Quantum Computing

Fujitsu Limited

ISC HIGH PERFORMANCE 2025

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Computing as a Service Vision

FUJITSU

Provide the top-class Computing Technologies “as a Service”

Application

Finance | Material | Energy | Medicine | Meteorology | Disaster Prevention

Platform

AI | Simulation | Data analytics

Computing as a Service

Low power consumption | Great computing power | Trust platform

Available on Public Cloud

Middleware
OS
Hardware

High Performance Computing (HPC)

A64FX Technology

Quantum-Inspired Technology

Digital Annealer
Quantum Simulator

Quantum Technology

Superconducting Qubit
Diamond Spin Qubit

©RQC

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Fujitsu's Strategy for Quantum Computing

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- Cover all the technology layers with the world's leading research institutions
- Put emphasis on software technologies, while working on several types of hardware
- Develop applications with end users by using Hybrid Quantum Computing Platform

Quantum Application	Research with end-user input: **Materials** | **Drug discovery** | **Finance**		**FUJIFILM, Tokyo Electron, TU Delft** etc.
Quantum Software	**QunaSys** Algorithm	**Keysight Technologies** Error Suppression	**Osaka Univ.** Error Correction
Quantum Platform	Middleware	Complier	Cloud Technology
Quantum State Control, Device & Integration	**RIKEN** Superconducting Qubit	**TU Delft** Diamond Spin Qubit	Exploring other possibilities, Neutral Atom etc.

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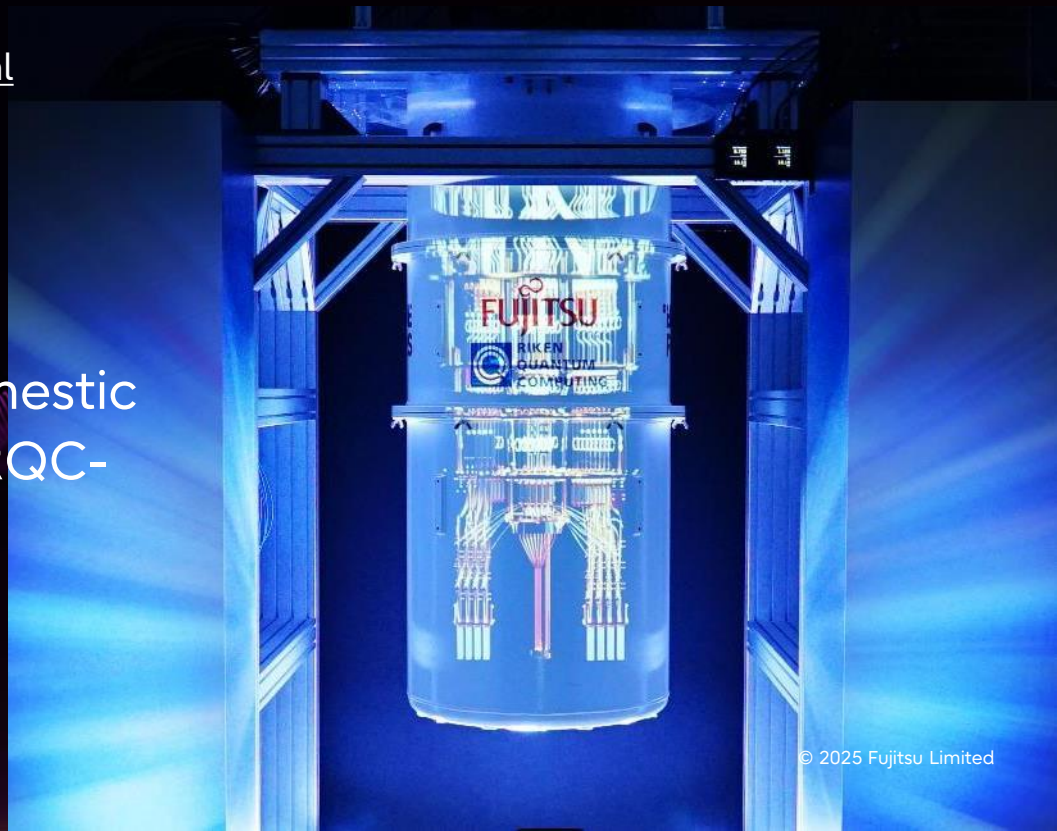
Oct. 5, 2023

Launch of a 64-qubit Quantum Computer

Press release:
https://pr.fujitsu.com/jp/news/2023/10/5.html

- Collaboration with Prof. Nakamura
- Developed Japan's second domestic quantum computer at RIKEN RQC-Fujitsu Collaboration Center



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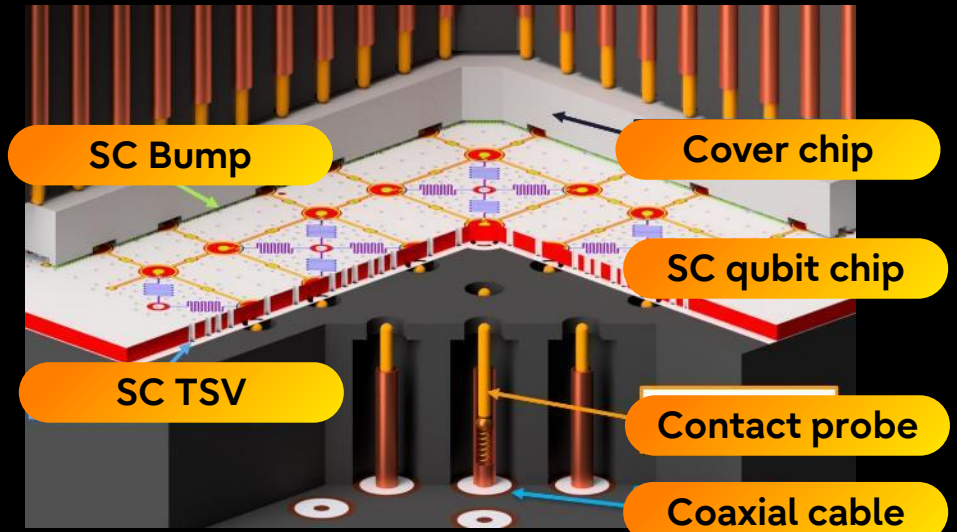
Superconducting Qubit Technology: Scalable Qubit Chip Design

RIKEN QUANTUM COMPUTING | FUJITSU

3D Contact structure



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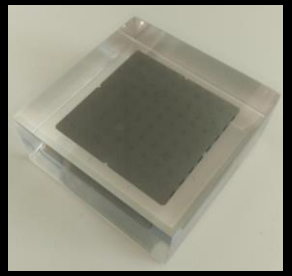
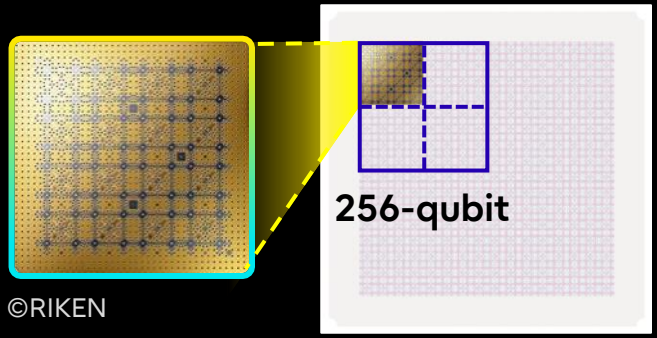
256-qubit



64-qubit

1,024-qubit



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Can scale up by tiling basic units

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Developed 256-Qubit Quantum Computer

Press release:
https://pr.fujitsu.com/jp/news/2025/04/22.html

- Achieved the development of one of the world's largest-class quantum computers* through thermal design and high-density integration technology
- Planned Availability: During the first quarter of 2025.

*quantum computer available to external users

64-qubit Quantum computer

© RIKEN Center for Quantum Computing
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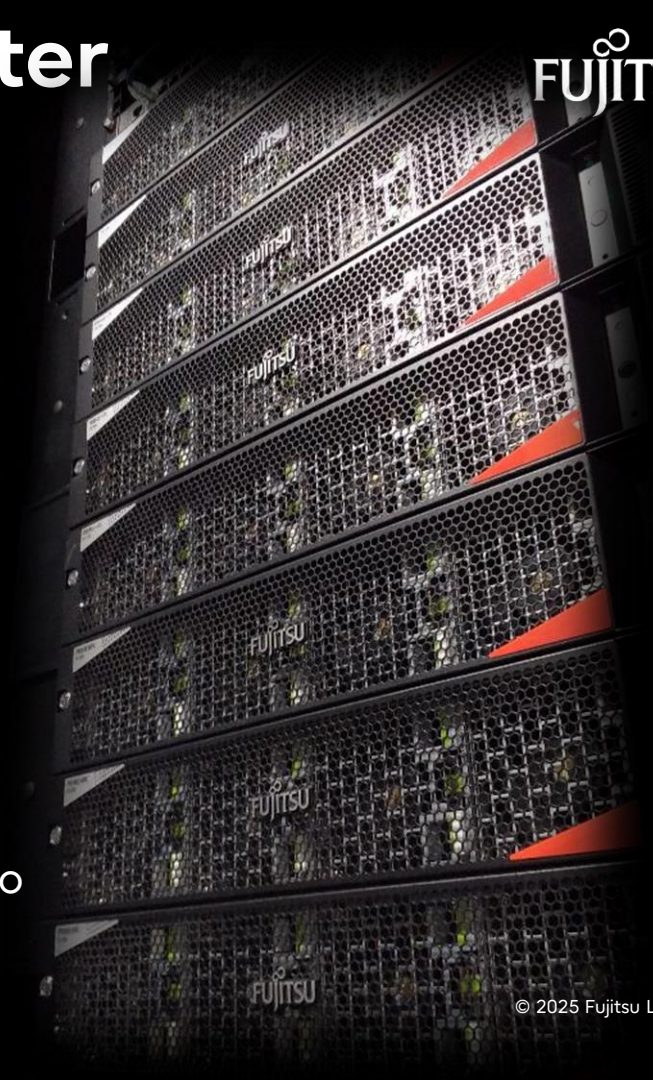
40-qubit Quantum Computer Simulator

Press release:
https://pr.fujitsu.com/jp/news/2024/02/19.html

- The world largest-class state vector simulator on PRIMEHPC FX700 cluster as a permanent dedicated system
- Research on new-type simulators for larger scale
  - ✓ Tensor Network simulator with Barcelona Supercomputing Center
  - ✓ Decision Diagram simulator with the Univ. of Tokyo



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Fujitsu Hybrid Quantum Computing Platform

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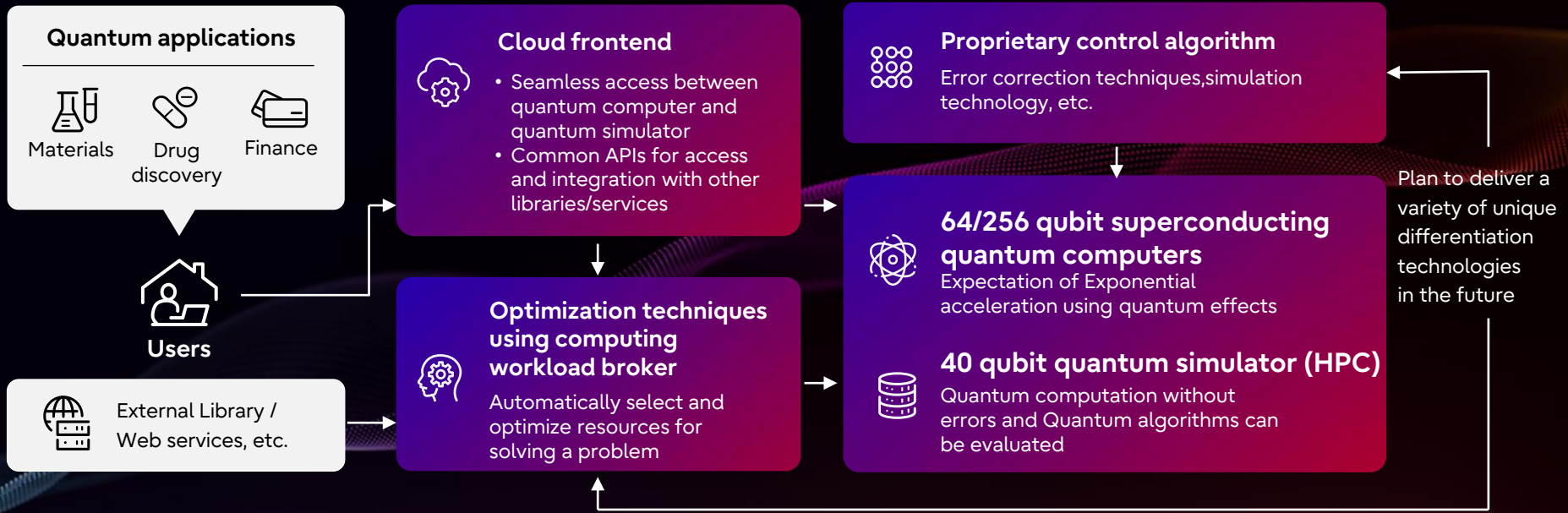
- Seamless operations between quantum computer and quantum simulator
- Development of computational methods that take advantage of both quantum computers and quantum simulators



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Release of platform software as OSS

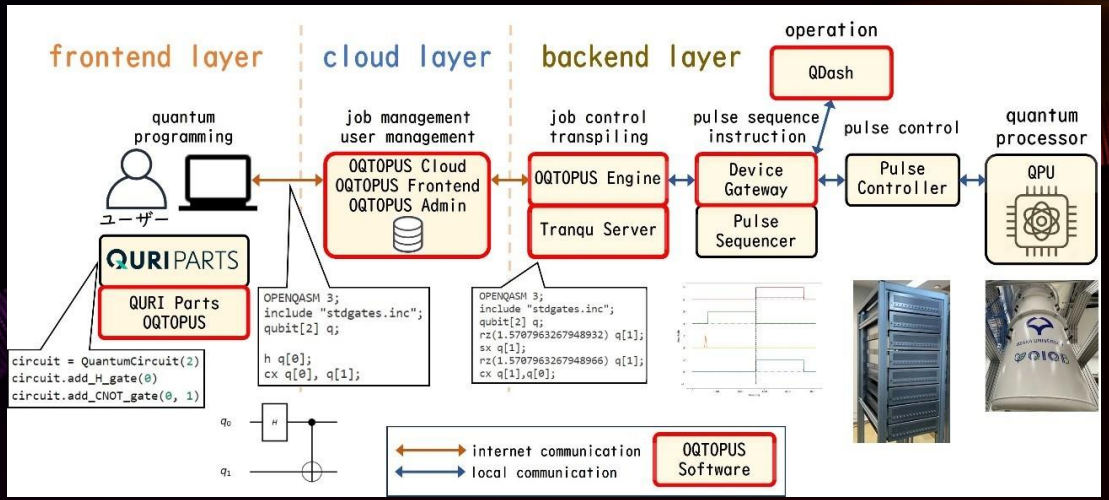
大阪大学 OSAKA UNIVERSITY | FUJITSU

Open Quantum Toolchain for Operators and Users

Press release:
Fujitsu and research partners launch open-source quantum computer operations software

- Developed with Osaka Univ and released V1.0 in Mar. 2025
- User/job/device management function on cloud
- Pre-/post-processing functions on the edge side

https://github.com/oqtopus-team



https://resou.osaka-u.ac.jp/en/research/2025/20250324_1

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Collaboration with Customers

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- Fujitsu is already working with customers to develop pioneering quantum applications using quantum simulators
- We accelerate collaboration research using this platform and expand the search for practical hybrid quantum applications in various fields such as materials, finance, and drug discovery.

FUJIFILM

MITSUBISHI CHEMICAL GROUP

TOKYO ELECTRON

Mizuho–DL Financial Technology

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Quantum Simulator Challenge

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Press release:
https://pr.fujitsu.com/jp/news/2025/03/28.html

- Competition for the development of quantum applications utilizing a large-scale quantum simulator, conducted in 2024.
- Participation of 46 teams from 13 countries
- The winners awarded at “Fujitsu Quantum Day 2025 Japan” last March.

1st place : Delft University of Technology
- ✓Industrial Shift Scheduling on the Fujitsu Quantum Simulator

2nd place : Technische Universität Ilmenau
- ✓QuPIV - Quantum algorithm for cross-correlation analysis in particle image velocimetry

3rd place: : Qunasys Inc.
- ✓Large-scale simulation of molecular electronic states using quantum phase estimation algorithm.

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Our First Commercial Quantum Computer

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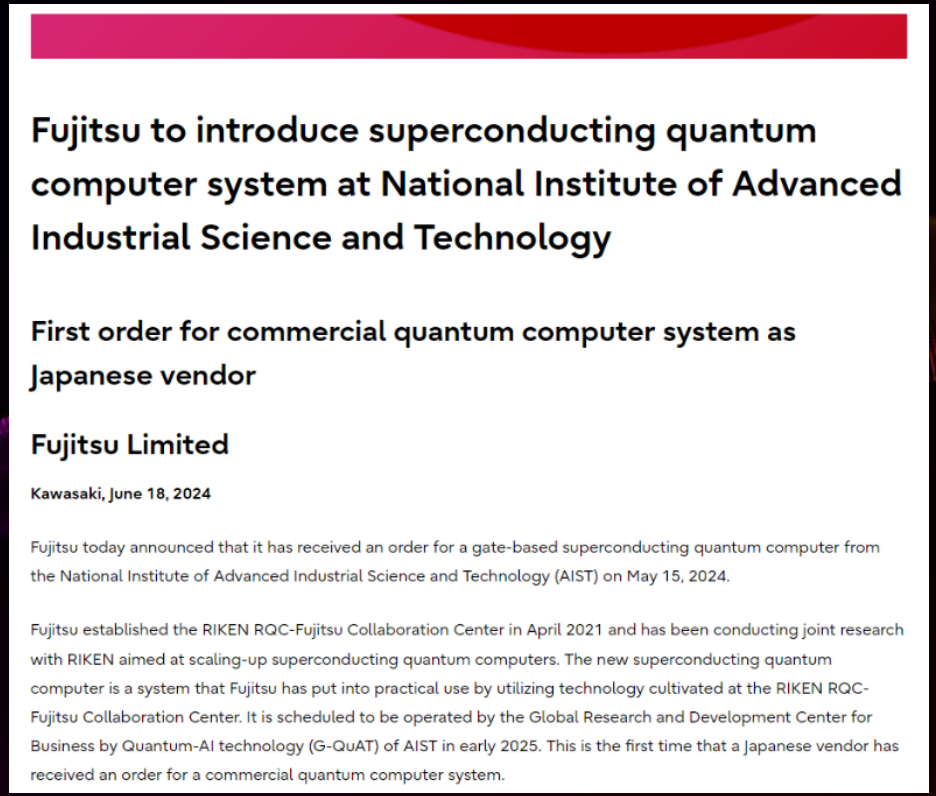
Press release:
https://pr.fujitsu.com/jp/news/2024/06/18.html

- Delivered to AIST
- We also plan to sell prototype systems overseas.



Fujitsu to introduce superconducting quantum computer system at National Institute of Advanced Industrial Science and Technology

First order for commercial quantum computer system as Japanese vendor

Fujitsu Limited

Kawasaki, June 18, 2024

Fujitsu today announced that it has received an order for a gate-based superconducting quantum computer from the National Institute of Advanced Industrial Science and Technology (AIST) on May 15, 2024.

Fujitsu established the RIKEN RQC-Fujitsu Collaboration Center in April 2021 and has been conducting joint research with RIKEN aimed at scaling-up superconducting quantum computers. The new superconducting quantum computer is a system that Fujitsu has put into practical use by utilizing technology cultivated at the RIKEN RQC-Fujitsu Collaboration Center. It is scheduled to be operated by the Global Research and Development Center for Business by Quantum-AI technology (G-QuAT) of AIST in early 2025. This is the first time that a Japanese vendor has received an order for a commercial quantum computer system.

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1000-Qubit System: Under Development

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- The construction of facility to house a 1000-qubit quantum computer is underway.
- We are planning to launch the 1000-qubit system in FY2026.

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Concluding Remarks

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- We are pushing the boundaries of both hardware and software to realize practical quantum computing as soon as possible.
- We welcome new collaborations with research institutions and companies to achieve this goal.

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Thank you

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