

## Donation request plan

### 1. Donation

Pioneer support for quantum information science and quantum computation

### 2. Project utilizing the donations

(1) Project name: Project to foster quantum information science and quantum computation pioneering researchers

#### (2) Purpose

Quantum mechanics, born in the early 20th century, has contributed to the development of a wide range of scientific fields as a fundamental theory of physics. It is no exaggeration to say that the computer and internet technologies that are indispensable to today's information society have all benefited from quantum mechanics. However, from the perspective of quantum information science, which has rapidly developed from around the end of 20th century, it has become clear that humanity has not yet fully mastered quantum mechanics. The RIKEN Center for Quantum Computing (RQC) is committed to expanding the possibilities of quantum technology through consistent research and development from hardware to software and from basic science to application, with the aim of realizing quantum computing as an innovative information processing technology based on the principles of quantum mechanics.

While quantum computer development around the world is contributing integrated circuits with hundreds to thousands of qubits, it is said that a socially implementable quantum computer requires integration in the million-qubit range. Other challenges, such as realization of error correction and error-resistant quantum computation, are endless. We are still on a long way toward realizing a quantum computer that can be implemented in society. In order for RQC to contribute to the long race to develop a quantum computer, we need to attract talented researchers from all over the world to work at RQC. In order to attract such human resources, RQC must serve as an international platform for fostering human resources involved in quantum information research, and must continue to communicate our message to attract scientists from around the world who want to conduct research at RQC.

This project will involve activities to attract young researchers who will lead the next generation to the field of quantum information science, and to support quantum research. By inviting domestic and international students and researchers to study abroad and promoting exchanges among researchers, we aim to foster researchers and produce completely new breakthroughs at RQC. Another challenge in human resource development is promoting diversity. The percentage of women in the physical engineering field, which is the parent field of quantum science researchers, is very low compared to

other science departments. In order to continue to secure the absolute number of excellent students in the quantum science field in the future, we believe that it will become increasingly important to promote the participation of female students. Therefore, for the future development of the quantum science field, we will also engage in activities to convey the attractiveness of the quantum science field so that it will become a career path of choice for female students.

(3) Project description

a) Representative: RIKEN Center for Quantum Computing (RQC)

Center Director: Yasunobu Nakamura

b) Details of the project

- Support for travel and living expenses for dispatch, invitation, and study abroad for the purpose of fostering quantum science researchers
- Support for participation fees for quantum science researcher symposiums
- Hosting research study sessions, promotion activities for research outcomes, developing research environment to promote quantum information and quantum computer research projects
- Outreach activities such as advertising research results of RQC etc.

3. Donation call amount

105,457,181 JPY

The amount was determined from the value of the Dirac constant, a physical constant that represents the smallest unit of energy.

$$(\hbar = h/2\pi = 1.054571817\dots \times 10^{-34} \text{ J}\cdot\text{s})$$

4. Donation call duration

From July 3, 2023 to March 31, 2028

5. Spending plan (estimate):

- Travel and living expenses for dispatch, invitation, and study abroad for young researchers: 50 million yen
- Participation fees and travel expenses for students and research support staff to attend conferences: 10 million yen
- Expenses related to hosting research meetings and disseminating research results: 19.91 million yen (includes five million yen for human resource development training expenses)
- Personnel expenses, honoraria, etc. for young researchers: 15 million yen
- General Management Fee (10% of the amount donated): 10.54 million yen

6. Call procedures/methods

- Post on RIKEN homepage (<https://www.riken.jp/en/about/support/>)

-Post on RQC homepage (<https://rqc.riken.jp/>)

-Other such as advertising at events, dissemination of flyers, etc.

#### 7. Special privileges for donors

-We will send you a donor member's card (membership card with membership number and donation year).

-We plan to send an annual report summarizing the experiences of the overseas invitees and the progress of our research.

-We will send you information on RQC's workshops and seminars (mainly held in English) upon request.

#### 8. Inquiries

RIKEN Center for Quantum Computing Promotion Office

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\*Please replace [at] with @.

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