiplication, and Python. You can find helpful materials covering all of these in the Khan Academy.

WHAT TO EXPECT IN A VIRTUAL EVENT

NAVIGATE THIS VIRTUAL EVENT TO YOUR MAXIMUM ADVANTAGE

AS EASY AS 1, 2, 3...

1 **Enter the event with a positive attitude!** Have your own goals, and don't let a webcam slow you down from reaching them. Our top recommendations are to get comfortable using your webcam, and to not be shy raising your hand to ask (or answer) questions

2 Seems simple enough, but it's worth a quick reminder: **update your software and check your connections.** Is your mic connected? Are your permissions up to date? Do a quick test run with a friend to make sure you are all set and ready to go when the event starts!

3 **Don't get overwhelmed, and enjoy yourself!** You are here to share an experience with others, and we all want to make it as enjoyable and educational as possible. The Summer School community will be with you every step of the way; watch your friends and colleagues unwind and get to know each other.

SELF CARE TIPS
IN A VIRTUAL WORLD

It can be easy to lose track of screentime - even in an event, take care of you!

TIPS & TRICKS:
FOR THOSE AT HOME

Whether participating in an event or simply working from home - some tips!

CODE OF CONDUCT

Make sure and review and be familiar with the official !CodeofConduct

ANY QUESTIONS?

LET US KNOW!

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