



Hokkaido University

INTERNATIONAL COURSE IN GRADUATE SCHOOL OF SCIENCE

2020 - 2021

MATHEMATICS

CONDENSED MATTER PHYSICS

COSMOSCIENCES

NATURAL HISTORY SCIENCES

- EARTH AND PLANETARY DYNAMICS
- EARTH AND PLANETARY SYSTEM SCIENCE
- SEISMOLOGY AND VOLCANOLOGY
- BIODIVERSITY
- SCIENCE COMMUNICATION



Message from the Dean

I am delighted to introduce you to the Graduate School of Science at Hokkaido University, one of Japan's top 10 research-intense universities. Graduate studies will enable you not only to deeply pursue your academic discipline in your chosen research field but also to develop skills and knowledge for a specific profession. The Graduate School of Science offers master's and doctoral programs related to such advanced graduate studies in a wide range of sciences including mathematics, physics, cosmosciences, earth and planetary sciences, biodiversity, and science communication.

Our 189 teaching staff are all active in their research community, and have garnered recognition for their commitment to excellence in research and graduate education. They will serve as your supervisor, your mentor, and your instructor. If you are not proficient in Japanese, you are welcome to our International Course in Graduate School of Science, where education is fully conducted in English. Under the guidance of our expert staff, you will acquire advanced knowledge and skills, find problems to solve, and enjoy using your imagination in scientific endeavors. The course also provides you with interdisciplinary learning opportunities by linking up with the Inter-Graduate School Classes provided by Hokkaido University, where you can have occasions to improve your leadership skills for the betterment of global society.

I hope you will find our booklet informative and friendly. You can find more information on our website. If you are not currently a student here, I encourage you to contact our faculty members. If you have an opportunity to visit our Sapporo campus, you will definitely recognize that the Graduate School of Science at Hokkaido University is the right place for your graduate studies.

I look forward to welcoming you to Hokkaido University.

With best wishes,
Hiroshi Amitsuka, Prof. Ph.D.
Dean, Graduate School of Science

Fact Sheet

Graduate School of Science

- Originally established in 1953 (School of Science was established in 1930)
- Teaching staff: 189
- Graduate student enrollment:
Master's course 294, Doctoral Course 160
- International student enrollment:
Master's course 30, Doctoral Course 51,
Research Student 6
- Distinguished alumni, including Prof. Akira Suzuki, 2010 Nobel Prize Laureate in Chemistry

Hokkaido University

- Originally established in 1876
- Member of RU11 (Research University) in Japan
- One of 13 universities selected for government's Top Global University Project (Type A)
- Total student enrollment: 18,628
- International student enrollment: 2,268
- Teaching Staff: 2,019

Sapporo

- Fifth largest city in Japan
(Population approximately 1.9 million)
- Hosted 1972 Winter Olympics (First in Asia)
- Low cost of living:
Average monthly rent ¥30,000-40,000
- Member city of UNESCO Creative Cities Network
- Regular direct flights to major Asian cities
(Beijing, Seoul, Shanghai, Taipei, Hong Kong, Vladivostok, Bangkok, Singapore, Manila, Kuala Lumpur, etc.)

Department of Mathematics

<http://www.math.sci.hokudai.ac.jp/en/>



Our department covers a wide range of research areas—from theory-driven approaches that mainly seek to achieve theoretical sophistication to more empirically oriented approaches that employ computers for calculations on various phenomena. Our research includes diverse fields such as hyperplane arrangements, representation theory, differential geometry, singularity theory, partial differential equations, mathematical physics, chaos, probability theory, and dynamical systems.

Every year, the department sponsors or participates in several research conferences in Sapporo that attract several hundred domestic and foreign researchers. A partial list of

the conferences in 2019 gives a sense of the high level of research activity in our department:

- Mathematics Conference for Young Researchers (organized annually by graduate students)
- Sapporo Symposium on Partial Differential Equations (held annually)
- Northeastern Symposium on Mathematical Analysis (held annually)
- Homotopy Theory Symposium
- Workshop on Shimura varieties, representation theory and related topics, 2019
- Lefschetz pencils and Low dimensional Topology

These conferences provide students with first-hand glimpses into current research activities as well as opportunities to present their research results to world-renowned

mathematicians. In addition, there are several weekly seminars that students are encouraged to attend. The department has an in-house library containing about 90,000 books and 525 journals, where students may study in a spacious and quiet environment. Graduate students are provided with their own desks in the department building. Our recent major achievements in receiving large research grants include: (1) the 21st Century Center of Excellence (COE) Program “Mathematics of Nonlinear Structure via Singularity” from 2003 to 2008, and (2) the Japan Society for the Promotion of Science (JSPS) International Training Program “The international sending-elevating project for young mathematicians based on

singularity, topology and mathematical analysis: Hokudai model” from 2008 to 2012. The fruitful success of the COE program resulted in our founding the Research Center for Integrative Mathematics in 2008 which was reformed into Research Center of Mathematics for Social Creativity in RIES, later. Our department provides an advanced integrated education program “Ambitious leader’s program” for graduate students from 2014.



Research Groups

Algebra

Keywords : Algebraic combinatorics, Algebraic geometry, Arithmetic geometry, Combinatorics, Representation theory, Rings of differential operators, Singularity theory, Special functions, Vertex algebras, Yang-Baxter equations and quantum groups

Geometry

Keywords : Complex geometry, Differential geometry,

Differential topology, Dynamical systems, Mathematical physics, Painlevé systems, Real algebraic geometry, Singularity theory, Topology, Hyperplane arrangement

Analysis

Keywords : Algebraic analysis, Differential equations, Functional analysis, Harmonic analysis, Mathematical fluid dynamics, Mathematical physics, Operator algebras, Partial differential equations, Potential theory, Probability theory, Real analysis

Applied Mathematics

Keywords : Applied analysis, Biophysical complex systems, Biophysics, Chaotic dynamical systems, Complex systems, Computational neuroscience, Computational topology, Ergodic theory, Free boundary problems, Mathematical modeling, Nonequilibrium statistical mechanics, Numerical analysis, Numerical simulation, Partial differential equations, Probability theory, Reaction-diffusion system, Scattering theory, Time series analysis, Variational methods



Department of Condensed Matter Physics

https://phys.sci.hokudai.ac.jp/cond-mat/index_eng.html 

In the Department of Condensed Matter Physics, our staff members conduct cutting-edge research on the physical properties of materials and provide quality physics education. Our department branches into the fields of theoretical physics (2 laboratories), experimental physics (5 laboratories), advanced functional materials and physics (4 laboratories), and material science (2 laboratories). Research in the department covers a wide range of areas, including complex liquids, semi-conductors, high- T_c superconductors, organic molecular crystals and organic polymers, nano-materials, multiferroic materials, complex networks, electron correlations in quantum materials, thermal-, pressure-, and photo-induced phase transitions, glass transitions, magnetism, spin electronics, nonlinear optics and photovoltaic devices as well as many other topics. These studies not only provide us with a greater understanding of natural phenomena but can also lead to a discovery of

novel functional materials. Condensed matter physics is thus one of the most important research fields for the progress in science and technology in our society.

Part of our department belongs to the cooperative graduate school with "National Institute for Materials Science (NIMS)" and "RIKEN", which are the leading research institutions in Japan. The laboratories in the field of "advanced functional materials and physics" and those in the field of "material science" are operated by researchers from NIMS and RIKEN, respectively. These laboratories accept doctoral students from our department. The students can study physics and take part in research projects within the excellent environment at NIMS and RIKEN. Our department is further participating in an interdisciplinary education and research program provided by the "Center of Education & Research for Topological Science & Technology". This program covers



the fields of mathematics, condensed matter physics, astrophysics, material science, life science, information engineering and economics. Graduate students as well as young researchers from our department will find an opportunity to interact with the different fields and gain a new insight into their own projects.

Based on this closer connection among the various fields, we aim to cross-fertilize research and education, and foster world-class human resources with creative talent. Students can expand their knowledge of modern physics through the curriculum and can improve their logical thinking skills and capabilities for problem-finding and problem-solving through their research activities. Our graduates will open up a new frontier in natural science and will be bearers of the future of science and technology.

Research Groups and Laboratories

Theoretical Physics

Statistical Physics

Keywords : Statistical physics, Non-equilibrium, Non-linearity, Random systems, Complex networks, Phase transition, Self-organization, Critical phenomena, Scale-free structures, Numerical simulation, Superconductivity, Superfluidity, Bose-Einstein condensation, Condensed matter physics, Magnetism, Multiferroics, Heavy fermion

Mathematical Physics

Keywords : Transition-metal complexes, Organic polymers, Single-molecule nanomagnets, Photoinduced phase transition, Optically switchable magnetism, Nuclear magnetic relaxation

Experimental Physics

Electronic Properties of Solids

Keywords: High-temperature cuprate superconductors, Frustrated spin systems, Surface & nano-structure magnetism, material research, Scanning tunneling microscopy/spectroscopy (STM/STS), Spin-polarized STM

J-Material: Physics of Strongly Correlated Systems

Keywords : J-material, Superconductivity, Magnetism, Heavy fermion, Quantum phase transition, Magnetoelectric effects, Very low temperatures, High magnetic fields, High pressure, Ultrasonic measurements, μ SR, Neutron scattering, Resonant X-ray Scattering (RXS), Ferroelectrics, Multiferroics, Electronic ferroelectricity, Phase transition, Photoinduced cooperative phenomena

Physical Properties of Low-dimensional Materials

Keywords : Low-dimensional organic conductors, Strongly-correlated electron systems, Superconductivity,

Magnetism, Spin liquid, Symmetry of Cooper pairs, Spin density wave (SDW), Chiral superconductivity, Mesoscopic systems, NMR, Scanning Tunneling Microscopy (STM), Scanning Tunneling Spectroscopy (STS), Nonlinear conductivity, Specific heat measurement

Condensed Matter Dynamics

Keywords : Microscopic dynamics of condensed matters, Dielectric and optical spectroscopy from 1 μ Hz to 10 PHz, Raman scattering, Femtosecond pump-probe spectroscopy, Terahertz time-domain spectroscopy, Solids, Complex liquids, Hydrogen-bonding systems, Semiconductors, Nonlinear optical phenomena, Biological materials

Nanostructure Physics

(Research Institute for Electronic Science)

Keywords : Nano-structured devices, New photovoltaic devices, Next-generation solar cells, Clean unit system platforms, Quantum field theory, Many-body perturbation theory, Spintronics devices, Magnetism, Electronic correlations, Dirac electron, Topological insulator

Advanced Functional Materials and Physics

(Cooperative Graduate School with National Institute for Materials Science)

Condensed Matter Theory

Keywords : Quantum many-body theory, Superconductivity, Magnetism, Critical phenomena, Electronic nematic liquids

Nanosystem Photonics

Keywords : Surface physics, Nanophotonics, Energy conversion, Nanomaterials

Solid State Physics in High Magnetic Field

Keywords : Spectroscopy, High magnetic field, Terahertz wave, Quantum Hall effect, Dirac fermion, Topological insulator

Surface Quantum Phase Materials

Keywords : Atomic-layer superconductors, STM, Metal nanostructures, Molecular motors

Material Science

(Cooperative Graduate School with RIKEN)

Muon Spin Resonance

Keywords : μ 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

Keywords : 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

Department of CosmoSciences

<https://www.ep.sci.hokudai.ac.jp/~cosmo/index-e.htm>

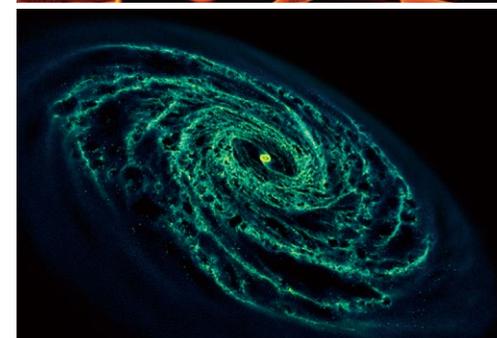


Many discoveries about the Universe in recent years have prompted us to reshape established paradigms, academic disciplines and our view of the world. For example, we now know that the expanding Universe is also accelerating, that there are many planets outside of our Solar System, that dark matter and dark energy are the dominant components in the Universe, and that cosmic dust was present even in the very early Universe. These advances have been obtained by breaking down the conventional boundaries between physics, astronomy, planetary science and Earth science, allowing scientists to understand the Universe from its smallest elements through a range of cutting-edge scientific methods.

Researchers at Hokkaido University have applied their wide selection of expertise to exploring the Universe over its breathtaking scale. Our interests run from elementary particles and atomic nuclei through to celestial objects such as the Earth and planets and the formation of the Universe itself. In addition, we are committed to sharing these research activities through

educational efforts, with undergraduate and graduate students from a wide range of backgrounds taking part in research projects under faculty tutorage.

Our department, established in 2006, consists of four laboratories belonging to the Department of Physics, one laboratory belonging to the Department of Earth and Planetary Sciences, two laboratories belonging to the Institute of Low Temperature Science (ILTS), and one laboratory belonging to the Information Initiative Center (IIC). In addition, we are also joined by researchers in the Nuclear Reaction Data Centre, and Spacecraft Observation group. In our department, education and research in physics, astronomy, planetary science and Earth science are combined closely with the goal of breaking free from the boundaries separating observation, experiment and theory. We strive to ensure our students go on to use their detailed knowledge and problem-solving expertise to contribute both to the international scientific community, and positively to society as a whole.



Laboratories

Observational Astronomy

Keywords : Observational astronomy, Galaxies, Galaxy evolution, Interstellar matter, Star formation

Theoretical Particle Physics and Cosmology

Keywords: Particle physics, Beyond the standard model, Dark matter, Dark energy, Grand unified theory, Superstring, Supersymmetry, Early Universe

Theoretical Nuclear Physics

Keywords : Quantum many body problems, Nuclear force, Unstable nuclei, Nucleosynthesis, Hadronic Matter

Theoretical Astrophysics

Keywords : Theoretical astronomy, Numerical simulations, Galaxy formation, Galaxy clusters, Supermassive blackholes, Interstellar matter, Star formation, Interstellar dust, the Milky Way, Galactic morphology

Planetary and Space Group

Keywords : 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, Theory and hierarchical numerical simulation models, Applications of information technology

Astrophysical Chemistry / Ice and Planetary Science (ILTS)

Keywords : Interstellar molecules, Ice dust, Amorphous solid water, Surface reactions

Phase Transition Dynamics (ILTS)

Keywords : Phase transition dynamics, Crystal growth, Ice, Snow, Surface/Interface science, In-situ observation

Information Media Science (IIC)

Keywords : Learning science, Learning platforms, Open education

Nuclear Reaction Data Science

Keywords : Nuclear data, Nuclear reactions, Evaluation

Spacecraft Observation

(Cooperative Graduate School with
Japan Aerospace Exploration Agency)

Keywords : Planetary exploration, Infrared astronomy from space, Radio-astronomy from space



Department of Natural History Sciences

<https://www.sci.hokudai.ac.jp/graduateschool/en/guide>



The Department of Natural History Sciences encompasses three main research areas: 1) Earth and Planetary Sciences, 2) Biodiversity and Organismal Evolution, and 3) Science Communication. The scientific interests of this department span a size scale from molecules to the solar system, and a time scale from microseconds to billions of years. We also recognize the importance of disseminating cutting-edge scientific results to the public.

Earth and Planetary Dynamics (Division)

The Division of Earth and Planetary Dynamics conducts basic researches across a broad range of both temporal and spatial scales to better understand the Earth as a dynamic system constituted by the solid Earth, the oceans, and the atmosphere. We investigate diverse topics in geophysics, including crust and mantle dynamics, earthquakes, volcanic activity, and atmosphere-ocean circulation. To elucidate the nature of the dynamic Earth, we take a comprehensive approach based on theoretical and experimental studies, analyses of geophysical data, and fieldwork that takes advantage of the distinctive location of Hokkaido University. There are four laboratories in this Division: Meteorology, Physical

Oceanography and Climate, Space Geodesy, and Seismology

Earth and Planetary System Science (Division)

The Division of Earth and Planetary System Science has a rich tradition of leadership in geoscience research and education, consolidated through 80 years of accumulated experience and expanding in new directions. The Division offers graduate courses in a wide range of fields in the modern Earth and planetary sciences to allow students to understand the Earth as a system of interrelated physical, chemical, and biological processes, encompassing the lithosphere, atmosphere, hydrosphere, and biosphere. There are six laboratories in this Division: Petrology and Volcanology, Paleobiology, Geochemistry, Earth Materials Science, Earth Biosphere Geoscience, and Geotectonics.

Seismology and Volcanology (Division)

When, where, and why do earthquakes and volcanic eruptions take place, and how large will they be? While earthquakes, tsunamis and volcanic eruptions are often a threat to public safety, they can also provide important clues to

understanding Earth dynamics and evolution. Earthquakes and volcanoes are surface manifestations of the internal activity of the Earth, and thus understanding their mechanisms and processes is a fundamental issue in the geosciences. We investigate the physical background of seismic and volcanic activity based on a multi-disciplinary approach, including seismology, geodesy, geothermics, fluid dynamics, electromagnetics, and geology, in collaboration with domestic and international universities and research institutes. Hokkaido provides good opportunities for students to apply the wide range of knowledge they have learned to real earthquakes, tsunamis and volcanoes.

Biodiversity (Division)

There exists today an amazing diversity of organisms, all of which are the consequence of evolution. In addition, during the evolutionary history of the earth, many more species have gone extinct than those surviving today. In the Division of Biodiversity, we investigate patterns of diversity and the processes generating these patterns. Through molecular, morphological, and ecological analyses, we study diversity at various levels of the biological hierarchy, including geographic

patterns of genetic variation, patterns of phylogenetic relationships relevant to macroevolution and the classification of life, and the process of speciation by which new biological species arise.

Science Communication (Division)

Science communication has received much more attention in recent years than previously. This is due to increased awareness that science communication plays important roles in helping the public understand the aims and significance of scientific research, and in fostering greater interest in science among young students. It also behooves scientific researchers to be involved in science communication, because this helps scientists understand what the public expects of them, and in the process helps them gain the public's confidence. The Division of Science Communication was founded in response to the above needs. Its fields of study include social studies of science, philosophy of science, museum studies, and science education.

Divisions and Laboratories

Earth and Planetary Dynamics

Meteorology

Keywords: Meteorology, Dynamics and Forecast, Cyclones and Fronts, Theory and Numerical Modelling, Meso-scale phenomena, Cloud, Rain and Snow, Material Transport, Applied meteorology

Physical Oceanography and Climate

Keywords: Physical oceanography, Meteorology, Air-Sea interaction, Climate variability & change, Ocean's role in climate, Multi-disciplinary challenges, Numerical modelling, Data analysis

Space Geodesy

Keywords: Space geodesy, GNSS, GPS, InSAR, GRACE, Gravity, Earth rotation, Atmospheric sensing, Crustal deformation, Glaciology, Planetary geodesy, Ionosphere

Seismology

Keywords: Seismic wave propagation, Internal structure of the Earth, Seismic tomography, Broadband waveform analysis, Lateral heterogeneity and anisotropy

Earth and Planetary System Science

Petrology and Volcanology

Keywords: Petrology and geochemistry of igneous rocks, Magmatology, Volcanic geology and physical volcanology, Long-term eruption forecasting and mitigation of volcanic disaster

Paleobiology

Keywords: Vertebrate, Marine biota, Evolution, Phylogenetic relationships, Comparative anatomy, Embryology, Extinction, Biogeography, Global environmental change

Geochemistry

Keywords: Cosmochemistry, Galaxies, Planets, Meteorites, Earth, Environment, Life, Geofluid, Mass spectrometry, Microscopy, Solar system evolution, Planetary exploration

Earth Materials Science

Keywords: Mineralogy, Crystallography, Crystal growth, Physics and chemistry of minerals

Earth Biosphere Geoscience

Keywords: Organic Geochemistry, Earth's hydrocarbon resources, Molecular paleobiology, Biogeochemistry of sedimentary organic matter, Carbonate geochemistry, Paleoenvironmental reconstruction

Geotectonics

Keywords: Microtectonics, Seismogenesis, Formation of continental crust, Magmatic processes in mid-ocean ridge, Oman ophiolite, Water-rock interaction

Seismology and Volcanology

Seismological Observation

Keywords: Seismology, Tsunamis, Earthquake prediction, Observational seismology and volcanology, Crustal deformation, Earthquake source physics

Ocean Bottom Seismology and Tsunami

Keywords: Ocean bottom seismology, Elastic wave propagation theory, Paleo-seismology, Tsunami science, Disaster mitigation

Volcano Physics

Keywords: Physical volcanology, Volcanic eruption prediction, Geodesy, Geomagnetism and geoelectricity, Seismology, Remote sensing, Geothermics

Subsurface Structure

Keywords: Subsurface structure, Seismogenic zone, Volcanoes, Electromagnetic field change, Airborne geophysical exploration

Biodiversity

Animal Systematics

Keywords: Bryozoa, Nemertea, Insect, Invertebrates, Evolution, Taxonomy, Biodiversity, Population, Phylogeography, Ocean acidification, Molecular phylogeny, DNA

Algal and Protist Systematics

Keywords: Biodiversity, Chemotaxonomy, Endosymbiosis, Environmental DNA, Macroalgae, Microalgae, Molecular phylogeny, Prokaryotes, Seaweeds, Taxonomy, Ultrastructure.

Ornithology, Island Biology

Keywords: ornithology, life history, breeding biology, inbreeding avoidance, acoustic communication, oceanic island, continental island

Genetic Diversity

Keywords: Molecular phylogenetics, Population genetics, Biogeography, Mammals, Birds, Archaeological remains, Osteology, Bone collagen, DNA

Science Communication

Communication of Science and Technology

Keywords: Science and technology studies, Environmental sociology, Public participation, Governance and policy, Technology assessment

Philosophy of Science and Technology

Keywords: Philosophy of science, Ethics of science and technology, Philosophy of risk, Statistical inference of cause

Museum Education

Keywords: Museum communication, Museum education, Museum evaluation, Museum management

Science Education

Keywords: Self-efficacy, Cognitive bias, Creativity, Human-computer interactions, Higher education, Educational technology, Open education, Faculty development, research

Faculty Listings

Department of Mathematics

Algebra (Research Group)

Professor	Masanori Asakura Mutsumi Saito Keiji Matsumoto Hiroshi Yamashita
Associate Professor	Youichi Shibukawa Simona Settepanella Kenichiro Tanabe Daisuke Matsushita
Assistant Professor	Hiraku Atohe

Geometry (Research Group)

Professor	Toshiyuki Akita Goo Ishikawa Katsunori Iwasaki Masahiko Yoshinaga Shimpei Kobayashi
Associate Professor	Masao Jinzenji Hitoshi Furuhashi Yutaka Kanda
Assistant Professor	

Analysis (Research Group)

Professor	Hideo Kubo Akihito Hora Naofumi Honda Jun Masamune Masaharu Kobayashi
Associate Professor	Yuhei Suzuki Takahiro Hasebe Nao Hamamuki Tadahiro Miyao

Applied Mathematics (Research Group)

Professor	Shin-ichiro Ei Akira Sakai Shuichi Jimbo Masaharu Nagayama (RIES) Takao Namiki Michiko Yuri*
Associate Professor	Hirotooshi Kuroda Yasuaki Kobayashi (RIES) Yuzuru Sato Hiroshi Teramoto (RIES) Kenji Matsumoto
Assistant Professor	Borislav Yordanov (IAHE) Yikan Liu (RIES)

Department of Condensed Matter Physics

Theoretical Physics (Research Group)

Statistical Physics (Laboratory)	
Professor	Koji Nemoto
Associate Professor	Takafumi Kita
Assistant Professor	Koji Okuda

Mathematical Physics (Laboratory)	
Professor	Shoji Yamamoto
Lecturer	Jun Ohara

Experimental Physics (Research Group)

Electronic Properties of Solids (Laboratory)	
Professor	Migaku Oda
Associate Professor	Hideo Matsuyama Hiroyuki Yoshida
Assistant Professor	Tohru Kurosawa
J-Material: Physics of Strongly Correlated Systems (Laboratory)	
Professor	Hiroshi Amitsuka
Associate Professor	Masaki Takesada Tatsuya Yanagisawa
Assistant Professor	Hiroyuki Hidaka

Physical Properties of Low-dimensional Materials (Laboratory)	
Professor	Atsushi Kawamoto
Associate Professor	Noriaki Matsunaga
Lecturer	Yoshihiko Ihara
Assistant Professor	Hiroyoishi Nobukane Shuhei Fukuoka

Condensed Matter Dynamics (Laboratory)	
Professor	Ryusuke Nozaki
Associate Professor	Tomobumi Mishina
Assistant Professor	Sekika Yamamoto

Nanostructure Physics (Laboratory) (RIES)	
Professor	Akira Ishibashi
Associate Professor	Kenji Kondo

Advanced Functional Materials and Physics (Research Group)(Cooperative Graduate School with NIMS)

Condensed Matter Theory (Laboratory) (NIMS)	
Professor	Hiroyuki Yamase
Nanosystem Photonics (Laboratory) (NIMS)	
Professor	Tadaaki Nagao
Solid State Physics in High Magnetic Field (Laboratory) (NIMS)	
Professor	Yasutaka Imanaka
Surface Quantum Phase Materials (Laboratory) (NIMS)	
Professor	Takashi Uchihashi

Material Science (Research Group)(Cooperative Graduate School with RIKEN)

Muon Spin Resonance (Laboratory) (RIKEN)	
Professor	Isao Watanabe
Electron Spin Resonance (Laboratory) (RIKEN)	
Associate Professor	Yugo Oshima

Department of Cosmospaces

Observational Astronomy (Laboratory)

Associate Professor	Kazuo Sorai
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Theoretical Particle Physics and Cosmology (Laboratory)

Professor	Hisao Suzuki Tatsuo Kobayashi Ryuichi Nakayama
Associate Professor	Osamu Seto*
Lecturer	Kazuhiko Suehiro
Assistant Professor	Eun-Kyung Park

Theoretical Nuclear Physics (Laboratory)

Associate Professor	Masaaki Kimura
Lecturer	Wataru Horiuchi
Assistant Professor	Bo Zhou

Theoretical Astrophysics (Laboratory)

Associate Professor	Elizabeth Jane Tasker (JAXA)
Lecturer	Takashi Okamoto
Assistant Professor	Alexander Petriti

Planetary and Space Group (Laboratory)

Professor	Kiyoshi Kuramoto Yukihiro Takahashi Masaki Ishiwatari Shunichi Kamata Hisayuki Kubota*
Associate Professor	Junichi Kurihara*
Lecturer	Mitsuteru Sato
Assistant Professor	Tetsuro Ishida* Seiko Takagi*

Astrophysical Chemistry / Ice and Planetary Science (Laboratory) (ILTS)

Professor	Akira Kouchi Naoki Watanabe
Associate Professor	Yuki Kimura
Assistant Professor	Hiroshi Hidaka Yasuhiro Oba

Phase Transition Dynamics (Laboratory) (ILTS)

Professor	Gen Sazaki
Assistant Professor	Ken Nagashima Ken-ichiro Murata

Information Media Science (Laboratory) (IIC)

Professor	Izumi Fuse
Assistant Professor	Yuichi Yamamoto

Nuclear Reaction Data Science (Laboratory)

Professor	Tokio Fukahori (JAEA) Nobuyuki Iwamoto (JAEA)
Associate Professor	Yoshiharu Hirabayashi (IIC)

Spacecraft Observation (Laboratory) (JAXA)

Professor	Takehiko Sato (JAXA)
Associate Professor	Yasuhiro Murata (JAXA) Issei Yamamura (JAXA)

Department of Natural History Sciences

Earth and Planetary Dynamics (Division)

Meteorology (Laboratory)	
Professor	Masaru Inatsu
Associate Professor	Yousuke Sato*

Physical Oceanography and Climate (Laboratory)

Professor	Shoshiro Minobe
Associate Professor	Yoshinori Sasaki

Space Geodesy (Laboratory)

Professor	Masato Furuya Kosuke Heki
Associate Professor	Youichiro Takada

Seismology (Laboratory)

Professor	Kiyoshi Yomogida
Associate Professor	Kazunori Yoshizawa

Earth and Planetary System Science (Division)

Petrology and Volcanology (Laboratory)

Professor	Mitsuhiro Nakagawa
Associate Professor	Takeshi Kuritani
Assistant Professor	Shumpei Yoshimura

Paleobiology (Laboratory)

Professor	Yoshitsugu Kobayashi (HUM)
Associate Professor	Yasuhiro Iba

Geochemistry (Laboratory)

Professor	Hisayoshi Yurimoto
Assistant Professor	Ken-ichi Bajo Noriyuki Kawasaki

Earth Materials Science (Laboratory)

Professor	Takaya Nagai
Associate Professor	Jun Kawano
Assistant Professor	Ayako Shinozaki

Earth Biosphere Geoscience (Laboratory)

Associate Professor	Ken Sawada
Lecturer	Tsuyoshi Watanabe

Geotectonics (Laboratory)

Professor	Toru Takeshita*
Associate Professor	Jun Kameda
Assistant Professor	Marie Python

Seismology and Volcanology (Division)

Seismological Observation (Laboratory)

Professor	Hiroaki Takahashi
Associate Professor	Kei Katsumata Mako Ohzono

Ocean Bottom Seismology and Tsunami (Laboratory)

Professor	Yuichiro Tanioka
Associate Professor	Yoshio Murai Yuichi Nishimura

Volcano Physics (Laboratory)

Associate Professor	Hiroshi Aoyama
Assistant Professor	Ryo Tanaka

Subsurface Structure (Laboratory)

Professor	Takeshi Hashimoto
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Biodiversity (Division)

Animal Systematics (Laboratory)	
Associate Professor	Helena Fortunato Hiroshi Kajihara Toru Katoh Keiichi Kakui
Lecturer	

Algal and Protist Systematics (Laboratory)

Professor	Takeo Horiguchi Kazuhiro Kogame
Associate Professor	Tsuyoshi Abe (HUM)
Assistant Professor	Kevin Wakeman*

Ornithology and Island Biology (Laboratory)

Professor	Masaaki Takagi
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Genetic Diversity (Laboratory)

Professor	Ryuichi Masuda
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Science Communication (Division)

Communication of Science and Technology (Laboratory)

Associate Professor	Naoyuki Mikami (IAHE) Shishin Kawamoto
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Philosophy of Science and Technology (Laboratory)

Professor	Masahiro Matsuou
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Museum Education (Laboratory)

Professor	Makiko Yuasa (HUM)
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Science Education (Laboratory)

Professor	Toshiyuki Hosokawa (IAHE) Makoto Suzuki (IAHE) Fumihito Ikeda (IAHE) Norikazu Iwama (IAHE) Katsusuke Shigeta (IIC) Kunimasa Yamada (IAHE)
Associate Professor	

Useful Links

Graduate School of Science

<https://www.sci.hokudai.ac.jp/graduateschool/en/>

Scholarship information

<https://www.global.hokudai.ac.jp/admissions/scholarships/>

Faculty of Science

<https://www2.sci.hokudai.ac.jp/faculty/en>

Facebook

<https://www.facebook.com/OIAS.Sci>

Hokkaido University

<https://www.global.hokudai.ac.jp/>

Related Graduate Schools

Graduate School of Life Science

<https://www.lfsci.hokudai.ac.jp/en/>

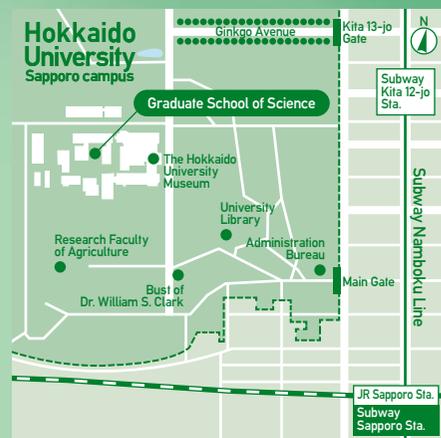
Graduate School of Chemical Sciences and Engineering

<https://www.cse.hokudai.ac.jp/english/>

Contact

Office for International Academic Support
Faculty of Science, Hokkaido University

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Step-by-step Guide To Entry

You need to have completed Step 1 at least six months prior to your intended enrollment!

STEP
1

Find a Supervisor

Graduate and research students conduct research under the guidance of a supervisor. To enter the Graduate School of Science as a research or graduate student, you need to find a faculty member who is willing to give you instruction on your research. Find a prospective supervisor from our website:

1. Graduate School of Science Website

<https://www.sci.hokudai.ac.jp/graduateschool/en/> 🔍

Please refer to the "International Course in Graduate School of Science" > "Study Field". Supervisor list is also available in the application guidelines. (see "Application Guidelines").

2. Hokkaido University Website>RESEARCH AND EDUCATION>Find a Researcher

<https://researchers.general.hokudai.ac.jp/search/index.html?lng=en> 🔍

3. HUSCAP

<https://eprints.lib.hokudai.ac.jp/dspace/?locale=en&lang=en> 🔍

STEP
2

Apply to the graduate school

You can check how to apply in the application guidelines. Applicants must pay the examination/application fee at the time of application.

STEP
3

Take the entrance screening (For Residing Abroad)

Screening procedures for research students are conducted on the basis of documentation submitted whilst screening procedures for graduate level students differ between each department.

STEP
4

Commence enrollment procedures

After passing the screening process, you will be required to submit necessary documentation, pay the entrance fee, and complete other necessary procedures to become enrolled.



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