

Academic Year 2024

Multidisciplinary PhD Program  
for Pioneering Quantum Beam Application

Osaka University

Application Guidelines

Institute for Transdisciplinary Graduate Degree Program



## 1. Overview of the “Multidisciplinary PhD Program for Pioneering Quantum Beam Application”

### 1) Purpose

Confronted with the reality of rapid aging and a low birthrate, our country must address the urgent tasks to extend the healthy life expectancy and realize a super-smart society with a clear vision of Society 5.0. Academia, including universities, are expected to address this issue and create new value through interdisciplinary cooperation. In this context, quantum beams created by accelerators are being applied in innovative ways to solve problems of modern society. Radioactive isotopes (RIs), which support nuclear medicine, have been essential in cancer research. RIs played a critical role in the rapid evolution of gamma imaging technology and targeted alpha-particle therapy. In addition, cosmic rays contribute to soft errors, which were originally discussed in devices operating in harsh environments such as space. However, due to the rapid development of the Internet of Things (IoT), cosmic ray-induced soft errors have also become an issue on the ground. Therefore, accelerated testing using quantum beams is urgently needed to evaluate and implement countermeasures. Despite the high potential of quantum beam applications, the development of human resources to support research and advance technologies is lagging.

This program aims to “continuously develop human resources to lead the creation of next-generation quantum beam application technologies” by targeting students mainly in the fields of science, medicine, and information technology in cooperation with domestic and foreign universities, institutions, and companies related to various quantum beams, including radionuclides, neutrons, and muons.

### 2) Student Attributes

Students accepted in the program are expected to be “intellectual professionals,” who will lead industry, government, and academia. They will acquire a high level of expertise, ability to comprehensively manage complex interdisciplinary issues, and the ability to compete at the international level. To achieve these goals, the program will develop students with the following qualifications:

- ① Ability to consider risks in terms of human sustainability
- ② Significant academic and technical knowledge in a specialized field
- ③ Ability to consider phenomena on various scales and academic fields
- ④ Experience and knowledge of advanced experiments and calculations in different fields
- ⑤ Ability to evaluate risks and benefits of the implementation of advanced technologies
- ⑥ Ability to develop and capitalize on human networks by taking a leadership role in international activities

### 3) Admission Policy

Students who wish to participate in the program must be committed to the purpose of the program and enthusiastic about acquiring the aforementioned qualifications (①~⑥ in section 1. 2), in addition to possessing a strong basic academic foundation and communication skills.

## 2. Eligibility for Application

Applicants must be a master’s student or 1<sup>st</sup> year doctoral student of the Department of Physics, Department

of Chemistry and Department of Macromolecular Science of the Graduate School of Science, the Department of Information Systems Engineering of the Graduate School of Information Science and Technology, and the Division of Health Sciences of the Graduate School of Medicine, or 1<sup>st</sup> year and 2<sup>nd</sup> year doctoral student of the Division of Medicine of the Graduate School of Medicine.

This programs and Next Generation Researcher Development Project can be taken in duplicate.

### 3. Program Capacity

A maximum of 12 students are accepted each year.

### 4. Application Procedures

Application Period          June 6(Thu.) ~June 12(Wed.), 2024

Application Documents    “7. Application Documents”①~⑦

Application Method

Please complete all the following items within the application period.

(1) Sending application documents from the applicant by NII File Sender.

(2) Sending an Evaluation Letter (form 4) from the supervisor by NII.

(3) After sending the application documents by NII File Sender, send an email to PQBA office(info-pqba@rcnp.osaka-u.ac.jp)

#### 4-1. How to send application documents by NII File Sender

- ① Be prepared to convert the application documents to PDF file with the file name “last name-1.pdf~last name-7.pdf”.
- ② Send the documents to [info-pqba@rcnp.osaka-u.ac.jp](mailto:info-pqba@rcnp.osaka-u.ac.jp) by NII File Sender ( <https://filesender.nii.ac.jp/> ). The subject of the email should be “Application + first and last name”.
- ③ After that send a blank email to [info-pqba@rcnp.osaka-u.ac.jp](mailto:info-pqba@rcnp.osaka-u.ac.jp) with the subject of the email as “Send completed + first and last name.”

NII File Sender is large-capacity file transmission service provided by the National Institute of Informatics (NII). You will need your Osaka University personal ID and password. For details, please refer to the following manuals.

NII File Sender Utilizing Method (Written in Japanese):

[https://web.auth.osaka-u.ac.jp/gakunin/NII\\_Filesender.pdf](https://web.auth.osaka-u.ac.jp/gakunin/NII_Filesender.pdf)

Method of login to the Academic Access Management Federation Japan (Written in Japanese):

<https://web.auth.osaka-u.ac.jp/gakunin/ds-login.html>

### 5. Schedule of Interview

July 8(Mon.), 2024

## 6. Selection Procedure

Students who wish to apply for the program must have a clear image of their research plan for the program by discussing it with their supervisor. The supervisor must certify that the consultation was completed by signing the certification statements on the Evaluation.

The selection process involves two stages:

### 1) Document Screening

Application Documents will be reviewed. Applicants who pass the document screening will be invited to an interview.

### 2) Interview

Applicants will be interviewed by faculty members of the PQBA. Applicants passing the document screening will receive detailed information regarding the interview schedule and preparing the presentation required for the interview.

Selection Process	Period	Time	Location
Application Period	From June 6(Thu.), To June 12(Wed.), 2024	By June 12, 16:00pm	Send to info-pqba@rcnp.osaka-u.ac.jp in PDF format by File Sender
Document Selection Results	July 1(Mon.), 2024	14:00 (tentative)	On the program website
Interview	July 8(Mon.), 2024	To be announced	Graduate School of Science
Final Selection Results	July 19(Fri.), 2024	14:00 (tentative)	On the program website

## 7. Application Documents

- 1) Examination Admission Slip (Form 1)
- 2) Application Form for the PQBA Program (Form 2)
- 3) Statement of Purpose and Research Plan (Form 3)
- 4) Master's thesis or equivalent (applicable to students of doctoral courses only)
- 5) Evaluation Letter (by a supervisor) (Form 4)
- 6) Transcript of undergraduate academic records
- 7) Transcript of graduate school academic records (applicable to 2<sup>nd</sup> year master's students, 1<sup>st</sup> year doctoral students and 2<sup>nd</sup> year students of the Division of Medicine, Graduate School of Medicine)

## 8. Notes on the Selection Process

The application number of those passing the document screening will be posted on the website of the "Multidisciplinary PhD Program for Pioneering Quantum Beam Application" on July 1, 2024. Inquiries about

the selection results by phone or email will not be accepted. Only those passing the document screening will be interviewed. Additional details, including the interview location, will be counted as credits of the program.

Please refer to the website for further details.

Website URL: <https://www.rcnp.osaka-u.ac.jp/pqba/>

### 13. Financial Support

The following financial support will be offered to those accepted by the program during the standard term of the course of study:

1) 2<sup>nd</sup> year of master's course:

- Maximum of approximately ¥480,000 per year for research assistant activities

2) Doctoral course:

- Maximum of approximately ¥1,000,000 per year for research assistant activities
- Tuition Fee Exemption

Regarding the research assistant activities by the doctoral students of the Division of Medicine, Graduate School of Medicine, 1) is applicable to 1<sup>st</sup> year students and 2) is applicable to the students of 2<sup>nd</sup> to 4<sup>th</sup> year.

Please note that the financial support may be terminated in case of extremely poor performance. The provision of the exemption may be changed according to the University's financial situation and other factors each year.

### 14. Handling of Personal Information

- The name, address, and other personal information submitted with the application will be used for the purpose of performing tasks related to the Doctoral Program for World-leading Innovative & Smart Education, including the selection process (application handling and selection test), announcement of selection results, and registration procedures.
- The personal information used for the selection process such as examination scores will be used only for purposes that contribute to the objectives of the program, including aggregating and analyzing the selection results, investigations and research of the selection method, and analyzing the correlation with performance of those who finish the program.

### 15. Notes

- Incomplete application forms will not be accepted.
- As a general rule, changes to the content of the application documents after submission will not be permitted.
- Submitted documents will not be returned.
- An application number will be assigned after the application is received, and the examination admission slip

with the application number will be sent to the laboratory to which the applicant belongs via intercampus mail.

- If the information provided in the application documents is found to be fabricated or falsified, enrollment permission to the program may be withdrawn even after acceptance into the program.
- If you have physical disabilities and require special arrangements for the selection test, please contact the PQBA Administrative Office (info-pqba@rcnp.osaka-u.ac.jp) by June 12, 2024.
- Qs & As related to the application guidelines will be posted on the website of the “Multidisciplinary PhD Program for Pioneering Quantum Beam Application” (<https://www.rcnp.osaka-u.ac.jp/pqba/>) as necessary.

---

## Inquiries :

### Toyonaka Campus:

PQBA Administrative Office, Graduate School of Science, Osaka University

1-1 Machikaneyama-cho, Toyonaka, Osaka 560-0043, Graduate School of Science B building, 1<sup>st</sup> floor, Room B101

Email: info-pqba@rcnp.osaka-u.ac.jp Phone: 06-6850-5297 (Direct)

### Suita Campus:

Research Cooperation Department, Research Center for Nuclear Physics, Osaka University

10-1 Mihogaoka, Ibaraki, Osaka 567-0047

Email: info-pqba@rcnp.osaka-u.ac.jp Phone: 06-6879-8904 (Extension 3169)