



Professor Profiles 2022

School of Materials and Chemical Technology

Tokyo Institute of Technology

Creating Future Society with the Power of Materials and Chemistry

Tokyo Tech boasts a world-class research team in the fields of materials and applied chemistry, and has achieved outstanding results to date. The School of Materials and Chemical Technology contributes to creating future society through developing novel materials useful in solving society's problems related to the environment, resources, energy, and health and medicine, as well as improving the quality of our lives. In particular, we aim to realize a carbon-neutral society, which is important for the Sustainable Development Goals (SDGs). The School is composed of the Department of Materials Science and Engineering, which focuses on studying solid materials, and the Department of Chemical Science and Engineering, which focuses on molecules and chemistry, and covers a wide range of subjects from atoms and electrons to devices and plants. We also promote innovative material development integrated with information science. Through such cutting-edge research, we foster global researchers and engineers who can lead the development of materials in the future.



Message from the Dean

The School of Materials Science and Engineering, as its name suggests, focuses on "materials" in its research and education. The difference in the way we approach materials is a distinctive feature of our two departments. In the Department of Materials Science and Engineering, we make sure the materials we create have optimized required properties. In the Department of Chemical Science and Engineering, materials are created through chemical reactions and processes that take advantage of the characteristics of raw materials. Both fields cover aspects such as micro to macro scales, and atoms and electrons to devices and plants. Recently, many research projects integrating information science are also being conducted. Through the cutting-edge research at our school, we are fostering researchers and engineers who can lead in the development of materials in the future. We live surrounded by materials and therefore must live in harmony with them. As they vary widely — some beneficial, some harmless, and some harmful —, we must have a firm grasp of their characteristics when creating materials and handle them with a solid sense of ethics. Based on this attitude, we are "Creating Future Society with the Power of Materials and Chemistry" — this is the concept of the School of Materials Science and Engineering.

Hidetoshi SEKIGUCHI

Department of Materials Science and Engineering

Vision

Create new materials and engineering technologies that contribute to industrial development and cultivate individuals who make a difference to society


Materials. They play an important role in forming, molding, and advancing societies. They are responsible for the considerable transformations in our daily lives. After all, they are what give shape to science and technology. At the Department of Materials Science and Engineering, we work to continuously progress the field of materials science. Our students are trained to use the advanced and specialized knowledge of materials they acquire to carry out original and challenging research and development. They learn to find creative solutions to materials-related problems on their own, and furthermore, to conceive of ways to implement these solutions in the real world. The curriculum is designed to allow students to acquire a broad range of fundamental knowledge in materials science, from metallic materials and organic materials to inorganic materials. Through our courses, students also gain the knowledge and develop the creativity necessary to bring new, innovative industrial materials into existence. Our students will become the leading scientists and engineers in the field of materials science that are sought by the industrial world.


Message from the Department Chair


Materials science is the oldest and strongest field of study at Tokyo Institute of Technology. To uphold this long-standing reputation, we strive to always be at the cutting edge of the field in terms of research and education. This department includes all areas of materials science; metallurgy, organic and polymeric materials, and inorganic materials. Students are presented with opportunities not only to comprehensively learn fundamentals, but also to cultivate their creativity and originality to develop new materials. Our team of faculty and staff members serve as helpful guides on the path towards advanced skills and knowledge. Welcome to the innovative field of materials science and engineering for sustainable societies and a sustainable world.


Materials Science and Engineering


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	Shigeo Asai
	Associate Professor
	asai.s.aa ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Structure and properties of polymers / Electrical conductive polymer composites / Ion-conducting polymer blends / Microcellular plastics
Current Research Projects	Polymers treated with high-pressure CO ₂ / Biodegradable polymers and polymer blends / Electrical conductive polymer composites / Ion-conducting polymer blends


	Masaki Azuma
	Professor
	azuma.m.ab ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Solid state chemistry / Transition metal oxides / Precise structural analysis / Functional materials
Current Research Projects	Negative thermal expansion / Multiferroics / Lead-free piezoceramics


	Tso-Fu Mark Chang
	Associate Professor
	chang.m.aa ● m.titech.ac.jp
	Major Human Centered Science and Biomedical Engineering / Materials Science and Engineering
Research Field	Metallic catalysts / Visible-light composite photocatalysts / Flexible functional materials / Chemical sensors / Electroless & electrochemical deposition
Current Research Projects	Development of metal-based catalytic materials for chemical sensors, visible-light photocatalyst, and flexible functional materials.


	Toshiyuki Fujii
	Professor
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	Major Materials Science and Engineering
Research Field	Microstructure in metals / Mechanical properties of materials / High strength and high conductivity copper alloys / Fatigue of metals
Current Research Projects	Evolution of dislocation structures during cyclic deformation of metals and alloys

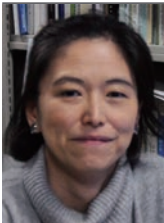
	Hiroshi Funakubo
	Professor
	funakubo.h.aa ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Functional inorganic films / Ferroelectric materials / CVD / Inorganic device
Current Research Projects	Ferroelectric devices / Inorganic capacitor/film devices / Thermoelectric devices / Thin Film SOFC

	Yoshihiro Gohda
	Associate Professor
	gohda.y.ab ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Condensed matter theory / Computational materials science / Magnetic metals / Nano-interfaces
Current Research Projects	Theory of permanent magnets / Theory of surface nanostructures

	Michikazu Hara
	Professor
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	Major Materials Science and Engineering / Energy Science and Engineering
Research Field	Catalyst / Chemical reaction / Inorganic / Heterogeneous catalysis
Current Research Projects	JST, ALCA / JST, ACCEL / JST, ASTEP STAGEIII / NexTEP-B


	Teruaki Hayakawa
	Professor
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	Major Materials Science and Engineering
Research Field	Polymer Synthesis / Polymer Thin Films / Self-Organizing Polymeric Materials / Directed Self-Assembly
Current Research Projects	Precise Synthesis of Block Copolymers / Directed Self-Assembly / Nano-Defect Management For Block Copolymer Lithography / Nanoporous Polymeric Materials


	Yuhei Hayamizu
	Associate Professor
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	Major Materials Science and Engineering / Human Centered Science and Biomedical Engineering
Research Field	Bio-Nano Interface / Peptide Self-Assembly / 2D nanomaterials / Biosensors
Current Research Projects	Bio-Nano Interface / Peptide Self-Assembly / 2D nanomaterials / Biosensors


	Miyuki Hayashi
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Physicochemical properties of Melts in Metallurgy / Ironmaking process / Environmentally Friendly High Temperature Process
Current Research Projects	Thermochemical properties and structures of molten silicates containing iron ions / Utilization of low grade iron ore / Development of new iron ore sinters aiming for CO ₂ emission reduction


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	Tomohiro Hayashi
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	<div>Major</div> Human Centered Science and Biomedical Engineering / Materials Science and Engineering
<div>Research Field</div>	Biointerfaces / Surface & interface science / Scanning probe microscopy / Nanophotonics
<div>Current Research Projects</div>	Development of atomic force microscopes / Biomaterials informatics / Single-molecule force and vibrational spectroscopy


	Hidenori Hiramatsu
	Professor
	hiramatsu.h.aa ● m.titech.ac.jp
	<div>Major</div> Materials Science and Engineering
<div>Research Field</div>	Thin film growth / Optoelectronic properties / Superconductivity / Optoelectronic devices
<div>Current Research Projects</div>	Nitride-, chalcogenide-, and oxide-semiconductors / Pnictide superconductors


	Takuya Hoshina
	Associate Professor
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	<div>Major</div> Materials Science and Engineering
<div>Research Field</div>	Dielectric and ferroelectric materials / Phonon analysis / Terahertz measurement / Computational and information science
<div>Current Research Projects</div>	Development of novel ferroelectric materials / Terahertz dielectric spectroscopy / Computational and information science for material design


	Hideki Hosoda
	Professor
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	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering / Human Centered Science and Biomedical Engineering
<div>Research Field</div>	Functional materials / Alloy design / Phase stability / Shape change materials / Intermetallics / Composites / Biomaterials / Microstructural control
<div>Current Research Projects</div>	Dynamics of domain homo interface in shape change materials / Development of advanced medical devices based on shape memory alloys / Development of Ti-based or precious-metal-based functional biomaterials / Development of ferromagnetic-shape-memory-alloy-based smart-composites


	Toshiyuki Ikoma
	Professor
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	<div>Major</div> Human Centered Science and Biomedical Engineering / Materials Science and Engineering
<div>Research Field</div>	Nanomedicine / Biosensing / Regenerative medicine / Inorganic material
<div>Current Research Projects</div>	Multifunctional nanomaterials for theranostics / Calcium phosphate and collagen composites for tissue engineering / hydroxyapatite and silver composites for antimicrobial biomedical devices / Biointerface of materials and cells

	Tomonari Inamura
	Professor
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	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div>	Phase transformation in metals / Crystallography / Metallography / Shape memory alloy
<div>Current Research Projects</div>	Super long life shape memory alloy, Biomedical titanium alloy

	Ken Ishikawa
	Associate Professor
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	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div>	Optoelectronic organic materials / Biomimetic organic materials
<div>Current Research Projects</div>	Organic solar cells / Organic transistors / Liquid crystals / Structural color materials


	Toshihiro Isobe
	Associate Professor
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	<div>Major</div> Materials Science and Engineering
<div>Research Field</div>	Inorganic materials / Environmental materials / Separation technology / Ceramics manufacturing process
<div>Current Research Projects</div>	Development of environmental purification material / Development of negative thermal expansion materials / Development of ceramic separation membrane

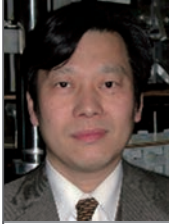
	Keigo Kamata
	Associate Professor
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	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div>	Catalyst / Chemical reaction / Inorganic / Heterogeneous catalysis
<div>Current Research Projects</div>	Catalyst / Chemical reaction / Inorganic / Heterogeneous catalysis


	Toshio Kamiya
	Professor
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	<div>Major</div> Materials Science and Engineering
<div>Research Field</div>	Materials science / Semiconductor devices / Simulation / Electronic structure and carrier transport
<div>Current Research Projects</div>	Design and development of new oxide semiconductors / Materials design using first-principles calculations / Development of thin-film transistors and light-emitting devices


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	Takayoshi Katase
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	Major Materials Science and Engineering
Research Field	Oxide electronics / Energy harvesting / Optoelectronic device / Superconductivity / Electrochemistry
Current Research Projects	High performance thermoelectric materials using thin film interface / Multifunctional memory device / High-temperature superconducting materials


	Hitoshi Kawaji
	Professor
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	Major Materials Science and Engineering
Research Field	Inorganic / Solid state physics / Functional materials / Thermal properties
Current Research Projects	Phase transition mechanism of multiferroic materials / Heat capacity, thermal expansion and thermal conductivity of ceramics / Phase transition of materials trapped in nanospaces


	Kenichi Kawamura
	Associate Professor
	kawamura.k.ab ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Solid chemistry / High temperature oxidation of metals / Electrochemistry in solid
Current Research Projects	Referenceless zirconia oxygen sensor / Electrochemical protection for high-temperature oxidation of metal

	Yoshisato Kimura
	Professor
	kimura.y.ac ● m.titech.ac.jp
	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Intermetallic compounds / Thermoelectric materials / Phase diagrams / Microstructure and lattice defects control
Current Research Projects	Heat resistant alloys design based on intermetallic phases / Thermoelectric materials design based on phase equilibria / Reliability evaluation of thermoelectric materials / Deformation behavior of intermetallic alloys


	Tetsuo Kishi
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Optical materials and devices / Laser processing / Adhesion science / Glass materials
Current Research Projects	Micro glass melting system for combinatorial science / Ultra-thin glass laminate seal for medical applications / Microsphere-based integrated optical circuits

	Yoshitaka Kitamoto
	Professor
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	Major Human Centered Science and Biomedical Engineering / Materials Science and Engineering
Research Field	Magnetic materials and devices / Biomaterials and biodevices / Nanomaterials and nanodevices
Current Research Projects	Nanomedicine materials and devices / Biomagnetic nanoparticles and clusters

	Masaaki Kitano
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Catalysis / inorganic material / Ammonia synthesis / Acid and base catalyst
Current Research Projects	Ammonia synthesis using electride-based catalyst / Synthesis of alloy nanoparticle catalyst / Selective hydrogenation reactions


	Equo Kobayashi
	Associate Professor
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	Major Materials Science and Engineering / Human Centered Science and Biomedical Engineering
Research Field	Non-ferrous metals / Biomedical materials / Functional materials / Standardization of medical devices
Current Research Projects	Alloy designing of biomedical beta type Ti alloys / Biodegradable Mg-matrix composite / Microstructural control of novel Al alloys / High performance Cu alloys


	Satoru Kobayashi
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	Major Materials Science and Engineering
Research Field	Heat resistant alloys/steels / Microstructure control / Intermetallic alloys / Ferrous materials
Current Research Projects	Novel Ni base superalloy design / Creep deformation mechanisms in Ni based wrought superalloys / Microstructural control in heat resistant ferritic steels with Laves phase precipitation

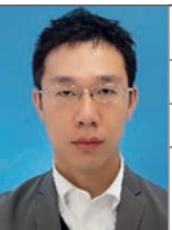
	Yoshinao Kobayashi
	Professor
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	Major Nuclear Engineering / Materials Science and Engineering
Research Field	Safety metallurgy for nuclear reactor / Metal smelting and refining / Metal recycle / Iron and steel making
Current Research Projects	Accessibility for removal of fuel debris in BWR plant after severe accident / Elements Strategy Initiative Project for Magnetic Materials / Thermodynamics and kinetics of steelmaking slags toward effective and high speed refining


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	Major Materials Science and Engineering
Research Field	Molecular devices / Single-electron devices / Scanning probe microscopy / Nanoscale electrical properties
Current Research Projects	Molecular Transistors / Single-Electron Transistors / Nanoscale Electro- and Electroless-Plating / Analysis of Electrical Properties of Nanomaterials by Scanning Tunneling Microscopy (STM) and Scanning Tunneling Spectroscopy (STS)


	Akifumi Matsuda
	Associate Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Electronic and energy materials / Inorganic thin films and nanomaterials / Atomic-scale material processing / New materials development
Current Research Projects	Synthesis of glass-based thermoelectric materials / low-temperature epitaxy of wide band-gap semiconductors / Self-assembled nanomaterials


	Satoru Matsuishi
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	Major Materials Science and Engineering
Research Field	Solid state chemistry / Inorganic functional materials / Electronic Structure Analysis
Current Research Projects	Functional mixed-anion materials / Inorganic phosphor materials / Superconductor / Electrides


	Hidetoshi Matsumoto
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Physical chemistry of organic materials / Nanofibers and nanomaterials / Polymer membranes and thin films / Energy conversion and storage
Current Research Projects	Nanocomposite membranes / Nanocomposite electrolytes / Functional thin films / Functional nanofibers


	Nobuhiro Matsushita
	Professor
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	Major Materials Science and Engineering
Research Field	Solution process / Functional ceramics / Electronic materials / Biomedical materials
Current Research Projects	Solution-processed transparent conductive oxide film / Conducted noise suppressing material in GHz range / Nanostructure fabrication for solid oxide fuel cells / Surface modification for nanostructured bioactive interface / Sensors device using ceramics electrode

	Sachiko Matsushita
	Associate Professor
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	Major Materials Science and Engineering / Energy Science and Engineering
Research Field	Energy conversion / Colloid / Thermoelectric / Plasmon
Current Research Projects	Sensitized thermal cell / Plasmonic color

	Tsuyoshi Michinobu
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Organic material / Polymer synthesis / Semiconducting polymer / Organic electronics
Current Research Projects	High mobility organic semiconducting polymers / Fluorescent semiconducting polymer dots / Crack detection paints


	Masahiro Miyauchi
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Photoelectrochemistry / Catalysis / Semiconductor / Wet chemical synthesis
Current Research Projects	Photocatalysis / Solar cell / Artificial photosynthesis / Methane reforming


	Takehiko Mori
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Organic electronics / Organic transistors / Organic conductors / Solid-state physical chemistry
Current Research Projects	New organic transistor materials / Single-crystal organic transistors


	Junko Morikawa
	Professor
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	Major Human Centered Science and Biomedical Engineering / Materials Science and Engineering
Research Field	Polymer physics / Thermophysical properties measurements / Thermal management / Thermal properties of materials / Polymer processing
Current Research Projects	Multi-spectrum thermal imaging of polymer composite / Heat storage materials / Materials informatics


Materials Science and Engineering


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	Shinji Muraishi
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Light metals and alloys / Electron microscopy / Dislocation dynamics / Thin metal films / Magnetic nano particles
Current Research Projects	Microstructural controlling of aluminum alloys / In-situ TEM observation of dislocation motion in alloys / Micromechanics based dislocation dynamics simulation / Characterization and magnetic anisotropy of nano-magnets


	Yuta Nabae
	Associate Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Organic and polymeric materials for catalysis
Current Research Projects	Pt-free fuel cell catalysts/ mesoporous carbon / hyperbranched polymers for catalysis

	Nobuo Nakada
	Professor
	nakada.n.aa ● m.titech.ac.jp
	Major Materials Science and Engineering
Research Field	Metals and alloys / Iron and steel / Metallurgy / Mechanical property
Current Research Projects	Microstructural control for steels with excellent mechanical properties / Relationship between microstructure and mechanical property in structural metals and alloys / Thermomechanical processing and phase transformations


	Akira Nakajima
	Professor
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	Major Materials Science and Engineering
Research Field	Inorganic environmental materials / Surface wettability control / Ceramics processing
Current Research Projects	Superwettability / Dynamic wettability / Photocatalyst


	Kazutaka Nakamura
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Solid state physics with laser / Laser science / Ultrafast phenomena / Inorganic materials science
Current Research Projects	Coherent control of electron-phonon coupled system

	Yoshio Nakamura
	Professor
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	Major Materials Science and Engineering
Research Field	Diffraction crystallography / Electron microscopy / Physical properties of thin film / Nanohetero structure
Current Research Projects	stress measurement of thin film / electronic state of magnetic alloy / in-situ X-ray diffraction

	Kan Nakatsuji
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Surface and interface physics / Physics at metal surfaces / Nano-structures / Photoelectron spectroscopy
Current Research Projects	Electronic structure of Bi-related ultra-thin films / Hydrogen adsorption on metal surfaces


	Fumiyasu Oba
	Professor
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	Major Materials Science and Engineering
Research Field	Computational materials science / Inorganic materials science / Electronic materials / Energy materials
Current Research Projects	Computational exploration of novel semiconductors / Systematic investigation of lattice defects in semiconductors


	Susumu Onaka
	Professor
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	Major Materials Science and Engineering
Research Field	Physical metallurgy / Deformation and fracture / Strength / Micromechanics
Current Research Projects	Control of microstructures by severe plastic deformation / Micromechanical analysis on deformation behavior of materials / Modeling of microstructural changes in metals and alloys


	Yukio Ouchi
	Professor
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	Major Materials Science and Engineering
Research Field	Physical chemistry and electrochemistry of ionic liquids / Surface Science / Nonlinear optical spectroscopy / Photoelectron emission spectroscopy /
Current Research Projects	Surface and interface chemistry of ionic liquids / Electronic structural control of ionic liquids / Polymer-ionic liquid composites /


Materials Science and Engineering


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	Toshiaki Ougizawa
	Professor
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	Major Materials Science and Engineering
Research Field	Physical properties of organic materials / Polymer alloys / Composites / Interfacial adhesion
Current Research Projects	Control of structure and properties in multicomponent polymer systems / Interfacial structure and adhesion in polymeric systems


	Yoshimitsu Sagara
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Supramolecular Chemistry / Organic Functional Materials / Mechanosensing Materials
Current Research Projects	Supramolecular Mechanophores / Mechanoresponsive Luminescence


	Takumi Sannomiya
	Associate Professor
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	Major Materials Science and Engineering / Energy Science and Engineering / Human Centered Science and Biomedical Engineering
Research Field	Transmission electron microscopy / Nano optical materials / Plasmonics / Biosensors
Current Research Projects	Cathodoluminescence on Plasmonic Nanostructures


	Takao Sasagawa
	Associate Professor
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	Major Materials Science and Engineering / Energy Science and Engineering
Research Field	Inorganic electronic material / Superconductivity / Spintronics / Novel nanomaterial
Current Research Projects	Exploration of innovative electronic materials such as topological insulators and superconductors / Computational material search and design / Single-crystal growth / Magnetotransport and spectroscopic measurements.


	Hiroyo Segawa
	Specially Appointed Professor
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	Major Materials Science and Engineering
Research Field	Glass science / Optical materials / Inorganic-organic hybrid materials / Anodization
Current Research Projects	Synthesis of functional oxynitride glasses / Luminescent glass materials / Functional alumina films via anodization

	Ji Shi
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Metal physics / Thin film technology / Magnetic thin films / Nanohetero structures
Current Research Projects	Design of functional nanohetero structures / Interface interactions in nanohetero structures / Perpendicular exchange bias / Magnetic semiconductors

	Masatoshi Shioya
	Associate Professor
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	Major Materials Science and Engineering
Research Field	Physical properties / Structure analysis / Fibers / Composites
Current Research Projects	Structure changes of polymeric materials under stress as measured by synchrotron radiation X-ray scattering / Intrinsic strength of carbon fibers / Effects of carbon nanofiller-dispersions on physical properties of elastomers and adhesives


	Masato Sone
	Professor
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	Major Human Centered Science and Biomedical Engineering / Energy Science and Engineering Materials Science and Engineering
Research Field	Biomedical materials / Bio-MEMS / Biosensor / Electrodeposition / Wearable sensor / Hybrid materials
Current Research Projects	Material design & the mechanical property evaluation of electrodeposited gold for high sensitive inertia detection device / Material design & evaluation of metal / polymer hybrid structure for wearable sensor


	Masahiro Susa
	Professor
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	Major Energy Science and Engineering / Materials Science and Engineering
Research Field	Physical chemistry of materials / Steelmaking process / Thermophysical properties measurements
Current Research Projects	Thermophysical properties measurements of iron oxide scale on steel / Water droplet boiling on steel surface / Mould flux designing for high speed continuous casting of steel


	Eiji Tada
	Professor
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	Major Materials Science and Engineering
Research Field	Electrochemistry / Corrosion science / Surface treatment / Metallurgy
Current Research Projects	Environmentally induced cracking of metallic materials / Galvanic corrosion of metallic joints / Numerical simulation of aqueous corrosion of metals and alloys


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	Masaki Tahara
	Associate Professor
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	<div>Major</div> Materials Science and Engineering / Human Centered Science and Biomedical Engineering
<div>Research Field</div> Shape memory alloy / Phase transformation / Metallurgy	
<div>Current Research Projects</div> Martensitic transformation / Noble shape memory alloys / Biomedical titanium alloys	


	Masao Takeyama
	Professor
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	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div> Physical Metallurgy of Alloys and Intermetallics / High-temperature Alloy Design / Phase Equilibria and phase transformations	
<div>Current Research Projects</div> Design principle of Titanium aluminides, super heat-resistant steels, superalloys / Structure of Intermetallics / Creep Deformation of high-temperature metallic and intermetallic alloys	


	Yoshihiro Terada
	Associate Professor
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	<div>Major</div> Materials Science and Engineering
<div>Research Field</div> Heat-resistant metallic materials / High-temperature strength / Alloy development / Microstructure	
<div>Current Research Projects</div> Development of Mg-rich nanolamellar alloys / Microstructure control of Ni-based superalloys / Evaluation of precipitate morphology in superalloys / Dislocation movements in heat-resistant Mg alloys	


	Takeharu Tsuge
	Associate Professor
	tsuge.t.aa ● m.titech.ac.jp
	<div>Major</div> Human Centered Science and Biomedical Engineering / Materials Science and Engineering
<div>Research Field</div> Bio-based plastic / Biodegradable polymer / Bioprocess / Chemolithotrophic bacteria	
<div>Current Research Projects</div> Biosynthesis and characterization of structurally new microbial polyesters	


	Takaaki Tsurumi
	Professor
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	<div>Major</div> Materials Science and Engineering
<div>Research Field</div> Dielectrics / Ferroelectrics / Piezoelectrics / Electroceramics	
<div>Current Research Projects</div> Development of energy storage capacitor / Development of high temperature capacitor / Reliability of multi-layered capacitor/Development of ultrasonic transducers	

	Mitsutoshi Ueda
	Associate Professor
	ueda.m.ac ● m.titech.ac.jp
	<div>Major</div> Energy Science and Engineering / Materials Science and Engineering
<div>Research Field</div> High temperature oxidation of metallic materials / Physical chemistry at high temperature	
<div>Current Research Projects</div> High temperature steam oxidation of austenitic steels	

	Martin Vacha
	Professor
	vacha.m.aa ● m.titech.ac.jp
	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div> Nanoscale properties of organic materials / Photophysics of organic molecules / Single-molecule spectroscopy	
<div>Current Research Projects</div> Conformation and photophysics of conjugated polymers for electroluminescence / Plasmon enhancement of molecular photophysics in single hybrid nanoparticles / Photophysics of novel semiconductor and perovskite nanocrystals / Nanoscale properties of organic photon-upconversion systems	


	Takafumi Yamamoto
	Associate Professor
	yamamoto.t.br ● m.titech.ac.jp
	<div>Major</div> Materials Science and Engineering
<div>Research Field</div> Solid state chemistry / Topochemical reaction / High pressure reaction / Structural analysis	
<div>Current Research Projects</div> Topochemical synthesis / High pressure synthesis / Anion engineering	


	Tetsuji Yano
	Professor
	yano.t.aa ● m.titech.ac.jp
	<div>Major</div> Materials Science and Engineering
<div>Research Field</div> Inorganic glass materials / Photonic materials / High-temperature chemistry / Ion dynamics in materials / Nuclear waste vitrification	
<div>Current Research Projects</div> Combinatorial material processing / In situ vitrification analysis / Chemical strengthening of glass / Optical MEMS	

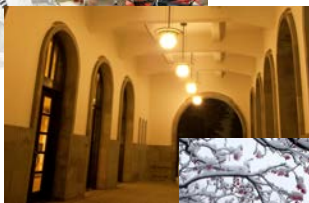
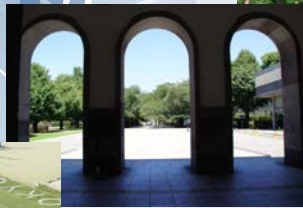
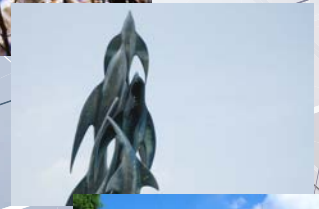
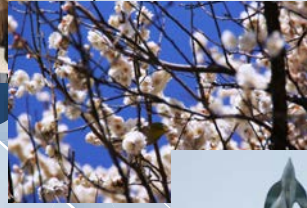
	Kouichi Yasuda
	Associate Professor
	yasuda.k.aa ● m.titech.ac.jp
	<div>Major</div> Materials Science and Engineering / Energy Science and Engineering
<div>Research Field</div> Engineering ceramics and composites / Solid mechanics / Fracture mechanics / Statistical mechanics / Weibull statistics/ Reliability	
<div>Current Research Projects</div> Stochastic analysis on ceramic granule collapse in powder compact during cold isostatic pressing / A theory on estimating internal stress during sintering of ceramic multiphase laminates / Easy-to-use torsion test Method and multiaxial fracture criteria / Weibull statistics of porous ceramics / Numerical simulation of linearity in Weibull plot	

Materials Science and Engineering

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	Katsumi Yoshida
	Associate Professor
	yoshida.k.ai ● m.titech.ac.jp
	Major Nuclear Engineering / Materials Science and Engineering
Research Field	Severe environment resistant materials / Materials for nuclear and fusion applications / Ceramic-based composites / Porous ceramics
Current Research Projects	Development of high performance ceramic-based composites / High performance porous ceramics based on microstructure control / Development of novel severe environment resistant ceramics

	Mamoru Yoshimoto
	Professor
	yoshimoto.m.aa ● m.titech.ac.jp
	Major Materials Science and Engineering / Energy Science and Engineering
Research Field	Solar cells / Inorganic thermoelectric materials / Surface nano-functionalization / Superconducting / Magnetic materials
Current Research Projects	UV Solar cells / Flexible glassy thermoelectric materials / Development of novel uniaxial pressure-induced thin film crystallization process





Department of Chemical Science and Engineering

Vision

Creating a future with no bounds using expertise in chemistry


The study of chemistry is for clarifying the laws of material conversion, for synthesizing unknown compounds, and for clarifying the mechanisms of manifestations of physical properties. In the Department of Chemical Science and Engineering, our aim is to deeply understand the basic properties and the responsiveness of substances at an atomic and molecular level, and to study the most advanced chemical technology systems. In the curriculum, study and education goals are set in order to develop individuals who are capable of pioneer chemical technologies that are essential for sustaining a rich society. Our aim is to produce scientists, engineers, and researchers who can take responsibility for society and the environment in the 21st century, and expert professionals who open new industries and civilizations.


Message from the Department Chair


We live surrounded by a multitude of chemically processed materials, such as clothes, plastics, computers and mobile phones, medicine, and fuel. The goal of the Department of Chemical Science and Engineering is to deeply understand chemical phenomena in all their forms, from research on atomic and molecular interactions to studies on global dynamics. We endeavor to offer a leading-edge education to aspiring scientists and engineers who will build a better tomorrow.


Chemical Science and Engineering


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	Shinji Ando
	Professor
	ando.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer functional materials / Polymer spectroscopy / Polymers for optical applications / Polymer inorganic hybrid materials
Current Research Projects	Aggregation structure and optical properties of aromatic polymer films at very high pressure (~10GPa) / Molecular design, synthesis and photo-physical properties of highly fluorescent & phosphorescent polyimides / Wavelength and light intensity dependences of photoconductivity of polymer films / Structural analysis of polymer thin films using VT pMAIRS spectroscopy and synchrotron X-ray diffraction


	Saiko Aoki
	Associate Professor
	aoki.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Tribology / Lubricant chemistry / Surface modification / Surface chemistry
Current Research Projects	Friction-reducing mechanism of organic polymers having multiple adsorption sites / Tribological characteristic of a fingertip on an organic molecular film-coated surface / Synergistic friction-reducing effect between surface roughness and adsorbed molecular films


	Hajime Arai
	Professor
	arai.h.af ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Energy storage device / Electrochemistry / Material Science
Current Research Projects	Zinc Air Battery / Aqueous Battery / Advanced interfacial analysis


	Tetsuro Fuchino
	Associate Professor
	fuchino.t.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Process Systems Engineering / Process Safety Engineering and Management
Current Research Projects	Development of Process Design Rationale Based Operation Design Environment / Process Safety Information Management through Plant Lifecycle


	Takanori Fukushima
	Professor
	fukushima.t.ac ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Physical organic chemistry / Functional π -electronic materials / Functional polymer materials / Molecular assembly
Current Research Projects	Electronic and optoelectronic organic materials / Functional soft materials / New methods for materials synthesis

	Hidemine Furuya
	Associate Professor
	furuya.h.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer structure / Polymer property / Molecular simulation
Current Research Projects	Mechanism of helix-sense inversion of polyaspartates / Orientation and properties for surface-grafted polypeptides / Molecular dynamics simulations of polymer chains

	Masahiko Hara
	Professor
	hara.m.af ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering / Earth-Life Science
Research Field	Self-assembly and organic thin films / Nanotechnology / Surface and interface chemistry / Chemical evolution and origins of life
Current Research Projects	High resolution STM and AFM studies of self-assembled monolayers, bio-interfaces, and devices / Development of highly sensitive tip-enhanced and surface-enhanced optical microscopy and spectroscopy with nanostructures / Nano-spectroscopic approaches to chemical evolution and origins of life at mineral-organic interfaces


	Takuya Harada
	Associate Professor
	harada.t.an ● m.titech.ac.jp
	Major Nuclear Engineering / Chemical Science and Engineering
Research Field	Inorganic Materials / Chemical Process Engineering / CO ₂ Capture & Utilization / Low-carbon Energy System
Current Research Projects	Advanced CO ₂ Capture Process / Carbon-free Hydrogen Production / Electrochemical CO ₂ Conversion

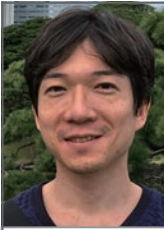
	Masaaki Hirayama
	Professor
	hirayama.m.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Solid state chemistry / Energy conversion materials / Lithium ion batteries / Design of electrochemical interface
Current Research Projects	Development of next-generation batteries (all solid-state battery / Li-ion battery / photo-rechargeable battery)


	Manabu Ihara
	Professor
	ihara.m.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Electrochemistry / Inorganic materials and devices / Chemical Engineering
Current Research Projects	Grid cooperative / distributed real time smart energy system Perovskite / Si tandem solar cells Solid oxide fuel cell / electrolyte cell


Chemical Science and Engineering


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	Takane Imaoka
	Associate Professor
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	Major Chemical Science and Engineering
Research Field	Physical chemistry / Coordination chemistry / Advanced material chemistry / Nanoparticle / Cluster science
Current Research Projects	Structural analysis and functionalization of subnanoparticles


	Shinsuke Inagi
	Professor
	inagi.s.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Organic electrosynthesis / Functional polymer / Polymer synthesis / Electrochemical device
Current Research Projects	Organic electrosynthesis / Functional polymer


	Ryohei Ishige
	Associate Professor
	ishige.r.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Structural analysis of polymeric materials based on synchrotron X-ray scattering and vibrational spectroscopies / polymeric thin film / Liquid crystalline polymers
Current Research Projects	Lyotropic liquid crystals formed by rigid functional-polymers / Anisotropy in physical properties of highly oriented polymers (optical, mechanical, and thermal properties) / Molecular orientation control in thin films. Variable temperature p-polarized multiple angle incidence resolution spectroscopy (VT-pMAIRS) for biaxially oriented thin films.


	Takashi Ishizone
	Professor
	ishizone.t.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer synthesis / Functional polymer / Organic chemistry
Current Research Projects	Living anionic polymerization of functional monomers / Synthesis of polymers containing adamantyl groups / Synthesis of water-soluble thermoresponsive polymers


	Shigekazu Ito
	Associate Professor
	ito.s.ao ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Physical organic chemistry / Organic synthesis / Catalysis
Current Research Projects	Open-shell singlet heterocycles toward functional materials, Low-coordinated phosphines for (chiral) gold catalysis

	Yukitaka Kato
	Professor
	kato.y.ae ● m.titech.ac.jp
	Major Nuclear Engineering / Chemical Science and Engineering
Research Field	Energy storage and conversion / Carbon recycling energy system / Energy carrier / Nuclear energy system
Current Research Projects	Thermochemical energy storage materials and systems / Active carbon recycling energy system / Innovative hydrogen permeation membrane / Low carbon nuclear energy system

	Gen-ichi Konishi
	Associate Professor
	konishi.g.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer science / Photochemistry / Bioimaging / Physiology
Current Research Projects	Functional Fluorescent Dye / Bioimaging / Polymer synthesis


	Shoichi Kubo
	Associate Professor
	kubo.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Polymer / Hybrid materials / Photonics / Liquid crystals
Current Research Projects	Design of aligned nanostructures for anisotropic functional materials


	Masatoshi Kubouchi
	Professor
	kubouchi.m.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Materials for chemical equipment / Composites / Epoxy resin / Smart structure / Risk Based Maintenance / Graphene
Current Research Projects	Evaluation of durability of plastic / Creation of furan resin based green composite / Mass production of high-aspect-ratio few-layer-graphene by high-speed laminar flow


	Sergei Manzhos
	Associate Professor
	manzhos.s.aa@m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Atomistic materials modeling / Machine learning / Solar cells
Current Research Projects	Machine learning for renewable energy system management Machine learning for large scale ab initio simulations. Ab initio modeling of phenomena in materials for electrochemical power sources. Computational spectroscopy.


Chemical Science and Engineering


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	Hideyuki Matsumoto
	Associate Professor
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	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Process Systems Engineering / Process Intensification / Process Informatics / Renewable Energy / Nitrogen Cycle
Current Research Projects	Development of methods and tools for synthesis / analysis and control of complex process systems Multiscale analysis and synthesis of chemical process intensified by alternative energy sources Multiscale design and control of process systems for production and utilization of hydrogen energy carrier


	Shinsuke Mori
	Associate Professor
	mori.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Plasma chemistry / Plasma surface modification / Plasma reforming / Nanomaterial synthesis
Current Research Projects	Synthesis of nanocarbon materials / Plasma surface modification / Plasma CO ₂ reforming / Ammonia synthesis by non-thermal plasma

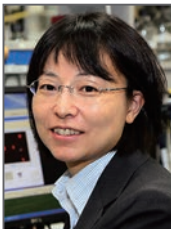
	Tetsuro Murahashi
	Professor
	murahashi.t.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Organometallic chemistry / Coordination chemistry / Catalysis / Inorganic chemistry
Current Research Projects	Synthetic inorganic and organometallic chemistry / Inorganic and Organometallic reaction chemistry

	Ken Nakajima
	Professor
	nakajima.k.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer nanomechanics / Polymer physics / Rubber/elastomer materials
Current Research Projects	nanomechanical property mapping by atomic force microscope on various polymeric materials / development of nanorheological measurement based on atomic force microscope, Investigation of rubber-filler interface / heterogeneous stress distribution of stretched rubber


	Ryuhei Nakamura
	Professor
	nakamura.r.am ● m.titech.ac.jp
	Major Earth-Life Science / Chemical Science and Engineering
Research Field	Chemical Science and Engineering / Energy Science and Engineering
Current Research Projects	Origin of Life, Systems Chemistry, Electrochemistry at Deep-Sea Hydrothermal Vents

	Kazuko Nakazono
	Associate Professor
	nakazono.k.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Supramolecular Chemistry / Polymer Chemistry / Material Chemistry
Current Research Projects	Development of polymer materials with supramolecular structure / Synthesis of new polymer materials by polymer reaction

	Akira Ohtomo
	Professor
	ohtomo.a.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Materials Science and Engineering
Research Field	Inorganic solid-state chemistry / Crystal engineering / Oxide electronics
Current Research Projects	Materials and chemical research in the field of complex metal oxides and hydrides for novel electronic and magnetic properties / Epitaxial growth of oxide semiconductors for visible-light driven water splitting and power electronics applications / Electrochemical induction of normal to superconducting transitions


	Mina Okochi
	Professor
	okochi.m.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Human Centered Science and Biomedical Engineering / Earth-Life Science
	Biotechnology / Peptide technology / Bioelectronics / Biomedical engineering
	Peptide-based biosensors / Screening of functional peptides / IgE epitope analysis for allergy analysis


	Shinichi Ookawara
	Specially Appointed Professor
	ookawara.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Microreactor / Microfluidic device / CFD
Current Research Projects	3D (Printed) Micro / Mini-Fluidic Devices for Chemical, Environmental and Energy process applications


	Hideyuki Otsuka
	Professor
	otsuka.h.ab ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Polymer chemistry / Polymer reactions / Dynamic covalent chemistry / Chemistry of soft materials
Current Research Projects	Polymer reactions based on dynamic covalent chemistry / Preparation and evaluation of self-healing polymers / Synthesis and characterization of mechanochromic polymers


Chemical Science and Engineering


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	Reiko Saito
	Associate Professor
	saito.r.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Polymer synthesis / Polymer reaction / Composites / Nano materials
Current Research Projects	Developing novel organic-silica nanocomposites / Developing novel functional polymers for energy devices / Developing nano-particles / Controlling nanostructures of organic-silica nanocomposites / Controlling radical polymerization of multi-vinyl monomers


	Kotaro Sato
	Professor
	sato.h.k.ad ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Polymer Synthesis / Precision Polymerization / Living Polymerization / Bio-Based Polymers
Current Research Projects	Development of Unprecedented Precision Polymerization / New Polymer Materials by Means of Precision Polymerization / Precision Polymerization of Renewable Monomers

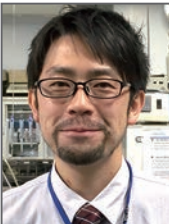
	Tomohisa Sawada
	Associate Professor
	sawada.t.ak ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Supramolecular chemistry / Organic chemistry / Coordination chemistry
Current Research Projects	Metal-induced peptide folding and assembly / Advanced molecular topologies

	Toshiki Sawada
	Associate Professor
	sawada.t.ab ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Biopolymer / Soft material / Biomolecular chemistry / Bioengineering
Current Research Projects	Development of protein / filamentous virus-based functional soft materials based on control of their self-assembly and functionalization through genetic engineering / machine learning.


	Hidetoshi Sekiguchi
	Professor
	sekiguchi.h.ab ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Plasma processing / Reaction engineering with high energy density field / Thermal energy engineering / Environmental chemical engineering
Current Research Projects	Bioenergy conversion using external energetic fields including plasma, ultrasound, and molten salt / Preparation of functional materials using various plasmas / Chemical energy storage

	Takeshi Serizawa
	Professor
	serizawa.t.ab ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Biopolymer / Natural polymer / Self-assembly / Surface and interfacial chemistry
Current Research Projects	Enzymatic synthesis and applications of cellulose oligomers and their derivatives / Identification and applications of polymer-binding peptides / Assembly and applications of filamentous bacteriophages

	Ryota Shimizu
	Associate Professor
	shimizu.r.af ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Solid-state chemistry / Solid-state physics / Functional inorganic thin films / Materials informatics with robotics
Current Research Projects	Functional inorganic thin films with anion engineering / Solid-state batteries / High-speed materials discovery using machine learning and robotics


	Yusuke Shimoyama
	Professor
	shimoyama.y.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	CO ₂ utilization / Separation process / Material process Current Research Projects: Metal-CO ₂ battery / Material process in high-pressure CO ₂ / Bioactive and pharmaceutical separation in CO ₂ solvent
Current Research Projects	Supercritical extraction of emulsion for nanosuspension / sol-gel reaction in supercritical carbon dioxide / Supercritical drying for carbon electrode fabrication


	Atsushi Shishido
	Professor
	shishido.a.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Polymer / Light / Liquid crystal / Material
Current Research Projects	Design of functional films for photonic and mechanical applications


	Yoshiaki Shoji
	Associate Professor
	shoji.y.ac ● m.titech.ac.jp
	Major Chemical Science and Engineering
Research Field	Organic Synthesis / Main-Group Chemistry / Supramolecular Chemistry
Current Research Projects	Development of functional π -electronic materials / Functional molecular assembly / Highly reactive main-group species

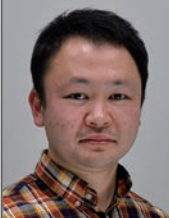
Chemical Science and Engineering


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	Kota Suzuki
	Associate Professor
	suzuki.k.bf ● m.titech.ac.jp
	<div>Major</div> Energy Science and Engineering / Chemical Science and Engineering
<div>Research Field</div> Solid State Chemistry / Energy Conversion Materials / Novel Energy Storage Device, and Material Search by Machine Learning	
<div>Current Research Projects</div> Development of Machine Learning Technique for Material Search of Lithium Ionic Conductors Liquid Phase Synthesis of Solid Electrolyte for Lithium-Sulfur Battery Cathodes Interfacial Reaction Analysis of All-Solid-State Lithium Battery Using Epitaxial Model Electrodes	


	Teruoki Tago
	Professor
	tago.t.aa ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering / Energy Science and Engineering
<div>Research Field</div> Chemical engineering / Catalysis and reaction engineering / Petrochemical / Biomass	
<div>Current Research Projects</div> Synthesis of metal-encapsulated zeolites and their application for catalytic reaction / Synthesis of carbon supported metal catalysts and their application for biomass conversion	


	Toshiro Takao
	Associate Professor
	takao.t.aa ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering
<div>Research Field</div> Organometallic chemistry / Coordination chemistry / Cluster chemistry / Chemistry of catalysis	
<div>Current Research Projects</div> Development of cluster catalysis / Synthesis of mixed-ligand polyhydrido cluster / Synthesis of heterometallic cluster / Activation of small molecules using polyhydrido cluster	


	Koichiro Takao
	Associate Professor
	takao.k.ac ● m.titech.ac.jp
	<div>Major</div> Nuclear Engineering / Chemical Science and Engineering
<div>Research Field</div> Coordination chemistry of actinides / Ionic liquids / Nuclear fuel cycle / Treatment and disposal of nuclear wastes	
<div>Current Research Projects</div> Fundamental Study on Advanced Nuclear Fuel Reprocessing Based on Actinide Coordination Chemistry / Retrieval of Long-lived Fission Products from Vitrified Nuclear Wastes / Microwave-assisted Solvent Extraction of Platinum Group Metals / Exploring Catalytic Activity of Uranyl Complexes	


	Masayoshi Tanaka
	Associate Professor
	tanaka.m.bn ● m.titech.ac.jp
	<div>Major</div> Human Centered Science and Biomedical Engineering / Chemical Science and Engineering
<div>Research Field</div> Bionanotechnology/Biomineralization/Proteomics/Biomedical engineering/Microbiology	
<div>Current Research Projects</div> Screening technique development of membrane curvature sensors / Green synthesis of functional nanomaterials / Drug target screening/Photothermal therapy	

	Hiroshi Tanaka
	Associate Professor
	tanaka.h.ae ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering
<div>Research Field</div> Natural product chemistry / Synthetic organic chemistry / Chemical biology / Carbohydrate chemistry	
<div>Current Research Projects</div> Synthesis of 18F PET tracers / Synthesis of food-orientated natural products / Synthesis of biologically important carbohydrates	

	Katsunori Tanaka
	Professor
	tanaka.k.dg ● m.titech.ac.jp
	<div>Major</div> Human Centered Science and Biomedical Engineering / Chemical Science and Engineering
<div>Research Field</div> Synthetic Chemistry / Natural Products Chemistry / Glycochemical Biology / In Vivo Chemistry	
<div>Current Research Projects</div> In Vivo Glycan Delivery System / In Vivo Molecular Imaging / In Vivo Metal Catalysis and Metalloenzyme / In Vivo Synthesis of Natural Products, Drugs and Functional Materials / Therapeutic In Vivo Synthetic Chemistry	


	Ken Tanaka
	Professor
	tanaka.k.cg ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering
<div>Research Field</div> Organic synthesis / Organometallic chemistry / Asymmetric catalysis	
<div>Current Research Projects</div> (Asymmetric) Catalysis for Construction of Non-Centro Chiralities / (Asymmetric) Catalysis for Construction of Multiple-Centro Chiralities / (Asymmetric) Catalysis Using Cationic Transition-Metal Complexes / (Asymmetric) Synthesis of Novel Organic Molecules	


	Izumi Taniguchi
	Associate Professor
	taniguchi.i.aa ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering / Energy Science and Engineering
<div>Research Field</div> Nanostructure material processing / Energy storage device / Aerosol technology / Powder engineering / Chemical engineering	
<div>Current Research Projects</div> Synthesis of nanostructured electrodes for lithium sulfur and lithium ion batteries by using aerosol and powder technologies / Development of novel energy storage devices	


	Masatoshi Tokita
	Professor
	tokita.m.aa ● m.titech.ac.jp
	<div>Major</div> Chemical Science and Engineering
<div>Research Field</div> Polymer structures / Polymer properties / Polymer liquid crystals / Soft materials	
<div>Current Research Projects</div> Creation of optical films using soft materials / Macroscopic orientation of microdomains of liquid crystalline block copolymers / Surface modification using polymer brushes / Nanoparticle dispersion using polymer brushes	

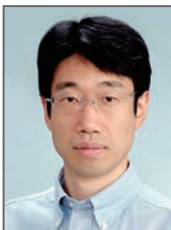
Chemical Science and Engineering

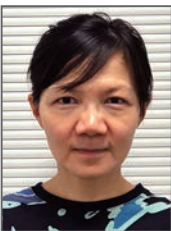
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	Ikuyoshi Tomita
	Professor
	tomita.i.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Polymer synthesis / Polymer reaction / Functional polymer / Organometallic chemistry
Current Research Projects	Synthesis of Elements-block π -Conjugated Polymers / Living Coordination Dispersion Polymerization / Three-component Polycondensation Processes


	Sakae Toyoda
	Associate Professor
	toyoda.s.aa ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Atmospheric chemistry / Earth and environmental chemistry / Material cycle analysis / Analytical chemistry
Current Research Projects	Global budget analysis of atmospheric nitrous oxide / Impact of ocean acidification on the production of nitrous oxide / Global cycle analysis of atmospheric molecular hydrogen


	Takehiko Tsukahara
	Professor
	tsukahara.t.ab ● m.titech.ac.jp
	Major Nuclear Engineering / Chemical Science and Engineering
Research Field	Nuclear Analytical Chemistry / Radioactive Waste Management / Nuclear Fuel Cycle / Functional Nanomaterial
Current Research Projects	Microfluidic-based analysis and separation of radionuclides / Creation of photonic crystal polymer for metal ion sensing / Novel phase-transition-based solvent extraction of target radionuclides


	Hiroyuki Wada
	Associate Professor
	wada.h.ac ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering / Human Centered Science and Biomedical Engineering
Research Field	Photofunctional chemistry / Nano material / Laser
Current Research Projects	Preparation of nanoparticle by laser process / Photoacoustic bioimaging by organic nanoparticles / Cancer treatment by photodynamic therapy / Quantum dot sensitized solar cell / Lithium ion battery using nanoparticles for electrode / Nanophosphors for white light emitting diode


	Keiko Waki
	Associate Professor
	waki.k.aa ● m.titech.ac.jp
	Major Energy Science and Engineering / Chemical Science and Engineering
Research Field	Materials engineering / Chemical engineering / Electrochemistry / Battery
Current Research Projects	Engineering of carbonnanotube for battery electrode application

	Keita Yamada
	Associate Professor
	yamada.k.ag ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Isotopomics / Organic geochemistry / Environmental chemistry / Isotope geochemistry
Current Research Projects	Source identification of volatile organic compounds in the atmosphere / Development of diagnosis of disease based on stable isotopic changes in metabolites / Discrimination between natural and synthetic organic compounds in foods based on stable isotopic signatures

	Takeo Yamaguchi
	Professor
	yamaguchi.t.al ● m.titech.ac.jp
	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Chemical engineering / Fuel cell materials and systems / Bio-inspired membranes / Membrane Science and Technology
Current Research Projects	Electrolyte membranes and electro-catalysts for polymer electrolyte fuel cells and solid alkaline fuel cells / Functionalized membranes inspired from bio-systems / Materials for water splitting / Antifouling membrane materials for water treatment

	Kimihisa Yamamoto
	Professor
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	Major Chemical Science and Engineering
Research Field	Macromolecular chemistry / Inorganic chemistry / Nanoscience / Material Science
Current Research Projects	Atom hybridization / Synthesis of Subnano metal Particles / Development of Advanced Nano-materials


	Ichiro Yamanaka
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	Major Chemical Science and Engineering / Energy Science and Engineering
Research Field	Post-fuel cell / Energy conversion chemistry / Material conversion chemistry / Green chemistry
Current Research Projects	Direct conversion of methane to higher hydrocarbons by new catalyst / Direct electrochemical synthesis of organic hydride by new electrocatalyst

	Toshiyuki Yokoi
	Associate Professor
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	Major Chemical Science and Engineering
Research Field	Nanospace catalysis / Zeolites / Catalytic reaction chemistry / Green chemistry
Current Research Projects	Direct conversion of methane into chemicals Conversion of methanol into light olefins Control of Al distribution in zeolite framework Advanced characterization of nanospace catalysts

Chemical Science and Engineering

Replace ● by @ in e-mail address upon sending e-mail.

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	<div>Major</div> <div>Chemical Science and Engineering</div>
<div>Research Field</div>	Transport phenomena / Membrane separation / Mixing operation
<div>Current Research Projects</div>	Modeling of flow characteristics of mixing equipment for chemical reaction / Optimum design and operational conditions of membrane separation module for blood purification / Modeling of transport phenomena in membrane separation processes in food industry

	Michito Yoshizawa
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	<div>Major</div> <div>Chemical Science and Engineering</div>
<div>Research Field</div>	Supramolecular chemistry / Nanospace chemistry / Material chemistry
<div>Current Research Projects</div>	Development of functional polyaromatic nanospaces



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