

September 12, 2023

Director Takashi Furumura  
Earthquake Research Institute  
The University of Tokyo

To whom it may concern,

**Earthquake Research Institute Joint Usage/Research Program**  
Call for proposals for research projects and workshops  
for the Academic Year 2024

The Earthquake Research Institute (ERI) has been designated as a nationwide Joint Usage/Research Center for Earthquake and Volcano Sciences by the Ministry of Education, Culture, Sports, Science, and Technology since the academic year 2010.

The goal of this center is to promote solid-earth sciences related to earthquakes and volcanoes, science and engineering to mitigate disasters caused by earthquakes and volcanic eruptions, and observational research both in Japan and abroad for the prediction of earthquakes and volcanic eruptions. In order to achieve this goal, the ERI conducts joint research, accepts visiting researchers from both Japan and abroad, and provides facilities, equipment, materials, and data held by the ERI to related research institutions nationwide.

This time, we call for proposals for joint research projects, workshops, and participants for Specific Research Projects for the Academic Year 2024.

1. Categories (See the Application Guidelines for the details)

- (1) Joint Research
- (2) Workshop/Symposium
- (3) Usage of Facilities, Observation Equipment, and Laboratory Equipment
- (4) Usage of Data and Records

\* We call for proposals for (1) and (2) annually. Please be aware that the period of application submission varies depending on the specific category. Applications for (3) and (4) are accepted all year-round, but with some exceptions.

2. Eligibility for application:

Faculty members and researchers of national, public, and private universities, or national and public research institutions, and their equivalents (a professor emeritus, graduate students, and researchers in private companies) are eligible to apply. Graduate students are not allowed to be the principal investigators of the research except for (3) Usage of Facilities, Observation Equipment, and Laboratory Equipment and (4) Usage of Data and Records. For more explanations about students, please refer to the “13. precautions (5).”

3. Submission of proposals:

Fill out the necessary fields on the specified forms to be found on the joint usage homepage

<https://www.eri.u-tokyo.ac.jp/en/joint-usage-top/>) and submit the form online.

Please follow the procedure shown on the homepage on Web-application guideline

<https://erikyodo2.conf.it.atlas.jp/en>)

4. Period of research: From April 2024 to March 2025.

5. Review Policy:

The Joint Usage Committee of the ERI will review the submitted applications. It is important that the content of the research plan follows the intent of the category for the joint usage/research program. It is required that a proposed project/workshop has relevance to the research conducted in the ERI and/or to the facilities, equipment, records, and data provided by the ERI. Applications are reviewed by all members of the Joint Usage Committee from several research fields. In addition, we will also refer to the application forms for the related Joint research for the past three years during a review.

For specific research projects (A), (B), and (C), the ERI will compile submitted participation applications for each project and send them to each principal investigator of the project. The principal investigator should submit a proposal for review by summarizing the application information before mid-November.

6. Application Deadline: October 31, 2023

7. Submission of Letter or File of Consent:

All members of a “1. Joint Research,” except those who belong to the ERI, must submit a Letter or a File of Consent (Form N-1-E) by the project. Please submit one by web system, email or postal mail with the signature of the head of your affiliated institution within two weeks after you submitted the application by web system. In case an applicant moves to a new institution, he/she should submit a Letter of Consent signed by the head of the new institution without delay.

Submission of the Letter of Consent is not required for the one applying for “2. Workshop/Symposium,” “3. Usage of facilities, observation equipment, and laboratory equipment” or “4. Usage of data and records.”

Researchers who belong to ERI do not need to submit the letter of consent.

8. Submission of Confirmation of Research Ethics form:

The Confirmation of Research Ethics form (Form N-2-E) must be submitted by all participants for “1. Joint Research”, “3. Usage of facilities, observation equipment, and laboratory equipment”, and “4. Usage of data and records”.

Submission of the form is not required for the participants for “2. Workshop/Symposium”. You will need to submit your application once between April 2022 and March 2027, once between April 2027 and March 2032, and so on, for a maximum of once every five years. If you are a member of the University of Tokyo, you do not need to submit this form as before. Please send a signed Confirmation of Research Ethics form by web system, email or postal mail to the mailing address shown in “15. precautions (11)” .

9. Submission of Confirmation of intellectual property

All members of a Cooperative Study on High Energy Geophysics Research project must submit a Confirmation of intellectual property (Form N-3-E). With the start of the fourth phase of ILCAA, you will need

to submit your application once between April 2022 and April 2027, once between April 2027 and April 2032, and so on, for a maximum of once every five years. If you are a member of the University of Tokyo, you do not need to submit this form as before.

10. Review Results:

The Joint Usage Committee of the ERI will evaluate all applications, and principal investigators of the projects will be informed about the results before late March 2024.

11. Funds for research/workshop:

The ERI will make expenditures for research/workshop expenses (travel costs, consumables, honorarium for simple labor, and service fees) within its budget. However, expenditure on equipment will not be provided. Please check the definition and examples of “equipment” and “consumable” in “15. precautions (6).”

12. Acknowledgments:

Please acknowledge the ERI’s joint usage/research program in any papers published, which uses the results of the research performed under the program. In addition, when publishing a paper on the Supercomputer Joint Research that has been adopted, please acknowledge the University of Tokyo Information Technology Center. And also, please provide a copy of the paper to the ERI.

The following is an example of an acknowledgment format:

- This study was supported by ERI JURP 20XX-X-XX (project number) in Earthquake Research Institute, the University of Tokyo.
- This study was funded by Earthquake Res. Inst., the University of Tokyo, Joint Research program 20XX-X-XX.
- This research was conducted using the FUJITSU Supercomputer PRIMEHPC FX1000 and FUJITSU Server PRIMERGY GX2570 (Wisteria/BDEC-01) at the Information Technology Center, The University of Tokyo.

13. Lodging facilities:

The ERI is not equipped with lodging facilities. Please arrange accommodations by yourself.

14. Handling of Personal Information

- (1) The applicant's personal data, such as name and address obtained through this Call for Proposals, will be used only for the management of our joint research programs. The Institute is required to share some of your data and statistics with MEXT (Ministry of Education, Culture, Sports, Science, and Technology), such as for mandatory surveys such as the Progress Reports and Annual Reports that the institutes are obliged to carry out. Your data may also be shared with the University of Tokyo to conduct surveys.
- (2) In principle, without obtaining the prior consent of the applicant, the personal information is not offered or disclosed to a third party, with the exception of the circumstances outlined in the article 18-3 and 27 below.

- (3) In accordance with the rules and regulations regarding personal information, and within a reasonable period of time and scope, the University will swiftly handle requests received from individuals for the disclosure, correction, suspension of use or deletion of their personal information collected through the University's site, once the University has confirmed the individual's identity.

15. Precautions:
  - (1) When using facilities, comply with the rules of the ERI as well as relevant laws, and follow the directions of the director for better management and safety.
  - (2) Keep adequate contact with and follow the orders of the contact person and/or related members in the ERI when executing budget, implementing research, and using the equipment.
  - (3) Losses and damages suffered by participants of the joint research projects or users of the equipment from outside the University of Tokyo shall be covered by their institution, and the University of Tokyo is not liable for them. A student participating in a joint research project, except Supercomputer Joint Research, should take out accident insurance. If provided equipment or accessories are damaged or lost, repairs or replacement will be made by the sole responsibility of the user. If defects are found after a device is returned, a repair fee may be claimed. It is recommended that you purchase insurance for your institution in case of malfunction.
  - (4) If you create intellectual property through this joint usage program, please inform the contact person at the ERI and research group members before making copyright or patent application. Additionally, please contact the intellectual property department of your affiliated institution. Division of rights and the application procedures will be determined following discussion among related parties.
  - (5) Graduate students may participate in the projects as members of a research group with acceptance of his / her supervisor, but they cannot be a principal investigator. Technical staff, technical assistants and graduate students may, however, apply as a principal investigator to use facilities, equipment, and data. Undergraduate students cannot participate in the projects but can be a “research assistant” by request of the principal investigator. A letter of consent is needed for the “research assistant”, too. Please contact the “Research Support Team” if you want to add a new “research assistant”.
  - (6) A material that is durable for more than one year and costs more than 100,000 yen per one piece/set is considered as “equipment”. Batteries/cells, chemicals, or software are, however, handled as “consumables” even if they are expensive. Please contact the Research Support Team (Joint Usage Section) for confirmation if there are difficulties classifying a material into one of the two categories.
  - (7) Honorarium for simple labor is for a research assistant, administrative assistant, event support, unskilled labor, which is defined as the table of standard reward in “10. The reward for the unskilled labor such as counting and site management”.
  - (8) If research meetings etc. are to be held using these funds, please make sure to include the

ERI as one of the organizers.

- (9) Reports on the joint research and research meetings must be provided by the principal investigator, which will then be posted on the Joint Usage page of the ERI's website.
- (10) If the participants' personal information is to be collected, please make sure to obtain the consent from the ERI and follow procedures in accordance with the Personal Information Protection Law, such as stating that the number of participants will be given in reports submitted to the ERI as well as in the progress reports of the ERI in such a way that individuals cannot be identified.
- (11) If you have any other inquiries with regard to the joint usage program, please ask the Research Support Team (Joint Usage Section).

[Contact Information]

1-1-1 Yayoi, Bunkyo-Ku, Tokyo 113-0032

Earthquake Research Institute, the University of Tokyo

Research Support Team (Joint Usage Section)

Phone: 03-5841-1769, 5710

FAX: 03-5689-4467

Email: [k-kyodoriyo@eri.u-tokyo.ac.jp](mailto:k-kyodoriyo@eri.u-tokyo.ac.jp)

## Application Guidelines

In order to facilitate researches in the fields relevant to earthquakes and volcanoes across Japan, the ERI conducts various joint usage/research programs. Applications for joint researches are accepted annually.

Please refer to the following explanations, and apply using the application form available from the online web system on the following website.

<https://www.eri.u-tokyo.ac.jp/en/joint-usage-top/>

Forms required for applications and related information are posted to the above URL.

If you apply for usage of equipment, please arrange a plan for the usage with a person in charge of the equipment at the ERI before submitting an application.

### 1. Joint Research

#### (1) Specific Research Project (A):

Specific Research Project (A) is for research projects that are already funded by a source other than the joint usage/research program. Individual projects are being conducted nationwide by the ERI and/or other institutions. We call for applications to participate in these projects.

Research projects in this category are listed in Appendix A. Expenses to work for the projects will be supported.

An applicant should contact the principal investigator or the contact person of the project at the ERI that he/she wishes to join in arranging a research plan and submitting the participation application (Form A-2a-E) with the principal investigator.

With regard to the joint research program based on “Promoting the Second Earthquake and Volcano Hazards Observation and Research Program (proposition)” (referred to as “Earthquake and Volcano Hazard Reduction Research”, hereafter) (A-01), announcements for project registrations and proposal submissions will commence in February of 2024 or later. This schedule adjustment is due to the completion of the proposition at the end of this fiscal year.

#### (2) Specific Research Project (B):

The projects in this category include those planned by individual researchers or research groups with the aim of forming future large-scale projects. Those who wish to participate in these projects are invited to apply. The projects in this category are not currently supported by large-scale project-funds such as the “Earthquake and Volcano Hazard Reduction Research.” Exploratory or international/interdisciplinary subjects are registered as in Appendix B.

Those who are interested in joining the project should inquire about the details of the research project with the principal investigator or the contact person of the project at the ERI. Those who wish to join the research projects listed in Appendix B should submit application form B-2-E. The maximum research expenses for each project should be 2,000,000 yen or less annually.

#### (3) Specific Research Project (C):

The projects in this category include those operating with funding other than joint usage/research program, but approved by the ERI approved as the projects belong to the program. The projects are listed in Appendix

C.

Those who are interested in participating in a project should inquire about the details of the research content with the principal investigator or the contact person of the project at the ERI. Those who wish to join the research projects listed in Appendix C should submit application form C-2-E. Some research titles are open to applications at all times of a year.

(4) General Research Project: (including grant program for Early-Career Scientists)

This category is for joint research projects conducted by a small group of researchers formed from inside and outside of the ERI. Proposals that advance research performed at the ERI further or that stimulate research activities in the ERI are welcome. In addition, proposals that involve foreign visiting researchers accepted by the ERI's International Research Promotion Office for the joint usage/research program are given appropriate consideration. Proposals for research that are not yet conducted at the ERI are also welcome. A principal investigator of a project must be a faculty member or researcher of a university/institution other than the ERI, and at least a member of the ERI must be involved in the project. The principal investigator of a project should submit an application (Form G-1-E).

A project in this category shall receive 500,000 yen or less for travel costs, consumables, and services to conduct the research. However, appropriate considerations shall be made for research projects that require more than 500,000 yen for some reason, which must be explained in the application. In addition, regardless of the category, if there is a carryover of expenses from the adopted joint research in 2020, please submit the additional form to confirm the relevance and difference between the previously proposed and actual expenses.

For research conducted at the ERI, please see the "2017 Handbook for Earthquake Research Institute, the University of Tokyo" or check the ERI website at (<https://www.eri.u-tokyo.ac.jp/en/>).

A principal investigator of a project must submit a project report (Form G-2-E) within 30 days of the completion of the research period through the online web system.

Grant program for Early-Career Scientists

According to the Grant program for Early-Career Scientists, the proposals from an individual researcher (\*) who had obtained his/her Ph.D. qualification within eight years of the application are prioritized. As an interim measure, a non-Ph.D. researcher who is 39 years old or younger may also apply.

(5) Cooperative Study on Elucidation and Prediction of Earthquakes and Volcanic Eruptions:

This category is for research projects related to items in “Earthquake and Volcano Hazard Reduction Research.” With regard to the joint research program based on “Promoting the Second Earthquake and Volcano Hazards Observation and Research Program (proposition)” (referred to as “Earthquake and Volcano Hazard Reduction Research”, hereafter), announcements for project registrations and proposal submissions will commence in February of 2024 or later. This schedule adjustment is due to the completion of the proposition at the end of this fiscal year.

(6) Cooperative Study on High Energy Geophysics Research:

This category is for research projects related to items in “High Energy Geophysics Research. Proposals based on industry-academia collaboration are given high priority, especially proposals with matching funds from the applicants themselves.

The period of research for a project is one year. Research funds shall be 1,000,000 yen or less per research project per year. Expenses shall include travel costs and joint research expenses (consumables and service fees).

The Coordinating Committee of High Energy Geophysics Research conducts an initial review of the proposals, and the ERI Joint Usage Committee will make the final decision regarding the review.

A faculty member shall be the contact person at the ERI for accepted research projects. The principal investigator of the proposed project should submit the application form H-1-E. All members of a project must submit a Confirmation of Intellectual Property (Form N-3-E). With the start of the fourth phase of ILCAA, you will need to submit your application once between April 2022 and April 2027, once between April 2027 and April 2032, and so on, for a maximum of once every five years. If you are a member of the University of Tokyo, you do not need to submit this form as before.

The principal investigator of a project must submit a project report (Form H-2-E) within 30 days of the completion of the research period through the online web system. As for the projects in this category, acknowledgments for the joint usage/research program by the ERI must be included in publications, and participants shall be obligated to submit reprints of these publications.

(7) Supercomputer Joint Research

In the research fields related to earthquakes, volcanos, and disaster prevention, research that uses big data and supercomputers is increasing. However, a supercomputer is a limited resource and is not yet widely available. Therefore, the ERI call for research that use supercomputer related to earthquakes, volcanos, and disaster prevention from the 2020 fiscal year.

ERI calls for the proposal of “A. Large research project”, “B. Research project”, and “C. Challenging” research as follows. In addition, the ERI calls for research related to earthquakes, volcanos, and disaster prevention. The earthquake and volcano information center computer system (EIC System) can be used at any time separately from this joint research. If you plan to do large scale computations, please apply for this call.



Category	Available computer resources	Application form	Remarks
A. Large research project	Over 250,000 tokens	S-1a	At least a member of the ERI must be involved in the project.
B. Research project	85,000– 250,000 tokens	S-1b	At least a member of the ERI must be involved in the project.
C. Challenging research	Under 50,000 tokens	S-1c	Target research is in the preparation stage for A and B, challenging exploratory research, and research that is difficult to carry out with EIC System.

The Coordinating Committee of Supercomputer Joint Research conducts an initial review of the proposals, and the Earthquake Research Institute Joint Usage Committee will make the final decision regarding the review. In principle, applications for C will not be reduced in the amount of applied computational resources by these committees, in order to support early research related to computational geoscience and calculations on a scale that cannot be performed by EIC.

The principal investigator of a project should submit an application form S-1a or S-1b or S-1c depending on category. The principal investigator of a project must submit a project report (Form S-2) within 30 days of the completion of the research period through the online web system.

A and B are solicited once a year (deadline at the end of October), and C is solicited three times a year (deadline at the end of May, August, and November). For C, the research period will be from immediately after the decision of adoption to the end of the relevant fiscal year, so please decide when to apply according to your desired research period.

As for the projects in this category, acknowledgments for the joint usage/research program by the ERI and Information Technology Center, The University of Tokyo, must be included in publications, and participants shall be obligated to submit reprints of the publications.

## 2. Workshop/Symposium

This category is for holding workshops and symposiums for topics on earthquakes, volcanoes, and related sciences. The length of a workshop or symposium should not be more than three days. The category includes a summer school and other workshops that are expected to contribute to the development of the research community on earthquakes, volcanos, and related fields. If workshops or symposia are to be held using these funds, please make sure to include the ERI as one of the organizers. A representative of the workshop/symposium should submit an application (Form W-1-E). At least one member of the ERI must be included in the application as a contact person. The venue should be at the ERI or online. If a workshop is to be held outside of the ERI (including overseas, excluding online), please state the necessity for this clearly. And, if the workshop is open to the general public, please select “open”, otherwise select “closed”. And then, it is necessary to include the ERI as the organizer in the workshop/symposium using this fund.

### (1) International workshop/symposium

International workshop/symposium will receive 2,000,000 yen or less, per workshop/symposium. The fund is expendable to cover travel and printing costs (including electronic version printed matter production

expenses (service contract expenses)), honorarium for simple labor for supporting workshop/symposium management, and service contract costs for workshop/symposium management.

(2) Domestic workshop/symposium

Domestic workshop/symposium will receive 1,000,000 yen or less, per workshop/symposium.

The fund is expendable to cover travel and printing costs (including electronic version printed matter production expenses (service contract expenses)), honorarium for simple labor for supporting workshop/symposium management, and service contract costs for workshop/symposium management.

If major changes in the plan, such as a change of venue, are needed, those should be reviewed again at the Joint Usage Committee of the ERI. The representative of the workshop/symposium should submit a statement of the reason explaining the changes as soon as possible to the Research Support Team of the ERI.

The Joint Usage Committee will evaluate the original proposal and the statement of the reason to decide whether to approve the changes or not.

The representative to the workshop/symposium must submit a report of workshop/symposium (Form W-2-E) within 30 days of the completion of the workshop/symposium through the online web system. These Reports on the research workshop or symposium, excluding the attendance list, will be posted on the Joint Usage page of the ERI's website.

### 3. Usage of Facilities, Observation Equipment, and Laboratory Equipment

Some of the facilities, observation equipment, and laboratory equipment managed by the ERI are available for joint usage. Available items are listed in Appendix F, and Appendix M. Those who wish to use the items should contact the contact person at the ERI for arrangement and submit an application (Form F-1-E or Form M-1). It is necessary to submit a specified items lease form (Form F-3-E) to take observation equipment outside the ERI. If funds are required to use these facilities, please apply to the general research project instead.

A user of the item must submit a report (Form F-2-E or Form M-2) within 30 days of the completion of the usage of the items through the online web system.

### 4. Usage of Data and Records

Appendix D is a list of earthquakes and other earth science data and records managed by the ERI, which are available for joint usage. Those who wish to use them should contact the contact person of the data and records at the ERI for arrangement, and submit an application (Form D-1-E) by the online system. Applications to use the computer system database of the Earthquake Information Center are accepted by the Earthquake Information Center homepage below.

<https://eic-support.eri.u-tokyo.ac.jp/>

If funds are required to use these data and records, please apply to the general research project instead.

If you wish to receive national earthquake observation system data using satellite communications, please submit an application (Form T-1-E). In addition, please submit reports (Forms D-2-E, T-2-E) within 30 days of the completion of the research using the data and records through the online web system.

## 【Appendix A】 2024FY Specific Research Project (A) Titles

Project code  Project title	○Principle investigator ▪ Contact Person at ERI	Details of the project and condition to participate in the project
2024-A-02 Structure and dynamics of Earth's deep interior	○Masayuki Obayashi (JAMSTEC)  •Hisayoshi Shimizu	This collaboration aims to deepen the understanding of the structure and dynamics of the Earth's deep interior mainly by observational approach. We continue long-term observations by geophysical network in the Pacific region (Ocean Hemisphere Network) and conduct observations by seismic and/or electromagnetic array both on land and seafloor to achieve the scientific aim by analyzing data from these observations.  <b><u>Project name of the financial base to conduct this specific research project(A) :</u></b> Contribution to Global Seismographic Network Geophysical studies by using submarine cables, TPC-1 and TPC-2.
2024-A-03 Joint Research on Disaster Risk Reduction for Widespread Volcanic Hazards in Southwest Pacific Countries	○Mie Ichihara (Earthquake Research Institute)  •Mie Ichihara	This project is motivated by the huge eruption of the Hunga Tonga-Hunga Ha'apai volcano in January 2022. In order to reduce the risk of oceanic eruptions, we proceed with the four subjects. (1) Features of eruptive activity of the volcanoes in the region. (2) Generation mechanism and history of the volcanic tsunami. (3) Regional monitoring of oceanic volcanoes. (4) Research for improving preparedness and education for volcanic disasters. This joint usage program expects the participation of graduate students and oversea experts.  <b><u>Project name of the financial base to conduct this specific research project(A) :</u></b> SATREPS : Joint Research on Disaster Risk Reduction for Widespread Volcanic Hazards in Southwest Pacific Countries
2024-A-04 Synergy effect Through Human and Artificial Intelligence Towards New Era in Seismology	○Hiromichi Nagao (Earthquake Research Institute)  •Hiromichi Nagao	Although artificial intelligence technology has been rapidly applied in seismology, it has yet surpassed the brains of experienced seismologists, which is to be called "natural intelligence." This project aims to deepen the detection methods for earthquakes and low-frequency tremors, and the modeling methods in seismology, under the theme of "dialogue and collaboration between artificial intelligence and natural intelligence," thereby contributing to new developments in earthquake research and earthquake disaster prevention.  <b><u>Requirement for participation:</u></b> Applicants are required to contribute to the project "Synergy effect Through Human and Artificial Intelligence Towards New Era in Seismology" (SYNTHA-Seis), on which this collaborative research is based. See the following website for the details of SYNTHA-Seis: <a href="https://www.eri.u-tokyo.ac.jp/project/SYNTHA-Seis/en/">https://www.eri.u-tokyo.ac.jp/project/SYNTHA-Seis/en/</a>  <b><u>Project name of the financial base to conduct this specific research project(A) :</u></b> "Synergy effect Through Human and Artificial Intelligence Towards New Era in Seismology" (SYNTHA-Seis) (Principal Investigator: Hiromichi Nagao, Earthquake Research Institute, The University of Tokyo, Research Period: from Jul. 2021 to Mar. 2026), in "Seismology towards Research Innovation with Data of Earthquake" (STAR-E Project), supported by Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan

【Table A-04】2024-A-04 Projects

Research topics in “Synergy effect Through Human and Artificial Intelligence Towards New Era in Seismology”

No.	PI	Affiliation	Research Project
A	Shin-ichi Ito	Earthquake Research Institute, The University of Tokyo	Development of seismic waveform data analysis methods based on information science technology
B	Kosuke Morikawa	Graduate School of Engineering Science, Osaka University	Development of seismic modeling methods based on state-of-the-art Bayesian statistics

## 【Appendix B】 2024FY Specific Research Project (B) Titles

Project code	○ Principle investigator/ ★ Early-Career Scientist	Details of the project and condition to participate in the project
Project title	• Contact Person at ERI	
2022-B-02 Accelerating International Research on Earthquake Disasters	○Hiroe Miyake (Earthquake Research Institute)  •Hiroe Miyake	<p>To improve the accuracy of converting earthquake hazard assessment into earthquake disaster risk calculation, we develop earthquake risk assessment indices in collaboration with science and engineering in national and international research fields. We establish seismic hazard and risk studies on long-period ground motion and real-time in sedimentary basins with significant long-period ground motion and existing damaging earthquake records. The project also aims to quantify the sensitivity of seismological and geodetic parameters in seismic hazard to risk for sites and structures.</p> <p><b><u>List of affiliations for projected participants:</u></b> e.g., Hokkaido University, The University of Tokyo, Kyoto University, Hiroshima University, Kochi University, Kyushu University, Building Research Institute</p>
2022-B-04 New development in solid-earth dynamics study based on advanced gravimetry	○Takahito Kazama (Kyoto University)  •Yuichi Imanishi	<p>Gravity measurement is one of the most effective methods to understand spatiotemporal mass variations associated with solid-earth dynamics such as earthquakes and volcanic activities. However, the seismic/volcanic gravity signals are typically smaller than 10 microGal. In order to detect such small gravity signals, gravity data should be acquired with spatiotemporally higher resolution, technologies in absolute/relative/superconducting gravimetry should be progressed, and environmental disturbances such as hydrological gravity change need to be corrected from acquired gravity time series accurately.</p> <p>This research project aims to reveal spatiotemporal mass variations associated with solid-earth dynamics such as earthquakes and volcanic activities, using high-quality gravity data obtained with advanced gravimetric techniques and data analyses. In this project, four-dimensional gravity data is obtained at seismic and volcanic areas by various time-spatial scales of gravity measurements. Gravity disturbances such as hydrological effects are then corrected from the obtained gravity data, using physical models and machine learning algorithms. Seismic/volcanic gravity signals are finally extracted from the original gravity data, and physical mechanisms of the gravity changes are discussed in terms of mass redistribution. In addition, this project will address some gravimetric issues related to instrumental error for relative gravimeters and future construction of gravity database. This research project invites nationwide researchers, technical staffs and graduated students in gravimetry, and also welcomes researchers in geodesy and solid-earth geophysics.</p> <p><b><u>List of affiliations for projected participants:</u></b> Hokkaido University, Tohoku University, Tsukuba University, The University of Tokyo, Toyama University, Kanazawa University, Nagoya University, Kyoto University, Kobe University, Kochi University, Kyushu University, Kagoshima University, National Astronomical Observatory of Japan, National Institute of Polar Research, Geospatial Information Authority of Japan, Meteorological Research Institute, National Research Institute for Earth Science and Disaster Resilience, National Institute of Advanced Industrial Science and Technology, National Institute of Information and Communications Technology, Institute of Physical and Chemical Research, Japan Agency for Marine-Earth Science and Technology, Hokkaido Research Organization, Hot Springs Research Institute of Kanagawa Prefecture, Mount Fuji Research Institute, Yamanashi Prefectural Government</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2022-B-06 Study on solid-earth science by deep learning and data assimilation	★Yuto Miyatake (Osaka University)  •Shin-ichi Ito	<p>Data assimilation combines numerical models and observations to obtain a better understanding or good prediction of physical phenomena. It has long been an essential tool in, for example, meteorology and oceanography. It is now attracting attention in solid-earth science, where the main applications include the estimation of frictional parameters on the plate interface, seismic wavefield, physical parameters inside volcanoes, and the prediction of fault slip, ground motions, and tsunami arrivals. The principal task of data assimilation is to numerically estimate the state variables and parameters of the underlying physical model, and it becomes challenging if the system of interest gets large. Further, there are significant difficulties specific to solid-earth science. For example, we have to deal with strong nonlinearity when considering earthquakes and volcanic eruptions, and we do not have a good governing equation like the Navier-Stokes equation in many cases. These difficulties are problematic from the computational viewpoint and restrict the applicability of data assimilation techniques in solid-earth science. In this project, focusing on new insights on the relationship between data assimilation and deep learning, and on a modern numerical analysis, researchers in solid-earth science and researchers in statistical science, meteorology and numerical analysis, who are familiar with algorithms on data assimilation, collaborate to establish a new statistical approach that overcomes the above difficulties by developing data assimilation and deep learning complementarily. For example, we consider using characteristic quantities extracted by using deep learning in the framework of data assimilation. We also discuss a unified theory that could embrace deep learning and data assimilation. Moreover, applying the developed methods to observations, we aim to understand further and predict seismic and volcanic phenomena.</p> <p><b><u>List of affiliations for projected participants:</u></b> Earthquake Research Institute, Graduate School of Information Science and Technology, The University of Tokyo, The Institute of Statistical Mathematics, The University of the Ryukyus, Kyoto University, Tohoku University, Hokkaido University, Osaka University, Prefectural University of Hiroshima, Japan Agency for Marine-Earth Science and Technology, RIKEN, Meteorological Research Institute</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2022-B-07 Multi-disciplinary Investigation on Usage of Full-text Data of Collections of Materials for the History of Japanese Earthquakes	★Junzo Ohmura (Earthquake Research Institute)  • Junzo Ohmura	<p>Database of materials for the history of Japanese earthquakes is now available. The next issue is how to make this large amount of text data more accessible for clarification of earthquake and volcanic eruption phenomena.</p> <p>In order to make use of this data, it is necessary to visualize the damage information of each location in the text in geospatial space. For this purpose, in FY2023, we generated a geographical dictionary derived from the Tenpo-gocho and developed a text structuring tool.</p> <p>In the next fiscal year, we will continue to improve a geographical dictionary and tools, and promote research to analyze the history of disasters in the region by actually using the database.</p> <p>Specifically, we will focus on the western part of Kanagawa Prefecture. We will analyze the reconstruction of these disaster phenomena and the responses of human society to them, focusing on earthquakes, volcanic eruptions, and floods that occurred successively in the early modern period.</p> <p>The analysis will take advantage of the unique characteristics of this project, which brings together researchers from different fields. We will analyze disaster phenomena from multiple perspectives and clarify the geography of disasters in the region. The project will be used as a model case for collaboration among different fields, and we aim to obtain other competitive funding.</p> <p><b><u>List of affiliations for projected participants:</u></b> National Institute of Informatics, Joint Support-Center for Data Science Research, National Museum of Japanese History, Kyoto University, Tokushima University, The University of Tokyo, Kokugakuin University, Hokkai Gakuen University</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2022-B-08 Discussion about normalization and development of a basic system to understand the scale of regional disasters using infrasound and seismic observation networks	○Masa-yukiYamamoto (Kochi University of Technology)  •Yuichi Imanishi	<p>The purpose of this project is to develop a basic system by using remote observation to understand the scale of disasters, such as tsunamis, landslides, and avalanches, that occur at the national or regional level.</p> <p>By utilizing the scheme of this specific joint research adopted in the previous years, researchers from research institutes and universities that observe and study infrasound (sound below audible frequency or micro-atmospheric pressure waves) in Japan have gathered and have been making efforts to improve the domestic observation network, which has recently developed into the "Nation-wide Infrasound Observation Consortium."</p> <p>In addition, several research institutes and universities have been working with several manufacturers and agencies to develop low-cost small infrasound sensors using MEMS type pressure sensors and microphones, to make observation systems more reliable and robust, and to build real-time visualization systems for observed datasets and make some of the data available online to the public.</p> <p>Owing to full use of these works with using standard open datasets obtained from existing domestic seismic observation networks, we aim to remotely detect and understand the scale (energy) of occurred disaster events at national and regional levels.</p> <p>In order to quantify the energy, it is important to calibrate the sound pressure level in the infrasound band, however, one of the problems is that there are no measurement standards for this band because it is an intermediate area between acoustic waves and pressure measurements. Internationally, it is necessary to establish a standard for this band, and discussions are underway in several countries, but it is still an open research/development area. In this situation, we will take advantage of this joint research scheme, which brings together domestic infrasound researchers, and start activities to develop domestic measurement standards for the infrasound band in near future.</p> <p><b><u>List of affiliations for projected participants:</u></b> Hokkaido University, Hokkaido Information University, NICT, AIST, The University of Tokyo (ERI), JWA, Kanazawa University, Nagoya University, Kyoto Sangyo University, Kochi University of Tech., Kyushu University</p>
2023-B-01 Synthesis and distribution of standard polycrystalline minerals for room experiments	○Takehiko Hiraga (Earthquake Research Institute)  •Takehiko Hiraga	<p>We will distribute synthetic highly-dense fine grained mineral aggregates that are suitable for room experiments. Any research groups that focus on measuring mineral/rock physical properties are welcome to join this project.</p> <p><b><u>List of affiliations for projected participants:</u></b> Tohoku University, The University of Tokyo, NIMS, Shizuoka University, Nagoya University, Okayama University, Ehime University, Kyushu University, Hiroshima University, University of Bayreuth, University of Minnesota, Université de Montpellier, MIT, Imperial College London, Princeton University, Université de Lile, Université d'Orléans, École normale supérieure Paris, Chinese Academy of Sciences</p>



Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2023-B-02 Applied research for earth science using ultra-dense GNSS observation network	○Mako Ohzono (Hokkaido University)  •Yosuke Aoki	<p>The development of low-cost GNSS receivers and the utilization of private GNSS stations have made it possible to deploy an ultra-dense GNSS observation network as an interpolation of GEONET. This study aims to obtain new knowledge for earth science by using this ultra-dense network, such as detection of detailed crustal deformation in seismically and volcanically active regions and monitoring atmospheric water vapor content and ionospheric activity. In seismically and volcanically active regions (e.g., eastern Hokkaido, and Miyake-jima Island), we will conduct joint GNSS observations to train and exchange students and young researchers and to hand down field observation techniques. This joint observation will be carried out as this project for 3-years.</p> <p><b><u>Requirement:</u></b> Nothing</p> <p><b><u>List of affiliations for projected participants:</u></b> Hokkaido University, Tohoku University, The University of Tokyo, Nihon University, Toyama University, Kanazawa University, Nagoya University, Kyoto University, Kochi University, Kyushu University, Kagoshima University, National Astronomical Observatory of Japan, National Institute of Polar Research, Geospatial information Authority of Japan, National Research Institute for Earth Science and Disaster Resilience, National Institute of Advanced Industrial Science and Technology, Meteorological Research Institute, National Institute of Information and Communications Technology, RIKEN, Japan Agency for Marine-Earth Science and Technology</p>
2023-B-03 Multidisciplinary utilization of ultra-precision geophysical observation records.	○Makoto Okubo (Kochi University)  •Akito Araya	<p>Observation technology to precisely measure fluctuation and deformation occurring on the Earth's surface is rapidly advancing.</p> <p>Such examples are long-baseline laser extensometers with <math>10^{-13}</math> strain resolution, strain observation network with ~20 borehole instruments along the Nankai trough, and gravimeters measuring vertical and potential fluctuations with ~1 cm equivalent resolution. In this project, we will collaborate with researchers in various fields to develop analysis methods to rapidly extract precursory signals related with earthquakes and volcanic eruptions from these highly-precise records and to utilize the results.</p> <p><b><u>List of affiliations for projected participants:</u></b> Hokkaido University, Tohoku University, The University of Tokyo, Tokyo City University, Toyama University, Nagoya University, Kyoto University, Kyushu University, Kochi University, Kagoshima University, Meteorological Research Institute, National Research Institute for Earth Science and Disaster Resilience, National Institute of Advanced Industrial Science and Technology, Japan Agency for Marine-Earth Science and Technology and Hot Springs Research Institute of Kanagawa Prefecture</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2024-B-01 Accelerating geophysical and geochemical data analysis and mathematical modeling using mathematical and statistical techniques	★Keita Itano (Akita University)  •Hiromichi Nagao	<p>The advancement of technology has recently driven a dramatic increase in the quality and quantity of geophysical observations and geochemical data. The development of various geophysical observation networks leads to large-scale databases, and the advance in geochemical analysis enables us to obtain high-throughput datasets. In response to increasing data, it becomes more important to (i) establish a rapid data processing methodology and (ii) obtain novel insights through new approaches.</p> <p>This project aims to expand our perspectives beyond conventional data analytical methods in each research field through collaboration with researchers in mathematical statistics and information science. The integration of data analysis and mathematical modeling provides significant progress in tackling various questions in Earth Science. Interdisciplinary research is promoted by handling various data with diverse temporal and spatial scales, which are characteristic of Earth sciences.</p> <p>The objective is to address Earth science problems that have persisted within conventional ideas and methods by employing fresh perspectives and analytical approaches. We encourage the active exchange of ideas across disciplines to discuss groundbreaking studies.</p> <p><b><u>List of affiliations for projected participants:</u></b> Hokkaido University, Akita University, Tohoku University, AIST, The University of Tokyo, Waseda University, Tokyo Gakugei University, ISM, JAMSTEC, Kanazawa University, Tokoha University, Kyoto University, Osaka Metropolitan University, Kitakyushu Museum of Natural History &amp; Human History, Kagoshima University</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2024-B-02 SAR surface deformation study using the combination of earlier and oncoming generations	★Yohei Kinoshita (University of Tsukuba)  •Yosuke Aoki	<p>Abundant data provided by ALOS (launched on 2006) and ALOS-2 (launched on 2014), both of them were developed and operated by Japan, largely contributed to produce a lot of scientific research achievements in fields of not only geophysical science but also other related fields. On FY2023, ALOS-4 will be scheduled to be launched as the ALOS-2 takeover as well as other new satellite SAR missions like Sentinel-1 C&amp;D and NISAR. Now we are facing to a SAR big data era. Facing to the new era, it is important to develop new technologies and to prevail SAR analysis techniques. PIXEL group, one of largest SAR research community in Japan, is founded on the joint usage of ERI, the University of Tokyo, and this project serves as a base of its activity. Under this project, participants share ALOS/ALOS-2 SAR data provided by JAXA.</p> <p>Purposes of this project are (1) to conduct surface deformation researches associated with various phenomena such as earthquakes, volcanic activities, landslides, glaciers, ground subsidence, etc., and (2) to expand the SAR user community and to upskill members' SAR analysis knowledge through information sharing and/or educational activities.</p> <p>SAR application research will be high-frequency observation era due to upcoming launches of ALOS-4, Sentinel-1C&amp;D and NISAR. In addition, we can utilize past L-band SAR data archives obtained from ALOS, JERS-1 and so on, resulting in the availability of long-term analysis over thirty-years. To maximize the values of such datasets for surface deformation researches, it is of crucial importance to develop advanced SAR time series analysis and standardized and/or efficient program of it as well as new technologies for improving observation accuracy related to atmospheric delay using various data and techniques like deep learning. In addition, we also proceed our research with dense GNSS network data for various purposes such as surface deformation monitoring and tropospheric modeling.</p> <p>Along with the studies stated above, we hold a series of lectures, for example, on the SAR analysis software "RINC" for the expansion and skill-up of the SAR community. We are also planning to hold a research workshop.</p> <p>Based on the fact that PIXEL has been steadily expanding, we aim to apply to large-scale project funds in the future. We also collaborate with the project "Next Generation Volcano Research B-2-1".</p> <p><b><u>List of affiliations for projected participants:</u></b></p> <p>The University of Tokyo, Hokkaido University, Tohoku University, Kanazawa University, Ibaraki University, University of Tsukuba, Tokyo Denki University, Tokyo Metropolitan University, University of Aizu, Nihon University, Shizuoka University, Niigata University, Nagoya University, Mie University, Kyoto University, Kochi University, University of Kochi, Kyushu University, Kagoshima University, Kagawa University, Tokushima University, The Graduate University for Advanced Studies, National Research Institute for Earth Science and Disaster Resilience, National Institute of Advanced Industrial Science and Technology, Center for Environmental Science in Saitama, Tono Research Institute of Earthquake Science, Hot Springs Research Institute of Kanagawa Prefecture, National Institute of Polar Research, Japan Meteorological Agency, Meteorological Research Institute, Meteorological College, Fukada Geological Institute, Hokkaido Research Organization, Japan Aerospace Exploration Agency, Public Works Research Institute</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2024-B-03 Geological and geochemical study of composite maar volcanoes to enhance gas disaster management	○ Takeshi Hasegawa (Ibaraki University)  • Hikaru Iwamori	<p>Hazardous Holocene maar volcanoes abound in Western Cameroon, e.g., Lakes Monoun and Nyos. Gas from Lake Monoun explosion in 1984 killed 35 people, while gas from Lake Nyos explosion in 1986 killed 1746 people. Maars are considered monogenetic volcanoes, although recent studies report “composite maars” formed by multiple eruptions at different vents. Lake Monoun bathymetry suggests that it could be a composite maar, but its eruptive history and magma plumbing system are not known. Composite maars pose a higher hazard because of repeated eruptions from different vents. In this project, we carry out geological (mapping and lithostratigraphy) and geochemical (eruptive products) studies of Lake Monoun to establish the formation model and magma plumbing system of a composite maar volcano as can contribute to hazard evaluation.</p> <p><b>List of affiliations for projected participants:</b> The University of Tokyo, Tokai University, IRGM (Institute of Geological and Mining Research), Bamenda University, Buea University</p>
2024-B-04 Elucidation of Earthquake and Tsunami History in the Western Sea of Japan to Northwestern Kyushu Region over the Past Several Thousand Years	★ Masaki Yamada (Shinshu University)  • Osamu Sandanbata	<p>Tsunami deposit studies help elucidating the history of earthquakes and tsunamis in prehistoric ages. Most tsunami deposit studies in Japan have been conducted in coastal areas facing the Japan Trench and the Nankai Trough. It is known that tsunamis are generated not only by plate-boundary earthquakes but also by intraplate earthquakes and submarine landslides, so it is important to reconstruct the tsunami history in areas not facing trenches. Many submarine active faults are distributed in the Sea of Japan. In the northern area north of Niigata Prefecture, tsunami deposits have been reported relatively frequently. By contrast, few tsunami deposits have been reported in the area west of Wakasa Bay in Fukui Prefecture. Tsunami deposit surveys were conducted in coastal areas of the Sea of Japan as part of the "Sea of Japan Earthquake and Tsunami Research Project (2013–2020)" led by the Earthquake Research Institute, the University of Tokyo. In the western part of the Sea of Japan to the northwestern part of the Kyushu region, probable tsunami deposits have been found in some areas. Still, the wide-area distribution of tsunami deposits has not been obtained to estimate the earthquake rupture area and tsunami magnitude. This study aims to clarify the wide-area distribution of tsunami deposits by expanding the study area (e.g., Wakasa Bay coast, Goto Islands, and Oki Islands). In addition, this study also conducts numerical simulations of tsunami and submarine landslide and inverse analysis using deep learning to clarify the tsunami history over the past several thousand years in this area. We seek researchers and students who conduct geological studies, both in the field and laboratory, of tsunami deposits or tsunami numerical simulations.</p> <p><b>List of affiliations for projected participants:</b> The University of Tokyo, Shinshu University, Kyoto University, Tohoku University, University of Tsukuba, Tokushima University, Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology (AIST), Agency for Marine-Earth Science and Technology (JAMSTEC)</p>

Project code  Project title	○ Principle investigator/ ★ Early-Career Scientist  • Contact Person at ERI	Details of the project and condition to participate in the project
2024-B-05 Development of monitoring method for flow-to-fracture transition of complex fluids	○Osamu Kuwano (JAMSTEC)  •Mie Ichihara	<p>The flow-to-fracture transition, such as slow earthquakes and fast rupture of plate boundary earthquakes, and brittle and ductile fracturing of magma in volcanic eruptions, is an important and unexplored phenomenon in solid earth science. In this project, we aim to predict the size and timing of fracture events by analyzing deformation noise (friction noise) and direct observation of the internal state. To this end, we will conduct laboratory experiments using various complex fluids (clay, gel, granular material, suspension, etc.) and attempt to estimate the distance to the critical point. In particular, we will focus on the critical slowing down. We hope that our project will lead to a foundation to detect critical points from geophysical data without detailed model assumptions.</p> <p><b><u>List of affiliations for projected participants:</u></b>  Japan Agency for Marine-Earth Science and Technology, The University of Tokyo, Tokyo  University of Agriculture and Technology, Osaka University, Kyoto University,  Ritsumeikan University, Kagoshima University</p>

**【Appendix C】 2024FY Specific Research Project (C) Titles**

Project code Project title	○ Principle investigator ▪ Contact Person at ERI	Details of the project and condition to participate in the project
-	-	There are no projects in 2024 FY.

## 【Appendix D】 2024 FY List of earthquake and other Earth Science Data and Records

Please also refer the our database page (<https://www.eri.u-tokyo.ac.jp/en/publication/>)

On publishing papers based on the results of the researches performed by using facilities in the Earthquake Research Institute joint usage program, please acknowledge the program in the paper. Also, please provide a copy of the paper or report to Earthquake Research Institute, joint usage section.

Examples of the appropriate format for the indication in the acknowledgments are given below.

- This study was supported by ERI JURP 202X-D-01 in Earthquake Research Institute, the University of Tokyo.
- This study was funded by Earthquake Res. Inst., the University of Tokyo, Joint Research program 202X-D-01.

Joint Usage Code and Name of data/ records	Contact person (○Responsible person)	Conditions of Use and Related URL	Application periods
<b>2024-D-01</b> WWSSN Seismogram microfiche	○Head of Committee for old seismograms and mareograms	Advance appointment required. Inquire about paper supplies. <a href="https://wwweic.eri.u-tokyo.ac.jp/wwssn/filmlist.html">https://wwweic.eri.u-tokyo.ac.jp/wwssn/filmlist.html</a>	Any time, as needed.
<b>2024-D-02</b> Historical seismograms	○Head of Committee for old seismograms and mareograms	Use microfiche archives. Original records can be used with ERI staff. <a href="https://wwweic.eri.u-tokyo.ac.jp/susu/">https://wwweic.eri.u-tokyo.ac.jp/susu/</a>  (Japanese version only)	Any time, as needed.
<b>2024-D-03</b> Seismological Bulletin, Selected newspaper articles, Foreign seismological reports	○Head of Committee for old seismograms and mareograms	Copies can be made in library. Bulletins: <a href="https://wwweic.eri.u-tokyo.ac.jp/record-J/index.html">https://wwweic.eri.u-tokyo.ac.jp/record-J/index.html</a>  Foreign seismological reports: <a href="https://wwweic.eri.u-tokyo.ac.jp/record-W/index.html">https://wwweic.eri.u-tokyo.ac.jp/record-W/index.html</a>	Any time, as needed.
<b>2024-D-04</b> Earthquake data of Center for Geophysical Observation and Instrumentation	○Head of Center for Geophysical Observation and Instrumentation	Data should be used under the treatment of earthquake data of Japanese universities.	—
<b>2024-D-05</b> Nation-wide earthquake data transfer by satellite communication system and other facilities	○Head of Center for Geophysical Observation and Instrumentation	Application required under the treatment on earthquake data transfer by satellite communication system. <a href="http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm">http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm</a> (Japanese version only)	—
<b>2024-D-06</b> Japan University Network Earthquake Catalog(JUNEC)	○Head of Earthquake and Volcano Information Center	Hypocenter data can be accessed through anonymous ftp. <a href="ftp://ftp.eri.u-tokyo.ac.jp/pub/data/junec/">ftp://ftp.eri.u-tokyo.ac.jp/pub/data/junec/</a>  Arrival time data can be provided by CD, according to rule among the universities.	Any time, as needed.
<b>2024-D-07</b> Seismic data of Asama, Izu-Oshima, Kirishima, and Fuji volcanoes	○Head of Volcano Research Center	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-D-08</b> Broadband Seismic Waveform Data	○Head of Ocean Hemisphere Research Center	none. <a href="http://ohpdmc.eri.u-tokyo.ac.jp/dataset/permanent/seismological/index.html">http://ohpdmc.eri.u-tokyo.ac.jp/dataset/permanent/seismological/index.html</a>	Any time, as needed.

Joint Usage Code and Name of data/ records	Contact person (○Responsible person)	Conditions of Use and Related URL	Application periods
<b>2024-D-09</b> New J-array seismogram data	○Head of Earthquake and Volcano Information Center	Can be used through website. <a href="http://jarray.eri.u-tokyo.ac.jp/">http://jarray.eri.u-tokyo.ac.jp/</a>	Any time, as needed.
<b>2024-D-10</b> Earthquake data in Nikko region, Northern Kanto, Japan, in 1993	○Head of Center for Geophysical Observation and Instrumentation	Treatment of data usage by participants of the 1993 Nikko seismic observation.	—
<b>2024-D-11</b> Strong motion observation database (mainly Suruga bay, Izu peninsula, and Ashigara valley)	○Hiroe Miyake	<a href="https://smsd.eri.u-tokyo.ac.jp/smad/">https://smsd.eri.u-tokyo.ac.jp/smad/</a>	Any time, as needed.
<b>2024-D-12</b> Copies of old historical documents and interpretation	○Yasuyuki Kano	No limitation. Copies and interpretation of a part of special database for historical materials of ERI library: <a href="https://wwweic.eri.u-tokyo.ac.jp/tokubetsu/">https://wwweic.eri.u-tokyo.ac.jp/tokubetsu/</a> (In Japanese only)	Any time, as needed.
<b>2024-D-13</b> Goelectromagnetic Observation Database	○Yoshiya Usui, Takao Koyama, Makoto Uyeshima	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-D-14</b> Provisional data at Yatsugatake geo-electromagnetic observatory	○Tsutomu Ogawa	Those who wish to use the data should contact the contact person at the ERI for arrangement and submit an application.	Any time, as needed.
<b>2024-D-16</b> Aerial photographs of Japan	○ERI Library	Number of holding sheets: 44,999 This collection is for research purposes only: active fault research, seismology, volcanology, tectonics, etc. Please have a request at the service counter of ERI library. <a href="https://www.eri.u-tokyo.ac.jp/tosho/collection-e.html">https://www.eri.u-tokyo.ac.jp/tosho/collection-e.html</a>	Any time, as needed.
<b>2024-D-17</b> Digital images of tsunami waveforms	○Head of Committee for old seismograms and mareograms	Apply through search system of digital images of tsunami waveforms. <a href="https://wwweic.eri.u-tokyo.ac.jp/tsunamidb/">https://wwweic.eri.u-tokyo.ac.jp/tsunamidb/</a> (In Japanese only) Same condition to joint usage of ERI applies.	Any time, as needed.
<b>2024-D-18</b> Superconducting Gravimeter Data	○Yuichi Imanishi	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-D-19</b> Special Project for Earthquake Disaster Mitigation in the Tokyo Metropolitan Area Data(2008-2011)	○Head of Center for Geophysical Observation and Instrumentation	Must contact with the responsible person prior to the application. <a href="https://www.eri.u-tokyo.ac.jp/shuto/index.html">https://www.eri.u-tokyo.ac.jp/shuto/index.html</a> (In Japanese only)	Any time, as needed.
<b>2024-D-20</b> Special Project for Reducing Vulnerability for Urban Mega Earthquake Disasters Data(2012-2016)	○Head of Center for Geophysical Observation and Instrumentation	Must contact with the responsible person prior to the application. <a href="https://www.eri.u-tokyo.ac.jp/project/toshi/">https://www.eri.u-tokyo.ac.jp/project/toshi/</a> (In Japanese only)	Any time, as needed.
<b>2024-D-21</b> Digital data of damage from old earthquakes	○Yasuyuki Kano	Digital dataset of earthquake damage and its location for the 1923 Kanto earthquake etc. Please contact the responsible person prior to application.	Any time, as needed.



## 【Appendix F】

### 2024 FY List of Facilities, Observation Equipment, and Laboratory Equipment

Please refer to Joint usage URL (<https://www.eri.u-tokyo.ac.jp/en/joint-usage-top/>)

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Examples of the appropriate format for the indication in the acknowledgments are given below.

- This study was supported by ERI JURP 202X-F1-01 in Earthquake Research Institute, the University of Tokyo.
- This study was funded by Earthquake Res. Inst., the University of Tokyo, Joint Research program 202X-F1-01.

#### (facilities)

Joint Usage Code and Name of facility/equipment	Information of facility	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F1-01</b> Tsukuba Seismological Observatory Aburatsubo Geophysical Observatory Nokogiriyama Geophysical Observatory Wakayama Seismological Observatory Hiroshima Seismological Observatory Shin-etsu Seismological Observatory Fujigawa Geophysical Observatory Muroto Geophysical Observatory Observatories and facilities		○Head of Center for Geophysical Observation and Instrumentation		—
<b>2024-F1-02</b> Yatsugatake Geo-electromagnetic Observatory		○Tutomu Ogawa	Must contact with the responsible person prior to the application.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of facility	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F1-03</b> Asama Volcano Observatory  Komoro observatory of Seismology and Volcanology  Izu-Oshima Volcano Observatory  Kirishima Volcano Observatory		○Head of Center for Geophysical Observation and Instrumentation		—

(observation equipment)

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F2-01</b> Data receiver system by satellite communication for a nation-wide seismic telemetry network.	<a href="http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm">http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/data_jushin_riyou.htm</a> 1 system (In Japanese version only)	○Eiji Kurashimo	Must contact with the responsible person prior to the application. It is a rule that the users install it and maintain it by themselves. Another application about data use is needed.	Any time, as needed.
<b>2024-F2-02</b> Temporal seismic data acquisition systems (incl. data transfer units, seismometers and recording units)	<a href="http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/vsat_riyou.htm">http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/vsat_riyou.htm</a> 1 system (In Japanese version only)  <a href="http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/chijo_souti.htm">http://eoc.eri.u-tokyo.ac.jp/eisei_system/riyou/chijo_souti.htm</a> (In Japanese version only)	○Eiji Kurashimo	Must contact with the responsible person prior to the application. Not always available for period of specific research projects.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F2-04</b> Broadband-MT instruments	1) Main unit: <i>Metronix</i> ADU07e                      22 sets ADU08e                      2 sets <i>NT System Design</i> ELOGMT                      7 sets  2) Induction coils: <i>Metronix</i> MFS06                      23 coils MFS07                      4 coils MFS06e                      16 coils MFS07e                      42 coils <i>Phoenix</i> MTC50                      3 coils  Basically, 5 component data (2-component E-field and 3-component H-field) can be measured. Sample frequency of ADU07e is 2 <sup>n</sup> Hz up to 524 kHz. In addition, we have some other items necessary to the MT survey, such as, various batteries and electrodes.	○Yoshiya Usui, Takao Koyama, Makoto Uyeshima	Must contact with the responsible person prior to the application. Please recognize that we cannot let you use the instruments if we have some field campaigns.	Any time, as needed.
<b>2024-F2-06※</b> <u>Marine heat flow measurement system</u>	The system consists of a data logger, probes, temperature sensors, weight, and an acoustic pinger. Heat flow is measured by penetrating a probe equipped with multiple temperature sensors into seafloor sediment. An instrument for thermal conductivity measurement on sediment samples (Quick Thermal Conductivity Meter, Kyoto Electronics Manufacturing Co., Ltd.) is also available.	○Masataka Kinoshita	Users must have an experience in marine heat flow measurement, unless they conduct cooperative research with the Earthquake Research Institute.	Any time, as needed.
<b>2024-F2-07</b> Portable broadband seismic observation system(1)	Broadband seismometers: 40 sets CMG3T,STS2 Recorders: REFTEK130	○Takeuchi Nozomu	Data have to become open in public at the data center of OHRC, ERI after 2-3 years of moratorium period. For the system availability, consult with the contact person.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
2024-F2-08※ <a href="#">Portable broadband seismic observation system (2)</a>	Broadband seismometers 14 sets (Nanometrics Inc., Canada) Trillium 120PA Number of equipment: 14	○Jun Oikawa	Must contact with the responsible person prior to the application.	Any time, as needed.
2024-F2-09※ <a href="#">Absolute gravimeter</a>	FG5 gravimeter with 1-2 microgal accuracy 2 sets manufactured by micro-Lacoste corp., U.S.A.	○Yuichi Imanishi	Must contact with the responsible person prior to the application.	Any time, as needed.
2024-F2-10※ <a href="#">Lacoste &amp; Romberg gravimeter</a>	Spring gravimeter with 10 microgal accuracy 2 sets manufactured by micro-Lacoste corp., U.S.A.	○Yuichi Imanishi	Operational instruction should be understood.	Any time, as needed.
2024-F2-11※ <a href="#">Potable strong motion observation system</a>	Potable strong motion observation system(Revision of SMAR-6A3P) equipment with amplifier(16 JEP-6A3P sensors with 1V/G) 16 units (Akashi Corporation) equipment without amplifier 5 units (5 JEP-6A3P sensors with 10V/G) (Akashi Corporation) logger LS-7000XT 10 units (Hakusan Corporation) logger LS-7000 10 units (Hakusan Corporation) ※A single set consists of an equipment and a logger. ※20 sets are available. ※Amplifier gain is a multiplication of 1, 20, 50, 100 and 0.1, 1, 10, 100.	○Hiroe Miyake	Must contact with the responsible person prior to the application.	Any time, as needed.
2024-F2-12 Volcanic gas observation system	Volcanic gas observation system 1 set	○Jun Oikawa	Must contact with the responsible person prior to the application.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F2-13</b> Ultra-long period MT instruments	Ukurine Systems with fluxgate sensors LEMI-417 6 sets 3 magnetic and 4 electric field components with 1 s sampling Tierra Technica systems with fluxgate sensors U43 12 sets U36MD 3 sets UY44 1 sets U43: 3 magnetic and 2 electric field components with 1s sampling U36MD: 3 magnetic and 2 electric field components with 1s sampling UY44: 3 magnetic field and 2 tilt components with 1s sampling	○Yoshiya Usui, Takao Koyama, Hisayoshi Shimizu, Makoto Uyeshima	Must contact with the responsible person prior to the application. Please recognize that we cannot let you use the instruments if we have some field campaigns.	Any time, as needed.
<b>2024-F2-14</b> High accuracy gyro-compass system	A SOKIA's GP1X manual gyro-compass system. Measurement accuracy is 20 angle-seconds. 1 system	○Yoshiya Usui, Takao Koyama, Hisayoshi Shimizu, Makoto Uyeshima	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-F2-15※</b> <u>3D deep-sea current profiler system</u>	NORTEK Aquadopp - 6000m 1 system <a href="https://www.nortek-as.com/en/products/CurrentMeter/Aquado pp6k">https://www.nortek-as.com/en/products/CurrentMeter/Aquado pp6k</a> A current profiling system by combination of the Doppler current profiler (Aquadopp) and the Ti sphere transponder system of a self pop-up recovery, which enables 10 s interval observation of more than one-year-long by the external power supply. Use of the current profiler only is also available.	○Hajime Shiobara	Must contact with the responsible person prior to the application.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F2-16</b> High accuracy broad-band voltage difference measurement instruments	NT System Design's 17 sets ELOG1K. We can measure 2-component voltage differences at 1024Hz or 32 Hz with 24 bit accuracy. Very low power consumption(1.8W).	○Yoshiya Usui, Takao Koyama, Makoto Uyeshima	Must contact with the responsible person prior to the application.	Any time, as needed.

(laboratory equipment)

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F3-01</b> Controlled Seismic source	Minivibrator T-15000 (IVI, 1 unit Inc.)	○Tatsuya Ishiyama	Users are required to have precise and detailed knowledges on how to use the controlled Seismic source.	Any time, as needed.
<b>2024-F3-02</b> Computer system of Earthquake and Volcano Information Center	<a href="https://eic-support.eri.u-tokyo.ac.jp/index-e.html">https://eic-support.eri.u-tokyo.ac.jp/index-e.html</a> 1 system	○Head of Earthquake and Volcano Information Center	Limited to academic use and along with the purpose of ERI, according to the rule. Apply directly to ERI, if joint usage fund is not needed.	Any time, as needed.
<b>2024-F3-03</b> Rock Fracture Apparatus with Data Acquisition System	<a href="https://www.eri.u-tokyo.ac.jp/gijyutsubu/jikken/">https://www.eri.u-tokyo.ac.jp/gijyutsubu/jikken/</a> 1 system (In Japanese version only)	○Masao Nakatani, Shingo Yoshida	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-F3-05</b> XRF spectrometer	RIGAKU Wavelength dispersive-X-ray fluorescence spectrometer  ZSX Primus II 1 system	○Atsushi Yasuda	All users are required to be trained before using the machine. Users must provide their own consumables.	—
<b>2024-F3-06</b> ※ <u>Vibration testing system</u>	EMIC Corp. Vibration testing system 1 system F-1400BD/LAS15  Horizontal or vertical shaking table(1-axis)	○Akito Araya	Must contact with the responsible person prior to the application. Operate the equipment by yourself in principle.	Any time, as needed.
<b>2024-F4-07</b> ※ <u>Laser source equipment</u>	NEOARK Corp. Frequency stabilized He-Ne laser 1 set  Emission wavelength 633nm (red light)	○Akito Araya	Must contact with the responsible person prior to the application.	Any time, as needed.
<b>2024-F3-08</b> National Seismogram Data System	National Seismogram Data System 8 system	○Head of Earthquake and Volcano Information Center	System to use national seismogram data, jointly operated with Japanese universities. Consult with corresponding faculty.	Any time, as needed.

Joint Usage Code and Name of facility/equipment	Information of Equipment	Contact person (○Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-F3-09</b> Karl Fischer moisture titrator (Coulometric titration)	Kyoto Electronics Manufacturing Co., Ltd. Karl Fischer moisture titrator (Coulometric titration) < MKC-610 > 1 set <a href="https://www.kyoto-kem.com/en/product-category/karl/">https://www.kyoto-kem.com/en/product-category/karl/</a> Evaporator for measurement of water in rocks < ADP-512 > 1 set <a href="https://www.kyoto-kem.com/en/product-category/option-karl/">https://www.kyoto-kem.com/en/product-category/option-karl/</a>	○Kenji Mibe	All users must be trained before operating the machine. It is requested that all applicants discuss their projects with contact person before submitting the proposal. The chemicals for measurements have to be purchased by users.	Any time, as needed.
<b>2024-F3-10</b> Laser diffraction particle-size analyzer(wet dispersion condition)	Sympatec HELOS/KF-RODOS-QUIXEL System 1 system	○Fukashi Maeno	All users are required to receive instruction from contact persons and to adjust schedule.	Any time, as needed.
<b>2024-F3-11</b> ※ <u>Equipment set for thermometer calibration</u>	Fluke 1586A, 9142, 7103 etc. 1 set Thermostatic bath(-30 degC to 150 degC), thermistor scanner, and so on	○Masao Nakatani	Must contact with the responsible person prior to the application. Operate the equipment by yourself in principle.	Any time, as needed
<b>2024-F3-12</b> Large-scale seismic waveform data analyzing system	It is the seismic waveform analysis system which stores nationwide seismic data. 1 system Users develop and execute their own codes for analyzing the data. The minimum tools are available.	○Shigeki Nakagawa	Must contact with the responsible person prior to the application. Also, all users were requested to finish the application for the Computer system of Earthquake and Volcano Information Center (2024-F3-02). Data should be used under the treatment of earthquake data of Japanese universities.	Any time, as needed

※Detailed information posted at Earthquake Research Institute, joint usage page.

## 【Appendix M】 2024 FY List of specific equipments

If you wish to use the specific equipment listed in this appendix for more than 2 months, please apply for the call for proposal for usage of specific equipments held in the previous year of the desired year. Applications for usage of less than 2 months are accept any time as needed.

On publishing papers based on the results of the researches performed by using facilities in the Earthquake Research Institute joint usage program, please acknowledge the program with joint usage code in the paper. Also, please provide a copy of the paper or report to Earthquake Research Institute, joint usage section.

Examples of the appropriate format for the indication in the acknowledgments are given below.

- This study was supported by ERI JURP 202X-M-01 and 202X-M-02 in Earthquake Research Institute, the University of Tokyo.
- This study was funded by Earthquake Res. Inst., the University of Tokyo, Joint Research program 202X-M-01 and 202X-M-02.

### (Specific equipments)

Joint Usage Code and Name of equipment	Information of Equipment	Contact person (○ Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-M-01</b> Compact digital recorder	HKS-9700a-0505      30 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-02</b> Seismometer(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkII      20 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-03</b> Seismometer(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkIII      10 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-04</b> Compact digital recorder(PELICAN)	LS-8800      52 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-05</b> Seismometer(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkIII      56 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-06</b> Compact digital recorder(Blue Box)	LS-8800      35 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-07</b> Seismometers(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkII      35 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.



Joint Usage Code and Name of equipment	Information of Equipment	Contact person (○ Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-M-08</b> Seismometers(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkIII 10 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-09</b> Single channel digital recorder	LS-8200SD 300 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-10</b> Seismometer(4.5Hz, UD-component)	SG820 300 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-11</b> Geospace Seismic Recorder	GSX-3 50 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-12</b> Seismometer(4.5Hz, 3-components)	GS-11D ,3C 50 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-13</b> Seismometer(1Hz, 3-components)	GS-1 3C SeisMonitor 2 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-14</b> Large capacity storage recorder	DAT5/DAT5A 54 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-15</b> Seismometer(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkII 53 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-16</b> Seismometer(1Hz, 3-components, Lennartz electronic GmbH)	LE-3Dlite MkIII 7 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-17</b> Nanometrics data recording units	Centaur digital recorder 6 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-18</b> Broad-band seismometer	Trillium-120PA 6 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-19</b> Broad-band seismometer	Trillium-120QA 15 sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.

Joint Usage Code and Name of equipment	Information of Equipment	Contact person (○ Responsible person)	Conditions of Use and Remarks	Application periods
<b>2024-M-20</b> Networked digitizer and logger (controller)	LF-1100R                      9    sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.
<b>2024-M-21</b> Networked digitizer and logger (digitizer)	LF-2100R                      9    sets	○Eiji Kurashimo, Kazushige Obara		Any time, as needed.