

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

#### Project manager

#### (selected in 2020)

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#### R&D institutions

NTT, U of Tokyo, U of Tsukuba, TMDU, RIKEN, Osaka U, OIST, Keio U, Kyoto U, UEC, AIST

### Summary of the project

This project aims to construct a co-design model encompassing qubit design, fault-tolerant architecture, and compilers and programming languages for efficient computation through collaborations of researchers in quantum information, architecture, and specific physical systems, thereby endeavoring to realize a large-scale quantum computer by the year 2050.

#### Milestone by year 2030

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



#### Milestone by year 2025

We will develop a supporting tool for designing a fault-tolerant quantum computer with integration of hardware and software. Total performance





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.

