List of Supervisors and Research Fields

As of September 1, 2024

Master's Course

Department of Condensed Matter Physics, Graduate School of Science

Laboratories	Supervisors		Keywords	Remarks
Electronic Properties of Solids	Professor	YOSHIDA Hiroyuki	We develop new materials in strongly correlated electron systems by various chemical methods including high pressure synthesis, and elucidate their properties by both bulk physical properties measurements (electrical resistivity, magnetization, specific heat measurements, and precise measurements in ultra-high magnetic fields, etc) and microscopic measurements (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	Associate Professor	MISHINA Tomobumi	We study the interaction of light with matter, mainly by spectroscopic measurements using laser light. Target systems include organic materials, metals, and semiconductors. In the case of molecular luminescence in solution, we deal with energy relaxation of a few milliseconds due to liquid dynamics; in the case of excited-state relaxation in semiconductors, we measure relaxation in microseconds to nanoseconds; and in the case of phonon spectroscopy in solids, we study relaxation phenomena on time scales of picoseconds or less. We also synthesize nanocrystals of a few nanometers in size by chemical synthesis methods and study various phenomena caused by quantum effects in the electron system confined in very small nanocrystals.	Will retire in March, 2025.
	Assistant Professor	YAMAMOTO Sekika		

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

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

As of September 1, 2024

Master's 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		
	Associate 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 theory, exotic nuclear deformations and collective excitations, nucleosynthesis, double beta decay, machine learning	
Theoretical Astrophysics	Professor	OKAMOTO Takashi	Theoretical astronomy, numerical simulations, semi-analytic modelling, first star formation, first galaxy formation, galaxy evolution, galaxy clusters, supermassive black holes, interstellar matter, star formation	
	Assistant Professor	SUGIMURA Kazuyuki		
Planetary and Space Group	Professor	KURAMOTO Kiyoshi	Origin and evolution of planets and satellites, material evolution during planetary system formation, structure and dynamics of Earth and planetary atmospheres, comparative planetology, space exploration and ground-based observation, experimental studies, theory and hierarchical numerical simulation models, applications of information technology	
	Professor	TAKAHASHI 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 the Japan Aerospace Exploration Agency (JAXA) in the field of spacecraft observation.
	Visiting Professor	FUJIMOTO Ryuichi		
	Visiting Associate Professor	YAMAMURA Issei		

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