List of Supervisors and Research Fields

As of April 1, 2025

Doctoral Course

Department of Mathematics, Graduate School of Science

Fields	Supervisors		Keywords	Remarks
Algebra	Professor	ASAKURA Masanori	Arithmetic geometry	
	Professor	SHIBUKAWA Youichi	Yang-Baxter equations and quantum groups	
	Professor	YASUDA Seidai	Number theory, arithmetic geometry	
	Specially Appointed Professor	SAITO Mutsumi	Algebraic analysis, rings of differential operators	Scheduled to retire in March, 2026.
	Specially Appointed Professor	MATSUMOTO Keiji	Special functions	Scheduled to retire in March, 2027.
	Associate Professor	OUCHI Genki	Algebraic geometry, derived category of coherent sheaves, moduli space	
	Associate Professor	CAI, Yuanqing	Number theory, representation theory,automorphic L-functions, automorphic representations, covering groups	
	Associate Professor	SCRIMSHAW, Travis	Combinatorics, representation theory, Schubert calculus	
	Associate Professor	MATSUSHITA Daisuke	Algebraic geometry	
Geometry	Professor	AKITA Toshiyuki	Algebraic topology, group cohomology, quandle	
	Professor	INOGUCHI Junichi	Geometry, integrable systems, Lie group, homogeneous spaces	
	Professor	KOBAYASHI Shimpei	Differential geometry, integrable systems	
	Professor	FURUHATA Hitoshi	Differential geometry	
	Associate Professor	KASUYA Naohiko	Differential topology, contact structures, complex structures	
	Associate Professor	KAWASAKI Morimichi	Symplectic geometry, Geometric group theory, differential topology	
Analysis	Professor	KUBO Hideo	Partial Differential Equations associated with Nonlinear Dynamics	
	Professor	KOBAYASHI Masaharu	Harmonic Analysis	
	Professor	HONDA Naofumi	Algebraic analysis	
	Professor	MIYAO Tadahiro	Mathematical physics, functional analysis, condensed matter physics	
	Specially Appointed Professor	HORA Akihito	Functional analysis, probability theory	Scheduled to retire in March, 2027.
	Associate Professor	UMETA Yoko	Exact WKB analysis, asymptotic analysis, higher order Painlevé equations, Stokes geometry	
	Associate Professor	SUZUKI Yuhei	Operator algebras	
	Associate Professor	HASEBE Takahiro	Probability theory, functional analysis	
	Associate Professor	HAMAMUKI Nao	Nonlinear partial differential equations, Theory of viscosity solutions	
Applied Mathmatics	Professor	SAKAI Akira	Probability theory, statistical mechanics, mathematical physics	
	Professor	NAGAYAMA Masaharu	Reaction-diffusion systems, mathematical modeling, numerical simulation	
	Professor	NAMIKI Takao	Ergodic theory, dynamical systems, complex systems	
	Professor	MASAKI Satoshi	Partial differential equations, harmonic analysis, variational analysis	
	Associate Professor	KURODA Hirotoshi	Partial differential equations, variational analysis	
	Associate Professor	SATO Yuzuru	Complex systems, chaotic dynamical systems	
	Associate Professor	TASAKI Sohei	Mathematical life sciences, Microbiology	
	Associate Professor	TABATA Koji	Online learning,data science,theory of computation	
	Associate Professor	NAKANO Yushi	Dynamical systems, ergodic theory, chaos	

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As of April 1, 2025

Doctoral 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 (μSR, 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, MuSR, 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-demensional Material	Professor	KAWAMOTO Atsushi	NMR, Strongly-correlated electrom 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	Assistant Professor	YAMAMOTO Sekika	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.	
Statistical Physics	Professor	HAYAMI Satoru	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. (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 (4) Cross-correlated phenomena over electric, magnetic, elastic, heat, and light (5) Exploring novel physics by using a machine-learning method (6) Development of effective model calculation method based on DFT calculation and electronic multipole theory (7) Elucidation of universal properties of chiral and ferroaxial materials	
	Lecturer	OIWA Rikuto		
	Assistant Professor	OKUDA Koji		

Laboratories	Supervisors		Keywords	Remarks
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.	
	Associate Professor	OHARA Jun		
	Assistant Professor	INOUE Takashi		
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	Qunatum field theory, Many-body perturbation theory, Spintronics devices, Magnetism, Electronic correlations, Dirac electron, Topological insulator	No acceptance for FY2025
Condensed Matter Theory Field of Advanced Functional Materials and Physics (NIMS).	Visiting Professor	YAMASE Hiroyuki	Quantum many-body theory, Superconductivity, Magnetism, Critical phenomena, Electronic nematic liquids	
Nano-system Photonics Field of Advanced Functional Materials and Physics (NIMS)	Visiting Professor	NAGAO Tadaaki	Surface physics, Nanophotonics, Energy conversion, Nanomaterials	
Solid State of Physics in High Magnetic Fields Field of Advanced Functional Materials and Physics (NIMS)	Visiting Professor	IMANAKA Yasutaka	Magneto-Spectroscopy, High magnetic field, Terahertz wave, Cyclotron resonance, Quantum Hall effect, Dirac Fermion, Topological insulator	
Surface Quantum Phase Materials Field of Advanced Functional Materials and Physics (NIMS)	Visiting Professor	UCHIHASHI Takashi	Surface and interface, Atomic layer, Two-dimensional, Quantum materials, Superconductivity, Topological state, Ultrahigh vacuum, Nanotechnology, Scanning tunneling microscopy, Electron transport	
Muon Spin Resonance Laboratory Field of Spin Resonance Material Science (RIKEN)	Visiting Professor	WATANABE Isao	μSR material science at the RIKEN-RAL Muon Facility in the UK. Experimental and theoretical studies on the magnestism, superconductivity, industiral applications, non-distructive element analysis, muon hyperfine interactions in metals, insuators and organic molecules. Muon site and magnetic spin structural analysis by the density functional theory.	
Electron Spin Resonance Laboratory Field of Spin Resonance Material Science (RIKEN)	Visiting Associate Professor	OSHIMA Yugo	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.	

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As of April 1, 2025

Doctoral Course

Department of Cosmosciences, Graduate School of Science

Laboratories	Supervisors		Keywords	Remarks
Observational Astronomy	Professor	SORAI Kazuo	Observational astronomy, extragalacitc astronomy, interstellar matter, development of observational instruments and system for the Antarctic THz telescope	
	Assistant Professor	SALAK Dragan		Institute for the Advancement of Higher Education
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	
	Professor	KOBAYASHI Tatsuo		
	Professor	SETO Osamu		
	Lecturer	SUEHIRO Kazuhiko		
	Assistant Professor	DAS Arindam		Institute for the Advancement of Higher Education
Theoretical Nuclear Physics	Associate Professor	NOMURA Kosuke	Nuclear structure and dynamics, and related quantum many-body techniques; Microscopic description of nuclear deformations and collective motions, nuclear density functional theory, collective models; exotic nuclear deformations and collective excitations, octupole deformation, and shape coexistence; beta decays relevant to the nucleosynthesis in the early universe, neutrinoless double beta decay, electric dipole moments, fundamental nuclear processes; numerical simulations using high-performance computers; international collaborations.	
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 Yukihiro		
	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 Japan Aerospace Exploration Agency (JAXA) in the field of spacecraft observation.
	Visiting Professor	FUJIMOTO Ryuichi		
	Visiting Associate Professor	YAMAMURA Issei		

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Doctoral Course

Department of Natural History Sciences, Graduate School of Science

As of April 1, 2025

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Earth and Planetary Dynamics	Meteorology	Professor	INATSU Masaru	Meteorology, dynamics and forecast, cyclones and fronts, theory and numerical modelling, development of numerical model, meso-scale phenomena, cloud, rain, snow, aerosol, lightning, material transport, and their application.	
	Physical Oceanography and Climate	Professor	MINOBE Shoshiro	Physical oceanography, meteorology, air-sea interactions, climate variability & change, oceans' role in climate, multidisciplinary challenges, numerical modelling, data analysis	
		Associate Professor	SASAKI Yoshinori		
	Space Geodesy	Professor	FURUYA Masato	Space geodesy, GNSS, GPS, INSAR, GRACE, gravity, Earth rotation, atmospheric sensing, crustal deformation, glaciology, planetary geodesy, ionosphere	
		Associate Professor	TAKADA Youichiro		
	Seismology	Professor	YOSHIZAWA Kazunori	Seismic wave propagation, Earth structure, seismic tomography, waveform analysis, seismic source process, microfracture, heterogeneity and anisotropy	
		Associate Professor	NAOI Makoto		

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As of April 1, 2025

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Earth and Planetary System Science	Petrology and Volcanology	Professor	KURITANI Takeshi	Field geology, petrography, igneous petrology, metamorphic petrology, experimental volcanology, geochemistry, volcanoes, ophiolites, plutons, metamorphic belts, crustal evolution, mantle melting, magmatic evolution, magma plumbing system, volcanic eruption, hydrothermal circulation, material circulation, crystal growth	
		Associate Professor	YOSHIMURA Shumpei		
		Assistant Professor	PYTHON Marie		
		Assistant Professor	MUJIN Mayumi		
		Assistant Professor	KITANO Ippei		Hokkaido University Museum
	Geochemistry	Associate Professor	KAWASAKI Noriyuki	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	BAJO Ken-ichi		
	Earth Materials Science	Professor	NAGAI Takaya	Mineralogy, crystallography, crystal growth, physics and chemistry of minerals	
		Associate Professor	KAWANO Jun		
		Associate Professor	SHINOZAKI Ayako		
	Paleobiology	Professor	YAMADA Toshihiro	Paleontology, Paleobotany, stratigraphy, vertebrate evolution, dinosaurs, reptiles, birds, phylogenetic relationships, functional morphology, comparative anatomy, embryology, evolution of Mesozoic marine biota, paleobiogeographic responses, global environmental change, origin of modern marine biota	
		Professor	KOBAYASHI Yoshitsugu		Hokkaido University Museum
		Associate Professor	IBA Yasuhiro		

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Earth and Planetary System Science	Earth Bisophere Geoscience	Professor	SAWADA Ken	Paleoenvironmental reconstruction, Organic sedimentology, Molecular paleobiology, Macromolecular biogeochemistry, biomarker paleoclimatology, Organic Geochemistry, paleobiochemistry, biomarker proxies for paleodiversity and paleoenvironments, molecular fossils, plant evolution, paleovegetation reconstruction, High-resolution reconstruction of palaeoenvironments, biogeochemical cycles in reef ecosystems on the geological time scale	
		Lecturer	WATANABE Tsuyoshi		
		Assistant Professor	IKEDA Masashi		

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As of April 1, 2025

Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Biodiversity	Biodiversity	Professor	KAJIHARA Hiroshi	Biodiversity I: Marine invertebrates, Nemertea, taxonomy, phylogeny, morphology	
		Lecturer	KAKUI Keiichi	Biodiversity I: Marine invertebrates, Crustacea, Tanaidacea, taxonomy, phylogeny, morphology	
		Professor	KOGAME Kazuhiro	Biodiversity II: Taxonomy, phylogeny, evolution, seaweeds,	
		Lecturer	NAKADA Takashi	Biodiversity II: Taxonomy, phylogeny, evolution, microalgae, Chlorophyceae	
		Assistant Professor	Kevin Wakeman	Biodiversity II: Biodiversity, evolution, protists, Apicomplexa, dinoflagellates	Institute for the Advancement of Higher Education
		Professor	TAKAGI Masaoki	Biodiversity III: Ecology,evolution,island,bird	
		Associate Professor	ABE Tsuyoshi	Biodiversity II: Seaweeds, taxonomy, phylogeny, chemotaxonomy	Hokkaido University Museum
		Associate Professor	KATOH Toru	Biodiversity I: Evolution, phylogeny, populations, insects	

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Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Science Communication	Communication of Science and Technology	Associate Professor	KAWAMOTO Shishin	science and technology studies, communication in science and technology, transdisciplinary, dual-use	Advancement of Recurrent Education Division
	Philosophy of Science and Technology	Professor	MATSUOU Masahiro	Philosophy of science, ethics of science and technology, philosophy of risk, statistical inference of cause	
	Educational Design	Associate Professor	IWAMA Norikazu	Psychological Statistics, Educational Measurement, Test Theory, Educational Technology, Instructional Design, Self-regulated Learning	Institute for the Advancement of Higher Education
		Associate Professor	OKUMOTO Motoko		Institute for the Advancement of Graduate Education
	Communication Media	Professor	SHIGETA Katsusuke	Communication Media, Educational Technology, Information and Communication Technology, Learning Effectiveness, e-learning, Hybrid Learning, Educational Practice Research.	Information Initiative Center, Hokkaido University
		Associate Professor	SUGIURA Mayumi		Institute for the Advancement of Graduate Education

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Research Fields	Research Groups & Laboratories	Supervisors		Keywords	Remarks
Seismology and Volcanology	Seismological Observation	Professor	OHZONO Mako	Earthquake geophysical observation, seismographs, GNSS, gravity, subduction great earthquakes, inland earthquakes, statistical seismology, land and ocean bottom crustal deformation, regional tectonics in northeastern Asia, geothermal exploration, earthquake disaster mitigation	
		Professor	TAKAHASHI Hiroaki		
		Associate Professor	KATSUMATA Kei		
	Ocean Bottom Seismology and Tsunami	Associate Professor	MURAI Yoshio	Subsurface structure at subduction zones,elastic wave propagationearthquake source processes, generation and propagation of tsunamis, international field science, disaster mitigation	
		Associate Professor	YAMANAKA Yusuke		
	Volcano Physics	Professor	AOYAMA Hiroshi	Volcanology, volcanic seismology, eruption prediction, transport processes, volcano hydrology, crustal deformation, space geodesy, geo-electromagnetism, spectroscopy of volcanic plume, volcano monitoring system	
		Assistant Professor	TANAKA Ryo		
	Subsurface Structure	Professor	HASHIMOTO Takeshi	Subsurface exploration in seismogenic zones and active volcanoes, tectono-electromagnetism, magnetotellurics, geomagnetic field observation, conductivity anomaly	

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