

【Common Core Program】 “Human Resources Development Program”

Project Name Development of the Standard Program for Quantum Science and Technology

Project Leader

Professor Kae NEMOTO, Principles of Informatics Research Division, National Institute of Informatics
Collaborators: Kyushu University, Keio University, Nagoya University, and The University of Tokyo

Overview

In this program, we aim to establish an online platform for higher education in quantum science and technology within Japan. The five educational institutions develop high quality online lecture courses as well as other educational materials, and the online system, which will be developed at NII, will enable to deliver these educational materials to any universities in Japan. This online educational system not only deliver the high quality teaching in both undergraduate and graduate courses, but also support the teaching preparation at individual universities by providing license-free educational materials. With the online system we aim to develop new ways of learning more adjustable to students' needs and hence more effective. The program targets not only students from undergraduate to graduate level in related fields in science and engineering, but also students in law and social science, and professionals in such as research, engineer, and media.

Goal of R&D

- Establishment of a curriculum
- Development of course teaching materials
- Implementation of lecture courses
- Implementation of internships

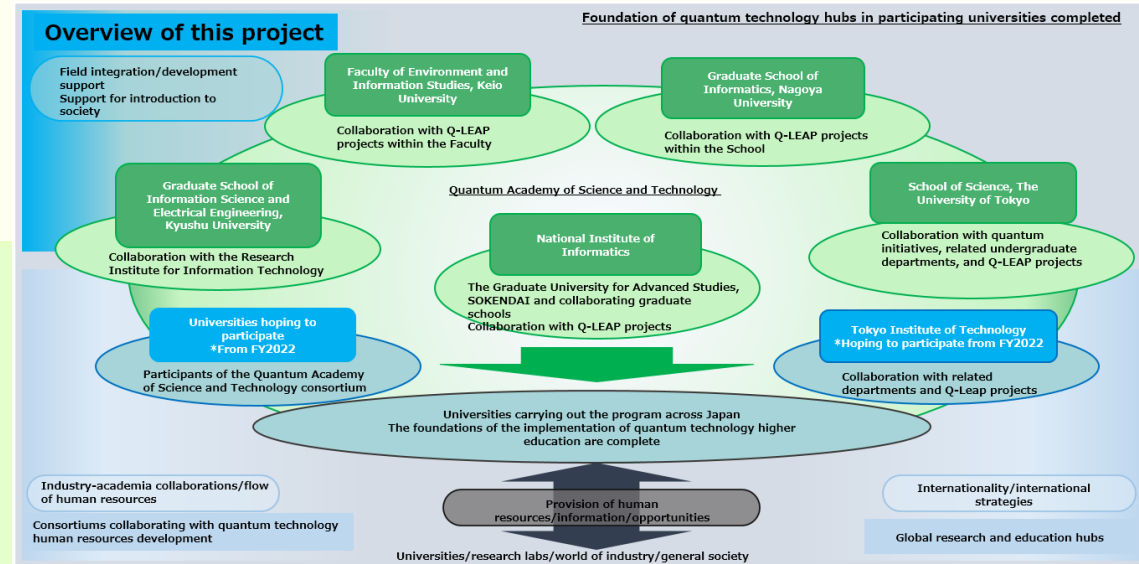
Milestones

- FY2020
 - Establishment of a curriculum
 - First-stage development of course teaching materials, the selection of applicable sites in which to implement this program, and a partial trial run
 - Trial run of portal site
- FY2021
 - Legislative preparations for operation, including usage regulations
 - Assignment of required teaching positions and staff
 - Second-stage development of course teaching materials
 - Implementation of pilot program
- FY2022
 - Full-scale program trial
 - Third-stage development of course teaching materials

- FY2025
 - Measurement and analysis of outcomes of full-scale program trial
 - Review and reform of program based on feedback from participants, the institutions carrying it out, consortiums, etc.
 - Development and expansion of the program to other universities, etc.

Exit Strategies

- The initial five members of the program will be the core institute for the education for quantum science and technology.
- Establish the consortium to collaborate with the industries and the national labs in this domain and strength the collaboration with overseas institutions.



【Original Subprogram】 “Human Resources Development Program”

Project Name Fostering Quantum Natives through Practical Research and Development

Project Leader Prof. Masayuki Ohzeki, Graduate School of Information Sciences, Tohoku University

Overview

Under the title “Fostering Quantum Natives through Practical Research and Development,” a program is being constructed to train human resources who can simultaneously and mutually learn about quantum annealing and quantum machine learning through lectures and practical exercises, grow to gain hands-on experience and carry out external activities, and tackle quantum computing through practice.

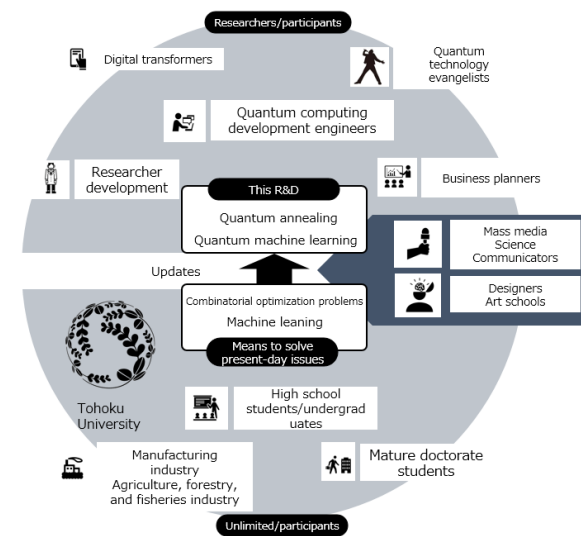


Figure 1: Raising the industrial base level and creating a foundation for quantum digital transformation

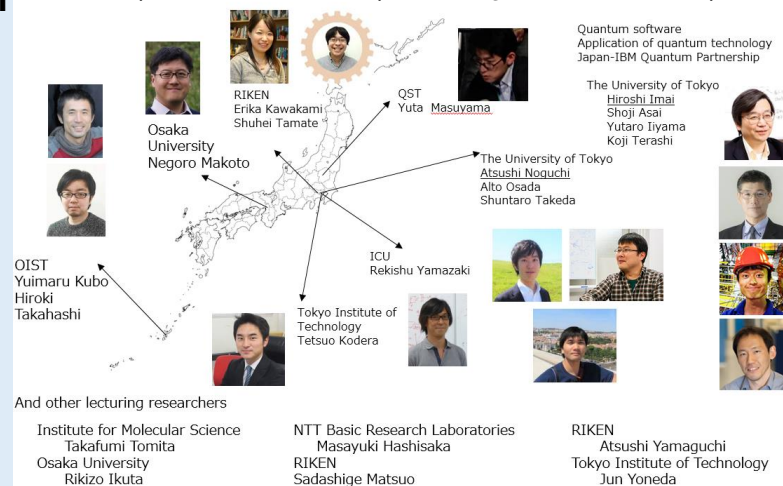
Project Name Quantum Education for future technologies

Project Leader Associate Prof. Atsushi Noguchi, Graduate School of Arts and Sciences, The University of Tokyo

Overview

The creation of an education program based on a hybrid model, made up of regular online courses concerning quantum technology and different types of quantum experiments, internships in various institutions, and concentrated summer schools. These courses will also be held offline, and, in principle, their content made public through videos. Teaching materials equivalent to textbooks will be created in accordance with this content, in a format similar to proceedings papers, and made public.

Gathering of young researchers involved in quantum experiments and the Japan-IBM Quantum Partnership



【Original Subprogram】 “Human Resources Development Program”

Project Name

A hands-on program for fostering quantum-based thinkers among emerging engineers in various disciplines

Project Leader

Associate Prof. Tetsuo Kishimoto, Graduate School of Informatics and Engineering, The University of Electro-Communications

Overview

Development of a program that aims to foster quantum-based thinkers among emerging engineers in various disciplines, who will be able to effectively communicate with quantum natives. The project includes the development of experimental kits for quantum physics (atomic and molecular physics and quantum optics).

