| English-based Program | | | | | | | | | | | | | |
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| Department | Research Area | Research Instruction | | Application Code | | Main Supervisor | | | | Vice Supervisor | | | |
| | | | | Master | Doctor | | | | | | | | |
| Department of Pure and Applied Physics | Mathematical Physics | Research on Mathematical Physics | Nonlinear partial differential equations arising in Classical Field Theory are studied from the viewpoint of functional and harmonic analyses. | J33 | J83 | Professor | Doctor of Science (Kyoto University) | OZAWA, Tohru | txozawa@waseda.jp | | | | |
| Department of Pure and Applied Physics | Mathematical Physics | Research on Mathematical Physics | Theory of fully nonlinear elliptic/parabolic partial dfferential equations and its applications to sciences, engineerings and economy are studied. | J47 | J97 | Professor | Doctor of Science (Waseda University) | KOIKE, Shigeaki | graduate@sci.waseda.ac.jp | | | | |
| Department of Pure and Applied Physics | Theoretical Nuclear and Particle Physics | Research on Theoretical Nuclear Physics | The main subject is the theoretical study of nuclear structure. In particular, emphasis is placed on the study of infinitely-large hypothetical nuclei by quantum-mechanical many-body techniques (mainly the variational method). Also studied are related topics such as the internal structure of neutron stars. | J03 | J53 | Professor | Doctor of Science (Waseda University) | TAKANO, Masatoshi | takanom@waseda.jp | | | | |
| Department of Pure and Applied Physics | Theoretical Nuclear and Particle Physics | Research on Fundamental Theory of Quantum Mechanics | Issues that are related with the foundations and/or the fundamental aspects of quantum mechanics are widely studied, with such topics as the mechanism of disappearance of quantum coherence and/or the appearance of irreversibility and dissipation in macroscopic/mesoscopic systems kept in mind. The particle physics is also within the research interest and has been studied in the context of the meaning and the method of quantization. | J04 | J54 | Professor | Doctor of Science (Waseda University) | NAKAZATO, Hiromichi | hiromici@waseda.jp | | | | |
| Department of Pure and Applied Physics | Theoretical Nuclear and Particle Physics | Research on Theoretical Particle Physics | Based on the quantum field theory, we study theories of elementary particles and their interactions, especially, physics beyond the standard model of elementary particles. We also search an ultimate unified description of elementary particles and the interactions by the use of supersymmetry, supergravity and superstrings. | J34 | J84 | Professor | Doctor of Science (Hiroshima University) | ABE, Hiroyuki | abe@waseda.jp | | | | |

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| | | | | Master | Doctor | | | | | | | | | |
| Department of Pure and Applied Physics | Particle and Applied Radiation Physics | Research on High Energy Experimental Particle Physics | Interactions between elementary particles are studied at high energy frontier experiments. Based on experimental data taken at large-scale accelerator-experiments, researches are widely performed to verify various theoretical models and also to search for new particles/phenomena. In addition, we focus on an understanding of possible connections between cosmology and particle physics through experimental approaches. | J35 | J85 | Professor | Doctor of Science (Waseda University) | YORITA, Kohei | kohei.yorita@waseda.jp | | | | | |
| Department of Pure and Applied Physics | Particle and Applied Radiation Physics | Research on Applied Radiation Physics | Our research group focuses on the high energy astrophysics experiments and data analysis using various satellite missions and balloon-borne experiments. We also conduct research and development for science/engineering crossover that shed new lights on medical and industrial fields. Specifically, state-of-the-art technologies for X-ray and gamma-ray imaging are being developed, toward future high precision proton therapy, three-dimensional multicolor X-ray CT, and radionuclide therapy. | J36 | J86 | Professor | Doctor of Science (The University of Tokyo) | KATAOKA, Jun | kataoka.jun@waseda.jp | | | | | |
| Department of Pure and Applied Physics | Particle and Applied Radiation Physics | Research on High Quality Beam Science | Fundamental science and application of laser light, electron beam, synchrotron radiation and other quantum beams are main subject. Especially, experimental research in the view point of physical chemistry between above mentioned beams and various kinds of materials will be conducted. | J37 | J87 | Professor | Doctor of Engineering (The University of Tokyo) | WASHIO, Masakazu | washiom@waseda.jp | Professor | Doctor of Science (Waseda University) | YORITA, Kohei | | |
| Department of Pure and Applied Physics | Astrophysics | Research on Theoretical Astrophysics and Cosmology | High energy phenomena in compact objects such as supernovae, neutron stars and black holes are theoretically studied. In particular, the dynamics, gravitational radiation, neutrino interactions in hot and dense matter, nucleosynthesis and galactic chemical evolutions are the focus of research. | J06 | J56 | Professor | Doctor of Science (The University of Tokyo) | YAMADA, Shoichi | shoichi@waseda.jp | | | | | |
| Department of Pure and Applied Physics | Astrophysics | Research on Observational Astrophysics and Cosmology | Using the world cutting-edge observational facilities such as Subaru telescope and Atacama Large Millimeter/submillimeter Array (ALMA), we study formation and evolution of galaxies, super-massive black-holes, proto-clusters of galaxies and the large-scale structure of the Universe, cosmic reionization, and the intergalactic medium. | J48 | J98 | Professor | Doctor of Science (Kyoto University) | INOUE, Akio | graduate@sci.waseda.ac.jp | | | | | |

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| Department of Pure and Applied Physics | Theory of Condensed Matter Physics | Research on Physics of Non-equilibrium System | Interdisciplinary study of pattern formation and collective behavior in physical, chemical, biological, and social systems from the viewpoint of statistical physics and nonlinear dynamics. | J13 | J63 | Professor | Doctor of Science (Kyoto University) | YAMAZAKI, Yoshihiro | yoshy@waseda.jp | | | |
| Department of Pure and Applied Physics | Theory of Condensed Matter Physics | Research on Theoretical Quantum Physics | Our interests lie in the fundamental aspects of quantum mechanics and quantum information. We are conducting theoretical researches on various quantum phenomena occurring in the microscopic and mesoscopic scales, and on the emergent quantum technologies making use of quantum correlations and entanglements. | J41 | J91 | Professor | Doctor of Science (Waseda University) | YUASA, Kazuya | yuasa@waseda.jp | | | |
| Department of Pure and Applied Physics | Theory of Condensed Matter Physics | Research on Nonlinear Physics | Research in our group focuses on applied and fundamental physics of nonlinear and chaotic dynamics, quantum and wave chaos, and transport in many-particle systems. | J42 | J92 | Professor | Doctor of Science (Waseda University) | HARAYAMA, Takahisa | harayama@waseda.jp | | | |
| Department of Pure and Applied Physics | Theory of Condensed Matter Physics | Research on Emergent Materials Physics | We theoretically study a variety of physical phenomena and materials functions of magnets, ferroelectrics, metals, insulators and superconductors by constructing microscopic models based on the quantum mechanics and by analyzing them using mathematical and statistical-mechanical methods. We particularly focus on emergent phase-transition phenomena, nonequilibrium dynamics, nonlinear responses, device functionalities due to interplays of charge, spin, orbital and lattice degrees of freedom caused by strong electron correlations. | J44 | J94 | Professor | Doctor of Science (The University of Tokyo) | MOCHIZUKI, Masahito | masa_mochizuki@waseda.jp | | | |
| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Complex Quantum Physics | Electrons in the crystal have various degrees of freedom, such as charge, spin, and orbital, and they are often correlated with each other. In addition, those degrees of freedom of the electrons can be coupled with external field, such as magnetic and electric field. To understand the complex behavior of the electrons in the crystal arising from such multi degrees of freedom, both synthesis of materials and the measurement of their physical properties are pursued in this lab. | J15 | J65 | Professor | Doctor of Science (The University of Tokyo) | KATSUFUJI, Takuro | katsuf@waseda.jp | | | |

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| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Soft Matter Physics | Liquid crystal (LC) is one of the most well-known soft matters, which possesses both the liquid-like fluidity and crystalline order. We especially focus on the dynamic properties of LCs and try to reveal the mechanism how the molecular-level motion should develop into the macroscopic dynamics. | J16 | J66 | Professor | Doctor of Engineering (The University of Tokyo) | TABE, Yuka | tabe@waseda.jp | | | | |
| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Atomic, Molecular and Optical Physics | Using intense, ultra-short and extreme ultra-violet laser pulses, we develop new approaches to measure and control electron dynamics of atoms or electronic and vibrational dynamics of molecules. | J38 | J88 | Professor | Doctor of Philosophy (The Graduate University for Advanced Studies) | NIIKURA, Hiromichi | niikura@waseda.jp | | | | |
| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Electronic Correlation Physics | Correlated electrons in the bulk or on the surface of solids provide surprisingly rich physical properties and useful functionality. We study the electronic structure of various solids by means of photoemission and x-ray spectroscopy, and try to find a novel quantum state or functionality due to electronic correlation. | J22 | J72 | Professor | Doctor of Science (The University of Tokyo) | MIZOKAWA, Takashi | mizokawa@waseda.jp | | | | |
| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Surface and Interface Non-equilibrium Physics | Researches on physical and chemical phenomena occurring in a material and on a surface, such as diffusion of atoms/ions and their reduction/oxidation processes. Development of conceptually new devices and systems based on the researches is also carried out. | J23 | J73 | Professor | Doctor of Science (Tokyo Institute of Technology) | HASEGAWA, Tsuyoshi | thasega@waseda.jp | | | | |
| Department of Pure and Applied Physics | Condensed Matter Physics | Research on Low-dimensional Physics | Researches on physical properties and structure for low-dimensional materials such as thin film, surface/interface, one-dimensional chain and edge state by means of ARPES, STM and electron/positron diffraction. | J49 | J99 | | Doctor of Science (Tohoku University) | TAKAYAMA, Akari * Only for April 2020 Intake (TBD) | a.takayama@waseda.jp | | | | |

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| Department of Pure and Applied Physics | Physics-Based Engineering: Informatics, Photonics and Image Science | Research on Semiconductor Device Engineering | Studies about compound semiconductors, related to quantum phenomena applicable to semiconductor devices | J25 | J75 | Professor | Doctor of Science (Osaka University) | TAKEUCHI, Atsushi | atacke@waseda.jp | | | | |
| Department of Pure and Applied Physics | Physics-Based Engineering: Informatics, Photonics and Image Science | Research on Quantum Optics Research | Experimental studies of Quantum Optics. Research topics include generation of nonclassical light such as squeezed light and single photons, cavity QED, quantam information with photons, nanophotonics using microresonators and waveguides. | J40 | J90 | Professor | Doctor of Engineering (The University of Tokyo) | AOKI, Takao | takao@waseda.jp | | | | |
| Department of Pure and Applied Physics | Physics-Based Engineering: Informatics, Photonics and Image Science | Research on Image Information Processing | My research is Image information processing covering from still pictures (2 dimensions) to stereoscopic animation (4 dimensions). They are including image understanding (Computer Vision) , image modeling and synthesis (Computer Graphics). Not only do we make clear the visual organ but also consider human factors of sensitivity, emotion and personality that are difficult to make a model with numerical information processing approach. | J28 | J78 | Professor | Doctor of Engineering (The University of Tokyo) | MORISHIMA, Shigeo | shigeo@waseda.jp | | | | |
| Department of Pure and Applied Physics | Physics-Based Engineering: Informatics, Photonics and Image Science | Research on Fundamentals and Applications of Pattern Information Processing | The fundamentals and applications of pattern information processing and instrumentation are mainly studied. Our research projects include image processing, acoustic signal processing, tactile and haptic studies, robotics, neural networks and human interface. | J45 | J95 | Professor | Doctor of Engineering (Waseda University) | SAWADA, Hideyuki | sawada@waseda.jp | | | | |
| Department of Pure and Applied Physics | Physics-Based Engineering: Informatics, Photonics and Image Science | Research on Integrated optical devices | The integrated optical devices based on silicon photonics are studied. The functional lasers, optical multiplexers and optical modulators for optical network system, optical interconnection and optical sensing are developed. | J46 | J96 | Associate Professor | Doctor of Material Science (Japan Advanced Institute of Science and Technology) | KITA, Tomohiro | tkita@waseda.jp | | | | |

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| Department of Pure and Applied Physics | Biophysics | Research on Theoretical Biophysics | Computer simulations, mainly molecular dynamics simulations, are applied to molecular machine systems composed of proteins and other biomolecules including DNA. Particularly, physical principles of how molecular machines works efficiently using different types of energies (e.g. chemical, mechanical, electrical, thermal, optical, etc.) are studied based on the statistical mechanics and electrostatics. | J31 | J81 | Professor | Doctor of Philosophy (The University of Tokyo) | TAKANO, Mitsunori | mtkn@waseda.jp | | | |
| Department of Pure and Applied Physics | Biophysics | Research on Molecular Biophysics | Experimental approaches to understand the molecular mechanism by which protein filaments and molecular motors work. Emphasis is placed on structural polymorphism of actin filaments, to unveil the principles and properties of protein machines that are distinct from artificial ones. | J30 | J80 | Professor | Doctor of Science (The University of Tokyo) | UEDA, Taro | t-uyeda@waseda.jp | | | |
| Department of Pure and Applied Physics | Biophysics | Research on Experimental Biophysics | The aim of this study is to understand the meaning and function of epigenetic information in living systems. A system of analyzing epigenetic information has been developed starting from the twin complementary viewpoints of cell regulation as an 'algebraic' system (emphasis on temporal aspects) and as a 'geometric' system (emphasis on spatial aspects). The knowlege acquired from this study may lead to the use of cells that fully control practical applications like cell-based drug screening and the regeneration of organs. | J43 | J93 | Professor | Doctor of Science (Waseda University) | YASUDA, Kenji | yasuda@waseda.jp | | | |