**Pushkar Kumar:** How can we see past recordings

**C-DAC Response**: https://www.youtube.com/@qniversedotin

**Tejasri K:** How are the deprecations in SDK and frequent updates are handled in qniverse

**C-DAC Response :** At **Qniverse**, we are committed to **delivering the latest versions and improvements in a phased and user-friendly manner**.

**Phased Rollouts**: New features, simulators, and SDK updates are released in **phases** to ensure stability, backward compatibility, and smoother adoption. Every release (e.g., v1.2.0) is accompanied by detailed **release notes**

**Ramniwas Meenea:** Does it work for CV gates as well?

**C-DAC Response:** As of now, the platform is focused on **discrete-variable (DV) quantum circuits**, which operate on **qubits** and **gate-based models. CV-based quantum models are being explored for future roadmap extensions.**

**Surajit Bosu:** Qsim and qniverse same?

**C-DAC Response:** No, Qsim and Qniverse are not the same.

**QSim** is a simulator developed by IISc that primarily uses a **density matrix backend** for quantum circuit simulation. It supports **only Python-based programming** and does **not offer a drag-and-drop interface** for gate-based circuit design. Moreover, QSim is focused solely on simulation functionalities.

In contrast, **Qniverse** is a **multi-purpose, unified quantum computing platform** that integrates **simulation, education, visual design tools**, and support for **multiple backends**, including **QPU execution**. It provides both **code-based and graphical interfaces**, making it more accessible and versatile for learners and researchers alike.

**Prajna Jha:** Sir please shift the time to 6pm, if possible

**Mihir Rath :** yes, it would be nice if possible

**LD :** Sir please shift the time to late evening, possibly after 7 pm, if possible

**C-DAC Response** : We welcome your suggestions. The next intermediate session is scheduled on 21st July 2025 is at 5:30pm to 6:30pm. However, you can always follow our recorded videos on our youtube channel qniversedotin

**Prajna Jha:** Sir what is the difference between these simulators?

**C-DAC Response:** The qsimcirq\_simulator (qsim + Cirq) is a high-performance statevector simulator that leverages GPU acceleration, integrates with Cirq, supports distributed runs via qsimh, and offers multi-GPU capabilities—ideal for benchmarking.

The quest\_simulator (QuEST) is a C-based, MPI/OpenMP simulator optimized for large-scale HPC systems and multi-node supercomputers, also supporting multi-GPU simulations.

qulacs\_multicpu\_simulator (Qulacs) offers a fast C++ backend with a Python interface, optimized for multi-core CPUs and extendable to GPU via cuStateVec, making it suitable for prototyping and medium-scale circuits.

The cirq\_simulator is Cirq’s native simulator, designed for flexible, moment-based execution but less suited for large circuits.

Lastly, the aer\_simulator\_statevector (Qiskit Aer) provides fast, idealized statevector simulations with both CPU and GPU support, typically used when measurements are deferred to the end.

**shivam katoch:** sir what are vector and QPU ?

**C-DAC Response: QPU** stands for **Quantum Processing Unit** — these are the actual **quantum computers** that process information using **qubits**. Example: **IBM Brisbane** is one such QPU

**Vector cards** are **classical parallel processing accelerators**, typically high-performance specialized cards. They are used to **simulate quantum circuits** (especially those with **many qubits**) more efficiently than standard CPUs.

Padmavati U: Does it include list of all the Algorithms?

**C-DAC Response:** We've included as many quantum algorithms as possible at this stage, and over time, we plan to add more — including advanced quantum algorithms and quantum machine learning techniques.

**Virat Prasad:** What are Credits, that we can see as 110 here?

**C-DAC Response:** When a user registers on Qniverse, they receive **150 free credits for lifetime use**. These **credits are used to run quantum simulations** on different backends like CPU, GPU, and QPU.

Each simulation consumes a certain number of credits. If a user needs more credits, he/she can approach [qniverse@cdac.in](mailto:qniverse@cdac.in) for more credits. We can also have a discussion for bulk credits for colleges/institutions for running UG/PG courses.

**Prajna Jha:** How can I register for exam to get completion certificate? Kindly send us the link for exam registration.

**C-DAC Response**: A **Developer Certificate Exam** will be conducted at the end of the 14-week webinar series. Participants interested in taking the exam will need to pay a fee of **Rs. 1000/-**. Detailed information regarding the exam schedule and registration process will be shared during the later stages of the webinar series.

Padmavati U: How frequently do we have our exam ? do we have Weekly Quizes?

**C-DAC Response:** The **Developer Certificate Exam** will be held **once**, at the conclusion of the 14-week webinar series. Details regarding the exam schedule and registration process will be shared in the later stages of the series.

As for quizzes, we regularly post them **every week** on our **Zulip platform**. We encourage you to stay active on Zulip for continuous updates, quizzes, and other important information.

**Prajna Jha:** Please keep the exam schedule on Sunday

**C-DAC Response:** We shall consider your suggestions. However, detailed information regarding the exam schedule and registration process will be shared during the later stages of the webinar series.

**Anitya Gupta:** Can I run my experiment of Sentiment and Emotion Prediction at Qniverse because it will reduce my coding part?

**C-DAC Response:** **Not directly.** Qniverse is primarily designed for **quantum circuit design, simulation, and algorithm execution** — especially for foundational and algorithmic quantum computing. If your **Sentiment and Emotion Prediction** experiment involves **Quantum Machine Learning (QML)** components – such as VQE, Quantum-Enhanced NLP, Hybrid neural networks, you can use Qniverse’s simulators to build and test **parts of your model**, especially the quantum circuit components.

**Prajna Jha:** How do we load data on Qniverse?

**C-DAC Response:** To load data on Qniverse for a **Quantum Machine Learning (QML)** algorithm, you need to **upload a** .csv **file** containing your dataset. This feature is primarily available in Qniverse’s QML modules, where small classical datasets are encoded into quantum states for hybrid learning tasks.

**Arpit Jain:** If I am trying to run a qiskit based program which requires other python packages, how to install it as we dont have access to the machine where the program is running internally

**C-DAC Response :** If your program depends on a specific Python package, please **contact our support team** at **qniverse@cdac.in** with the package name and use case. Our team will review and, if appropriate, **integrate the requested package** into the environment.

**Anitya Gupta:** I can see we have been awarded 150 credits then we need to buy and what is the package?

**C-DAC Response:** When a user registers on Qniverse, they receive **150 free credits for lifetime use**. These **credits are used to run quantum simulations** on different backends like CPU, GPU, and QPU.

Each simulation consumes a certain number of credits. If you need more credits, you can approach [qniverse@cdac.in](mailto:qniverse@cdac.in) for more credits. We can also have a discussion for bulk credits for colleges/institutions for running UG/PG courses.

**Prajna Jha:** Very good initiative from CDAC. Sir, please give us email id. I am a faculty and need credits for research.

**C-DAC Response:** If you need more credits, you can approach [qniverse@cdac.in](mailto:qniverse@cdac.in) for more credits. We can also have a discussion for bulk credits for colleges/institutions for running UG/PG courses.

**Swapan Kumar Nandi:** How commercials will be handled when one use IBM quantum machine through Quniverse?

**C-DAC Response:** IBM Quantum machines are **chargeable** services. IBM currently offers **10 minutes of free access per month**, after which usage is billed by IBM based on their pricing structure.

When accessing IBM Quantum machines via **Qniverse**, in addition to IBM’s actual charges, Qniverse applies a **platform fee of 2 credits per simulation**.

**Aashray Jain:** Can you tell us more about Photonics computing and how is this different?

**C-DAC Response: Photonic (or Optical) Quantum Computing** uses **light particles (photons)** instead of matter-based qubits (like superconducting circuits or trapped ions) to perform quantum computations.

**Asha S:** sir good evening can you suggest some books or sites to understand basics

**C-DAC Response:** The book **“Quantum Computing and Quantum Information”** — often referred to as **"Mike & Ike"** — is a highly regarded textbook authored by **Michael A. Nielsen and Isaac L. Chuang** and is considered foundational in the field of quantum computing.

For those interested in **Quantum Machine Learning**, a recommended resource is **“Quantum Machine Learning: What Quantum Computing Means to Data Mining”** by **Peter Wittek**.

YouTube offers a vast collection of videos, but it's important to stay focused and avoid getting distracted while exploring the content.

**VIJAYARAM S:** Shall we visit the CDAC Bengaluru and interact with the people to explore the knowledge?

**C-DAC Response:** You can write to us at qniverse@cdac.in, and our team will be happy to assist you.

**Apoorva K A:** Sir, any basic beginner sites to refer to as I’m a newbie to this field?

**C-DAC Response:** Refer to the IBM Quantum Experience and Qiskit Textbook

Gopinath: Sir, upto how much qubit we can simulate?

**C-DAC Response:** You can currently simulate up to 37 qubits using Qulacs on Qniverse. We are actively working on scaling this further by leveraging C-DAC’s PARAM Supercomputing infrastructure to support even larger simulations.

**Lalith Kothapalli:** Will you eventually have a connector to QpiAi’s quantum computer as well?

**C-DAC Response:** Yes. We are continuously working to expand Qniverse’s interoperability with various quantum hardware providers.

Valarmathi Krishnasamy: What’s the accuracy rate compare to other platform?

**C-DAC Response:** The **accuracy of simulations and quantum circuit results in Qniverse** depends on the **backend** being used — whether it's **ideal** or **real quantum hardware.**

**Swapan Kumar Nandi:** Does Quniverse support round tripping, meaning changes in generated code will change the circuit diagram also?

**C-DAC Response:** Yes , it supports , if you do any changes in generated code , you can see the changes in the composer section.

**Adam Ahmed Yahya:** Is there docs for QML in Qniverse so that I can learn and try out things?

**C-DAC Response : There**  are documentation for the individual QML algorithms such as QSVM , QKMEAN, QNN, Qperceptron, QPCA, QHC, QKNN,

**Prerana Vyavahare:** Would the course on Monday be right from basics like quantum circuits and qubits etc ?

**C-DAC Response: Yes.**

**Sai Sidhant Mishra, DHID, C-DAC Mohali:** What is the Course on Monday??

**C-DAC Response:** It’ll be an intermediate session onQubits & Gates: Building blocks of Quantum Computing.