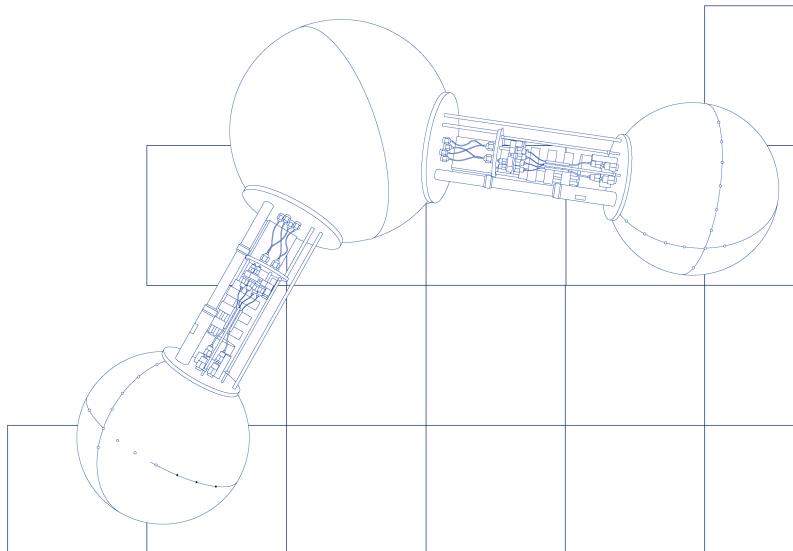


# Attendee Guide

Summer School 2022: Quantum Simulations

July 18 – July 29

#QGSS2022



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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 18]

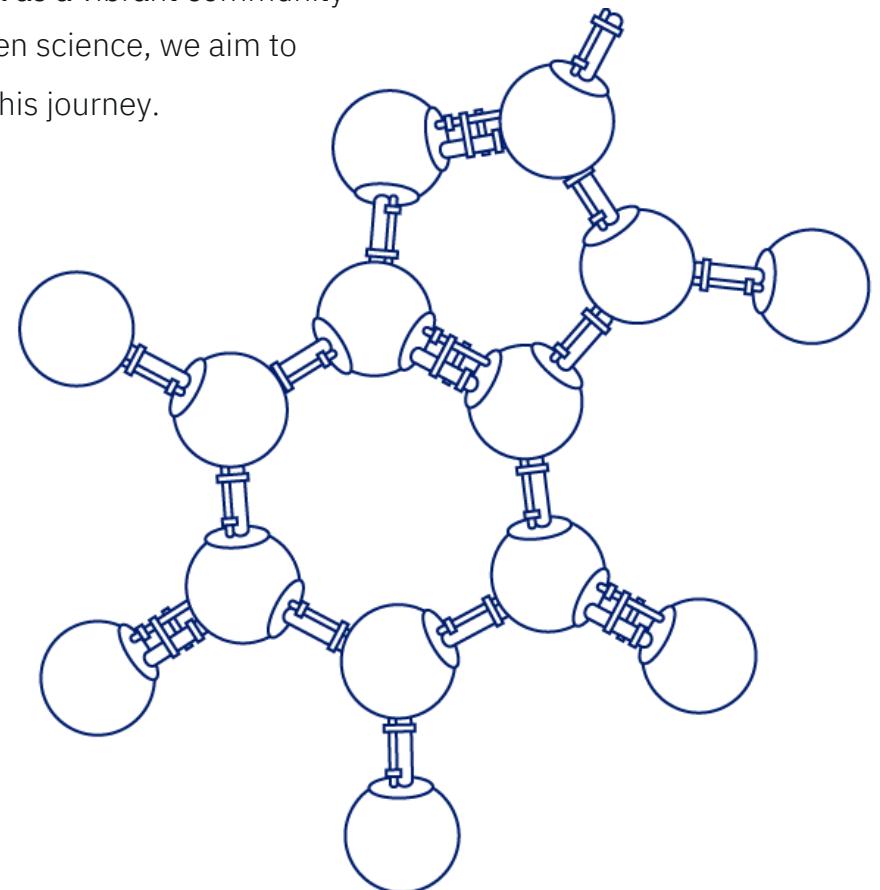
[Verification Form](#)

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

Welcome to the third-annual Qiskit Global Summer School hosted by IBM Quantum, focused on Quantum Simulations. 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 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.



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.

# Students from around the world

With 5,000 students registered, the 2022 Summer School showcases the global reach and engagement of students and industry professionals around the world – putting the GLOBAL in Global Summer School



## Over 100 Countries Represented

- 72%  
First time participating in a QGSS
- 69%  
Current Students
- 19%  
Industry Professionals
- 53%  
Little to no knowledge of Qiskit

# Resources

## Pre-Requisites

Minimal prerequisites are required for the Qiskit Global Summer School. If you know how to multiply two matrices, and have some programming experience in Python, you are ready for the Summer School.

You can brush up on Python programming, before attending the lectures by using the Qiskit Textbook. To make the most out of these lectures, you may also consider looking through additional resources in the [Qiskit Global Summer School Syllabus](#).

[\[ Qiskit Global Summer School Syllabus \]](#)

## Additional Resources

Suggested readings will be [provided in Discord](#) & more resources are available online at [qiskit.org/learn!](#)

## Quantum Computing

[\[ Read Textbook \]](#)

**Quantum Computing for the Quantum Curious**  
by Hughes C et al

[\[ Read Textbook \]](#)

**Learn Quantum Computing Using Qiskit**  
by IBM Quantum

[\[ Join Course \]](#)

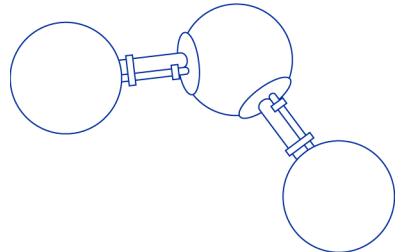
**Introduction to Quantum Computing**  
by IBM Quantum

[\[ Buy Textbook \]](#)

**Quantum Computation and Quantum Information**  
by Nielsen & Chuang

# 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

**North American Lead, Qiskit &  
IBM Quantum Community**



Maria Violaris

**IBM Quantum Advocate Intern**



Jeffrey Cohn

**IBM Quantum Researcher**

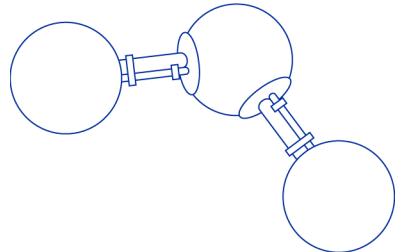


Zlatko Minev

**IBM Quantum Physicist**

# 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.



**Yukio Kawashima**  
**IBM Quantum Researcher**



**Ieva Liepuoniute**  
**IBM Quantum Researcher**



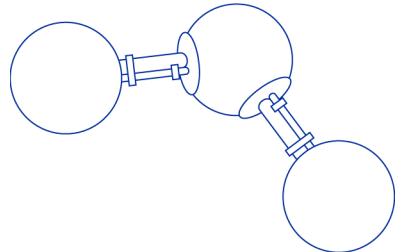
**Alexander Miessen**  
**IBM Quantum Researcher**



**Panos Barkoutsos**  
**Pasqal**

# 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.



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Marcel Pfaffhauser

**Workforce Development  
Advocate and Educator,  
IBM Quantum**



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Mirko Amico

**Software Developer,  
Qiskit Research**



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Alexander Rasmusson

**Quantum Community  
Advocate Intern**

# Week 1 Schedule

**July 18**

Monday

**9:00 AM EDT**

Global Summer School  
Welcome & Kickoff

**11:00 AM EDT**

History of Quantum Computing  
and Motivation for Quantum  
Simulation - Part 1  
*Speaker: Olivia Lanes*

**1:00 PM EDT**

History of Quantum Computing  
and Motivation for Quantum  
Simulation - Part 2  
*Speaker: Olivia Lanes*

**3:00 PM EDT**

Live Q&A Session with  
Olivia Lanes

**JULY 19**

Tuesday

**9:00 AM EDT**

Introduction to Linear Algebra,  
Prerequisite Mathematics, and  
Circuit Composition - Part 1  
*Speaker: Maria Violaris*

**11:00 AM EDT**

Introduction to Linear Algebra,  
Prerequisite Mathematics, and  
Circuit Composition – Part2  
*Speaker: Maria Violaris*

**1:00 PM EDT**

Live Q&A Session with  
Maria Violaris

**3:00 PM EDT**

Lab 1: Introduction to Circuit  
Composition and Cost  
*Marcel Pfaffhauser*

**JULY 20**

Wednesday

**9:00 AM EDT**

Hamiltonian Time Evolution -  
Part 1  
*Speaker: Maria Violaris*

**11:00 AM EDT**

Hamiltonian Time Evolution -  
Part 2  
*Speaker: Maria Violaris*

**1:00 PM EDT**

Live Q&A Session with  
Maria Violaris

**3:00 PM EDT**

**JULY 21**

Thursday

**9:00 AM EDT**

Simulation Problems - Part 1  
*Speaker: Jeffrey Cohn*

**11:00 AM EDT**

Simulation Problems - Part 2  
*Speaker: Jeffrey Cohn*

**1:00 PM EDT**

Live Q&A Session with  
Jeffrey Cohn

**3:00 PM EDT**

Lab 2: Advanced Circuits  
*Mirko Amico*

**JULY 22**

Friday

**9:00 AM EDT**

Noisy Real Hardware - Noise in  
Quantum Computers - Part 1  
*Speaker: Zlatko Minev*

**10:45 AM EDT**

Noisy Real Hardware - Noise in  
Quantum Computers - Part 2  
*Speaker: Zlatko Minev*

**12:30 PM EDT**

Noisy Real Hardware - Noise in  
Quantum Computers - Part 3  
*Speaker: Zlatko Minev*

**2:00 PM EDT**

Live Q&A Session with  
Zlatko Minev

# Qiskit | Global Summer School 2022

JULY 25

Monday

**9:00 AM EDT**

Broad Overview of Quantum Chemistry Simulation and Why it is a Challenge - Part 1  
*Speaker: Panos Barkoutsos*

**11:00 AM EDT**

Broad Overview of Quantum Chemistry Simulation and Why it is a Challenge - Part 2  
*Speaker: Panos Barkoutsos*

**1:00 PM EDT**

Get more involved in the Community with Abby Mitchell

**3:00 PM EDT**

Lab 3: Quantum Noise  
Mirko Amico

JULY 26

Tuesday

**9:00 AM EDT**

Methods for Quantum Simulation - Part 1  
*Speaker: Yukio Kawashima*

**11:00 AM EDT**

Methods for Quantum Simulation - Part 2  
*Speaker: Yukio Kawashima*

**1:00 PM EDT**

Live Q&A Session with Yukio Kawashima

JULY 27

Wednesday

**9:00 AM EDT**

Quantum Static Simulation  
*Speaker: Ieva Liepuoniute*

**11:00 AM EDT**

Live Q&A Session with Pauline Ollitrault

**1:00 PM EDT**

Lab 4: Simulate a Quantum Spin-1/2 Model with Alexander Rasmusson

JULY 28

Thursday

**9:00 AM EDT**

Quantum Dynamics - Part 1  
*Speaker: Alexander Miessen*

**10:45 AM EDT**

Quantum Dynamics - Part 2  
*Speaker: Alexander Miessen*

**12:30 PM EDT**

Quantum Dynamics - Part 3  
*Speaker: Alexander Miessen*

**2:00 PM EDT**

Q&A Session with Alexander Miessen

## Week 2 Schedule

# Labs & Lectures

The summer school is made up of a total of 19 lectures, 4 lab sessions & application exercises, in addition to the daily Live Q&A Sessions.

**Participation and completion of all labs and lectures are required in order to receive a certificate of completion from the Summer School,** with the 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.

## Lectures

- Live Q&A will be hosted each day following the multi-part lecture - 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 on July 18<sup>th</sup>.
- 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 18.

Each lab is made up of multiple exercises, with an estimated time to complete ranging from 30 minutes to a few hours, depending on your background and grasp of the material. Exploratory exercises are not graded, but all others count towards your final grade.

To achieve a passing grade, **a minimum score of 75% or more is required** (27/35 total exercises).

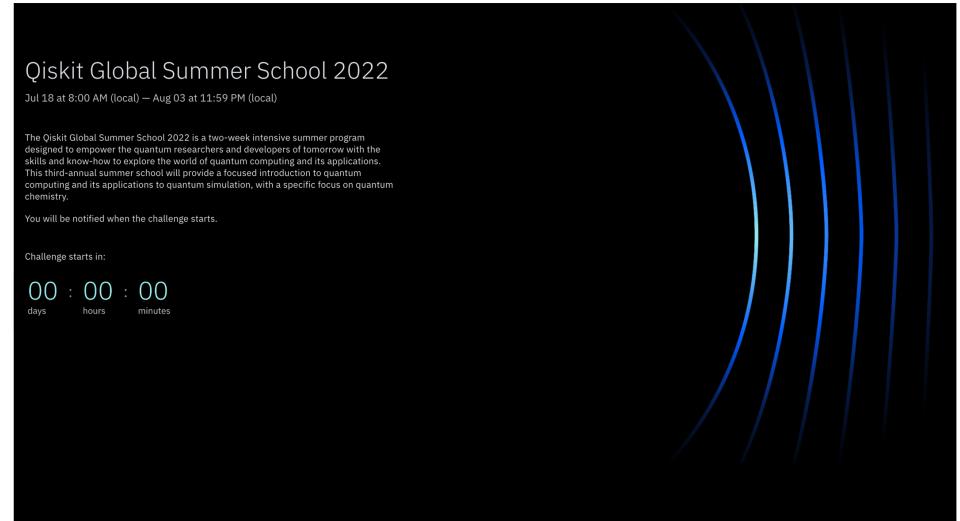
## Access & Verification

In order to access the labs, [all students must complete this verification form](#). This form will also confirm your status as a student in the Summer School.

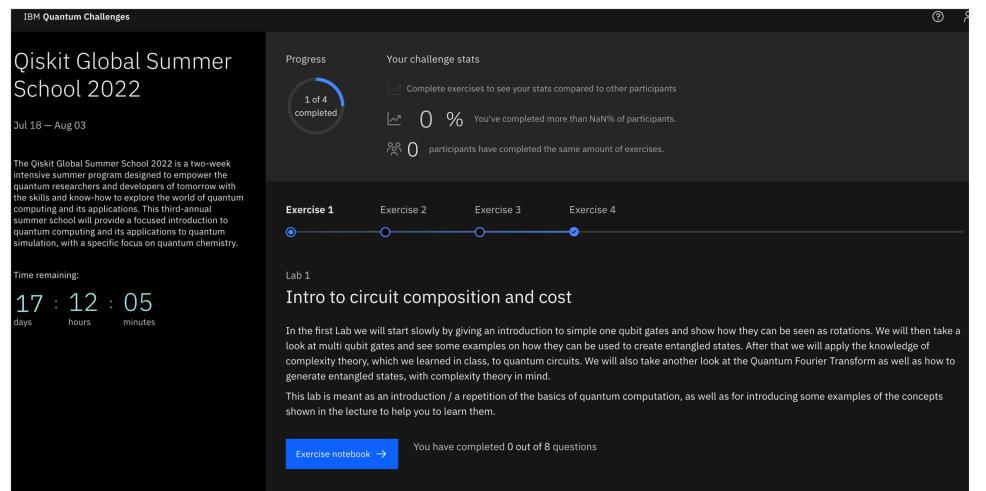
For your IBM Quantum Account, **you must use the same email address** you registered with on Eventbrite for the QGSS22. If this email address is not registered as your IBM Quantum Account, please visit here to register this email as your [IBM Quantum account](#). (*If you skip this step, it will result in delays in your verification process.*)

On July 18th, you will have full access to the lab portal and all related Discord channels.

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.



IBM Quantum without verification



IBM Quantum WITH verification

# As you join the Discord and Summer School...

Everyone will need to complete a quick verification step prior to getting full access to the Summer School Discord and lab exercises. It just takes three simple steps, and a dash of patience!

STEP 1

[\[ Join Discord \]](#)

STEP 2

[\[ Use your Eventbrite Email for IBM Quantum \]](#)

STEP 3

[\[ Submit Verification \]](#)

## And that's it!!!

Verification may take up to 24-48 hours – make sure and submit your information immediately upon joining the Discord server! Let us know in [#verification-support](#) if you run into any issues or require support.

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 channels, where mentors will be able to see active groups to join to provide lab guidance and support. Students will be able to use the **!raisehand** command to tag mentors directly!

## CORE Channels

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

**#announcements**  
Follow this channel for all live announcements and updates.

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

## ESSENTIAL Commands

**!schedule**  
Get the schedule for the course.

**!gethelp**  
Get helpful tips for when you need help but aren't sure where to go.

**!raisehand**  
Let our mentors and support know directly for insights in ongoing conversations.

**!channels**  
Get a list of easily-linked server channels and resources.

# Certificates

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, August 3<sup>rd</sup> (11:59 PM EDT)** with a **cumulative average score of 75% or higher** in order to receive a certificate.

**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 like [#general-discussion](#) & [#lab-1](#) (*will open once lab 1 is live*) 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, August 3rd.

**Students must achieve cumulative/average 75% across notebook submissions to get a certificate.**

# 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 (we recommend #sandbox!):

### **/report [message]**

This will send a report to the admins. It will also display a confirmation message that the report was sent which will be visible only to you.

Make sure to include a link to the reported message (Select the message you are reporting and "Copy Message Link" for admins to review.

# FAQ

## 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 and provided as a textbook module in the Qiskit Textbook to use in classrooms even after the Summer School concludes.

## How many students are in the Summer School?

There are 5k students at the Qiskit Global Summer School.

## Can my friend/student/colleague be added to the Summer School or Discord?

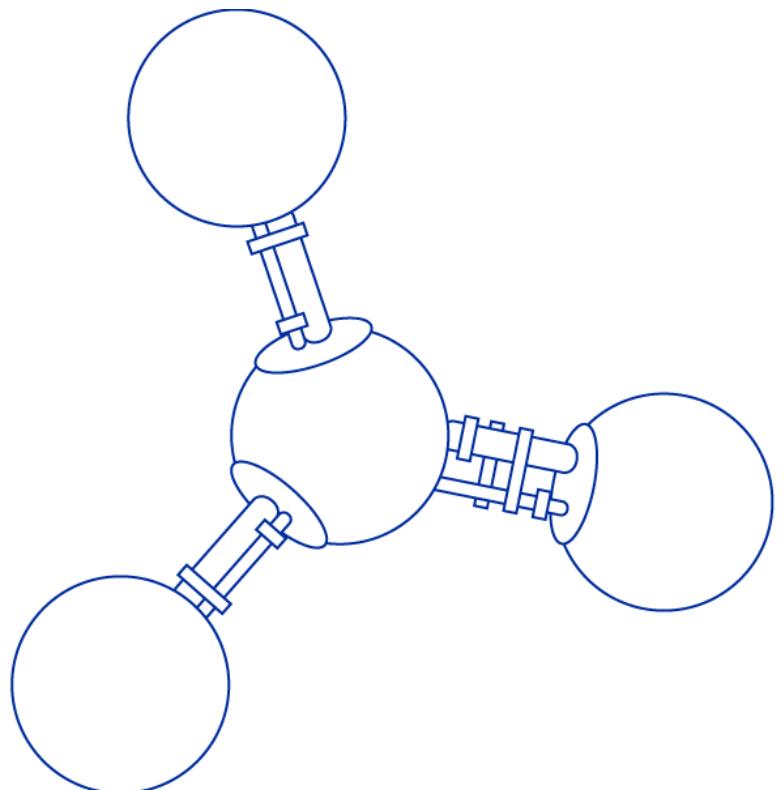
No.

## Can I download/share this content?

Not yet - the team will share all of this (and more!) as an update to the Qiskit Textbook later this year.

# IMPORTANT!

Please make sure and 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!

- 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.

E-mail

[qiskit.events@us.ibm.com](mailto:qiskit.events@us.ibm.com)

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

# Let's Get Started!

1

[Join the Discord](#)

2

[Verify Yourself](#)

3

[Join Kickoff](#)