

Gunma University Graduate School of Science and Technology (Doctoral Program)

Faculty Members and Fields of Specialization

※Please make sure to receive an approval for acceptance from the supervisor before applying.

※Please put "gunma-u.ac.jp" after the at sign (@).

◆ Domain of Materials and Bioscience

Faculty Members	E-mail	Fields of Specialization
Professors Naoki Asakawa * Motoko S. Asano Hideki Amii Yusuke Inoue Hiroki Uehara * Tetsuo Okutsu * Hiroaki Ozaki Ken-ichi Kasuya Toru Kyomen Hideo Satsu Kiichi Sato Soshi Shiraishi Yoshihiro Sumiyoshi Masashi Sonoyama Hiroshi Takahashi Shigeki Takeda Yuya Tachibana Yosuke Nakamura Minoru Hanaya Jun-ichi Fujisawa Ichiro Matsuo Takako Muraoka Toshitada Yoshihara	asakawa@ motoko@ amii@ yinoue@ hirokiuehara@ okutsu@ h-ozaki@ kkasuya@ tkyomen@ satsu@ kiichi.sato@ soshishiraishi3@ y-sumiyoshi@ sonoyama@ hirotakahashi@ stakeda@ tachibana@ nakamura@ mhanaya@ jfujisawa@ matsuo@ takakomuraoka@ yoshihara@	<ul style="list-style-type: none"> • Bio-inspired devices using emergent property found in polymers • Photophysics and design of photofunctional composite molecular systems including coordination compounds • Development of synthetic organic reactions and their applications • Functional analysis of the liver-enriched nuclear receptors using gene-targeted mice • Development of property and functionality of polymeric materials by drawing techniques • Physical chemistry, photochemistry and crystal growth • Development of modified nucleic acids and its application • Structure and function of polyester-degrading enzymes, screening of microorganisms involved in the environmental cleanup • Solid state chemistry and design of functional oxides • Search and analysis of functional food ingredients expected to prevent disease and promote health • Development of micro bioanalysis systems • Development of carbon-based nanoporous materials and electrochemical capacitors • Studies on molecular structures of transient species and complexes consisting of radicals • Biomolecular science, Biophysical chemistry of proteins, Biospectroscopy, Bioinformatics • Structural analysis and thermal study of model biomembranes • Functional analysis of receptors, characterization and application of protein self-assembly • Development of biobased and biodegradable polymers • Construction and properties of novel π-conjugated systems including fullerene chemistry and supramolecular chemistry • Development and characterization of functional solid-state materials • Studies of organic-inorganic hybrid materials for light energy conversions • Glycoscience, Glycotechnology, Synthetic study of glycoconjugates • Studies on unique ligands with heavier typical elements and their transition metal complexes • Photophysical and photochemical studies of aromatic compounds and its
Associate Professors Shinji Iwamoto Hiroyuki Oku Masaki Kakiage Ryohei Kakuchi Koki Kamiya Ken-ichiro Kanno Masanao Kinoshita Takafumi Shimoaka Tsuyoshi Takahashi Nobuhiro Takeda Hiroyuki Takeno Nobukazu Nameki Tomohisa Moriguchi Minoru Yamaji Keiichi Yamada	siwamoto@ oku@ kakiage@ kakuchi@ kamiya@ kkanno@ kinoshi@ shimoaka@ ttakahas@ ntakeda@ takeno@ nameki@ moriguchi@ yamaji@ kyamada@	<ul style="list-style-type: none"> • Solvothermal synthesis of inorganic materials and their performance as catalysts autoantigens, advanced functional foods for prevention of diseases • Synthetic vaccines and diagnosis material; biofunctional chemistry; biomedical and functional polymers • Development of high-performance polymer fiber and film materials and ceramics by green processing • Synthesis of polymeric materials through a combination of computational and experimental chemistry • Design of biomolecular complexes and exploration of biological phenomena through synthetic biology • Synthesis and properties of novel organosilicon compounds using transition-metal complexes • Structure and property of biomembranes and their functions • Physical chemistry and vibrational spectroscopy on molecular aggregation systems transition-metal complexes • Construction and application of functional molecules using peptide and protein engineering • Synthesis of metal complexes bearing new ligands for the purpose of activating small molecules • Self-assembling structure and dynamics of multicomponent polymer systems • Analyses of novel translation regulation mechanisms, and structural bioinformatics • Development of functional oligonucleotides, chemistry of natural products • Photophysics and photochemistry of organic and organometallic compounds • Development of novel bioactive peptides utilizing molecular imaging technique application for bioimaging
Visiting Professors Noriaki Seko Mitumasa Taguchi Tetsuya Yamaki Hiroki Yamamoto Zhao Yue		<ul style="list-style-type: none"> • R & D of the polymer modification technique by radiation processing • Quantum beam reaction and environmental / medical applied research • Nanotechnology Research and Material Development for Application to Next-Generation Energy Devices • Study on Ultra-finefabrication Matterials Based on Reaction Induced by Quantum Beam • Synthesis and structure/property analysis for functional polymer materials

* will retire in March, 2027

◆Domain of Mechanical Science and Technology

Faculty Members	E-mail	Fields of Specialization
Professors Kenji Amagai Mikiya Araki Tsuneaki Ishima Atsushi Iwasaki Shinji Koyama Ikuo Shohji Takaaki Suzuki Nobuaki Nakazawa Yoshihiko Hangai Yusaku Fujii Tomohiko Furuhashi Shinichi Maruyama Takao Yamaguchi Ko Yamada Weimin Lin	amagai@ mikiya.araki@ ishima@ aiwasaki@ koyama@ shohji@ suzuki.taka@ n.nakazawa@ hanhan@ fujii@ tfuruhashi@ maruyama@ yamaguchi3@ yamada@ wlin@	<ul style="list-style-type: none"> • Thermo-fluid engineering, Interfacial flow, Atomization, Environmental fluid engineering • Jet engines, Jet noise, Combustion, Spray • The experimental elucidation for flow, heat and mass transfer and laser application for flow including small particle • Structural health monitoring and composite material • Precision bonding, surface hardening, corrosion resistance, wear resistance • Heterophase interface science, micro joining, electronics packaging materials, brazing, surface treatment and corrosion of metals • Micromachines and MEMS for bio, optical and IoT applications • Human interface, biomedical motion control, and motion planning for a robot • Fabrication and mechanical evaluation of porous metals • Precision measurement, Optical measurement, Electrical-mechanical measurement • Combustion, spray flow, exhaust gas aftertreatment and gas turbines • Vibration analysis and measurements of machines and structures, Nonlinear phenomenon • Numerical analysis for dynamics of cars, machines and living bodies, Vibration damping, Sound-proof structure, Acoustic black hole • System control theory and its application, control of machine and robot, and intelligent control of the machine • Developing a high efficiency ultra-precision polishing machine. Research for the application of ELID process. Creating a desktop processing machine and test.
Associate Professors Masahiro Inoue Takahiro Kawaguchi Hisanobu Kawashima Yoshio Zama Ryosuke Suzuki Akihiro Takita Yuya Tanaka Masato Funatsu Iwanori Murakami Md Abdus Samad Kamal	masa-inoue@ kawaguchi@ hkawa@ yzama@ r_suzuki@ takita@ yuya.tanaka@ mfunatsu@ murakami@ maskamal@	<ul style="list-style-type: none"> • Development and characterization of organic/metal/inorganic hybrid materials, and their application to novel electronic systems • Control engineering, system identification, state estimation, machine learning • Bubble dynamics, heat and fluid flow measurement, and multiphase flow • Spray flow, Quantitative visualization measurement, Automotive engineering • Smart manufacturing, IoT utilization, Digital communications, Material testing technology • Optical measurement, Image processing, Social safety, IoT devices • Characterization of organic materials and their application to semiconductor and mechatronic devices • Hypersonic and high-temperature gas dynamics, Thermal protection system for space vehicle, Plasma diagnoses by spectroscopy • Applied electromagnetics, Actuator, Applied of superconducting levitation, Jumping robot • Control of next generation vehicular traffic system, model predictive control and intelligent control and their applications
Visiting Professors Satoshi Okajima Takashi Wakai Tomoyoshi Watakabe		<ul style="list-style-type: none"> • Design evaluation method for fast reactors, Coupling of probabilistic risk assessment and structural reliability evaluation • Structural design and material strength evaluation techniques for Fast Breeder Reactors • Seismic design evaluation techniques for Fast Reactors

◆Domain of Environmental Engineering Science

Faculty Members	E-mail	Fields of Specialization
Professors Hideyuki Itabashi * Jun-ichi Ozaki Mitsuo Ozawa * Shinji Katsura Masanobu Kanai Kazuyoshi Sato * Nobuyoshi Nakagawa Hideyuki Morimoto Akihiko Wakai Tomohide Watanabe	itabashi@ jozaki@ ozawa@ katsura@ kanai@ kazuyoshi-sato@ nob.nakagawa@ hmorimoto@ wakai@ watanabe@	<ul style="list-style-type: none"> • Speciation and removal of heavy metal ions in the environment • Design and preparation of catalytic carbon materials, particularly used in the applications of fuel cell and biomass conversion. • Fire resistance of concrete, Control of cracking due to volume change in concrete at early age • Development of manipulation technologies for biological molecules and their industry applications • Local disaster prevention, evacuation, disaster information, disaster education • Synthesis and processing of ceramic materials and application for energy and environmental devices • Development of an efficient liquid fuel cell by means of catalyst preparation and by optimizing the electrode structure. • Development of all-solid-state batteries and novel battery materials • Slope failure mechanisms, soil-structure interaction and their numerical simulation • Biological wastewater treatment, microbial and physicochemical degradation of water pollutants, Advanced water / wastewater treatment , resource recovery
Associate Professors Takafumi Ishii Tsukasa Ito Ken-ichi Uzaki Masahiko Oshige Fei Cai Takahiro Saitoh Reiji Noda Miyabi Hiyama Junpei Fujiki	ishii@ t.ito@ k-uzaki@ oshige@ feicai@ t-saitoh@ noda_r@ miyabi@ jun.fujiki@	<ul style="list-style-type: none"> • Development of surface analysis techniques for carbon materials, application of carbon materials to material conversion catalysts and energy devices • Water treatment, environmental microbiology and biodegradation of environmental pollutants • A study of regional sediment transport from rivers to coastal regions. Development of the calculation model to estimate the sediment discharge of river by using the simple model and field data. • Development of bio-molecular manipulation methods and application of reaction process analysis by using molecule design techniques • Earthquake-resistant measures for ground and earth structures, safety evaluation of landslides, and shallow ground thermal energy utilization • Applied mechanics, computational mechanics and non-destructive evaluation for civil engineering structures • Development and evaluation of waste/biomass energy utilization processes, Evaluation and design of a local society based on energy/mass flow analysis • Application of electrostatics on bio-separation and micro-chemical systems, development of bio-micro-electromechanical systems • Development of functionalized porous materials, analysis and modeling of adsorption properties, and application to adsorption processes
Visiting Professors Hiromi Shirai Kenji Tanno Naoki Noda		<ul style="list-style-type: none"> • Environmental combustion engineering, clean energy conversion engineering • Numerical combustion simulation, Energy control • Environmental combustion engineering, aerosol engineering, energy conversion of coal and biomass

* will retire in March, 2027

◆Domain of Electronics and Informatics, Mathematics and Physics

Faculty Members	E-mail	Fields of Specialization
Professors Kazuyuki Amano You Yin Hiromasa Oku Syun-ji Ozaki Tsuyoshi Kato Tamihiro Gotoh Hiroshi Sakurai Kaoru Shimada Koji Jimura Hayato Sone Toshiki Takahashi Manabu Takahashi * Kazumi Tanuma Shin-ichi Nakano Tatsuya Nagao Seiji Hashimoto Kenta Miura Takashi Miwa Kuniyuki Motojima Masakazu Yamamoto Yasushi Yuminaka	amano@ yinyou@ h.oku@ shunji@ katotsu.cs@ tgotoh@ sakuraih@ k.shimada@ jimura@ hayatosone@ t-tak@ mtakahas@ tanuma@ nakano@ nagao@ hashimotos@ mkenta@ miwa@ motojima@ mk-yamamoto@ yuminaka@	<ul style="list-style-type: none"> • Computational complexity, theory of algorithms, machine learning • Materials and devices for brain-like chip and information storage, nanofabrication, nanometrology • Dynamic image control, High-speed image processing, High-speed optical devices • The optical properties and electronic energy-band structures of nanostructured semiconductors and ternary compound semiconductors • Bioinformatics, machine learning, and statistical analysis • Material science for optical devices • Spintronics, Lithium ion battery, X-ray imaging, medical engineering • Evolutionary computation, knowledge discovery and data mining • Human cognitive neuroscience, neuroinformatics, and decision neuroscience • Nanometer measurement and fabrication, nanoelectronic devices, high-sensitive biosensor for medical use, crystal growth • Physics of compact torus plasmas for thermonuclear fusion reactors • Theoretical study on electronic properties and magnetism in transition metal compounds • Elasticity equations, inverse problems • Graph algorithm, and Information visualization, optimization • Theory of strongly correlated electron system • Motion control, system identification, vibration control, precision control, renewable energy • Light-emitting materials and devices, Photoelectric devices • Applied measurement for electromagnetic and ultrasonic wave • Radio wave propagation, Wireless measurement, Electromagnetic wave simulation • Nonlinear partial differential equations, Mathematical model of diffusion phenomena, Time evolution of nonlinear diffusion • Multiple-valued logic and new-paradigm analog/digital integrated circuits
Associate Professors Toru Araki Ken-ichi Kawanishi Ren Koda Kosuke Suzuki Masako Suzuki-Sakamaki Yuki Tanaka Akito Chiba Hui Zhang Hirofumi Nagoshi Toshiya Hikihara Takafumi Miyazaki Yoshifumi Morita	arakit@ kawanisi@ koda@ kosuzuki@ masakoss@ ytanaka@ chiba@ huizhang@ nagoshi@ hikihara@ tmiyazaki@ morita@	<ul style="list-style-type: none"> • Graph theory, Graph algorithm, Combinatorial optimization • Information and communication systems, performance evaluation, queueing theory • Medical ultrasound imaging, Tissue elasticity measurement, Wave propagation, Micro/nano-bubble treatment • X-ray characterization, Backscatter imaging, Electronic structure, Functional oxide, Lithium rechargeable battery • Synchrotron Science, Surface/Interface Science, Multiferroics • High-speed arithmetic algorithm, IoT device and its management system, graph theory • Photonics, Optoelectronics • Nano-fabrication and measurement, nanoelectronic devices, ultra-sensitive biosensors, and simulation-based • Analytic number theory, value-distribution of arithmetic functions • Low-dimensional strongly correlated electron systems, quantum spin systems, numerical calculation • Exponential Diophantine equation, Diophantine analysis • Theoretical study on low dimensional quantum systems and superconductors
Visiting Professors Tomio Iwasaki Teruo Kohashi Kazuo Saito Ken Harada Naoki Kawachi Mitsutaka Yamaguchi	 m-yamaguchi@	<ul style="list-style-type: none"> • Sustainable and bio-compatible materials design with molecular simulations and materials informatics • Magnetic metrology, Spin polarized scanning electron microscopy • Advanced electronic engineering • Electron microscopy, electron interferometry, electron holography, and their physical applications • Research utilizing radioisotope imaging technologies to address challenges in agriculture, medicine, and the environment • Development of radioisotope (RI) imaging technologies in the field of life sciences

* will retire in March, 2027

◆Gunma University Initiative for Advanced Research (GIAR)

Faculty Members	E-mail	Fields of Specialization
Professor Keisuke Nimura Md. Zakir Hossain	nimura@ zakir@	<ul style="list-style-type: none"> • Gene expression, Gene Therapy, Oncotherapy, DNA barcode, Next Generation Sequencing • Chemical modification of epitaxial graphene on SiC substrate
Assistant Professor Takehiko Yokobori	bori45@	<ul style="list-style-type: none"> • Biomarker research using clinical cancer specimens, Development of cancer treatment tools