

**Academic Year 2025**

**Graduate School of Science  
Hokkaido University**

**Department of Condensed Matter Physics  
Department of Cosmosciences**

**Master's Course**

(Former Period of Doctoral Program)

**Fall Selection**

**Application Guidelines for the  
Entrance Examination**

(Admission for General Category)

**September 2024**

## Important Notice

### I. General Category

Applicants for the general category must submit an English proficiency certificate (either TOEFL or TOEIC original scoresheet). See page 4 for details. Check the examination schedule, etc. on your own, based on the period during which application forms are accepted.

## **Personal Information Management by Hokkaido University**

- (1) In handling personal information at Hokkaido University, Hokkaido University makes every effort to obey relevant laws and ordinances such as the “Protection Law for Private Information Held by Independent Administrative Corporations”, and protect personal information pursuant to “National University Corporation Hokkaido University Personal Information Management Rules”.
- (2) Personal information, such as name, address, etc., provided by the applicant to the university in the process of applying for admission and pre-assessment of eligibility will be used only for 1) assessment of applicants (processing of application, conducting selection), 2) the announcement of application results, 3) enrollment procedures, 4) surveys and research on enrollee selection methods, and 5) business operations pertaining to 1-4.
- (3) Private companies commissioned by the University (hereafter called “commissioned companies”) may handle personal data to engage in the relevant operations. Part or all of the personal information submitted to the University by the applicant will be provided to the commissioned companies, to the extent necessary for them to carry out their duties.
- (4) After successful applicants are enrolled, the personal information provided by the applicants to the university in the process of applying for admission and pre-assessment of eligibility will be used for; 1) academic affairs (registration, academic guidance, etc.), 2) student support services (health management, scholarship applications, etc.), 3) career support services, and 4) tuition and fees, and related administrative operations.
- (5) Among the personal information of (4), only contact details, name and address and so on, may be used by Hokkaido University Frontier Foundation, Alumni Association of the School of Science and Alumni Association Elm of Hokkaido University with safety measure.
- (6) Applicants will be informed separately about the handling of personal data in accordance with the EU General Data Protection Regulation (GDPR). Applicants to whom such rules apply (those applying from within the European Economic Area (EEA) member states) should notify the Graduate School Educational Affairs Section, Science and Life Science Administration Department, prior to application.

## Admission Policy for the Graduate School of Science

Applicants must have completed core subjects in the fields of Mathematics, Physics, Chemistry, Biological Sciences, Earth Sciences, or related subjects to engage in more specialized and advanced academic research. They must also have the ability, character, and aptitude to study independently and to rigorously investigate the principles of nature.

### ▪ Principle Selection Policy (Multiple-Layered Evaluation Method)

#### 【General Category】

Written and oral examinations will be conducted in accordance to each department and field of study.

In the written examination, particular emphasis will be placed on the evaluation of "knowledge and skills" and "ability to think, judge, and express".

In the oral examination, particular emphasis will be placed on the evaluation of "knowledge and skills," "ability to think, judge, and express," "ability to work independently and cooperatively", "comprehension", "ability to identify problems", and "interest and motivation".

The Graduate School of Science will comprehensively assess applicants on the basis of the application documents (such as research plan, transcript, etc.).

#### 【Special Category for International Students】

In the oral examination, particular emphasis will be placed on the evaluation of "knowledge and skills," "ability to think, judge, and express," "ability to work independently and cooperatively", "comprehension", "ability to identify problems", and "interest and motivation".

The Graduate School of Science will comprehensively assess applicants on the basis of the application documents (such as research plan, transcript, etc.).

### ▪ Principle Selection Policy (Evaluation Elements and Their Importance)

#### 【Master's Course】

Category of Entrance Examination	Evaluation Element	3 Key Academic Elements			Comprehension	Ability to identify problems	Interest and motivation	Cultural knowledge
		Knowledge and Skills	Ability to think, judge, and express	Learning Attitude (to take initiative, to cooperate with diverse people)				
General Category	Writing Examination	◎	◎		○			
	Oral Examination	◎	◎	◎	◎	◎	◎	○
	Application Documents	Comprehensively evaluated						
Special Category for International Students	Oral Examination etc. (※1)	◎	◎	◎	◎	◎	◎	○
	Application Documents	Comprehensively evaluated						

※1 : Examination will be carried out by using Online Meeting System, etc.

(Note) ◎◎◎Key element we will give great importance on evaluation / ○◎◎Key element we will give importance on evaluation

## General Category

### 1. Admission Quota

Department	Admission Quota	Website
	April 2025	
Condensed Matter Physics	A few students	<a href="http://phys.sci.hokudai.ac.jp/cond-mat/index_eng.html">http://phys.sci.hokudai.ac.jp/cond-mat/index_eng.html</a>
Cosmosciences	A few students	<a href="https://www.cosmo.sci.hokudai.ac.jp/en/index.html">https://www.cosmo.sci.hokudai.ac.jp/en/index.html</a>

Notes: (1) For more details about each department, please contact the department concerned.  
(2) The entrance examination for the winter selection is scheduled in mid-February.

### 2. Eligibility

#### Applicants must fulfill one of the following criteria.

- (1) Graduated or are expected to graduate from a university prior to admission;
- (2) Received or are expected to receive a bachelor's degree prior to admission in accordance with Article 104(7) of the School Education Act (Act No. 26 of 1947);
- (3) Completed or are expected to complete 16 years of school education outside Japan prior to admission;
- (4) Completed or are expected to complete 16 years of school education of a foreign country through a distance-learning course offered by a school of that country while living in Japan prior to admission;
- (5) Completed or are expected to complete education at an institution established in Japan that is recognized by the school education system of a foreign country as an equivalent to a university of that country (limited to individuals who are recognized as having completed 16 years of school education in that country) and that is designated by the Minister of Education, Culture, Sports, Science and Technology (MEXT) prior to admission;
- (6) Received or are expected to receive a degree equivalent to a bachelor's degree from a university or school outside Japan (limited to the university or school which has received evaluation from the person who is authorized by the government of that country or the relevant agencies regarding the overall performance of its education and research activities, or which has been separately designated by MEXT as equivalent to the aforementioned) by completing a program that requires three years or more of course work (including the case of completing a distance-learning course offered by a school of that country while living in Japan, and the case of completing a study at the institution recognized by the school education system of that country and designated by MEXT as referred to in (5));
- (7) Completed or are expected to complete a specialist training course at a vocational school (limited to a course with a period of four years or more and that satisfies the conditions set by the MEXT) that is designated separately by the MEXT after the date set by the MEXT; or
- (8) Have been designated by the MEXT (Ministry of Education Notification No. 5, February 7 of 1953).
- (9) Have attended a university for three years or more or completed 15 years of school education outside Japan, and are recognized by the Graduate School of Science as having earned the required number of credits with an excellent academic record; or
- (10) Are recognized as having an academic aptitude equivalent or superior to university graduates through the screening for entrance eligibility conducted by the Graduate School of Science, and have reached the age of 22 at the point of entrance to the Graduate School of Science.

\* Applicants must contact their prospective supervisor and obtain his/her acceptance in advance. The approval from the prospective supervisor does not confirm the success in the entrance examination. Also, applicants must check a supplementary description of "Documents Specified by Each Department (Reason for application and List of preferred laboratories or fields.)"

### 3. Pre-Assessment of Eligibility

**Application Period: September 10(Tue) – September 12(Thu), 2024**

Applicants who fall under (9) or (10) in “2. Eligibility” must go through a pre-assessment of eligibility prior to the application for entrance examination. Please submit “5. Application Documents” during the period described above. To receive the result, please enclose a self-addressed envelope with an 84-yen stamp affixed. Applicants must not pay the entrance examination fee at the time of the pre-assessment. They shall pay the entrance examination fee in accordance with the notes below. (Application documents must be sent by mail and received by the deadline.)

Notes:

\*The results of the pre-assessment will be sent to applicants around September 26(Thu), 2024 by post. Once their qualifications have been approved, applicants must pay the examination fee in accordance with “7. Entrance Examination Fee,” and submit the payment certificate by October 4(Fri), 2024. Application will not be accepted if the payment certificate is not received during the specified period.

\*Students who will receive the Japanese Government (MEXT) scholarship, the State-Sponsored Scholarship Program of the China Scholarship Council, or the Hokkaido University President’s Fellowship (including those who are expected to receive these scholarships) are not required to pay the examination fee.

### 4. Application Period

**Application Period: October 1(Tue) – October 4(Fri), 2024**

Applicants who fall under (1) through (8) in “2. Eligibility” must submit “5. Application Documents” together with the payment certificate (see “7. Entrance Examination Fee”) during the application period. (Application documents must be sent by mail and received by the deadline.)

### 5. Application Documents

\*Applicants who fall under (9) or (10) in “2. Eligibility” must submit the following documents during the application period described in “3. Pre-assessment of Eligibility”

\*In the following table, “○” indicates documents that must be submitted by all applicants, while “△” indicates documents that must be submitted by those who meet the definition in the “Remarks”.

Documents	Applicants			Remarks
	(1)(2) (3)(4) (5)(6) (7)(8)	(9)	(10)	
1 Application Form, Resume, Admission Ticket and Photo Card	○	○	○	[Specified form] Applicants who have completed a school education outside Japan or a distance-learning course offered by a foreign educational institution must fill out <b>Resume B</b> .
2 Official transcript issued by the last university or similar institution	○	○	○	Applicants under (9) in “2. Eligibility” must submit a transcript issued by their current university. *In the case that official transcript is written in a language other than Japanese or English, “Original Official Transcript written in the language concerned” and “Original official translation in Japanese or English” must be attached.
3 Official Certificate of Graduation (or expected graduation) or Degree Conferral (or expected degree conferral) issued by the last university or similar institution.	○	○	○	①An Official Certificate must be issued by the Head of the university or similar institution. (Degree information should be contained if you have already graduated.) ◎ Applicants who graduated or are expected to graduate from a university or similar institution in China (except Taiwan, Hong Kong and Macao) must submit the following document in English along with an official certificate of graduation (or expected graduation.) Applicants who; -graduated ... (a) Online Verification Report of Higher Education Qualification Certificate -are expected to graduate ... (a) Online Verification Report of Student Record

					<p>Document (a) can be obtained from the China Credentials Verification (中国高等教育学历证书查询 <a href="https://www.chsi.com.cn/xlcx/bgys.jsp">https://www.chsi.com.cn/xlcx/bgys.jsp</a>) Please make sure the web authentication should be valid at least 15 days at the time of submission.</p> <p>②Applicants under (2) in “2. Eligibility” must submit either an Official Certificate of Degree Conferral (or an Application Acceptance Certificate) issued by the National Institution for Academic Degrees and Quality Enhancement of Higher Education (NIAD-QE) or a Graduation Certificate (or an expected Graduation Certificate ) along with an expected Application Certificate of Degree Conferral issued by the technical school that the applicants are affiliated with.</p> <p>*In the case that official transcript is written in a language other than Japanese or English, “Original Official Transcript written in the language concerned” and “Original official translation in Japanese or English” must be attached.</p>
4	Documents certifying that the applicant has academic skills equal or superior to university graduates			<input type="radio"/>	<p>[In any format] e.g., documents detailing international activities, work experience, language learning experience, research papers, patent publications, certificate of qualification, recommendation letter from faculty etc.</p>
5	Documents specified by each department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See “Documents Specified by Each Department” below.
6	Self-addressed envelope to receive an admission ticket for entrance examination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>[Specified envelope] Write your name, mailing address and postal code on the specified envelope with a 480-yen stamp attached. If you need to change your address afterwards, notify the Graduate School Educational Affairs Section immediately.</p>
7	Stickers to receive application results and to be used for communication purposes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>[Specified Sticker] Write your name, mailing address and postal code on each sticker. If you need to change your address afterwards, notify the Graduate School Educational Affairs Section immediately.</p>
8	Recommendation letter from the head of the undergraduate school or the university which an applicant graduated most recently (must be sealed up)	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<p>[A4- sized paper in any format] ① Applicants under (9) in “2. Eligibility” must submit this document. ② Applicants under (1)-(8) or (10) in “2. Eligibility” may submit this document only if applying to the Department of Condensed Matter Physics, or CosmoSciences (not mandatory).</p>
9	English proficiency certificate. (An original score sheet of TOEFL or TOEIC)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<p>Applicants must submit a score sheet for either (1) or (2). The score sheets must be the originals. (See *[Important] below.)</p> <p>(1) TOEIC Public Testing 【Listening &amp; Reading Test only】 (must have been taken in or after July 2022) *In the case of taking TOEIC (Public Testing) after April 2023, a printed Digital Official Score Certificate could be submitted instead of the original Official Score Certificate.</p> <p>(2) TOEFL-iBT (Home Edition is accepted) (must have been taken in or after July 2022) TOEFL-ITP, TOEIC-IP, and TOEIC-Bridge are not accepted.</p> <p>Those who took this year’s examination (summer selection held on August 8 and 9, 2024) and already submitted the score sheet may apply for an exemption (or you may submit a new score sheet). If you wish to apply for an exemption, check the appropriate box in the application document.</p>
10	Self-addressed envelope to receive the result of pre-assessment		<input type="radio"/>	<input type="radio"/>	Write your name, mailing address and postal code on a standard envelope with an 84-yen stamp attached.

\* **[Important] Submission of the English Proficiency Certificate (scoresheet)**

Submission of the English proficiency scoresheet during the application period is final. No additional scoresheets will be accepted to replace the original submission.

A printed version of the proficiency test results, available online is acceptable for the application if a hardcopy of the original scoresheet can be submitted in person or by postage by November 5(Tue), 2024.

If a hardcopy of the original scoresheet is not submitted by November 5(Tue), 2024, the proficiency test results will be considered invalid and regarded as a “score of zero”. In this case, the entrance examination fee will not be refunded.

© Documents Specified by Each Department

Department	Documents to be submitted	Remarks
Condensed Matter Physics	List of preferred laboratories or fields (specified form)	Provide your first, second and third choices of laboratories from the List of Supervisors and Research Fields. When filling in the form, be sure to contact the supervisor in charge of the laboratory of your choice in advance to obtain permission to accept you into the laboratory and to fill in the survey form.
Cosmosciences	1. List of preferred laboratories or fields (specified form) 2. Cosmosciences report (any format in A4-sized paper)	1. Provide your first, second and third choices of laboratories from the List of Supervisors and Research Fields. When filling in the form, be sure to contact the supervisor in charge of the laboratory of your choice in advance to obtain permission to accept you into the laboratory and to fill in the survey form. 2. Summarize the research theme which interested you most about your thesis or study related to cosmosciences within two pages in A4-sized paper.

## 6. Where to Submit

To: Graduate School Educational Affairs Section  
Science and Life Science Administration Department, Hokkaido University  
Kita-10 Nishi-8, Kita-ku, Sapporo 060-0810 Japan

You are required to send your application documents by mail. Please mark “Application Enclosed” in red on the envelope and send it by express registered mail. Prepare an envelope by yourself, do not use the “Envelope for Admission Ticket” in the application guideline.

## 7. Entrance Examination Fee: 30,000 yen

- (1) Students who will receive the Japanese Government (MEXT) scholarship\*, the State-Sponsored Scholarship Program of the China Scholarship Council, the Hokkaido University President’s Fellowship (including those who are expected to receive these scholarships), or students who are currently enrolled in the ISP program of School of Science are not required to pay the examination fee.  
\* MEXT scholarship students recommended by universities other than Hokkaido University are required to submit a copy of the letter proving that they will receive this scholarship.
- (2) Remit the examination fee through a bank or a post office by using the payment slip for entrance examination fee which is enclosed in the application package, and attach the payment certificate to the appropriate section on the application form.
- (3) The examination fee is not refundable except for the following cases:
  - The applicant has decided not to submit an application after examination fee was remitted, or the application was not accepted.
  - The applicant paid the examination fee twice by mistake.

## 8. Screening Method

The Graduate School of Science will assess applicants based on the entrance examination (oral exam), official transcript and other application documents submitted.



## 9. Examination Date and Venue (oral exams)

**Date: November 6(Wed) • November 7(Thu), 2024**

**Venue: Graduate School of Science, Hokkaido University (Kita-10 Nishi-8 Kita-ku, Sapporo)**

**\*Excluding online examination**

Department	November 6(Wed)	November 7(Thu)
	A.M. • P.M.	A.M. • P.M.
Condensed Matter Physics	Oral examination (9:00-)	
Cosmosciences	Oral examination (9:00-)	

\* Details of the exam including time and venue will be notified when sending the admission ticket.

## 10. Announcement of Results

The successful examinee's number will be posted on the website of the Graduate School of Science around 4:30 PM on November 21(Thu), 2024. In addition, all applicants are notified of their results individually.

## 11. Procedures for Enrollment and Payment of Fees

All successful applicants are notified of the registration procedure at the time of notification of results.

Enrollment Fee: 282,000 yen (estimated)

Tuition Fee: 267,900 yen for the first semester (estimated) [Total annual tuition fee = 535,800 yen]

\* If the tuition fee is revised during the period of your enrollment, the revised fee becomes effective immediately.

## 12. Important Notice

- (1) Make sure to bring your admission ticket on the day of examination and put it on your desk.
- (2) After submitting the application documents, applicants are not allowed to change their selection of department for any reason.
- (3) If you need special assistance in taking the examination due to physical difficulties, consult with the Graduate School Educational Affairs Section at the time of application.

## 13. Period of Extended Enrollment

It is possible to extend the standard years of study at the Graduate School of Science. Read "Period of Extended Enrollment" on page 8, and submit an application if you wish to take advantage of this system.

## 14. Other Information

The admission ticket for entrance examination will be sent around October 17(Thu), 2024 to all applicants whose application document is accepted.

**If you have any questions about the application procedure, please contact the following:**

**Graduate School Educational Affairs Section**  
Science and Life Science Administration Department  
Hokkaido University  
Kita-10 Nishi-8 Kita-ku, Sapporo 060-0810, Japan  
(Office hours: 8:30 a.m. – 5:00 p.m. weekday)  
Tel: +81-11-706 - 3675  
E-mail: [r-gakuin@sci.hokudai.ac.jp](mailto:r-gakuin@sci.hokudai.ac.jp)  
**Graduate School of Science, Hokkaido University**  
<https://www2.sci.hokudai.ac.jp/gs/en>

## Period of Extended Enrollment

### 1. Aims

When students under special circumstances such as having a job, etc. (including child and nursing care) have asked for an extension to complete the program for a period exceeding the standard years of study (2 years) with a scheduled plan of study, such scheduled study (hereinafter referred to as "Period of Extended Enrollment") may be approved after reviewing their application.

### 2. Intended Students

Students who fall under one of the criteria below and for that reason, wish to set the study period longer than the standard period to complete an academic (research) course:

- (1) Have a full-time job in a public office or company (excluding those who are exempt from job duty but receive a salary), or are self-employed;
- (2) Have a part-time job that has a significant influence on the full-time academic work;
- (3) Are taking care of children or other family members, which has a significant influence on the full-time academic work; or
- (4) Are visually impaired, hearing impaired, physically handicapped, etc., which are deemed to have a significant influence on the academic work for an extended period of time.

### 3. Attendance Period

The period approved for the Period of Extended Enrollment is up to 4 years for the master's degree program, and a student can apply for extension by the year. Students who have been approved of Period of Extended Enrollment may not continue their study beyond the period of adding 2 years to the Period of Extended Enrollment.

Students may take a temporary leave of absence from school for up to 2 years, the same as the students under the standard period of study.

### 4. Application Procedure

#### (1) Application Period

As a general rule, application documents for Period of Extended Enrollment should be submitted at the time of application for entrance examination.

#### (2) Required Documents

- ① Application Form for Period of Extended Enrollment (Form 1)
- ② Research Plan Under Period of Extended Enrollment (Form 2)
- ③ Documents to prove that an applicant needs to apply for Period of Extended Enrollment

#### (3) Announcement of Results

The Graduate School of Science reviews each application individually and will notify the results to all the successful applicants of the entrance examination.

### 5. Reducing or Extending the Period of Extended Enrollment

When regarded as necessary, the Graduate School of Science may approve of reducing or extending the Period of Extended Enrollment only once. The period of reducing the Period of Extended Enrollment may not exceed the period of adding one year to the standard period of study (2 years).

### 6. Annual Tuition Fee

The tuition fee for students approved to study for an extended period will be calculated by multiplying the annual tuition fee by the number of years equivalent to the standard period of study (2 years), then dividing the resulting amount by the number of years approved for extended study. If the revision is made to the annual tuition fee or the changes to the Period of Extended Enrollment are approved, the fee will be calculated accordingly. However, the adjustment will not be made to the tuition fee which has already been paid.

Students who are waiting for results of application for Period of Extended Enrollment must not pay the tuition fee before they receive the official notification of results

### 7. Other Information

For more details about Period of Extended Enrollment, please contact the Graduate School Educational Affairs Section, Science and Life Science Administration Department, Hokkaido University.

# List of Supervisors and Research Fields

As of September 1, 2024

Master's Course

## Department of Condensed Matter Physics, Graduate School of Science

Laboratories	Supervisors		Keywords	Remarks
Electronic Properties of Solids	Professor	YOSHIDA Hiroyuki	We develop new materials in strongly correlated electron systems by various chemical methods including high pressure synthesis, and elucidate their properties by both bulk physical properties measurements (electrical resistivity, magnetization, specific heat measurements, and precise measurements in ultra-high magnetic fields, etc) and microscopic measurements ( $\mu$ SR, neutron and synchrotron X-ray scattering, etc).  Specifically, we develop frustrated magnetic materials, multipole materials, skyrmion materials, novel actinide compounds and also search for quantum many-body states in high magnetic fields, cross-correlational phenomena, and new superconducting states and odd-parity multipoles.	
	Assistant Professor	KON Fusako		
J-Material: Physics of Strongly Correlated Systems	Professor	AMITSUKA Hiroshi	J-material, Superconductivity, Magnetism, Heavy fermion, Quantum phase transition, Magnetoelectric effects, Very low temperatures, High magnetic fields, High pressure, Ultrasonic measurements, $\mu$ SR, Neutron scattering, RXS, Ferroelectrics, Multiferroics, Electronic ferroelectricity, Phase transition, Photoinduced cooperative phenomena	
	Professor	YANAGISAWA Tatsuya		
	Associate Professor	TAKESADA Masaki		
	Assistant Professor	HIDAKA Hiroyuki		
Electronic Properties of Low-dimensional Material	Professor	KAWAMOTO Atsushi	NMR, Strongly-correlated electron systems, Superconductivity, Magnetism Low-dimensional organic conductors, Scanning tunneling microscopy (STM), Scanning tunneling spectroscopy (STS), Nonlinear conductivity, Symmetry of Cooper pairs, Spin density waves (SDWs), Chiral superconductivity, Mesoscopic systems, Topological phenomena	
	Associate Professor	MATSUNAGA Noriaki		
	Lecturer	IHARA Yoshihiko		
	Assistant Professor	NOBUKANE Hiroyoshi		
	Assistant Professor	FUKUOKA Syuhei		
Condensed Matter Dynamics	Associate Professor	MISHINA Tomobumi	We study the interaction of light with matter, mainly by spectroscopic measurements using laser light. Target systems include organic materials, metals, and semiconductors. In the case of molecular luminescence in solution, we deal with energy relaxation of a few milliseconds due to liquid dynamics; in the case of excited-state relaxation in semiconductors, we measure relaxation in microseconds to nanoseconds; and in the case of phonon spectroscopy in solids, we study relaxation phenomena on time scales of picoseconds or less. We also synthesize nanocrystals of a few nanometers in size by chemical synthesis methods and study various phenomena caused by quantum effects in the electron system confined in very small nanocrystals.	Will retire in March, 2025.
	Assistant Professor	YAMAMOTO Sekika		

Laboratories	Professors		Keywords	Remarks
Statistical Physics	Professor	NEMOTO Koji	We theoretically study novel physical phenomena in strongly-correlated electron systems based on quantum mechanics and statistical physics. We aim to systematically understand physical phenomena and explore the possibility of new electronic states and quantum phenomena. The recent research topics are the following.	Will retire in March, 2025.
	Professor	KITA Takafumi	(1) Classification of electronic physical properties based on microscopic multipoles (2) Topological magnetism including magnetic skyrmions (3) Emergent spin-orbit-coupled physics in magnetic materials	Will retire in March, 2025.
	Associate Professor	HAYAMI Satoru	(4) Cross-correlated phenomena over electric, magnetic, elastic, heat, and light (5) Exploring novel physics by using a machine-learning method	
	Assistant Professor	OKUDA Koji	We also study efficiency of heat engines using nonequilibrium statistical mechanics and complex dynamics in pattern formation and chaos of coupled-oscillator systems, using not only theoretical analysis but also numerical simulation.	
Mathematical physics	Professor	YAMAMOTO Shoji	Making full use of various—both analytical and numerical—quantum statistical methods, we explore novel quantum cooperative phenomena in strongly correlated electron systems. A recent keyword is "topology". Interpretation of phenomena must be our ultimate goal, but we often take further interest in the mathematical and methodological ways we can accomplish this. We construct microscopic theories on a variety of physics such as quantum spin liquid, photoinduced magnetism, nuclear magnetic resonance, inelastic neutron scattering, Raman scattering, optical conductivity, and angle-resolved photoemission spectroscopy. We sometimes enjoy theoretical formulation in itself and sometimes interpret observations in cooperation with experimentalists and chemist.	
	Lecturer	OHARA Jun		
Nanostructure Physics (RIES)	Professor	KOBAYASHI Kaya	Superconductors and magnets, novel materials synthesis, layered materials, transition metal dichalcogenides, van der Waals heterostructure, material characterization, thin flake devices, thin film, MBE, TEM	
	Associate Professor	KONDO Kenji	Quantum field theory, Many-body perturbation theory, Spintronics devices, Magnetism, Electronic correlations, Dirac electron, Topological insulator	No acceptance for FY2025

※There is a possibility that the members of supervisors change. Please get the latest information from the website of the Graduate School of Science.

## Department of CosmoSciences, Graduate School of Science

Laboratories	Supervisors		Keywords	Remarks
Observational Astronomy	Professor	SORAI Kazuo	Observational astronomy, extragalactic astronomy, interstellar matter, development of observational instruments and system for the Antarctic THz telescope	Institute for the Advancement of Higher Education
	Assistant Professor	SALAK Dragan		
Theoretical Particle Physics and Cosmology	Professor	SUZUKI Hisao	Particle physics, beyond the standard model, dark matter, dark energy, grand unified theory, superstrings, supersymmetry, early universe	Institute for the Advancement of Higher Education
	Professor	KOBAYASHI Tatsuo		
	Associate Professor	SETO Osamu		
	Lecturer	SUEHIRO Kazuhiko		
	Assistant Professor	DAS Arindam		
Theoretical Nuclear Physics	Associate Professor	NOMURA Kosuke	Nuclear structure and dynamics, and related quantum many-body theory, exotic nuclear deformations and collective excitations, nucleosynthesis, double beta decay, machine learning	
Theoretical Astrophysics	Professor	OKAMOTO Takashi	Theoretical astronomy, numerical simulations, semi-analytic modelling, first star formation, first galaxy formation, galaxy evolution, galaxy clusters, supermassive black holes, interstellar matter, star formation	
	Assistant Professor	SUGIMURA Kazuyuki		
Planetary and Space Group	Professor	KURAMOTO Kiyoshi	Origin and evolution of planets and satellites, material evolution during planetary system formation, structure and dynamics of Earth and planetary atmospheres, comparative planetology, space exploration and ground-based observation, experimental studies, theory and hierarchical numerical simulation models, applications of information technology	
	Professor	TAKAHASHI Yukihiko		
	Professor	ISHIWATARI Masaki		
	Professor	SATO Mitsuteru		
	Associate Professor	KAMATA Shunichi		
	Specially Appointed Associate Professor	KUBOTA Hisayuki		
	Lecturer	TAKAGI Seiko		

Laboratories	Supervisors		Keywords	Remarks
Astrophysical Chemistry	Professor	WATANABE Naoki	Interstellar molecules, ice dust, amorphous solid water, surface reactions, nanoparticle, crystallization, nucleation, electron microscopy, microgravity	
	Professor	KIMURA Yuki		
	Associate Professor	OBA Yasuhiro		
	Associate Professor	YAMAZAKI Tomoya		
	Assistant Professor	HIDAKA Hiroshi		
	Assistant Professor	TSUGE Masashi		
Phase Transition Dynamics	Professor	SAZAKI Gen	Phase transition dynamics, crystal growth, ice, snow, interferometry, advanced optical microscopy, atomic force microscopy	
	Assistant Professor	NAGASHIMA Ken		
	Assistant Professor	MURATA Ken-ichiro		
Information Media Science	Professor	FUSE Izumi	Learning science, learning platforms, open education	
	Assistant Professor	YAMAMOTO Yuichi		
Nuclear Reaction Data Science	Associate Professor	HIRABAYASHI Yoshiharu	Nuclear data, nuclear reactions, evaluation	Information Initiative Center
	Visiting Professor	FUKAHORI Tokio		Inter-field Cooperation with the Japan Atomic Energy Agency (JAEA) in the field of nuclear data.
	Visiting Professor	IWAMOTO Nobuyuki		
Spacecraft Observation Group	Visiting Professor	SATO Takehiko	Planetary exploration, infrared astronomy from space, radio astronomy from space	Inter-field Cooperation with the Japan Aerospace Exploration Agency (JAXA) in the field of spacecraft observation.
	Visiting Professor	FUJIMOTO Ryuichi		
	Visiting Associate Professor	YAMAMURA Issei		

※There is a possibility that the members of supervisors change. Please get the latest information from the website of the Graduate School of Science.