

Goal 6 Realization of a fault-tolerant universal quantum computer that will revolutionize economy, industry, and security by 2050.

Fault-tolerant Quantum Computing with Photonically Interconnected Ion Traps

Project manager

TAKAHASHI Hiroki

Assistant Professor, OIST



leader's institution

OIST

R&D institutions

Kyoto Univ., Kyushu Univ., NICT, OIST, Osaka Univ., QST, The Univ. of Tokyo

Summary of the project

This project aims to develop ion trap devices that facilitate building large-scale quantum systems beyond the limitations posed by conventional approaches. The new approach is based on a novel idea of photonically interconnecting multiple ion traps. Thereby we aim to realize large-scale quantum computing by 2050.

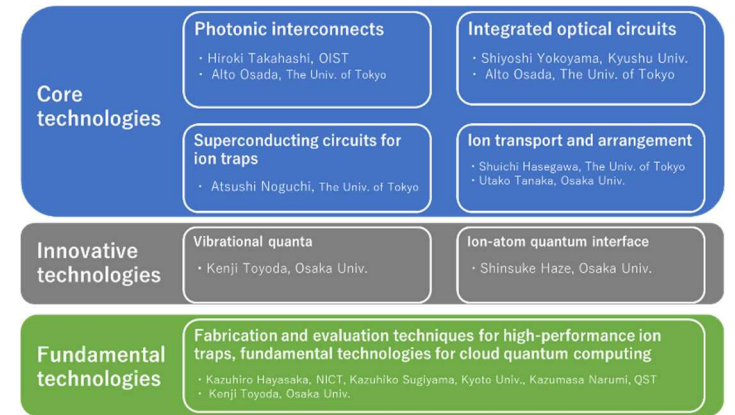
Milestone by year 2030

We aim to realize a fault-tolerant photonically interconnected quantum computing system by photonically connecting ion trap modules.

Milestone by year 2025

We develop ion trap modules that enable the expansion of the number of qubits, demonstrating their scalability to the level required for fault-tolerance.

R&D theme structure of the project



NICT: National Institute of Information and Communications Technology
 OIST: Okinawa Institute of Science and Technology Graduate University
 QST: National Institutes for Quantum Science and Technology