December 13, 2024

To whom it may concern

FY 2025 Joint Use/Research Program

We invite applications for the FY 2025 Joint Use/Research Program at the Institute for Planetary Materials (IPM), Okayama University, Misasa, Japan.

1. Application types
   1) International joint research
   2) General joint research
   3) Joint Use of facility
   4) Workshop
2. Period of research: April 1, 2025 – March 31, 2026
3. Application eligibility: International and domestic researchers belonging to a research institute or other equivalent organizations, including 4th-year undergraduate students and graduate students
4. Application procedure: Fill out the application form for Joint Use/Research (see attached form) and submit by e-mail.
5. Application deadline: Must be received no later than January 31 (Fri.), 2025
6. Notification: Written notification by the end of March, 2025
7. Other: See the attached “Guideline for the FY 2025 Joint Use/Research Program at the Institute for Planetary Materials, Okayama University”

Takashi Yoshino
The director of Institute for Planetary Materials, Okayama University, Misasa, Japan

Guideline for Application of the FY 2025 Joint Use/Research Program at the Institute for Planetary Materials, Okayama University

1. Guideline

The mission of the Institute for Planetary Materials (IPM) is to study the origin, evolution and dynamics of the Earth and other planets and the origin of life. As a Joint Use/Research Center for planetary materials science designated by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), we offer Joint Use/Research opportunities to both domestic and overseas researchers in research fields related to Earth and planetary materials science.

We accept five research categories of Joint Use/Research at IPM (hereafter called the Joint Research), i.e. international joint research, general joint research, joint use of facility, workshop, and internship-type joint research, in order to promote collaborative research in research fields related to Earth and planetary materials science. We welcome not only proposals that further promote research conducted at IPM, but also research in areas that are complementary, as well as those that accelerate the research activity of IPM as a research center for earth and planetary materials science and innovative applications for joint use/research. Priority will be given to projects that are recognized as being of particular academic importance and that are expected to produce outstanding results.

1) International joint research

Joint research conducted by a researcher belonging to an international research organization in collaboration with faculty of IPM by using the facilities, equipment, samples and data of IPM. Researches conducted outside IPM may be considered. Domestic researchers outside IPM can join the research as a collaborator.

2) General joint research

Joint research conducted by a researcher belonging to a domestic research organization other than IPM in collaboration with faculty of IPM by using the facilities, equipment, samples and data of IPM. Researches conducted outside IPM may be considered.

3) Joint use of facility

Research conducted by a researcher belonging to an international or domestic research organization other than IPM by using the facilities of IPM. Please note that a usage fee will incur for Joint use of facility.

4) Workshop

Domestic/international workshop on a specific research theme sponsored by IPM for promoting joint research. In principle, the workshop should be held at Okayama University or online.

5) Internship-type joint research

Long-term joint research conducted by a student belonging to a domestic/international research

and educational organization, in collaboration with the faculty of IPM, on a research project proposed by the faculty of IPM, by using the facilities, equipment, samples and data of IPM.
*Remote collaborative research (either asking IPM staff to perform measurement and analysis, or remote access to IPM facilities, without visit to the institute) might be offered for Joint research 1) ・ 2) and Joint use of Facility 3) depending on the facilities. Please inquire your host faculty member of IPM for details.
*The recruitment of Internship-type joint research (category 5) conducted separately once a year. The eligibility and period of the program will be described separately.
*We also accept applications for joint use/research from the industry in order to promote industry-university collaboration. Please consult with a faculty member whom you are interested in collaborating with.

2. Eligibilities

- The application is open to international and domestic researchers belonging to a research organization or others equivalent, including 4th-year undergraduate students and graduate students. When an undergraduate/graduate student applies as a principal researcher, his/her supervisor must agree to and participate in the project as a collaborator. When the project includes, as a collaborator, undergraduate/graduate student who is not supervised by the principal researcher, permission from the student's supervisor must be obtained.
- A principal investigator can apply for up to one joint research project and one workshop. For Workshop (category 4), a faculty member of IPM is also eligible to apply.

3. Method of application

- Before application, obtain formal consent from the organization you belong, and consult with your host faculty member of IPM about your research project, expected visiting period, and required expenses. Your host faculty member of IPM must be included as a collaborator.
- Refer to "Research Divisions and Faculty Members of the Institute for Planetary Materials, Okayama University" shown separately for the research area and faculty members of IPM.
- The application must be done by filling out a designated format and send it to "16. Address for Submission and contact information" by e-mail.
- Application forms are available on the website below for download and use.

[Application page for Joint Use/Research]
https://www.misasa.okayama-u.ac.jp/jointuse/index_E.php

4. Application deadline

Must arrive no later than January 31(Fri.), 2025

(Application for joint research in urgency may be accepted any time, but must be received no later than January 23 (Fri.), 2026)

5. Selection and notification

The decision will be made immediately by the director after evaluation by the Steering Committee of Joint Use/Research Center of IPM. The proposals will be evaluated comprehensively on the basis of conformity of project with the aim of the program, academic importance, feasibility of research proposal, and expenses required. Applications that are considered to have particular academic importance and expected to produce outstanding results will be considered in priority. Special considerations will be given to the applications from researchers of university or research organization of small scale and young researchers. The principal applicant will be informed in written of the decision by the end of March 2025.

6. Research period

- International joint research, General joint research, and Joint Use of facility:
  Period between April 1, 2025 and March 31, 2026 or Period between the date of adoption to March 31, 2026.
  The application must be made each fiscal year even if the project is continued from previous year.
- Workshop
  Period between April 1, 2025 and March 31, 2026 or Period between the date of adoption to March 31, 2026.

7. Necessary expenses

- The use of equipment is in principal free of charge for International joint research and General joint research. On the other hand, a usage fee will incur for Joint use of facility. Please check the IPM's HP or contact with your host faculty member of IPM about this.
- The users may be requested to partly cover the cost of expendables. Please consult with your host faculty member of IPM in advance.
- Travel expenses are in principle not provided for all accepted research projects. Nevertheless, if you need support for your travel expenses due to lack of external funds, etc., please write down the reasons for requesting support for travel expense in your application. Based on the reasons, we will review the support of travel expenses and provide within the limits of the budget as necessary（＊1）. Priority for support of travel expenses will be given to undergraduate students, graduate students, and early career researchers who are less than 8 years after obtaining a doctoral degree as of April 1, 2025.
  ＊1: Travel expenses are in principle not provided for joint use of facility outside IPM, and joint

research applied after the application deadline.

8. Submission Method about report of joint use/research

A report must be submitted with the designated form of “Research report of joint use/research” to the e-mail address shown below after the research period. Due date of the research report of FY 2025 joint use/research will be May 31, 2026.

The copyright of the submitted report belongs to IPM. Therefore, please be sure to conform with the following:

1. The report must be original. A copy of an article already published on journals or proceedings cannot be accepted.
2. The author must take the responsibility when any problems related to the copyright law incur.

9. Disclosure of results

The report submitted to IPM will be made open at IPM’s website. If you do not wish to disclose it to the public due to a patent application, please let us know at the time of the submission.

10. Publication of research results and others

When the research results are published, please properly describe in the acknowledgement, that it is a joint use or joint research with IPM. Some examples are shown below.

1) This paper presents results of a joint research program carried out at the Institute for Planetary Materials, Okayama University, supported by "Joint Use / Research Center" program by MEXT, Japan.

2) This study was performed using joint-use facilities of the Institute for Planetary Materials, Okayama University.

3) ____ was supported from IPM for Joint-Use Research.

Also, please send a reprint of the published paper to the administration office of IPM (PDF file or two hard copies)

11. Intellectual properties

In the event that inventions are made as a result of joint research, its attribution etc. shall be decided after negotiation with consideration given to the contribution to the invention by each researcher and the institution concerned.

12. Handling of the personal information

Personal information provided in the application process will be handled strictly in accordance with the related laws of Japan and the regulations of Okayama University, and will be used only for the purposes of the application, reporting of the results of joint use/research, and providing related

information. Regardless of adoption or rejection, applications and submitted documents will not be returned.

13. Security trade control

When providing research instruments, samples, technology etc. to overseas (non-residents in Japan) or domestic residents those who are under the strong influence of foreign governments or corporations, and conducting joint research with overseas researchers, it may be necessary to take measures according to the Okayama University Regulations on University Security Export Management.

14. Accident insurance

Accepted joint use researchers from overseas must purchase travel insurance before leaving your country to cover medical expenses for unexpected accidents or sickness during the period of joint use/ research at IPM. For students enroll at universities in Japan, please join the Personal Accident Insurance for Students Pursuing Education and Research(“Gakkensai”) before starting joint use/research.

15. Accommodation

The “Misasa guest house” located close to IPM may be used. Please communicate with the faculty of IPM and notify the administration office below for the visit period at least two weeks before the visit.

The accommodation fee for joint-use researchers is:

Western-style room: 1,600 yen (per night)

Japanese-style room: 1,200 yen (per night)

16. Address for submission and contact information

The Department of General Affairs
Institute for Planetary Materials, Okayama University
827 Yamada, Misasa, Tottori, 682-0193, Japan
Phone: +81-858-43-1215 E-mail: eee0502@adm.okayama-u.ac.jp

Research Divisions and Faculty Members of the Institute for Planetary Materials, Okayama University

(As of December, 1, 2024)

Division for Planetary Materials Experimental Physics

Takashi Yoshino (Professor) tyoshino@misasa.okayama-u.ac.jp
Xianyu Xue (Professor) xianyu@okayama-u.ac.jp
Daisuke Yamazaki (Professor) dy@misasa.okayama-u.ac.jp
Shigeru Yamashita (Associate Professor) shigeru@misasa.okayama-u.ac.jp
Takayuki Ishii (Associate Professor) takayuki.ishii@okayama-u.ac.jp
Izumi Mashino (Assistant Professor) izumi.mashino@okayama-u.ac.jp

To understand the internal structure and evolution of the Earth and planets via determination of the structure and physical properties of Earth and planetary materials using experimental and computational approaches. Toward that goal, researchers are being conducted in the development of ultra-high pressure generation technique, large-volume high pressure generation technique, high-temperature high-pressure in-situ physical properties measurement, understanding the basic physical processes via structural analysis of materials at the atomic level and first-principles calculation, and unravelling the inner structure of the planets and the evolutional process of the solar system by understanding meteorites and ice physiochemically.

Division for Planetary Materials Analytical Chemistry

Katsura Kobayashi (Professor) katsura@pheasant.misasa.okayama-u.ac.jp
Ryoji Tanaka (Professor) ryoji@misasa.okayama-u.ac.jp
Takuya Kunihiro (Associate Professor) tkk@misasa.okayama-u.ac.jp
Christian Potiszil (Associate Professor) cpotiszil@okayama-u.ac.jp
Hiroshi Kitagawa (Assistant Professor) kitaga-h@cc.okayama-u.ac.jp

To understand the origin, evolution and dynamics of the Earth and planets by highly accurate/precise quantitative analysis, mass spectroscopic analysis and spectroscopic analysis of Earth and extraterrestrial materials. Toward that goal, development of state-of-the-art analytical methods and the construction of a “Comprehensive Analytical System for Terrestrial and Extraterrestrial Materials (CASTEM)” that link various apparatuses in a coordinated fashion have been made.

Division for Planetary Surface Environment Scinence

Jun Kameda(Professor) jkameda@okayama-u.ac.jp
Akio Makishima (Professor) max@misasa.okayama-u.ac.jp

Takuya Moriguti (Associate Professor) moriguti@misasa.okayama-u.ac.jp
Trishit Ruj (Associate Professor) trishitruj@okayama-u.ac.jp
Matthew Izawa (Associate Professor) matthew_izawa@okayama-u.ac.jp

To understand the evolution of the surface environment from the past to the future which can influence to the surface environment from remote sensing techniques, environmental simulations, space chamber (to be introduced during FY2025) and so on.

Facilities of the Institute for Planetary Materials, Okayama University

High-temperature, high-pressure apparatus

- 6-axis high-pressure apparatus, 6UHP-70（Yamazaki）
- KAWAI-type multi-anvil high-pressure apparatus, USSA-5000（Yoshino）
- KAWAI-type multi-anvil high-pressure apparatus, USSA-1000（Yamazaki）
- Boyd-Ingland-type Piston-cylinder apparatuses （Yamashita）
- MS800-type Piston-cylinder apparatuses （Yoshino）
- Depth of the Earth Quick Press-type Piston-cylinder apparatuses （Xue）
- Internally heated pressure vessel（Yamashita）
- The high-pressure apparatus with DIA-type guide blocks （UHP-2000/20, AMAGAEL）（Yoshino）
- DII-type multi-anvil press with deformation facility（Yamazaki）
- Basset-type, symmetrical-type Externally heated diamond anvil cells （Yamashita , Mashino）
- HDAC-V-type Externally heated diamond anvil cells（Xue）
- Diamond anvil cells （Mashino）
- Cold-seal hydrothermal apparatuses （Xue）

X-ray analytical equipment and Electron Microscope

- Powder X-ray diffractometer Rigaku SmartLab （Yoshino）
- Micro-focused X-ray diffractometer Rigaku RintRapid II （Yoshino）
- Electron probe micro analyzer JXA-8800（Yamashita, Yoshino）
- Field-emission Electron probe microanalyzer with Soft X-ray Spectrum Detector JXA-8530F（Yoshino）
- Field-emission Electron probe microanalyzer JXA-8530F（Kunihiro）
- SEM JSM-7001F with EBSD and EDS （Yamazaki）
- Low Vacuum Field-emission SEM JSM-7001F with EDS（Kunihiro）
- High Vacuum Field-emission SEM JSM-7001F with EDS（Kunihiro）
- Transmission Electron Microscope JEM-7001F（Kobayashi）
- X-ray fluorescence spectrometer PANalytical Axios Advanced （Kitagawa）

Mass spectrometers

- Multi-collector ICP-MS: Thermo Fisher Scientific Neptune plus（Kobayashi）
- ICP-MS: Thermo Fisher Scientific iCAP TQ（Kitagawa）
- High-resolution inductively coupled plasma Mass Spectrometer: Thermo Fisher Scientific ELEMENT XR （Kobayashi）

- TIMS: Thermo Fisher Scientific Triton plus Bundle 2 SEM/RPQ （Tanaka）
- TIMS: Thermo Fisher Scientific Triton（Tanaka）
- TIMS: Thermo Fisher Scientific Triton plus （Tanaka）
- HR-SIMS: Cameca IMS-1280HR（Kunihiro）
- SIMS: Cameca IMS-5f（Kunihiro）
- Gas-IRMS: MAT 253 IRMS（Tanaka）
- Noble Gas-MS: Micromass VG 5400（Kitagawa）
- Noble Gas-MS: Thermo Fisher Scientific Helix（Kitagawa）
- Orbitrap Mass Spectrometer: Thermo Fisher Scientific Orbitrap Fusion （Potiszil）
- GC-MS :Thermo Fisher Scientific TRACE 1310 & ISQ 7000 （Potiszil）

Spectrometers

- Micro-Raman spectrometers （Izawa,Mashino）
- Micro Raman spectrometer: Thermo Fisher Scientific Raman Spectroscopy （Kobayashi）
- Micro-FTIR spectrometer （Yamashita）
- Low-frequency micro-Raman spectrometer （Xue）
- Near infrared micro-Raman spectrometer （Xue）
- Vacuum FTIR spectrometer （Yoshino）
- Micro-FTIR spectrometer: Thermo Fisher Scientific Micro FT-IR （Kobayashi）
- High-resolution NMR spectrometer Bruker Avance NEO 400 MHz （Xue）
- Micro-Ruby fluorescence pressure measurement system （Xue）

Other instruments

- UV laser micro-machining system （Mashino）
- Sputtering system （Yamazaki）
- Wire-cut electrical discharge machining （Yamazaki）
- Pulsed Laser Deposition System （Yamazaki）
- Focused Ion Beam Instrument JIB-4500 （CASTEM）（Kobayashi）
- Ion chromatographs Metrohm Compact IC 761 （Kitagawa）
- HPLC: Thermo Fisher Scientific Vanquish（Potiszil）
- Nanoflow High Performance Liquid Chromatograph Thermo Fisher Scientific Easy-nLC 1200（Potiszil）
- High-temperature conversion elemental analyzer （Tanaka）
- Combustion elemental analyzer （Tanaka）
- GC-IsoLink system （Tanaka）
- Laser fluorination oxygen extraction system （Tanaka）

- Multifunctional organic sample preparation system: PAL RTC2000 （Potiszil）
- Rheometer（Kameda）
- Atomic force microscope（Kameda）
- Particle size and zeta potential analyzer（Kameda）
- Surface area and pore size distribution analyzer (Kameda)