Research and Development of Theory and Software for Fault-tolerant Quantum Computers

Project manager

(selected in 2025)

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Leader's institution

UTokyo

R&D institutions

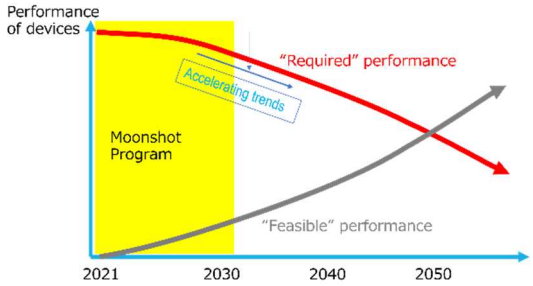
Hokudai; RIKEN; JWU; UTokyo; Kyoto U; OIST; NTT, Inc.; Keio U; Kyusyu U; AIST.

Summary of the project

This project develops and expands a co-design model for fault-tolerant quantum computers, encompassing all technological layers. This model is used to integrate various innovative approaches conceived by our diverse team of researchers in quantum information, computer architecture, and various physical systems, aiming to realize a large-scale quantum computer by 2050.

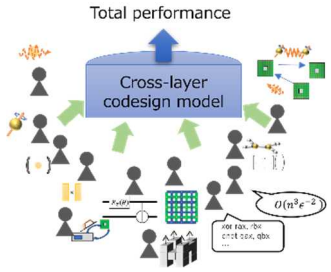
Milestone by 2030

We will deliver a significant reduction in hardware requirements for realizing a large-scale fault-tolerant quantum computer.

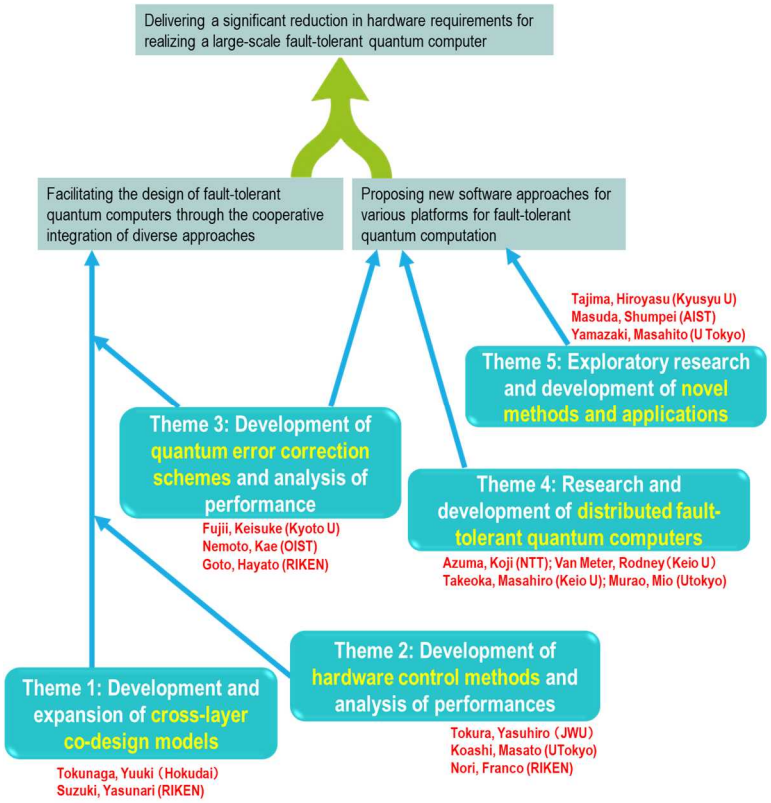


Milestone by 2028

We will propose diverse approaches and present a design for fault-tolerant quantum computing that cooperatively incorporates them.



Project structure



To expedite the theoretical research, the project members of the R&D institutes are collaborating with each other beyond the assigned themes shown above and tackling the problems with their open minds.