

Qiskit Hackathon at World of Quantum

April 26 - 27



Attendee Guide

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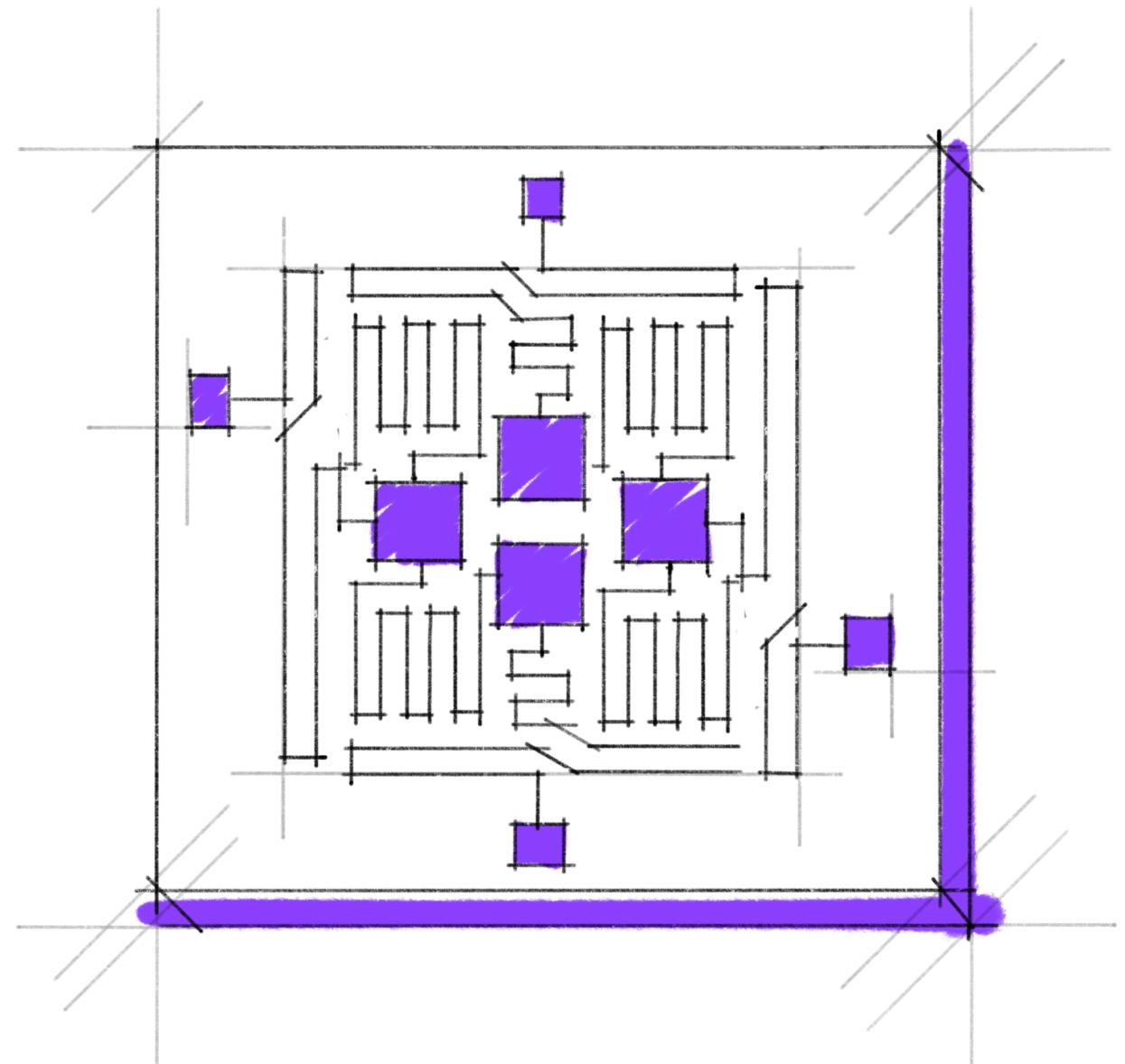
About

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.



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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 |

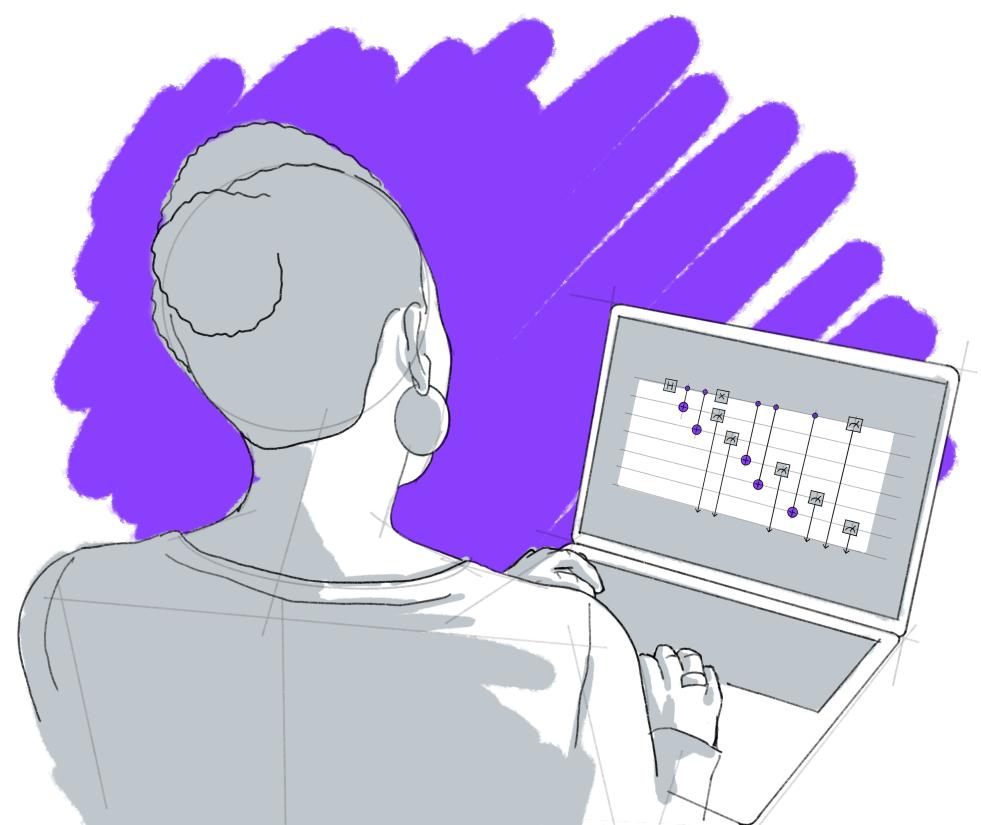
Between 23:45 (26 April) and 08:00 (27 April) you may ask questions in the Qiskit Slack Channel [#hackathon-woq-support](#) for remote assistance. [[Click here to join Qiskit Slack, if needed.](#)]

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



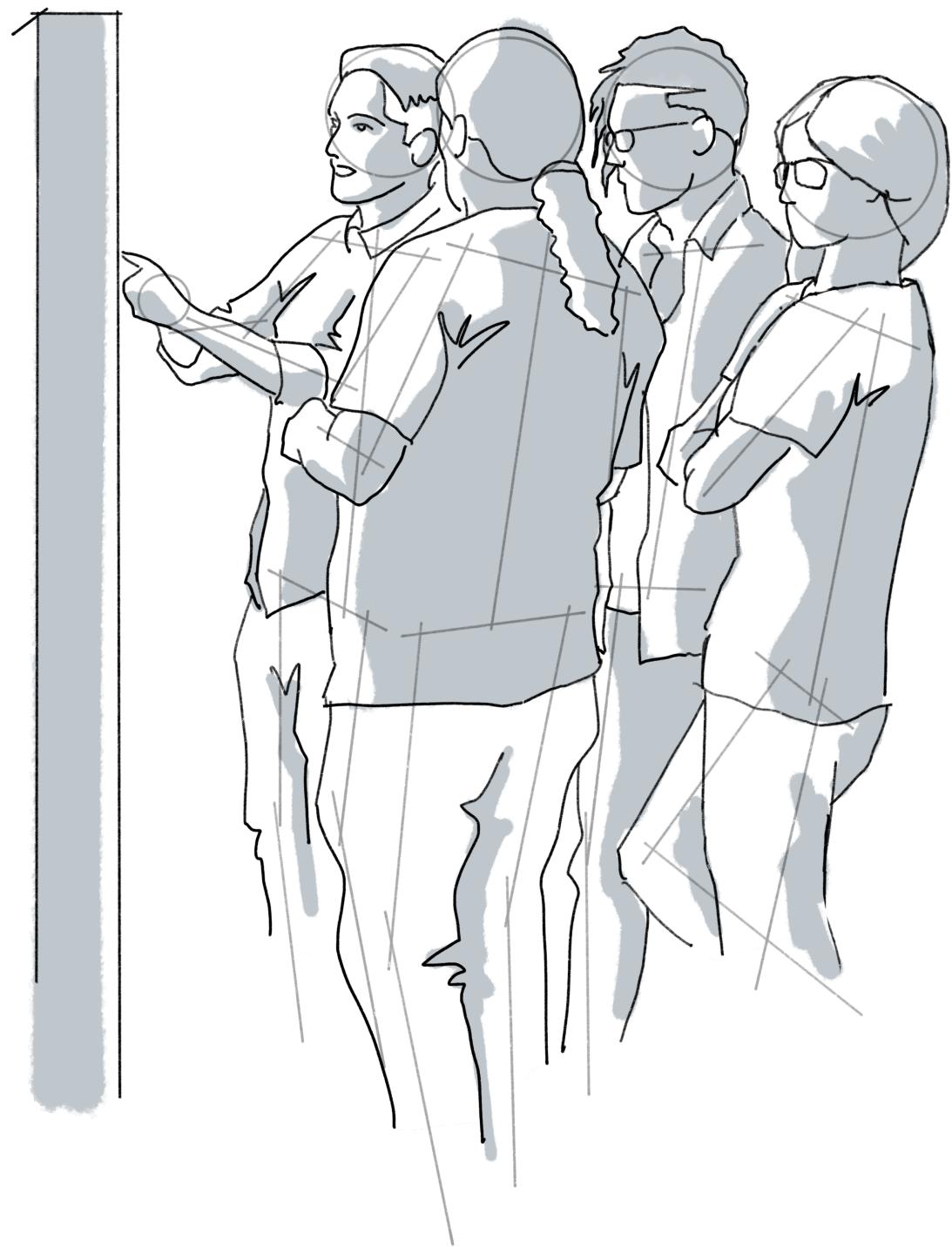
Team Formation

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

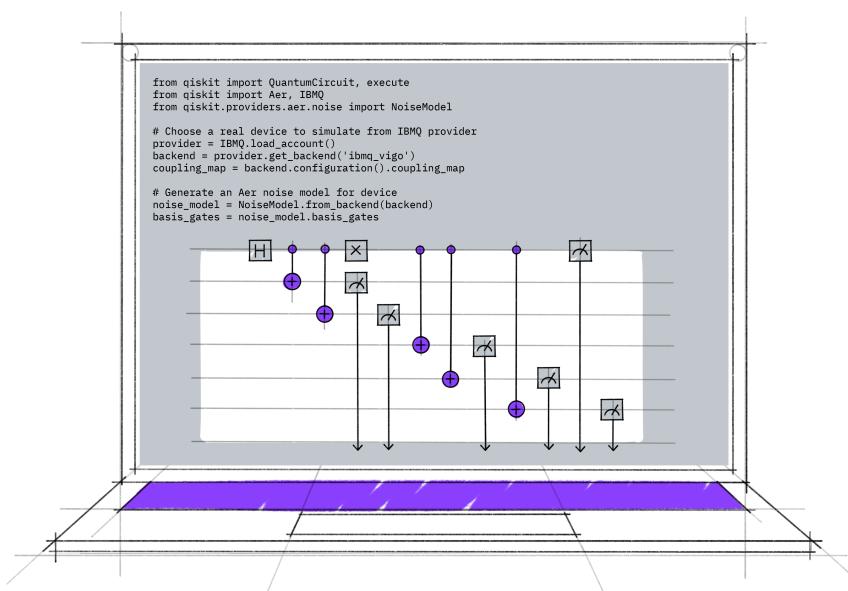
Consisting of differing exercises and separate solutions

- 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)

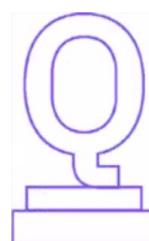
Originality and Uniqueness (30%)

- 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

**1st 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



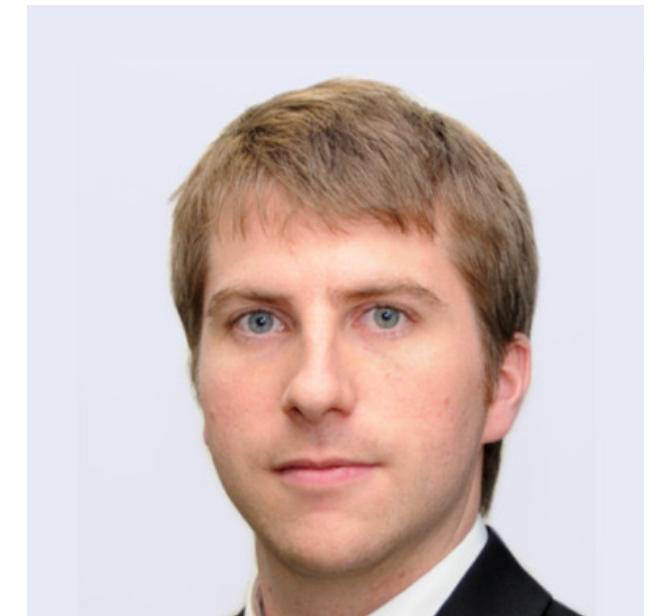
Christa Zoufal

Quantum
Research



**Fabio
Scafirimuto**

Quantum
Community



Daniel Egger

Quantum
Research



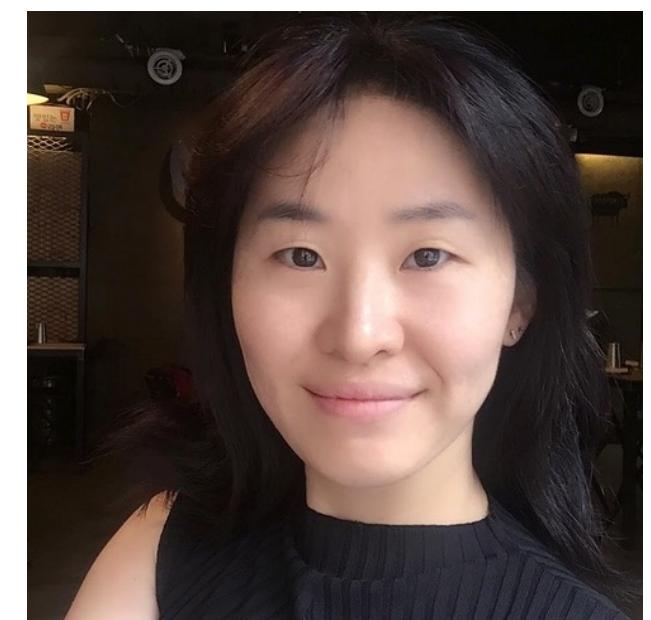
**Marcel
Pfaffhausser**

Quantum
Community



Carmen Recio

Quantum
Community



***Sophy Shin**

Quantum
Community

***Sophy Shin** will be online between 23:45 (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](#).

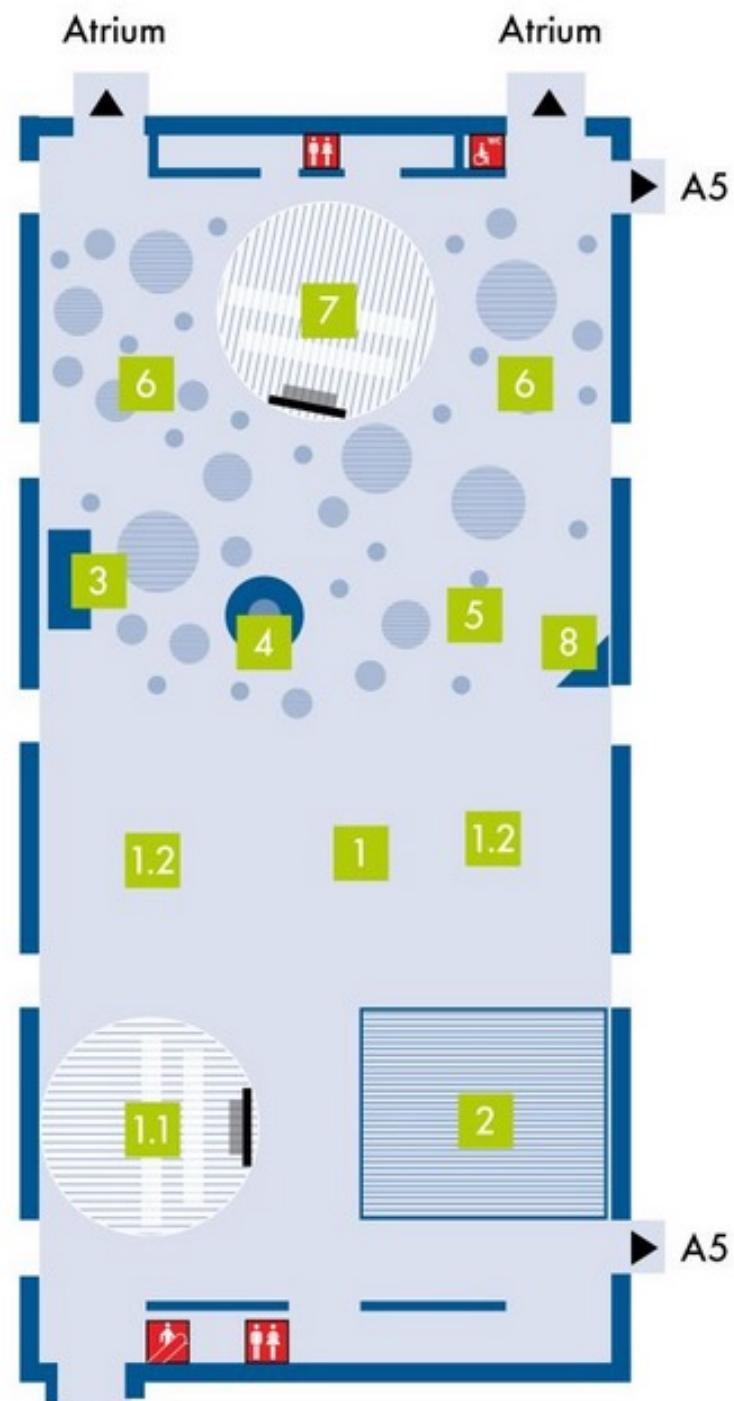


Qiskit Resources

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

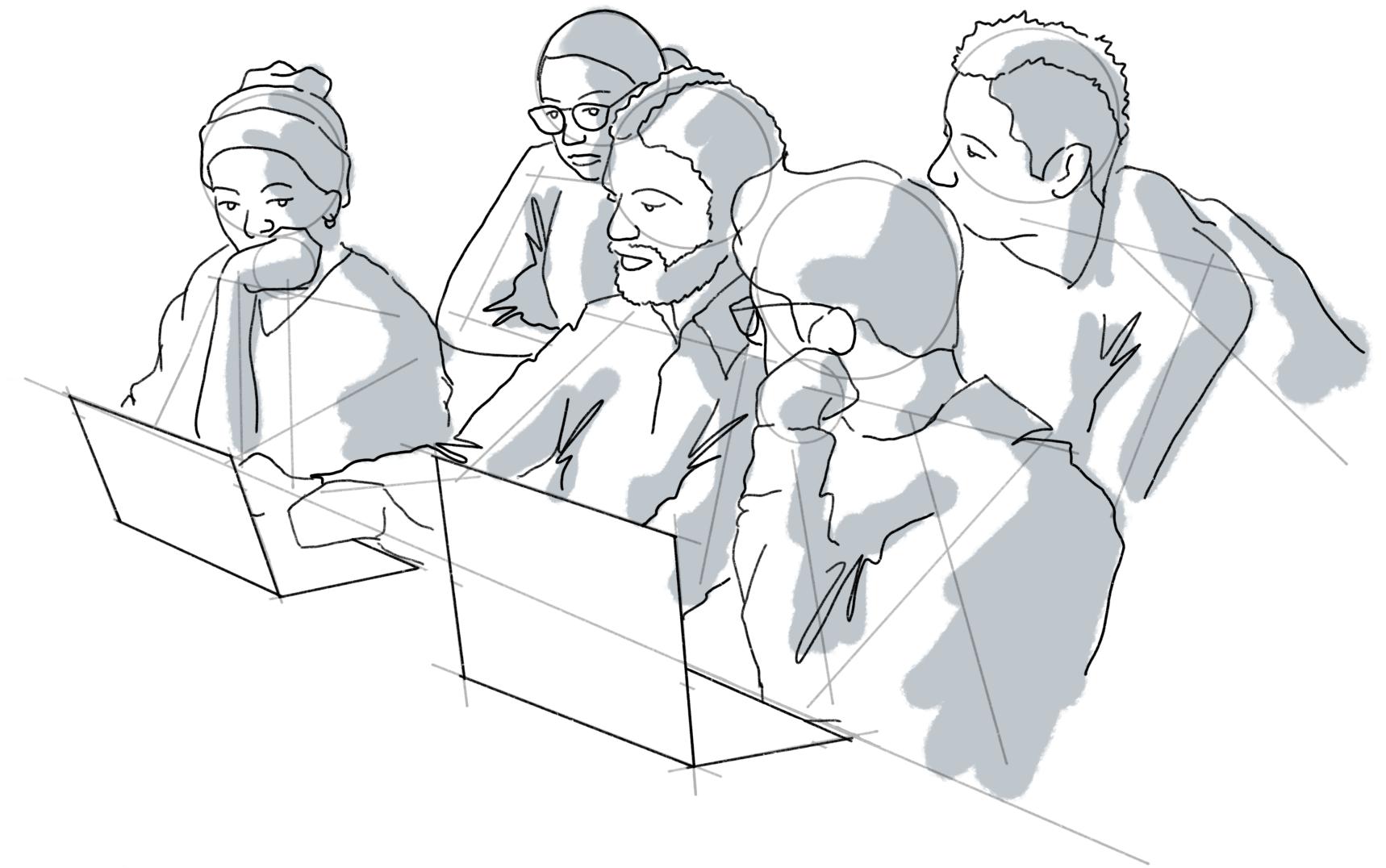




Stay connected!

 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.