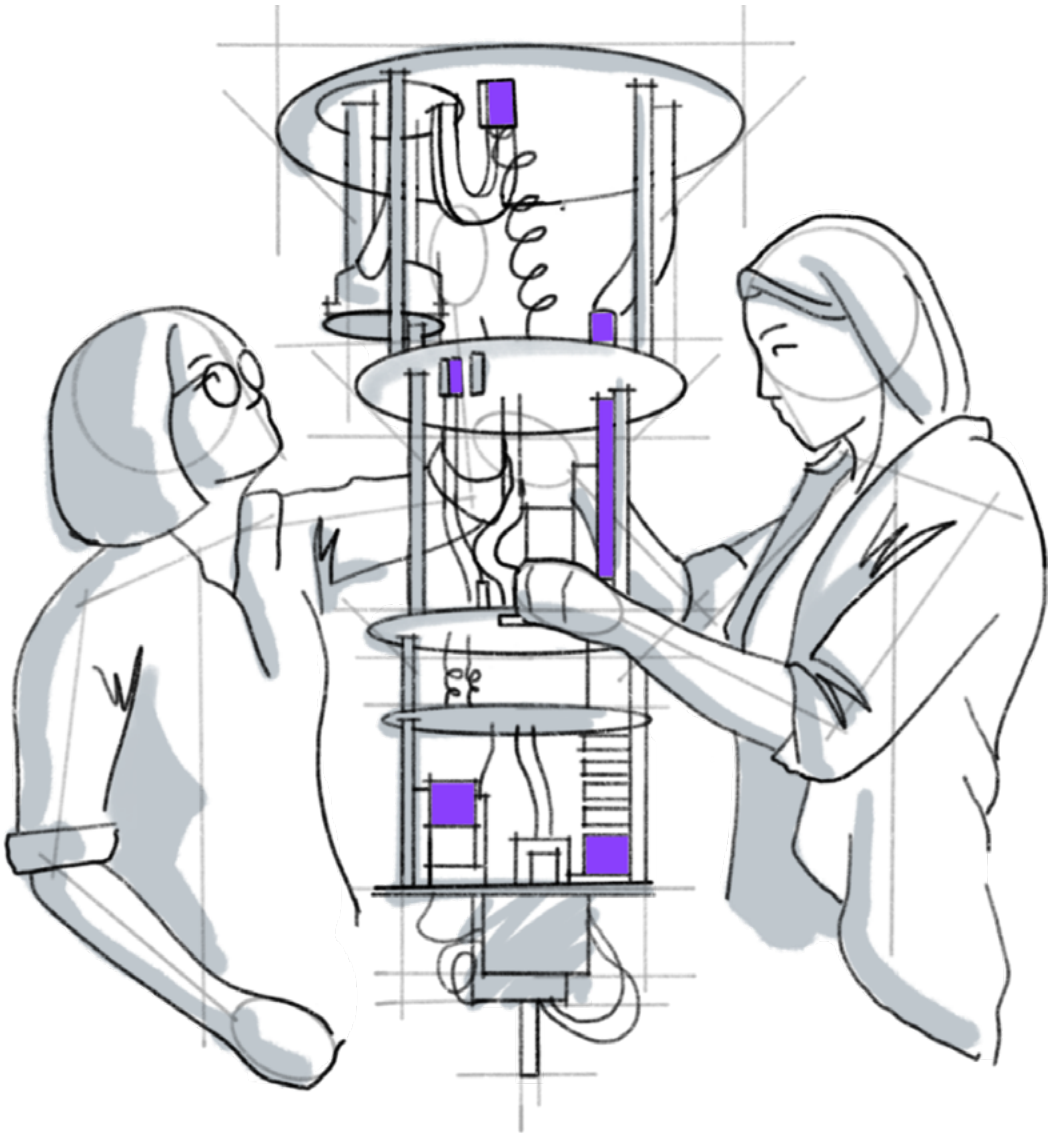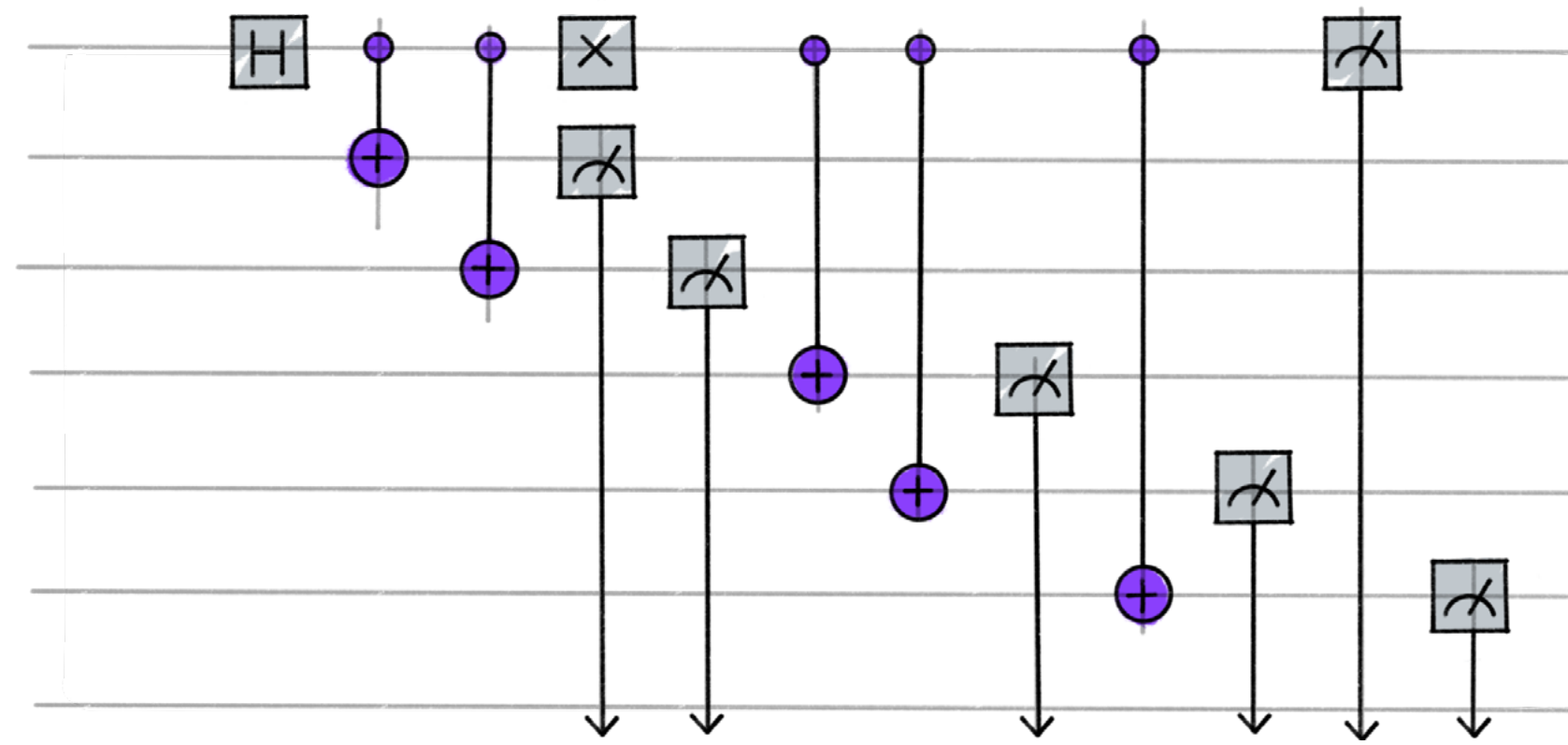# Research Study Groups
Attendee Guide

About

Welcome to **Qiskit Hackathon Europe: Research Study Groups**! We are excited to welcome you to our first-ever European research study groups event and see the amazing projects you come up with. This is a unique opportunity to explore your ideas, turn them into research projects with your team, and get inspired by people sharing a passion for quantum computing .

Please read through this Attendee Guide to find information and insights about the structure, setup, agenda, resources and general tips for ensuring you have a great hackathon experience. **This is not a passive event** - wherever you are across Europe, your engagement is key to making it successful. Grab your computer and find your favorite chair. Research Study Groups is about to begin.

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Schedule

Qiskit Hackathon Europe: Research Study Groups is a two-month hackathon event, with important dates and times to remember. Keep this schedule handy for reminders on important deadlines, and so you know what's happening (and where to go to join). Any changes to the schedule will be announced via Discord, so make sure and check for any recent announcements or updates to any times or locations.

April

14 — **Discord Server Opens**
All participants will receive their link to join the conversation and collaboration on Discord.
Join the Server

14 — **Project Pitches Open**
Everyone will be able to submit their project ideas, and explore the ideas from others, on the event platform.
Explore & Submit Ideas

20 — **Hackathon Kickoff Event**
Welcome to Research Study Groups! Join the live kickoff for important updates and get introduced!
5:00 PM CET - Join Live!

21 — **Project Pitches Due**
Make sure and have all your pitches submitted prior to **11:59 PM CET!** Once closed, team formation begins!
Explore & Submit Ideas

23 — **Teams Finalized**
Explore, ask questions, network - make sure and join your favorite project team **prior to 11:59 PM CET!**
Explore Ideas & Join a Team

24 — **Phase 1 Collaboration & Proposal Creation**
Kick off your project with your new team, and work together to finalize your phase 1 proposal!
Explore Proposal Requirements

29 — **Project Proposals Due**
Make sure and have your teams project proposal submitted **prior to 11:59 PM CET** for judging!
Submit Final Proposal

30 — **Proposal Judging Begins**
All proposals begin review and scoring by our panel of judges - explore other projects and teams in anticipation!
Explore Project Proposals

May

6 — **Top 20 Teams Announced**
Join the live announcement of the top 20 teams that advance to phase 2 of the hackathon!
Join Live!

7 — **Phase 2 Collaboration & Presentation Creation**
Celebrate your teams achievement, and continue collaborating on your project and final presentation.
Explore Project & Presentation Requirements

More Activities to be announced!

Keep an eye on Discord for the latest updates on seminars and social activities!

June

4 — **Final Projects Due**
Have your teams final project and presentation submitted **prior to 11:59 PM CET** for judging!
Submit Final Presentation

7 — **Project Judging Begins**
All projects begin review and scoring by our panel of judges - explore other projects!
Check out Projects

14 — **Award Ceremony & Wrap**
Join the live announcement of the hackathon winners, and celebrate the top three teams!
Join Live!

Resources

The Necessities

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

- Python 3.6 or later
- Jupyter notebook
- Qiskit

For installing Qiskit, you can follow the instructions provided here or watch a video here.

Some Suggestions

Optional resources to install before the hackathon include an integrated development environment (IDE) or text editor for coding. **We suggest one of the following:**

- PyCharm (for python)
- Atom text editor
- Visual Studio Code

Qiskit Resources

Here are some of our top Qiskit resources - check out even more resources that are available on the event site here!

- Contributing to Qiskit *(required for code contributions!)*
- Coding with Qiskit Youtube series *(strongly recommended!)*
- Qiskit Learning & Tutorials
- Qiskit Textbook
- Qiskit.org

Games on the Brain?

Specifically for making quantum games, we also suggest these resources:

- Qiskit for GameDev toolkit
- Pygame game engine
- Unity game engine
- Godot game engine

Hackathon Projects

phase 1: from idea to proposal

In these two weeks, pitch your ideas, form a team, and turn those ideas into a viable project proposal based on Qiskit. This intense period will give you the potential for future project collaboration and the **top 20 proposals** will proceed to Phase 2.

step 1. project idea

What is a Project Idea? A project idea consists of a title and 5 sentences (maximum) and it should include the description of the research idea and the desired collaborator skills (i.e. error correction, QML, chemistry, games...). Project ideas are submitted by **INDIVIDUALS**.

How to pitch a project idea? To pitch a project idea, go to "Projects" and submit your idea by selecting "Create a Project" and provide an overview of your project idea. Submissions open on April 14th and are open **until April 21st**, a day after we kick off the live hackathon. In the project description, it is important to be thorough and precise. Start by addressing the issue. Why did you choose this project? Why do you feel like this issue needs to be addressed? You want to make sure to fully capture your project idea so other participants are able to understand, ask questions, and join your project team. Don't forget to add tags to make your project easy to find for potential teammates!

Need to make changes? No problem. You are able to edit the project page anytime before the submission deadline of April 21st. However, once the deadline passes, you will be unable to make additional updates to your final project idea submission.

step 2. team formation

As project pitches are submitted, it's important to note that team formation will not be available until April 21st, the day after the live hackathon kicks off. This will give every participant a chance to submit their project ideas and see what project teams they may want to join without missing any updates! Please note, the deadline for team formation is **April 23rd**, so make sure you set time aside during this short period to review as many project pitches as possible!

Every project will be open for interested participants to explore and join (each team must have at least 3, but no more than 5 members.). The original pitcher for each project will be the primary contact for that project's team, and will be the one you reach out to if you want to join a team. Project pitchers will be the only people who can directly add members to their team.

All teams must be validated by Event Support or an Admin before they can be confirmed and finalized. If you have less than 3 people in your team or if you have any concerns about getting the right teammates, reach out to our Support team on Discord.

Finding Teammates

Check out 'Join the Team Now' below the "Our Team" section. If your project is looking for, or needs support from, a specific skill set or background, you can select the type of team member(s) you are looking for to complete your team. All participants will be able to view your project pitch, ask questions, and request to join the project of their choice.
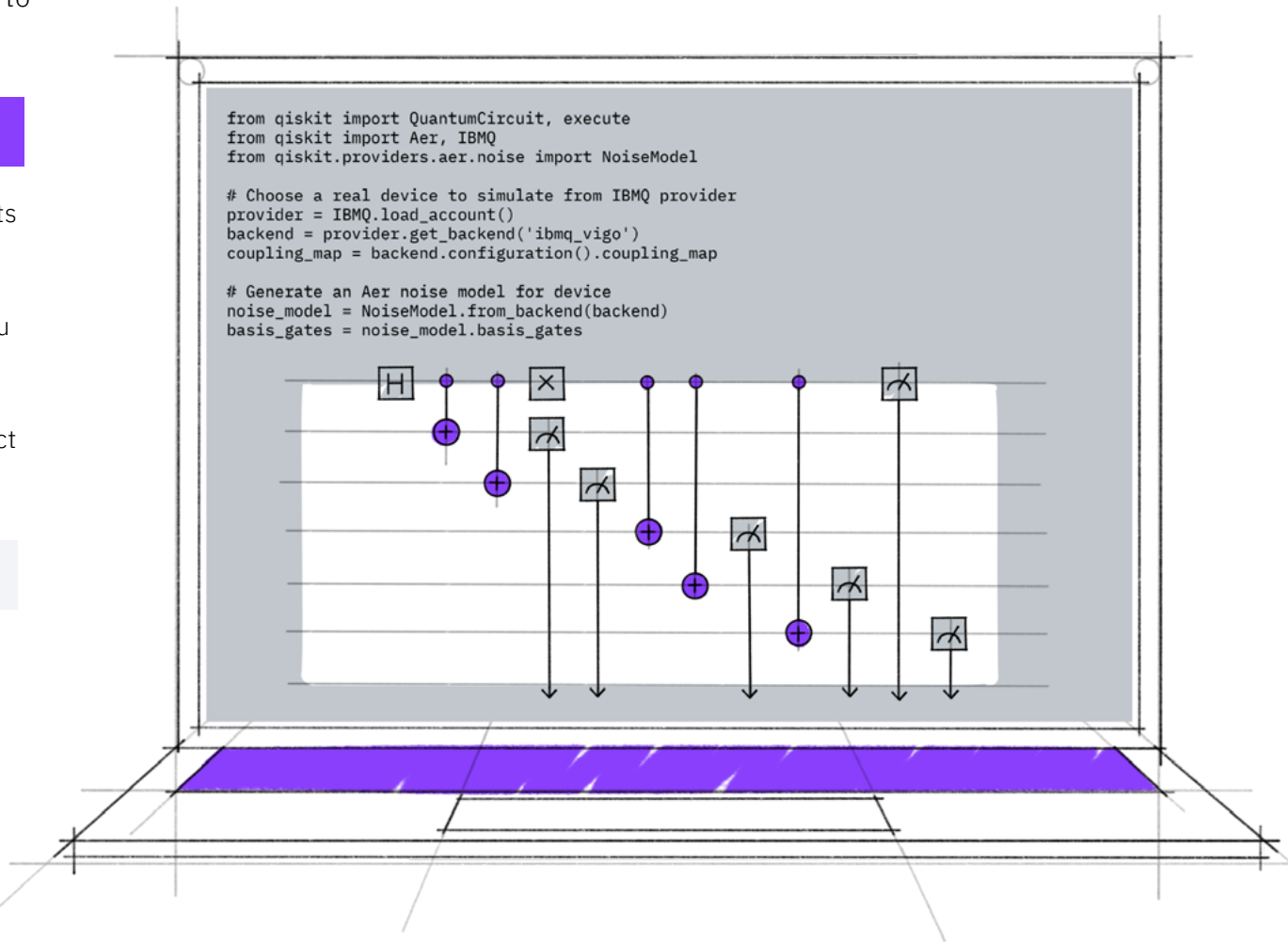
Joining a Project Team

Look through the projects listed and see what interests you. Have a specific topic or interest area? Filter the pitches by project tags to highlight those projects related to your interest! If you have any questions, you can direct message the pitcher directly, or comment on the project publicly. Ready to join a project team? Simply select "Join Team!" at the bottom of the project page.

step 3. project proposal

Once all teams are formed, you'll work with your team to write a project proposal. Project proposals are submitted by **TEAMS**.

What is a project proposal? A project proposal should include 3 slides describing:
1. Project idea.
2. Impact and goals.
3. Implementation plan: timeline, tasks & resources (research papers, Qiskit libraries/modules...) .

Note: All projects must be based on Qiskit.

```
from qiskit import QuantumCircuit, execute
from qiskit import Aer, IBMQ
from qiskit.providers.aer.noise import NoiseModel

# Choose a real device to simulate from IBMQ provider
provider = IBMQ.load_account()
backend = provider.get_backend('ibmq_vigo')
coupling_map = backend.configuration().coupling_map

# Generate an Aer noise model for device
noise_model = NoiseModel.from_backend(backend)
basis_gates = noise_model.basis_gates
```

phase 2: from proposal to project

In Phase 2, develop your Qiskit research project alongside your team and have the opportunity to attend seminars from Quantum Computing experts and a social event. At the end of this journey, your team will hand in a project report and a video presentation for the chance to win 3,000 EUR for the top three projects as determined by our judges!
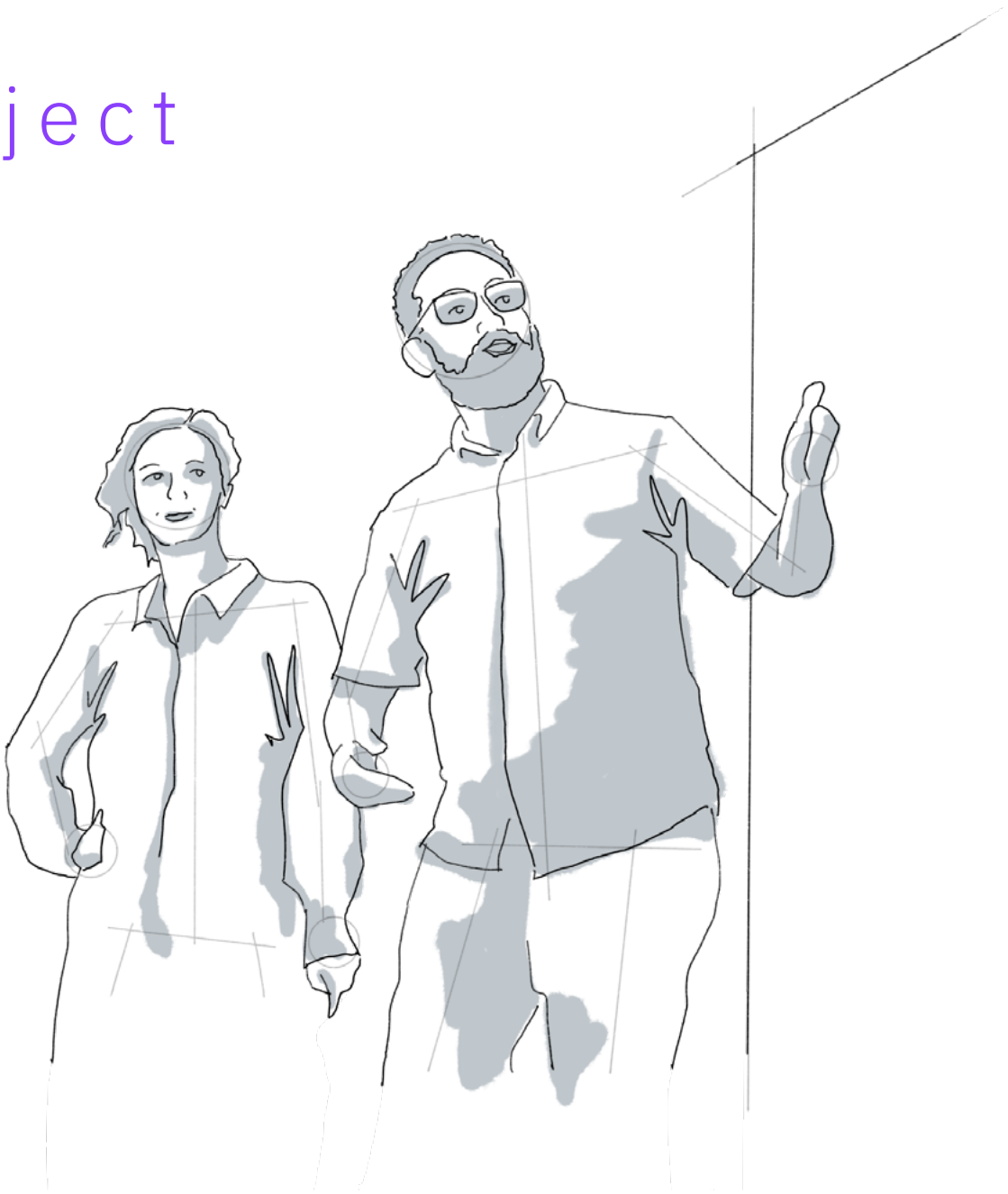
project submission requirements

What should the final submission include? The final submission should include:

Scientific report - 2-3 pages in pdf format, including:
1. Motivation (Which research questions do you want to address with this project?)
2. Implementation (What was your strategy to answer those questions? How did you divide the tasks among your teammates?)
3. Project results (What did you achieve?)
4. Impact-outlook (Which value does this project bring? What are the future perspectives? What still needs to be done?)

GitHub repo: structured & easily readable. (Please comment the code as much as you can). As an example, you may want to have a look at the style guide that we use for Qiskit contributions. To enforce a consistent code style in the project, we use Pylint and pycodesytle to verify that code contributions conform to and respect the project's style guide. To verify that your changes conform to the style guide, run: **tox -elint**

3-minute pre-recorded video presentation: crisp summary of the scientific report.

Awards

Winners
Top 3 Teams

Medal & €3,000 EUR Prize Pool

The top three teams will be awarded € 3,000 EUR. Additionally, each member of the top three teams receive a custom medal, exclusive Qiskit swag kit, and will be featured on the Qiskit Youtube in an exclusive recap segment!

Top 20 Teams

Certificate

Each member of the teams that advance to Phase 2 will receive a certificate of accomplishment.

Community Choice

Award Plaque & Certificate

Selected by fellow qiskitters, the selected team receives a Community Choice Award Plaque and exclusive Qiskit swag kit for each of its members.

Poor
The criterion is inadequately addressed, or there are serious inherent weaknesses.

Fair
The proposal broadly addresses the criterion, but there are significant weaknesses.

Good
The proposal addresses the criterion well, but a number of shortcomings are present.

Very Good
The proposal addresses the criterion very well, but a small number of shortcomings are present.
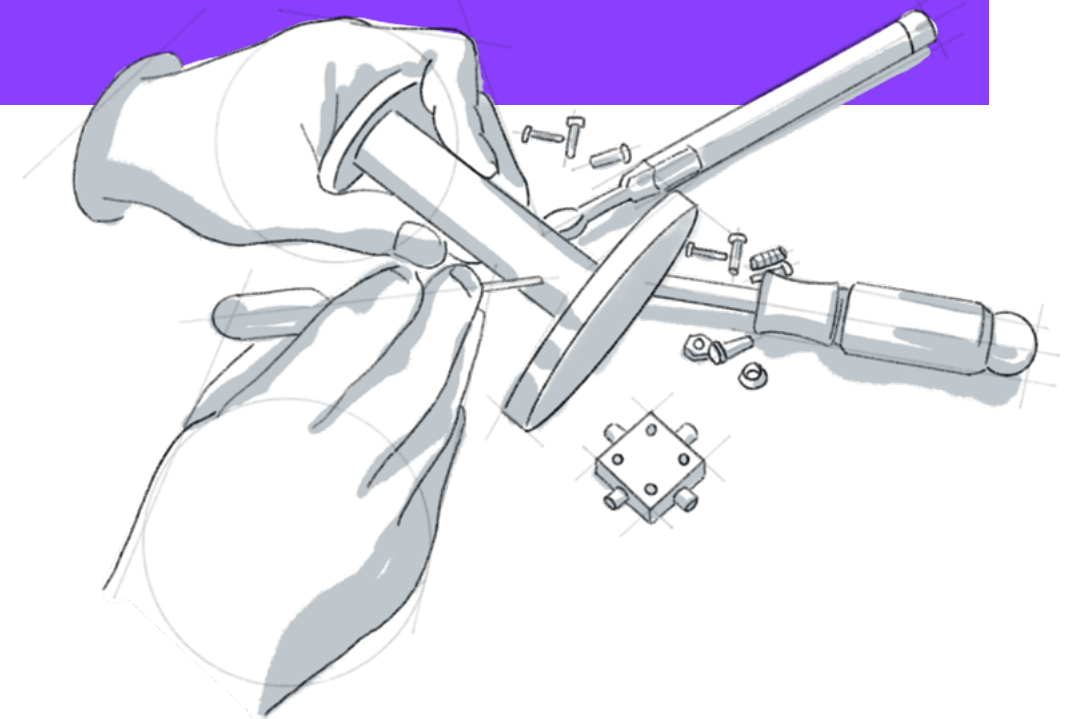
Excellent
The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Judging Criteria

Judging at Qiskit Hackathon Europe: Research Study Groups will be in two phases. During Phase 1, all proposals are reviewed by a panel of judges, where the top 20 teams are selected for advancement to Phase 2, with the opportunity to complete their project with their team and submit their video presentation to the event judges, who identify the top three project teams that are announced at the final award ceremony and wrap event.

When preparing your projects, it's important to be familiar with the judging criteria as it applies to Phase 1 Proposals and Phase 2 Final Project Presentations. Each criterion will be scored on a scale of 1-10; should the proposal fail to address the criterion or cannot be assessed due to missing or incomplete information, it will be given an automatic zero.

Please note that it is a requirement for eligibility that all projects are based in Qiskit. For any questions, please reach out to any of the events support resources!

phase 1
proposal criteria

40%

30%

30%

Excellence

Compared to what you've seen before, how original/unique is this proposal?
How relevant is the research question and project?

Impact

How well does the proposal advance research and open source science in the field of quantum computing?
How useful is this idea? Does it have prospects for future development?
Will this project help the community at large? Will this project spark interest in the quantum computing community?

Implementation

How feasible and effective is the work plan within the timeframe considering the allocation of tasks and resources?
How coherent and structured is the proposal?

phase 2
project criteria

35%

25%

20%

20%

Excellence

Compared to what you've seen before, how original/unique is this proposal?
How relevant is the research question?

Impact

How well does the proposal advance research and open source science in the field of quantum computing?
How useful is this idea? Does it have prospects for future development?
Will this project help the community at large? Will this project spark interest in the quantum computing community?

Implementation

How coherent and structured is the implementation of the project?
To which extent did this project develop compared to the proposal?
How did the team divide the tasks and collaborate throughout the entire project?

Presentation

Is the project report well structured and clearly readable?
Is the GitHub repo structured & clearly readable?
Is background for the project scope provided? Was the team able to explain why they made certain decisions?
Did the team present their project clearly? Were the main points explained?

Discord

Discord will be used for all Qiskit Hackathon Europe: Research Study Groups event communications, updates, team formation, co-working, and more.

Most notably, teams will have dedicated spaces to collaborate via text/video, with each other. Additionally the support team will be available to provide guidance throughout the program.

Discord Commands

Once you join Discord, you will be assigned a role. Roles make it easy to notify everyone directly of a need or request with an immediate notification. To send an alert to a specific Role, simply tag the appropriate Role with the "@" symbol.

Aside from direct, text-based chat and meme sharing, Discord has one key thing that makes life easy: Commands.

Commands are automated functions that activate a response or operation. In the "Message" field, input your command by typing the prefix and associated command trigger with no spaces.

As an example, if you input the command...

!essentials

you will get an automatic in-channel reply that provides you with the essential links and other key commands you can use that may be helpful!

=tex [equation]

with the desired equation, it will automatically render your post in LaTex!

You can find a full list of commands in the Discord, but if you only remember three, these are the ones:

!essentials

!resources

!pingsupport

See you there!

p.s. don't forget to review the Qiskit Community Code of Conduct before the hackathon!