

# Qiskit Hackathon at World of Quantum

April 26 - 27



## Attendee Guide

Sponsored By

IBM Quantum



SPONSORED BY THE



Federal Ministry  
of Education  
and Research



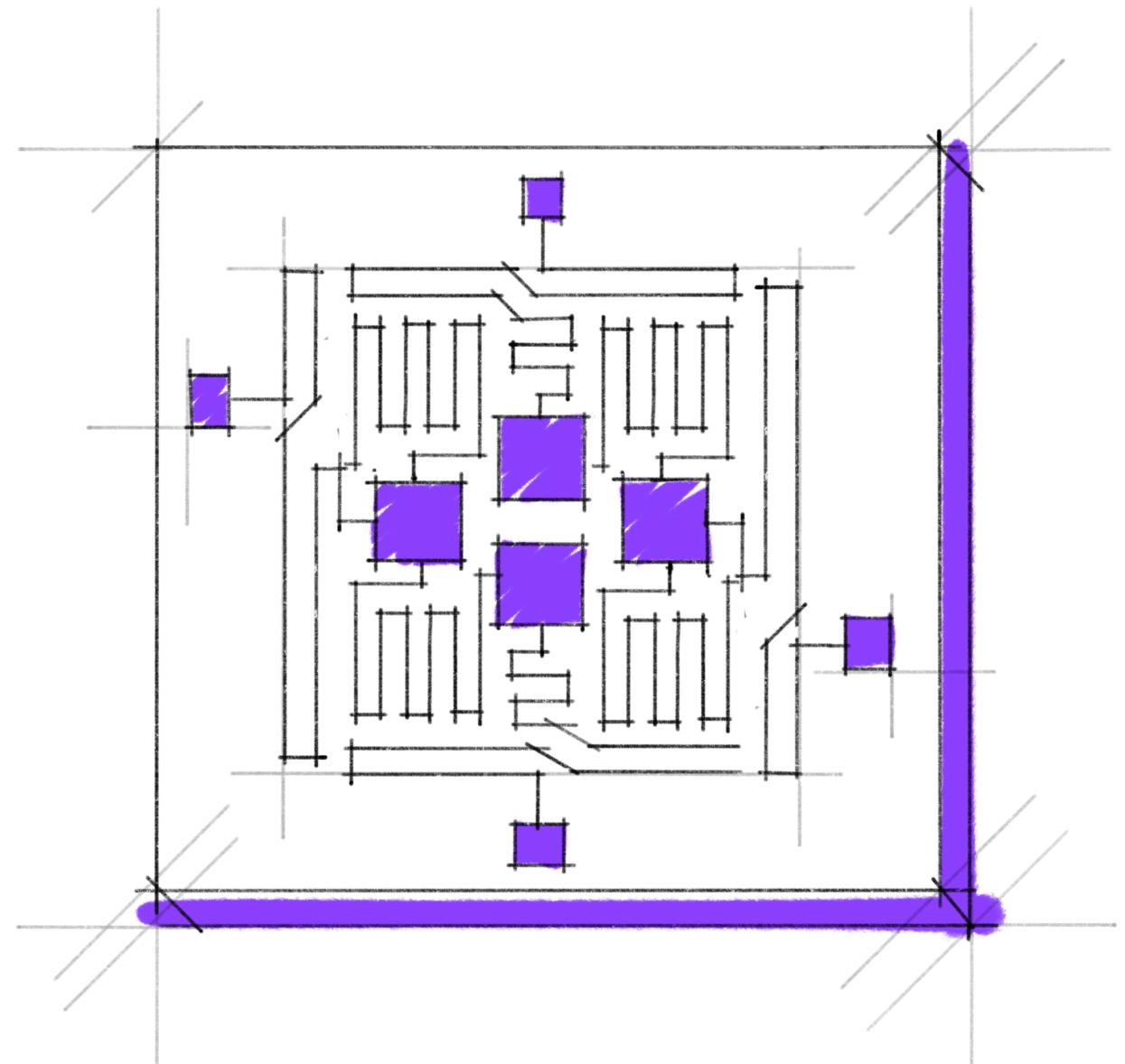
# About

Welcome to Qiskit Hackathon at World of QUANTUM!

We are excited to welcome you to our first-ever educational hackathon in Germany and see what amazing projects you come up with.

Please read through this Attendee Guide to find answers about the structure, setup, agenda, and resources for the hackathon.

Grab your computer and find your favorite chair. The Qiskit Hackathon at World of QUANTUM is about to begin.



## Index

Schedule	2
Code of Conduct	2
Hackathon Projects	3
Team Formation	4
Project Submission	5
Judging & Awards	6
Mentors	7
Resources	8
Map of Venue	8
Stay Connected	9



# Schedule

**26 April**

Tuesday

- |               |  |
|---------------|--|
| 11:55 – 12:15 | Welcome Note at the Forum World of QUANTUM                   |
| 12:15 – 14:30 | Guidelines, lunch, and team formation in the Hackathon Space |
| 14:30         | Start of the Hacking Phase in the Hackathon Space            |

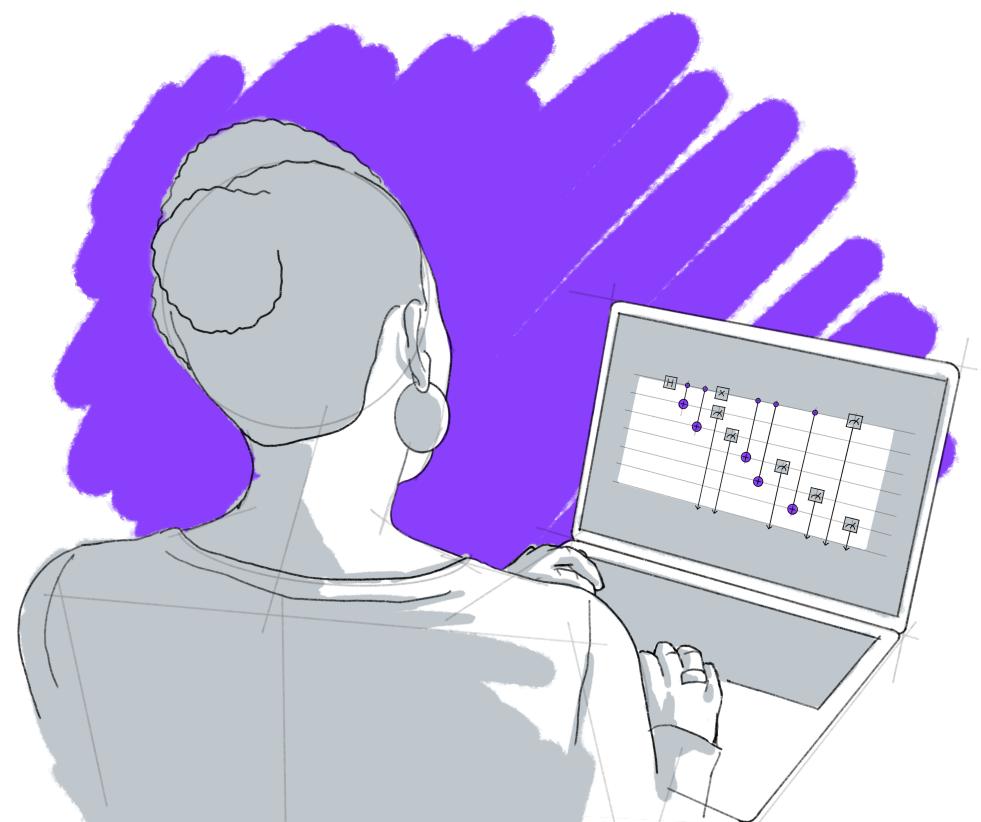
Between 20:00 (26 April) and 08:00 (27 April) you may ask questions in the Qiskit Slack Channel [#hackathon-woq-support](#) for remote assistance. [[Click here to join Qiskit Slack, if needed.](#)]

**27 April**

Wednesday

- |               |  |
|---------------|--|
| 14:00         | End of the Hacking Phase and start of the Judging Phase                                    |
| 14:30 – 16:00 | <i>Optional</i> presentations of the projects by the participants & Community Choice Award |
| 16:00 – 16:30 | Closing Ceremony at the Forum World of QUANTUM   |

*Note: Time zone is CET*



## Code of Conduct

The Qiskit Hackathon at World of QUANTUM is committed to maintaining the highest level of enjoyment, accessibility, and inclusivity by maintaining an environment of respect, empathy, and compassion for others. In order to support that, we ask that each attendee review the [Qiskit Community Code of Conduct](#) before the event, and be familiar with our community standards to join us in maintaining a safe and welcoming event for all.



# Hackathon Format and Projects

Full details on Hackathon format and projects can be found below.

## Challenge Format

**Part One** of the challenge consists of a set of given exercises that the teams must solve.

**Part Two** of the challenge is to design a 45 to 60 minute lecture using Qiskit for a quantum computation course, focusing on one of the listed topics in the next section.

The level of the lecture should be appropriate for the corresponding target audience listed with the topics. The lecture should include (more details below):

- Table of contents
- Theory
- Exercises
- Useful visualizations



## List of Possible Topics

As in any other course, different target audiences can be exposed to different topics, with different language styles therefore take into consideration the target audience when you pick a lecture.

### Target Audience: High School Students

- Introduction to Quantum Circuits and Gates
- Quantum Computing as Linear Algebra
- Superdense Coding

### Target Audience: Bachelor Students

- Quantum Teleportation
- Grover's Algorithm
- Shor's Algorithm
- Quantum Key Distribution

### Target Audience: Master Students with QC Background

- QAOA
- VQE Algorithm
- Quantum Time Evolution



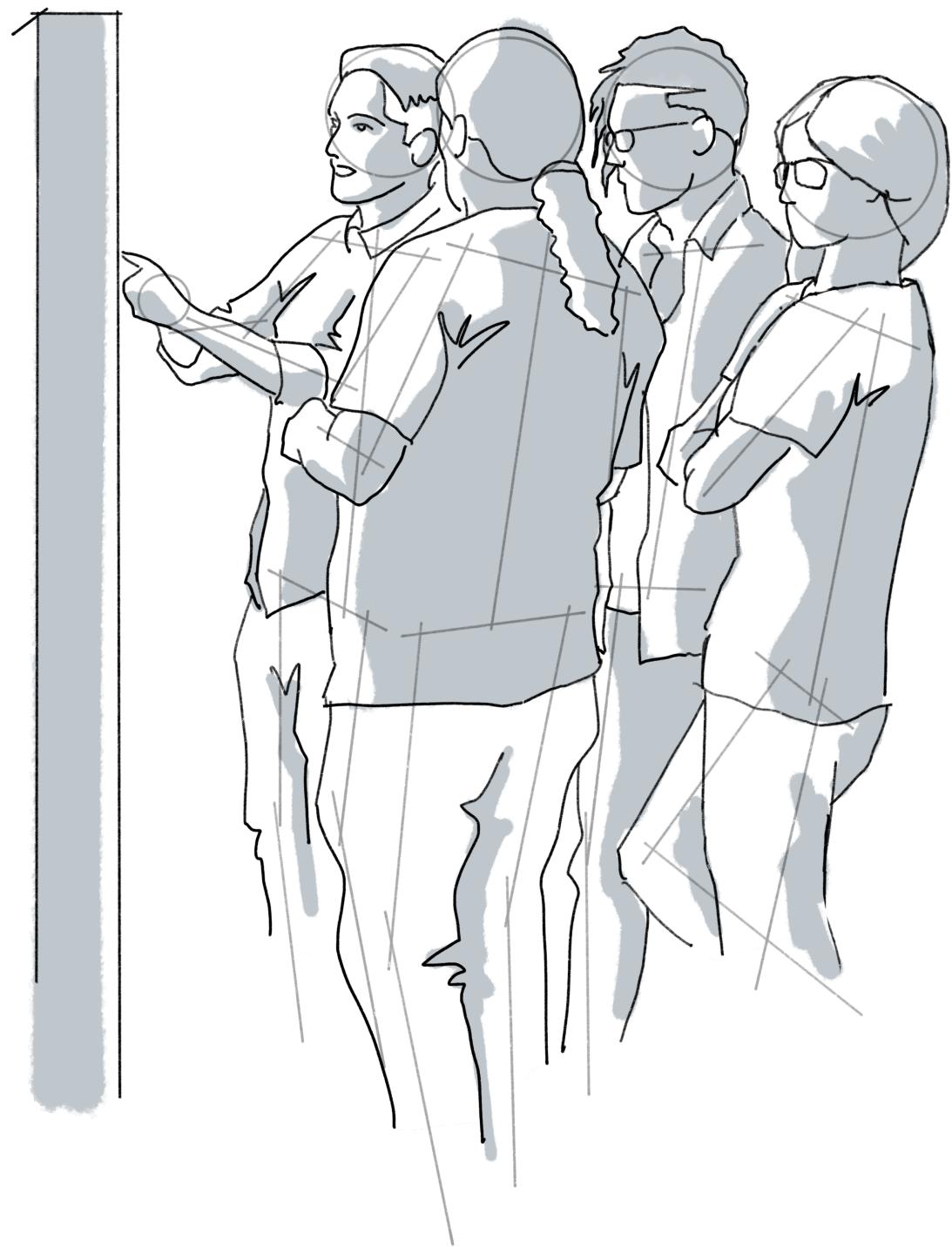
# Team Formation

## Team Formation

Once you've reviewed potential projects and find one that interests you, you should connect with other attendees who are interested in the same topic.

Group up in teams of 4 or 5 members. (Max of 5)

If you are interested in a topic, **write it on one of the boards** so that others can join your team. Interested in joining a team? Check out the topics on the boards and **add your name on a post-it note**.



## Roles

To make it easier for you to organize your team, we have listed some roles which might be distributed among the team. This is a suggestion & is not required to be used. Of course, it's still fundamental to discuss, brainstorm, and help the rest of the team, even if you use these roles.

### Instructor

Writes the introduction/summary of the lecture

### Examiner

Designs the exercises for the students to solve

### Planner

Brings everything together, plans & has an overview of the lecture

### Scientific Visualization

Makes illustrations/animations to help teach the topic  
(Could be hand drawn sketches)

### Problem Solver

Writes solutions for the exercises & troubleshoots



# Project Submission

This is what you are required to submit in order to be eligible for the judging phase.

## Lecture Plan (PDF/Text Document)

- How long does each part of the lecture take?
- What material is covered in each part?
- What teaching method(s) are used in the part? (Teaching methods refer to how the material is taught: e.g. in self reading, teacher presentation, exercises, etc.)

## Jupyter Notebook

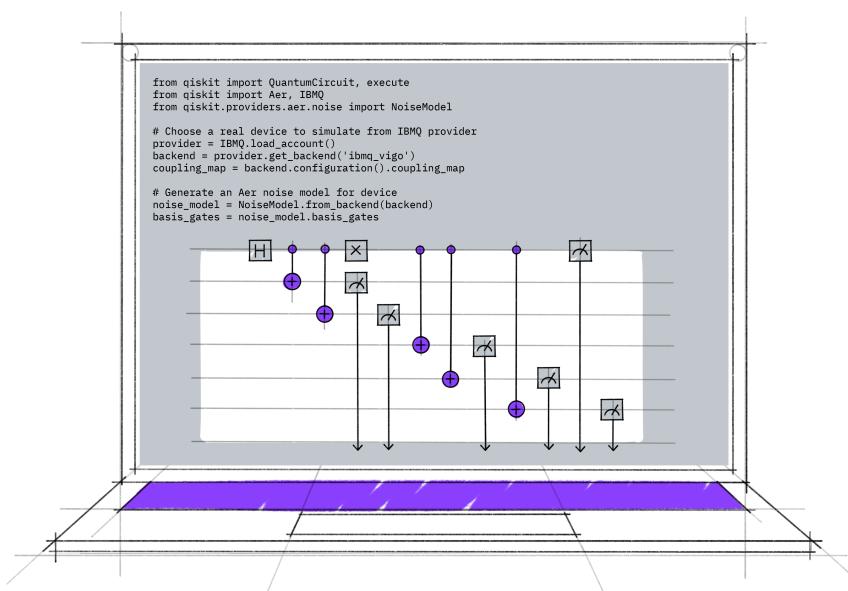
Consisting of differing exercises and separate solutions

- At least 1 exercise (Learning Exercise) as an example to learn the topic.
- At least 1 exercise (Test Exercise) to test the audience after the lecture.
- A separate list of solutions (in another Jupyter notebook) for all the exercises.

## Additional Materials Needed for the Lecture

- Include at least some written explanation, or theory part, explaining the different parts or summary of the lecture.
- Everything else needed for the lecture, which can include:
  - a text/script, which may already be part of the notebook
  - a script given to the students
  - a PowerPoint presentation
  - animations/images which are shown during the lecture
  - additional materials needed for exercises (like cards etc.)

[Here is an example of an Education Hackathon Project Submission for your review.](#)



**Note: The lecture must use Qiskit in a valid form.  
(The entire lecture does not need to be focused on Qiskit though.)**

Teams can do an **optional** presentation to be eligible for a **Community Choice Award**.

Presentations will occur at 14:30 on 27 April and should be a maximum of 3 minutes/3 slides.

Slides must be submitted by 14:00 on 27 April with your project submission.



# Judging Criteria

Below is the criteria our expert panel of judges will be using to select the top team.

## Correctness (10%)

- The provided solution is written clearly, precise, and thorough.
- There are no factual errors in the material

## Structure (30%)

- The lecture can be reasonably done in 45-60 minutes.
- The lecture has a clear concept guiding it. (Not just randomly placed topics)

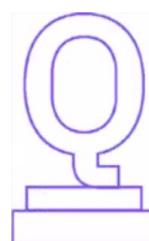
## Originality and Uniqueness (30%)

- The lecture is compelling for the students.
- There are interesting examples and visualizations in the lecture to explain the topic.

## Educational Value (30%)

- The lecture is suitable for the target group.
- The lecture material is easy to follow for the target audience.
- The learning exercises help the students to build up their knowledge.
- The test exercises test all the learned knowledge and no other knowledge.

## Awards and Prizes



### First Place Winning Team

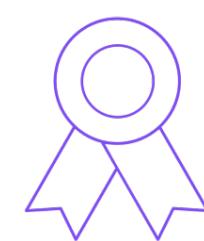
**1<sup>st</sup> Place Trophy  
2500€ for Team**

Selected by team of Judges



### Community Choice Award

**“The Quantum Decade” Book  
Exclusive Polo Shirt**  
Participants will choose a team based on an *optional* presentation



### Active Participants

**Qiskit Swag**  
To recognize your hard work in the Hackathon



# Meet your Mentors!

Mentors will be available throughout the Hackathon to provide guidance and assist with any questions



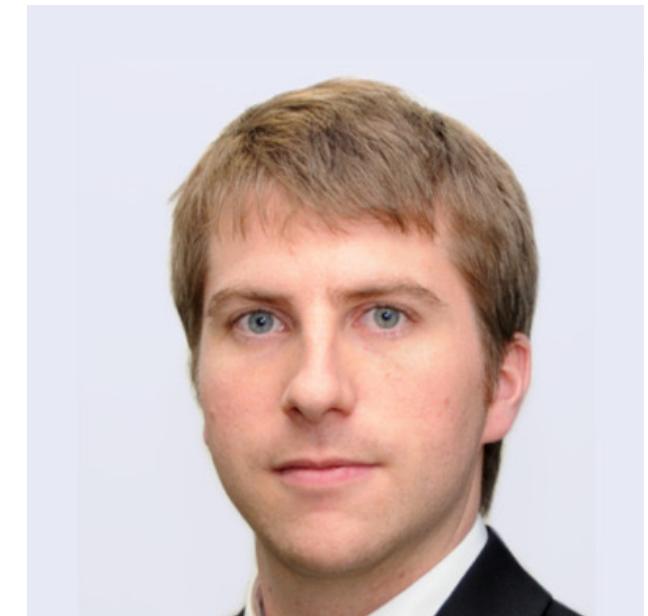
**Christa Zoufal**

Quantum  
Research



**Fabio  
Scafirimuto**

Quantum  
Community



**Daniel Egger**

Quantum  
Research



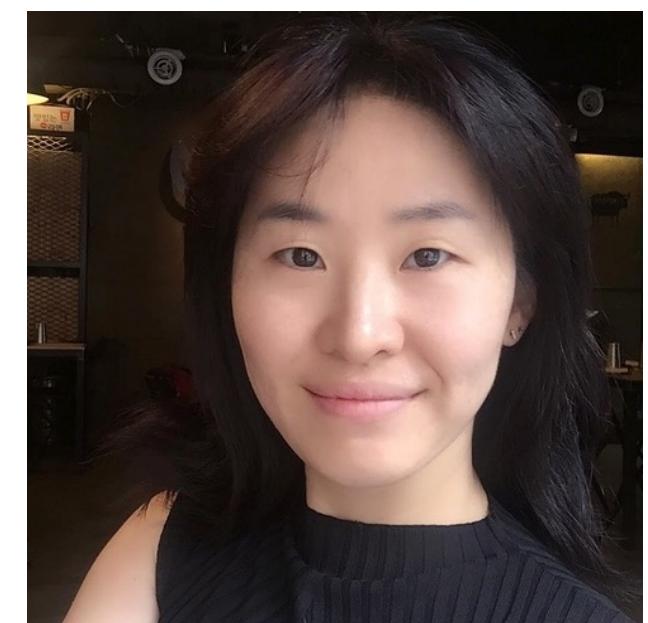
**Marcel  
Pfaffhausser**

Quantum  
Community



**Carmen Recio**

Quantum  
Community



**\*Sophy Shin**

Quantum  
Community

\***Sophy Shin** will be online between 20:00 (26 April) and 08:00 (27 April) on the Qiskit Slack Channel [#hackathon-woq-support](#) for remote assistance. [[Click here to join Qiskit Slack, if needed.](#)]



# Resources

## The Necessities

Before the hackathon, you will need to install these software packages:

- [Python 3.6 or later](#)
- [Jupyter notebook](#)
- [Qiskit](#)
- Suggested Tool: [Anaconda](#)

For installing Qiskit, you can follow the instructions provided

[here](#) or watch a [video here](#).

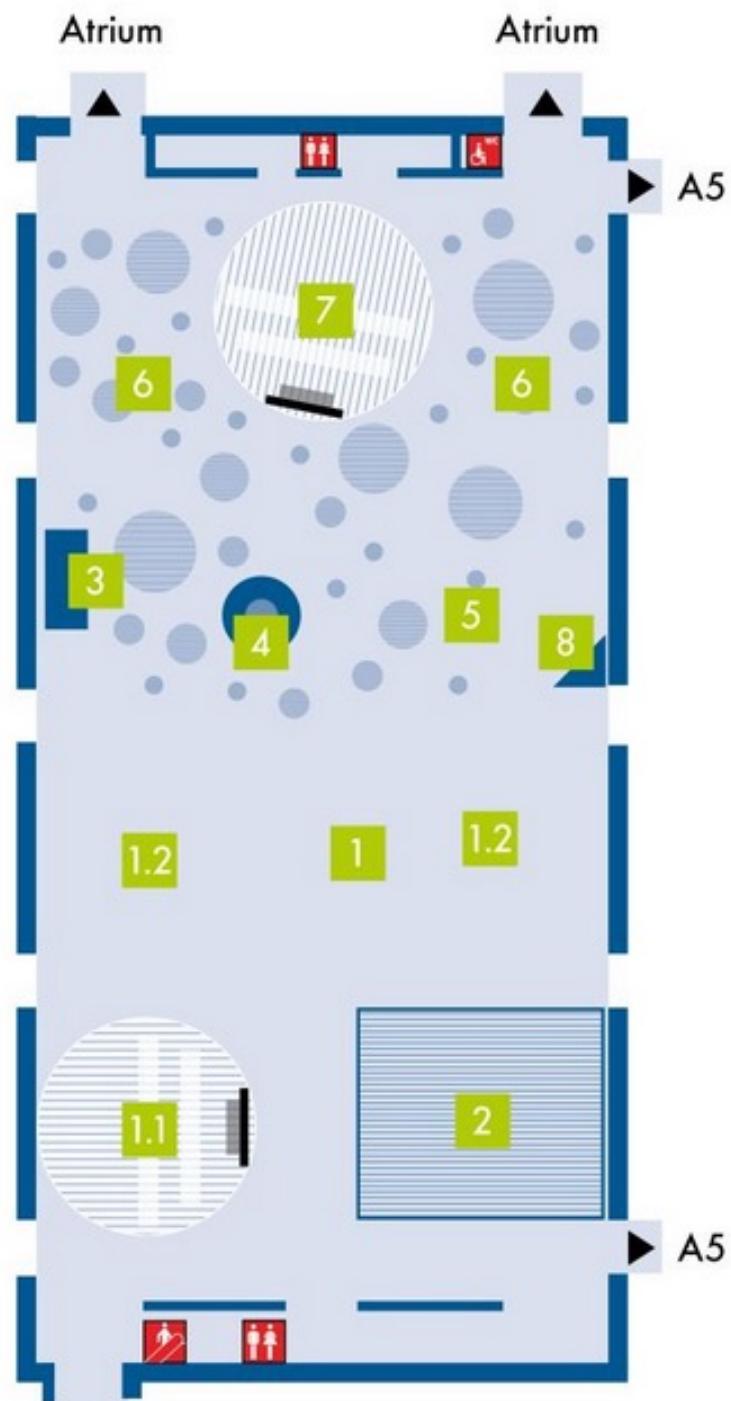


## Qiskit Resources

Here are some of our top Qiskit resources for you to review:

- [Contributing to Qiskit](#) (*required for code contributions!*)
- [Qiskit tutorials](#)
- [Qiskit textbook](#)
- [Qiskit.org](#)
- [IBM Quantum 2020 Challenge](#)

## Map of the Venue



### WORLD OF QUANTUM

- 1 BMBF-Networking Event Quantum Computing
  - 1.1 Stage Area
  - 1.2 Poster Area
- 2 Qiskit Hackathon@World of QUANTUM
- 3 Tiny Coffeehouse & Networking Area
- 4 Inside IBM Quantum
- 5 Start-Up Area
- 6 Exhibition Area
- 7 Forum World of QUANTUM
- 8 Speaker's Corner & Job Board

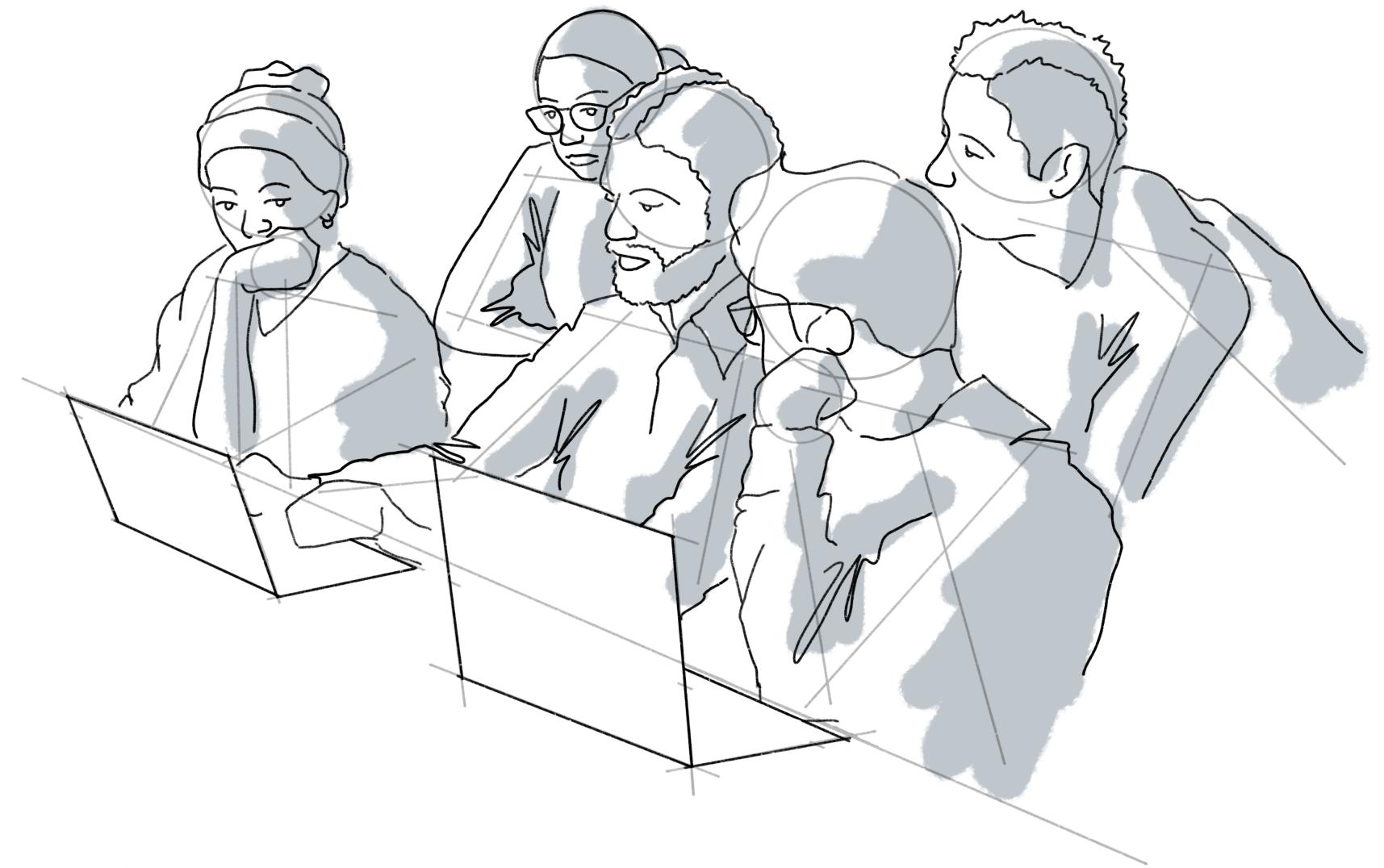




# Stay connected!

 Join the [Qiskit Slack Community](#) & the dedicated event channel [#hackathon-woq-support](#)

 Follow us on [Twitter](#)



If you have any questions, please reach **ask the mentors in-person** or **post in the [#hackathon-woq-support](#)** Slack channel.