

**Academic Year 2016**  
**Graduate School of Science**  
**Hokkaido University**

# **Doctoral Course**

**(Second Part of Doctoral Program)**

**First Selection of 2016**

## **Guidelines for Application for the Entrance Examination**

For enrollment October 2015 or April 2016  
(Admission for International Students Abroad)

**June 2015**

## **Hokkaido University's Acquisition and Use of Personal Information**

- (1) In handling personal information from applicants, Hokkaido University makes every effort to protect this information through appropriate management based on the "Privacy Policy of Hokkaido University" and relevant laws and ordinances such as the "Protection Law for Private Information Held by Independent Administrative Corporations."
- (2) Personal information, such as name, address, etc., provided by applicants to the university in the process of applying for admission will be used only for 1) assessment of applicants, 2) the announcement of results, 3) enrollment procedures, 4) surveys and research on enrollee selection methods, and 5) business operations pertaining to 1-4.
- (3) Companies commissioned as part of the relevant operations by the university (hereafter called "commissioned companies") may handle personal data. Part or all of the personal information submitted to the university by applicants will be provided to the commissioned companies, to the extent necessary for them to carry out their commissioned operations.
- (4) After successful applicants are enrolled, personal information they provided on their application forms will be used for 1) educational affairs (such as registration, educational guidance, etc.), 2) student support services (such as health administration, fellowship applications, etc.), and 3) business operations related to their tuition fees and other expenses.
- (5) Regarding the personal information in (4), only the name and address can be used for contact from 1) Hokkaido University Frontier Foundation, 2) Hokkaido University Athletic Union, and 3) Hokkaido University Clark Memorial Foundation, and 4) the Alumni Association of the School of Science, Hokkaido University.

June 2015

Graduate School of Science,  
Hokkaido University

## Admission Requirements for the Graduate School of Science

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

### Special Category for International Students

#### 1. Admission Quota

Department	Admission Quota
Mathematics	A few students
Condensed Matter Physics	
Cosmosciences	
Natural History Sciences	

#### 2. Eligible Applicants

Applicants who cannot come to Japan to take the entrance examination, who have obtained a recommendation letter attesting to the applicant's competence and scholastic performance from the prospective supervising faculty member in the Graduate School of Science who has agreed to be the applicant's supervisor after enrollment, and who fulfill one of the following admission requirements:

- (1) Received or are expected to receive, a degree equivalent to a Master's degree or a professional degree at an overseas institution prior to admission to the Graduate School.
- (2) Received or are expected to receive, prior to admission to the Graduate School, a degree equivalent to a Master's degree from the United Nations University which was promulgated by the General Assembly of the United Nations on December 11, 1972 and in accordance with the Agreement between Japan and the United Nations concerning the Act on Special Measures Incidental to Enforcement of the Agreement between the United Nations and Japan regarding the Headquarters of the United Nations University [1976, Resolution 72, Article 1, Item 2].
- (3) Completed or are expected to complete, prior to admission to the Graduate School, a formal education by taking a correspondence course through a non-Japanese university, an educational institution as designated by (4), or the United Nations University; passed an examination or a screening equivalent to that specified in the regulations in Article 16-2 in Standards for the Establishment of Graduate Schools; and be recognized by the Graduate School as having reached an academic level equivalent to that of a Master's degree holder.
- (4) Designated by the Ministry of Education, Culture, Sports, Science and Technology (Ministry of Education Notification No. 118/1989):

Completed of a 16-year overseas school education course, or an overseas correspondence course in Japan equivalent to a 16-year school education course in the country concerned, and subsequently engaged in research at a university and/or a research institute for two years or longer, and be recognized by the Graduate School as having reached an academic level equivalent to or higher than that of a Master's degree holder, based on research results.

- (5) Be recognized by the Graduate School as having reached an academic level equal to or higher than that of a Master's degree holder or a professional degree holder, as verified by the individual admission qualification screening, and be at least age 24 before admission to the Graduate School.
- ※ **Applicants must contact their prospective supervisor in advance, and after obtaining his/her acceptance, they will receive a password necessary for online application. In addition, applicants must request their prospective supervisor to make their recommendation letter (discretionary format) and ask them to directly submit it to the Educational Affairs Section during the application period.**
- ※ Those who wish to enroll in October 2015 must indicate this by choosing “October 2015 enrollment” on the online application registration screen.

### **3. Pre-assessment of Applicants' Qualifications**

**June 22 – June 24, 2015, 5:00 PM JST.**

The Pre-assessment of Applicants' Qualifications is held prior to the application period for the entrance examination. **Applicants under (4) or (5) in “2. Eligible Applicants”** must apply for this by submitting “6. Application Documents” in PDF format during the above period by email to the following address. If you provide false information on documents submitted, your application may be rejected.

**Email address: daigakuinkyou@mail.sci.hokudai.ac.jp**

**Applicants who apply for the Pre-assessment of Applicants' Qualifications should not pay the entrance examination fee when they apply for the pre-assessment.**

Applicants will be notified by email of the pre-assessment results around July 2, 2015; once their qualifications have been accepted by the pre-assessment, they must complete “5. Application Procedure” during “4. Application Period.”

- Japanese Government (MEXT) scholarship students, students in the State-Sponsored Scholarship Program of the China Scholarship Council, and students having a Hokkaido University President's Fellowship or a Hokkaido University Special Grant for International Students (including those who are expected to receive these scholarships) are not required to pay the examination fee.

### **4. Application Period**

- ◆ **Online application: July 1 – 5:00 PM JST on July 7, 2015**

**Note: After online application, applicants must scan all the application documents (see “5. Submission of Application Documents”) in PDF format and send them via email by July 7.**

**Email address: daigakuinkyou@mail.sci.hokudai.ac.jp**

- ◆ **Deadline for submission of the application documents: 5:00 PM JST on July 15, 2015.**

Applicants must send hard copies of the application documents by mail after online application registration (they must be received by the deadline).

**Applicants under (1), (2) or (3) in “2. Eligible Applicants”**

Referring to “5. Application Procedure”, applicants must apply during the above application period.

### **Applicants under (4) or (5) in “2. Eligible Applicants”**

Applicants must first apply for the Pre-assessment of Applicants’ Qualifications, and then once their qualifications have been accepted by the pre-assessment, complete the application procedure, referring to “5. Application Procedure and Entrance Examination Fee”, during the above application period.

## **5. Application Procedure and Entrance Examination Fee**

Applications will be accepted from those who complete the following procedure (①–③) during “4. Application Period.”

### **① Online Application Registration**

- 1) Access the Hokkaido University Internet Application website (<http://e-apply.jp/e/hokudai-sci/>) using the password received from your prospective supervisor.

Notes:

- i. **Detailed information on the online application procedure has been posted on the website, so please read the operation procedures and precautions in advance.**
  - ii. Applicants should have (or have access to) a printer for printing the application documents, and have an email address capable of receiving notification of registration and payment (not a mobile email address).
- 2) Follow the instructions on the screen and enter the necessary information.
  - 3) After all necessary information has been provided, notification of completion of the registration will be sent to the email address you submitted.

### **② Payment of the Entrance Examination Fee**

Pay the entrance examination fee in accordance with the instructions provided on the payment procedures screen shown after you complete the online application registration process. Use one of the following methods to make the payment. (Required information and procedures differ depending on the payment method you choose). Please follow the instructions on the screen.

### **Entrance Examination Fee: 30,000 yen**

- I. Credit card.
- II. Pay-easy (bank ATM, Japan Post bank ATM, or online banking), convenience store, Japan Net Bank, or Rakuten Bank.
- III. ChinaPay (online payment service offered by China UnionPay).

Note:

- 1) Japanese Government (MEXT) scholarship students, students in the State-Sponsored Scholarship Program of the China Scholarship Council, and students having a Hokkaido University President’s Fellowship or a Hokkaido University Special Grant for International Students (including those who are expected to receive these scholarships) are not required to pay the examination fee.
- 2) The examination fee is not refundable except in the following cases:

- The applicant has not submitted an application, or the application was rejected after the application fee was remitted.
- The applicant paid the examination fee twice by mistake.

### ③ Submission of Application Documents

- 1) Print the application form and resume that were generated after you completed of the online application registration process and send them along with all other necessary documents (see “6. Application Documents”) in an envelope; affix one of the address labels (printed with the application form and resume) to the envelope, and send it by registered mail (It must be received by the deadline.). Please note that the application documents will not be returned once submitted.

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

- 2) The application is considered complete once all documents are received by the Graduate School. Please note that completion of the online application registration alone does not constitute completion of the application procedure.
  - Applications received after the application period will not be accepted, so be sure to leave enough time for postal delivery.

## 6. Application Documents

In the following chart, “○” indicates documents that must be submitted; “△” indicates optional documents that may be submitted in particular cases.

Documents		Applicants		Remarks
		(1), (2) (3)	(4), (5)	
1	Application Form and Resume.	○	○ ※	Print the application form and resume that were generated after completion of the online application registration process, and submit them (print on A-4 size pages). <b>※Applicants under (4) or (5) in “2. Eligible Applicants” should submit these documents after their qualifications have been accepted by the pre-assessment.</b>
2	Application Form for the pre-assessment.		○	Prescribed. Download this form from the online application page and complete it.
3	Photograph (for Resume)	○	○	One photograph (4cm×3cm)
4	Research Plan after enrollment.	○	○	Prescribed. Download this form from the online application page and complete it (print on A-4 size pages).
5	Copy of the Master’s Thesis.	△		Only Master’s degree or professional degree holders.
6	Summary of research during the Master’s Course (in two A-4 or letter-size pages or	△		Only applicants expecting to receive a Master’s degree. Applicants for the Department of Mathematics are required to submit a summary of their study and research instead of a summary of research.

	less).			
7	Official Transcript issued by the last graduate school previously attended.	○	○	① An applicant can also attach recommendation letters from faculty members at the graduate school previously attended. ② Applicants under (3), (4) or (5) in “2. Eligible Applicants” are required to submit a transcript issued by the last academic institution (university) previously attended.
8	Official Certificate of Graduation or Expected Graduation issued by the last graduate school previously attended.	○	○	① Applicants under (4) or (5) in “2. Eligible Applicants” are required to submit an Official Certificate of Graduation issued by the last academic institution (university) previously attended. ② Applicants under (3) in “2. Eligible Applicants” are required to submit an Official Certificate of Qualifying Examination.
9	Copy of Passport	○	○	Submit a copy of the page of your passport with your name on it.
10	Other Documents that the prospective supervisor requests.	△	△	

## 7. Selection Criteria

The Graduate School will assess applicants on the basis of their application form, resume, official transcripts from academic institutions previously attended, recommendation letter from the prospective supervisor, and all other documents submitted.

## 8. Announcement of Application Results

Successful applicants will be announced on the bulletin board on the ground floor of the Graduate School of Science (large lobby inside north entrance to Building 2), Hokkaido University, **around 4:30 PM on July 24, 2015**. All applicants will also receive the results by mail.

## 9. Procedures for Enrollment and Payment of Fees

All successful applicants will be notified along with their letter of acceptance about how to proceed with enrollment registration.

Enrollment Fee: 282,000 yen (estimated).

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

※The above tuition and fees are subject to revision at the time of or during your enrollment. In the event of a revision, the revised amounts are immediately applied.

## 10. Long-term Graduate System

The Long-term Graduate System is an option in the Graduate School of Science. If you wish to take advantage of this system, please apply after referring to “Information on the Long-term Graduate System” .

◎If you have any questions regarding application procedures, please contact:

Graduate School Educational Affairs Section

Science and Life Science Administration Department

Hokkaido University

Kita-10 Nishi-8 Kita-ku, Sapporo 060-0810, Japan

Tel: (011) 706-3677

**Graduate School of Science, Hokkaido University**

URL: [http:// http://www.sci.hokudai.ac.jp/english/index.html](http://http://www.sci.hokudai.ac.jp/english/index.html)



## Information on the Long-term Graduate System

### 1. Aims of the Long-term Graduate System

Under the Long-term Graduate System, a student can request an individual review by the Graduate School and be accepted to complete a course in a planned manner within a period longer than the regular course term (3 years), for certain reasons such as responsibilities of work, or child and family care.

### 2. Intended Students

Applicants fulfilling one of the criteria below, who want to set a period of study in advance longer than the regular course term to complete an academic (research) course.

- (1) Have a full-time job in a public office or company (excluding people who are exempt from job duty but receive a salary), or are self-employed.
- (2) Have a part-time job that makes it stressful to engage in full-time academic work.
- (3) Are taking care of children or other family members, which makes it stressful to engage in full-time academic work.

### 3. Attendance Period

The attendance period for the Long-term Graduate System is up to 6 years, and a student can apply for the system by the year. Once the application is accepted, the student can attend school for up to the accepted period. Students can also take a temporary leave of absence from school for up to 3 years.

### 4. Procedure for Applying for Long-term Graduate Status

#### (1) Application Period

Please submit complete application documents for the Long-term Graduate System and for the entrance examination together.

#### (2) Required Documents

- ① Application Form for Long-term Graduate System (Form 1).
- ② Research Plan Under Long-term Graduate System (Form 2).
- ③ Documents that prove that an applicant needs to complete an academic course under the Long-term Graduate System (the format is discretionary).

#### (3) Announcement of Application Results

The Graduate School individually assesses each application for Long-term Graduate Status, and will notify only applicants who successfully pass the entrance exam of the results.

### 5. Annual Tuition Fees

The annual tuition fees are determined by the calculation below for every year of the term.

$$\text{Annual tuition fee as a Long-term Graduate Student} = \text{Annual tuition fee for his/her attending year} \times \frac{\text{Regular course term (3 years)}}{\text{Period of his/her accepted Long-term Course (years)}}$$

### 6. Other Information

For the details regarding the Long-term Graduate System, please contact the Graduate School Educational Affairs Section, Science and Life Science Administration Department, Hokkaido University.

# List of Supervisors and Research Fields

As of April 1, 2015

## Department of Mathematics, Graduate School of Science

## Doctoral Course

Fields	Supervisors		Keywords	Remarks
Algebra	Professor	Mutsumi Saito	Algebraic analysis, rings of differential operators	
	Professor	Keiji Matsumoto	Special functions	
	Professor	Hiroshi Yamashita	Representation theory	
	Specially Appointed Professor	Hiroaki Terao	Singularity theory, combinatorics	
	Associate Professor	Masanori Asakura	Arithmetic geometry	
	Associate Professor	Noriyuki Abe	Representation theory	
	Associate Professor	Youichi Shibukawa	Yang-Baxter equations and quantum groups	
	Associate Professor	Kenichiro Tanabe	Vertex algebras, algebraic combinatorics	
	Associate Professor	Daisuke Matsushita	Algebraic geometry	
	Associate Professor	Masahiko Yoshinaga	Algebraic geometry, combinatorics	
	Specially Appointed Lecturer	Simona Settepanella	Singularity theory, combinatorics	
Geometry	Professor	Goo Ishikawa	Real algebraic geometry, singularity theory	
	Professor	Shyuichi Izumiya	Geometry, singularity theory	
	Professor	Katsunori Iwasaki	Complex geometry, dynamical systems, Painleve systems	
	Professor	Toru Ohmoto	Singularity theory, topology	
	Associate Professor	Toshiyuki Akita	Topology	
	Associate Professor	Shimpei Kobayashi	Differential geometry	
	Associate Professor	Masao Jinzenji	Mathematical physics	
	Associate Professor	Hitoshi Furuhashi	Differential geometry	
Analysis	Professor	Hiroaki Aikawa	Potential theory, real analysis	
	Professor	Asao Arai	Mathematical physics, functional analysis	
	Professor	Hideo Takaoka	Differential equations	
	Professor	Akihito Hora	Functional analysis, probability theory	
	Associate Professor	Masaharu Kobayashi	Harmonic Analysis	
	Associate Professor	Reiji Tomatsu	Operator algebras	
	Associate Professor	Naofumi Honda	Algebraic analysis	
	Associate Professor	Tadahiro Miyao	Mathematical physics, functional analysis	
Applied Mathematics	Professor	Shin-ichiro Ei	Nonlinear analysis, nonlinear partial differential equations	
	Professor	Hideo Kubo	Partial differential equations, scattering theory	
	Professor	Shuichi Jimbo	Applied analysis, partial differential equations	
	Professor	Ichiro Tsuda	Complex systems, chaotic dynamical systems, brain theory	
	Professor	Masaharu Nagayama	Reaction-diffusion systems, mathematical modeling, numerical simulation	
	Professor	Michiko Yuri	Ergodic theory, dynamical systems, complex systems	
	Associate Professor	Zin Arai	Dynamical systems, computational topology	
	Associate Professor	Akira Sakai	Mathematical physics, probability theory	
	Associate Professor	Yuzuru Sato	Complex systems, chaotic dynamical systems	
	Associate Professor	Takao Namiki	Ergodic theory, dynamical systems, complex systems	
	Associate Professor	Kenji Matsumoto	Biophysical complex systems, chaotic dynamical systems	
	Associate Professor	Chun Biu Li	Nonequilibrium statistical mechanics, biophysics, time series analysis	

**Department of Condensed Matter Physics, Graduate School of Science**
**Doctoral**

Laboratories	Supervisors		Keywords	Remarks
High-Pressure Physics	Professor	Migaku Oda	High-Tc superconductivity, cuprates, scanning tunneling microscopy, scanning tunneling spectroscopy	
	Assistant Professor	Hiroyuki Yoshida		
Electronic Properties of Low-Dimensional Conductors	Specially Appointed Professor	Kazushige Nomura	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	Will retire in March 2017
	Associate Professor	Noriaki Matsunaga		
Magnetism in Strongly Correlated Electron Systems	Specially Appointed Professor	Kazuyuki Koike	Spin, nano, surface, thin films, spin-polarized scanning electron microscope (spin SEM), spin-polarized scanning tunneling microscope (SP-STM), spin-polarized spectroscopy, superconductivity, magnetism, heavy fermion behavior, quantum criticality, non-Fermi-liquid behavior, very low temperatures, high magnetic fields, high pressure, transport measurements, ultrasonic measurements, muSR, RXS	Will retire in March 2016
	Associate Professor	Hideo Matsuyama		
	Professor	Hiroshi Amitsuka		
	Associate Professor	Tatsuya Yanagisawa		
	Assistant Professor	Hiroyuki Hidaka		
Low Temperature Physics	Professor	Atsushi Kawamoto	NMR, strongly-correlated electrom systems, superconductivity, magnetism	
	Lecturer	Yoshihiko Ihara		
Optical Science and Semiconductor Physics	Associate Professor	Tomobumi Mishina	Laser spectroscopy, THz time domain spectroscopy, femtosecond pump-probe spectroscopy	
	Assistant Professor	Sekika Yamamoto		
Laboratory of Dielectrics	Specially Appointed Professor	Akira Onodera	Complex liquids, glass transition, broadband dielectric spectroscopy, ferroelectrics, multiferroics, electronic ferroelectricity, phase transition, photoinduced cooperative phenomena	Will retire in March 2016
	Associate Professor	Ryusuke Nozaki		
	Associate Professor	Masaki Takesada		
Condensed Matter Theory I	Professor	Koji Nemoto	Statistical physics, non-equilibrium, non-linearity, random systems, complex networks, phase transition, self-organization, critical phenomena, scale-free structures, numerical simulation	
Condensed Matter theory II	Associate Professor	Takafumi Kita	Superconductivity, superfluidity, Bose-Einstein condensation	
Condensed Matter Theory III	Professor	Shoji Yamamoto	Transition-metal complexes, organic polymers, single-molecule nanomagnets, photoinduced phase transition, optically switchable magnetism, nuclear magnetic relaxation	
	Lecturer	Jun Ohara		

Laboratories	Supervisors		Keywords	Remarks
Nanostructure Physics (RIES)	Professor	Akira Ishibashi	Nano-structured devices, new photovoltaic devices, next-generation solar cells, clean unit system platforms	
	Associate Professor	Kenji Kondo	Quantum field theory, many-body perturbation theory, spintronics devices, magnetism, electronic correlations, Dirac electron, topological insulator	
Phase Transition (RIES)	Specially Appointed Associate Professor	Yuhji Tsujimi	Time domain light scattering, ferroelectrics, quantum ferroelectrics, glass transition, frequency domain light scattering, complex liquids, relaxor ferroelectrics	Will retire in March 2017
Advanced NMR Field of Advanced Functional Materials and Physics (NIMS).	Visiting Professor	Tadashi Shimizu	Solid-state-NMR, highly magnetic fields, condensed matter physics, advanced NMR techniques	
Condensed Matter Theory Field of Advanced Functional Materials and Physics (NIMS).	Visiting Professor	Hiroyuki Yamase	Quantum many-body theory, superconductivity, magnetism, critical phenomena, electronic nematic liquids	
Nanosystem Photonics Field of Advanced Functional Materials and Physics (NIMS)	Visiting Professor	Tadaaki Nagao	Surface physics, nanophotonics, energy conversion, nanomaterials	
Solid State Physics in High Magnetic Field Field of Advanced Functional Materials and Physics (NIMS)	Visiting Professor	Yasutaka Imanaka	Spectroscopy, High magnetic field, Terahertz wave, Quantum Hall effect, Dirac Fermion, Topological insulator	
Muon Spin Resonance Laboratory Field of $\mu$ SR Material Science (RIKEN)	Visiting Professor	Isao Watanabe	$\mu$ SR material science at the RIKEN-RAL Muon Facility in the UK. Experimental and theoretical studies on the magnetism, superconductivity, industrial applications, non-destructive element analysis, muon hyperfine interactions in metals, insulators and organic molecules. Muon site and magnetic spin structural analysis by the density functional theory.	
Electron Spin Resonance Laboratory Field of ESR Material Science (RIKEN)	Visiting Associate Professor	Yugo Oshima	Electron Spin Resonance (ESR) from X-band to millimeter and sub-millimeter waves, High magnetic field, Strongly-correlated materials, Molecular magnets, Molecular conductors, Spin-Liquid system, Nano-carbon materials.	

Laboratories	Supervisors		Keywords	Remarks
Observational Astronomy	Associate Professor	Kazuo Sorai	Observational astronomy, galactic and extragalactic astronomy, interstellar matter, star formation	
Particle Theory Group	Professor	Hisao Suzuki	Particle physics, beyond the standard model, dark matter, dark energy, grand unified theory, superstrings, supersymmetry, early universe	
	Professor	Tatsuo Kobayashi		
	Associate Professor	Ryuichi Nakayama		
	Lecturer	Kazuhiko Suehiro		
	Assistant Professor	Eun-Kyung Park		
Theoretical Nuclear Physics	Associate Professor	Masaaki Kimura	Quantum many-body problems, nuclear force, unstable nuclei, nucleosynthesis, hadronic matter	
	Assistant Professor	Wataru Horiuchi		
Theoretical Astrophysics	Professor	Asao Habe	Theoretical astronomy, numerical simulations, galaxy formation, galaxy clusters, supermassive black holes, interstellar matter, star formation, interstellar dust	
	Professor	Takashi Kozasa		
	Assistant Professor	Elizabeth Jane Tasker		
	Assistant Professor	Takashi Okamoto		
Theoretical Planetary Science	Associate Professor	Hidekazu Tanaka	Planet formation, cosmic dust, protoplanetary disks, nucleation theory	
Planetary and Space Group	Professor	Kiyoshi Kuramoto	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	Yukihiro Takahashi		
	Associate Professor	Akihiko Hashimoto		
	Associate Professor	Masaki Ishiwatari		
	Specially Appointed Associate Professor	Junichi Kurihara		
	Lecturer	Mitsuteru Sato		
	Assistant Professor	Masatsugu Odaka		
	Specially Appointed Assistant Professor	Makoto Watanabe		
	Specially Appointed Assistant Professor	Shunichi Kamata		
	Specially Appointed Assistant Professor	Tetsuro Ihida		

Theoretical Planetary Science	Associate Professor	Hidekazu Tanaka	Planet formation, cosmic dust, protoplanetary disks, nucleation theory	
Astrophysical Chemistry / Ice and Planetary Science	Professor	Akira Kouchi	Interstellar molecules, ice dust, amorphous solid water, surface reactions	
	Professor	Naoki Watanabe		
	Associate Professor	Yuki Kimura		
	Assistant Professor	Hiroshi Hidaka		
	Assistant Professor	Tetsuya Hama		
	Assistant Professor	Yasuhiro Oba		
Phase Transition Dynamics	Professor	Gen Sazaki	Phase transition dynamics, crystal growth, ice, snow, interferometry, advanced optical microscopy, atomic force microscopy	
	Specially Appointed Professor	Yoshinori Furukawa		Will retire in March 2016
	Assistant Professor	Ken Nagashima		
	Assistant Professor	Ken-ichiro Murata		
Information Media Science	Professor	Izumi Fuse	Learning science, learning platforms, open education	
	Assistant Professor	Yuichi Yamamoto		
Nuclear Reaction Data Science	Professor	Masayuki Aikawa	Nuclear data, nuclear reactions, evaluation	Inter-field Cooperation with the Japan Atomic Energy Agency (JAEA) in the field of nuclear data.
	Associate Professor	Yoshiharu Hirabayashi		
	Specially Appointed Assistant Professor	Shuichiro Ebata		
	Visiting Professor	Keiichi Shibata		
	Visiting Professor	Hideo Harada		
	Visiting Professor	Tokio Fukahori		
Spacecraft Observation Group	Visiting Professor	Takehiko Sato	Planetary exploration, infrared astronomy from space, radio astronomy from space	Inter-field Cooperation with Japan Aerospace Exploration Agency (JAXA) in the field of spacecraft observation.
	Visiting Associate Professor	Yasuhiro Murata		
	Visiting Associate Professor	Issei Yamamura		

**Department of Natural History Sciences, Graduate School of Science**

**Doctoral**

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Earth and Planetary Dynamics	Physical Oceanography and Climate	Professor	Shoshiro Minobe	Physical oceanography, meteorology, air-sea interactions, climate variability & change, oceans' role in climate, multidisciplinary challenges, numerical modelling, data analysis	
		Associate Professor	Masaru Inatsu		
		Lecturer	Yoshinori Sasaki		
		Assistant Professor	Hanna Na		
	Physical Hydrology	Specially Appointed Associate Professor	Kazuhisa Chikita	Drainage basins, water and material cycles, sedimentation, lake hydrodynamics	Will retire in March 2017.
	Space Geodesy	Professor	Kosuke Heki	Space geodesy, GNSS, GPS, INSAR, GRACE, gravity, Earth rotation, atmospheric sensing, crustal deformation, glaciology, planetary geodesy, ionosphere	
		Professor	Masato Furuya		
	Seismology	Professor	Kiyoshi Yomogida	Seismic wave propagation, Earth structure, seismic tomography, broadband waveform analysis, lateral heterogeneity and anisotropy	
Associate Professor		Kazunori Yoshizawa			
Earth and Planetary System Science	Petrology and Volcanology	Professor	Mitsuhiro Nakagawa	Processes of evolution and eruption in magma plumbing systems in volcanos, processes of magma generation and eruption in caldera volcanos, spatial and temporal variation in arc volcanism, long-term forecasting of volcanic activity, mitigation of volcanic disasters	
		Associate Professor	Takeshi Kuritani	Petrological, geochemical, experimental, and theoretical studies for understanding generation, ascent, evolution, and eruption processes of magmas, differentiation processes of the lunar, and evolutionary processes of the Earth.	
		Assistant Professor	Shumpei Yoshimura	Experimental and theoretical studies on igneous and volcanic processes	
	Geochemistry	Professor	Hisayoshi Yurimoto	Geochemistry, cosmochemistry, planetary chemistry, galaxies, stars, planetary systems, protoplanetary disks, planets, meteorites, Earth, core, mantle, crust, oceans, atmosphere, life, magma, geofluids, mass spectrometry, spectroscopy, microscopy, dust formation, crystal growth, high pressure, solar system evolution, planetary exploration	
		Assistant Professor	Kenichi Bajo		
		Associate Professor	Shogo Tachibana		
	Earth Materials Science	Professor	Takaya Nagai	Mineralogy, crystallography, crystal growth, physics and chemistry of minerals	
	Earth Environmental History · Paleontology	Associate Professor	Yoshitsugu Kobayashi	Vertebrate evolution, dinosaurs, reptiles, birds, phylogenetic relationships, functional morphology, comparative anatomy, embryology	Hokkaido University Museum
		Assistant Professor	Yasuhiro Iba	Evolution of Mesozoic marine biota, paleobiogeographic responses, global environmental change, origin of modern marine biota	

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Earth and Planetary System Science	Earth System Evolution	Professor	Noriyuki Suzuki	Fate of organic matter in sediments and sedimentary rocks, Earth hydrocarbon resources, long-term carbon cycle, evolution of Earth systems	
		Associate Professor	Ken Sawada	Molecular paleobiology, paleoenvironmental reconstruction, biogeochemistry of geomacromolecules, biomarker paleothermometry, algal biofuels	
		Assistant Professor	Marie Python	Petrography and chemistry of the crust and mantle in ophiolites and the Pacific Ocean, mantle melting, magmatic evolution of the oceanic crust, hydrothermal circulation, interactions within the oceanic crust and mantle	
	Geotectonics	Associate Professor	Makoto Kawamura	Tectonostratigraphy, soft-sediment deformation, clastic composition, forearc geology, accretion tectonics	
		Specially Appointed Associate Professor	Jinichiro Maeda	Igneous petrology and geochemistry of deep crustal rocks from modern and ancient plate boundaries, magmatic processes in mid-oceanic ridges, deep crustal magmatic processes, history of the Hidaka Magmatic Belt, tectonics of Hokkaido	Will retire in March 2016.
		Associate Professor	Jun Kameda	Subduction zone seismogenesis, water-rock interactions, diagenesis, electron microscopy, clay mineralogy	
Biodiversity	Biodiversity	Associate Professor	Hiroshi Kajihara	Biodiversity I: Marine invertebrates, Nemertea, taxonomy, phylogeny, morphology	
		Associate Professor	Helena Fortunato	Biodiversity I: Mollusks, coralline algae, Bryozoa, calcification patterns, population genetics, ecology, ocean acidification, biogeography	
		Lecturer	Keiichi Kakui	Biodiversity I: Marine invertebrates, Crustacea, Tanaidacea, taxonomy, phylogeny, morphology	
		Professor	Takeo Horiguchi	Biodiversity II: Microalgae, protists, dinoflagellates, phylogeny, endosymbiosis	
		Lecturer	Tsuyoshi Abe	Biodiversity II: Seaweeds, taxonomy, phylogeny, component taxonomy	
		Specially Appointed Professor	Shin Tochinai	Biodiversity III (Evo-Devo Laboratory): Evo-devo, reproduction, development, regeneration, animal models	Will retire in March 2016.
		Professor	Ryuichi Masuda	Biodiversity IV (Laboratory of Genetic Diversity): Molecular phylogenetics, population genetics, biogeography, mammals, birds	
		Lecturer	Masaki Eda	Laboratory of Archaeozoology & Zooarchaeology: archaeological remains, birds, bones, bone collagen, DNA	
		Assistant Professor	Toru Katoh	Biodiversity I: evolution, phylogeny, populations, insects	
		Associate Professor	Kazuhiro Kogame	Biodiversity II: Taxonomy, phylogeny, evolution, seaweeds	



Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Science Communication	Communication of Science and Technology	Specially Appointed Professor	Shigeo Sugiyama	Sociology, science and technology, public participation, governance and policy, technology assessment	Will retire in March 2016.
		Associate Professor	Naoyuki Mikami		Creative Research Institution.
		Associate Professor	Shishin Kawamoto		CoSTEP
	Philosophy of Science and Technology	Professor	Masahiro Matsuou	Philosophy of science, ethics of science and technology, philosophy of risk, statistical inference of cause	
	Museum Education and Media Studies	Associate Professor	Makiko Yuasa	Museum communication, museum education, museum evaluation, media studies, museum video production	Hokkaido University Museum
		Associate Professor	Yoshiharu Fujita		Creative Research Institution.
	Science Education	Professor	Makoto Suzuki	Self-efficacy, cognitive bias, creativity, human-computer interactions, higher education, educational technology, open education	Creative Research Institution
		Professor	Toshiyuki Hosokawa		
		Associate Professor	Fumihito Ikeda		
		Associate Professor	Kunimasa Yamada		
		Associate Professor	Katsusuke Shigeta		Information Initiative Center, Hokkaido University
	Seismology and Volcanology	Seismological Observation	Professor	Yuichiro Tanioka	Earthquake source processes, generation and propagation of tsunamis, pre-historical earthquakes and tsunamis, seismic tomography, active fault, earthquake prediction, early warning system, tectonics in northeastern Asia
Associate Professor			Kei Katsumata		
Associate Professor			Hiroaki Takahashi		
Ocean Bottom Seismology		Associate Professor	Yoshio Murai	Subsurface structure at subduction zones, elastic wave propagation, tectonics of Northern Mid Atlantic Ridge, subduction earthquake, paleo-seismological analysis, international field science, disaster mitigation	
		Assistant Professor	Yuichi Nishimura	subduction earthquake, paleo-seismological analysis, international field science, disaster mitigation	
Volcano Physics		Professor	Makoto Murakami	Volcanology, volcanic seismology, eruption prediction, transport processes, volcano hydrology, crustal deformation, space geodesy, geo-electromagnetism, spectroscopy of volcanic plume, volcano monitoring system	
		Associate Professor	Hiroimitsu Ooshima		
		Assistant Professor	Hiroshi Aoyam		
Subsurface Structure		Professor	Takeshi Hashimoto	Subsurface exploration	
		Specially Appointed Professor	Toru Mogi		Will retire in March 2016.