Professor Profiles 2021

School of Materials and Chemical Technology

Tokyo Institute of Technology

Encompassing the Disciplines of Science

Tokyo Tech boasts top-level research teams in the fields of chemical and materials science and engineering, with some excellent achievements to their name. In the School of Materials and Chemical Technology, students learn how to improve our lives and solve environmental, resource, and energy issues by creating new substances and materials of direct use to society, and creating new methods for their production. The School consists of two departments — Chemical Science and Engineering, with its roots in molecular chemistry, and Materials Science and Engineering, with its roots in solid materials. Students will learn a broad range of basic theories related to matter and materials, and how these theories can be applied to better support our lives. We also have affiliated research centers designated as national research hubs for research in chemistry and materials, where students come into contact with and engage in cutting-edge research as they advance through their studies.

Message from the Dean

Our School is dedicated to creating new functions based on a solid understanding of the structure and properties of matter. It also aims to nurture researchers and engineers capable of discovering principles and methods for controlling the dynamic chemical processes of substances. This is a place for top-level researchers to interact and cooperate, and for educating young people willing to solve issues related to the environment, energy, resources, safety, and health through work with various materials. Get involved with learning and research that creates a civilization in which all living things can prosper.

Masahiro Susa

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 teach and research cutting-edge materials science. To help us with this, we have done some restructuring. Before the education reform, the Departments of Metallurgical Engineering, Organic and Polymeric Materials, and Inorganic Materials formed what was called the 2nd Academic Group (for undergraduate students). Along with this, many departments in different graduate schools dealt with materials. Namely, these were the Department of Metallurgy and Ceramics Science, Part of the Department of Organic and Polymeric Materials, Department of Innovative and Engineered Materials, and Department of Materials Science and Engineering. We brought all of these establishments together under a single roof to comprehensively study materials science. Welcome to the new Department of Materials Science and Engineering.

Metallurgy and Surface Science

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

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

fujii.t.af ● m.titech.ac.jp

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

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

Miyuki Hayashi

Associate Professor

hayashi ● mtl.titech.ac.jp

Major: Energy Science and Engineering / Materials Science and Engineering

Research Field: Physicochemical properties of Melts in Metallurgy / Ironmaking process / Envrionmentally Frinedly High Temperature Process

Current Research Projects: Thermochemical properties and strucutres of molten silicates containing iron ions / Utilization of low grade iron ore / Development of new iron ore sinters aiming for CO_2 emisstion reduction

Hideki Hosoda

Professor

hosoda.h.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering / Human Centered Science and Biomedical Engineering

Research Field: Functional materials / Alloy design / Phase stability / Shape change materials / Intermetallics / Composites / Biomaterials / Microstructural control

Current Research Projects: Dynamics of domain homo interface in shape change materials / Development of advanced medical devices based on shape memory alloys / Development of Ti-based or precisous-metal-based functional biomaterials / Development of ferromagnetic-shape-memory-alloy-based smart-composites

Tomonari Inamura

Professor

inamura.t.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Phase transformation in metals / Crystallography / Metallography / Shape memory alloy

Current Research Projects: Super long life shape memory alloy, Biomedical titanium alloy

Kenichi Kawamura

Associate Professor

kawamura ● mtl.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 / Reliablity evaluation of thermoelectric materials / Deformation behavior of intermetallic alloys

Equo Kobayashi

Associate Professor

equo ● mtl.titech.ac.jp

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

Associate Professor

kobayashi.s.be ● m.titech.ac.jp

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

Metallurgy and Surface Science

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Yoshinao Kobayashi

Professor

kobayashi.y.at ● m.titech.ac.jp

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

Shinji Kumai

Professor

kumai.s.aa ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Light metals and alloys / Advanced casting process / Dissimilar metal joining / Fatigue and fracture

Current Research Projects: Similar- and dissimilar-metal joining by using advanced impact welding methods / Formation mechanism of wavy interface in impact welded metals / Fabrication of advanced aluminum alloy sheets by using vertical-type high-speed twin-roll casting / Color metallography of aluminum alloys by using special etchant

Shinji Muraishi

Associate Professor

muraishi.s.aa ● m.titech.ac.jp

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

Nobuo Nakada

Associate 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

Yoshio Nakamura

Professor

nakamura.y.ab ● m.titech.ac.jp

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 dffraction

Kan Nakatsuji

Associate Professor

nakatsuji.k.aa ● m.titech.ac.jp

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

Susumu Onaka

Professor

onaka.s.aa ● m.titech.ac.jp

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

Takumi Sannomiya

Associate Professor

sannomiya.t.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering / Human Centered Science and Biomedical Engineering

Research Field: Transmission electron microscopy / Nanooptical materials / Plasmonics / Biosensors

Current Research Projects: Cathodoluminescence on Plasmonic Nanostructures

Ji Shi

Professor

shi.j.aa ● m.titech.ac.jp

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

Masato Sone

Professor

sone.m.aa ● m.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Materials Science and Engineering / Energy 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

Metallurgy and Surface Science

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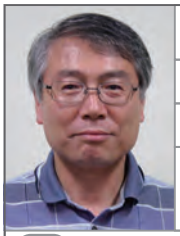

Masahiro Susa

Professor

susa.m.aa ● m.titech.ac.jp

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

tada.e.aa ● m.titech.ac.jp

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

Masaki Tahara

Associate Professor

tahara.m.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Human Centered Science and Biomedical Engineering

Research Field: Shape memory alloy / Phase transformation / Metallurgy

Current Research Projects: Martensitic transformation / Noble shape memory alloys / Biomedical titanium alloys

Masao Takeyama

Professor

takeyama ● mtl.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Physical Metallurgy of Alloys and Intermetallics / High-temperature Alloy Dsign / Phase Equilibria and phase transformations

Current Research Projects: Design principle of Titanium aluminides, super heat-resistant steels, superalloys / Structure of Intermetallics / Creep Deformation of high-tempereaure metallic and intermetallic alloys

Yoshihiro Terada

Associate Professor

terada.y.ab ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Heat-resistant metallic materials / High-temperature strength / Alloy development / Microstructure

Current Research Projects: Devolopment of Mg-rich nanolamellar alloys / Microstructure control of Ni-based superalloys / Evaluation of precipitate morphology in superalloys / Dislocation movements in heat-resistant Mg alloys

Mitsutoshi Ueda

Associate Professor

mueda ● mtl.titech.ac.jp

Major: Energy Science and Engineering / Materials Science and Engineering

Research Field: High temperature oxidation of metallic materials / Physical chemistry at high temperature

Current Research Projects: High temperature steam oxidation of austenitic steels

Organic and Polymeric Materials

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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

Teruaki Hayakawa

Professor

hayakawa.t.ac ● m.titech.ac.jp

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

hayamizu.y.aa ● m.titech.ac.jp

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

Ken Ishikawa

Associate Professor

ishikawa.k.ab ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Optelectronic organic materials / Biomimetic organic materials

Current Research Projects: Organic solar cells / Organic transistors / Liquid crystals / Structural color materials

Hidetoshi Matsumoto

Professor

matsumoto.h.ac ● m.titech.ac.jp

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

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

Takehiko Mori

Professor

mori.t.ae ● m.titech.ac.jp

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

morikawa.j.aa ● m.titech.ac.jp

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

Yukio Ouchi

Professor

ouchi.y.ab ● m.titech.ac.jp

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 /

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 propertes in multicomponent polymer sysytems / Interfacial strucure and adhesion in polymeric systems

Organic and Polymeric Materials

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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

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

Martin Vacha

Professor

vacha.m.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Nanoscale properties of organic materials / Photophysics of organic molecules / Single-molecule spectroscopy

Current Research Projects: 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

Inorganic Materials

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Masaki Azuma

Professor

mazuma ● msl.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

Yasuo Azuma

Associate Professor

azuma.y.ac ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Nanodevice / Molecular electronics / Nanoparticle

Current Research Projects: Nanofabrication by electron-beam lithography / Bottom-up single-electron transistors / Electrical characteristics of nanomaterials

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

Michikazu Hara

Professor

hara.m.ae ● m.titech.ac.jp

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

Tomohiro Hayashi

Associate Professor

hayashi.t.al ● m.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Materials Science and Engineering

Research Field: Biointerfaces / Surface & interface science / Scanning probe microscopy / Nanophotonics

Current Research Projects: Development of atomic force microscopes / Biomaterials informatics / Single-molecule force and vibrational spectroscopy

Hidenori Hiramatsu

Professor

h-hirama ● mces.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Thin film growth / Optoelectronic properties / Superconductivity / Optoelectronic devices

Current Research Projects: Nitride-, chalcogenide-, and oxide-semiconductors / Pnictide superconductors

Takuya Hoshina

Associate Professor

hoshina.t.aa ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Dielectric and ferroelectric materials / Phonon analysis / Terahertz measurement / Computational and information science

Current Research Projects: Development of novel ferroelectric materials / Terahertz dielectric spectroscopy / Computational and information science for material design

Toshiyuki Ikoma

Professor

tikoma ● ceram.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Materials Science and Engineering

Research Field: Nanomedicine / Biosensing / Regenerative medicine / Inorganic material

Current Research Projects: 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

Toshihiro Isobe

Associate Professor

isobe.t.ad ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Inorganic materials / Environmental materials / Separation technology / Ceramics manufacturing process

Current Research Projects: Development of environmental purification material / Development of negative thermal expansion materials / Development of ceramic separation membrane

Keigo Kamata

Associate Professor

kamata.k.ac ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Catalyst / Chemical reaction / Inorganic / Heterogeneous catalysis

Current Research Projects: Catalyst / Chemical reaction / Inorganic / Heterogeneous catalysis

Inorganic Materials

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Toshio Kamiya

Professor

kamiya.t.aa ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Materials science / Semiconductor devices / Simulation / Electronic structure and carrier transport

Current Research Projects: Design and development of new oxide semiconductors / Materials design using first-principles calculations / Development of thin-film transistors and light-emitting devices

Takayoshi Katase

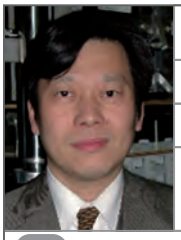
Associate Professor

katase ● mces.titech.ac.jp

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 superconduting materials



Hitoshi Kawaji

Professor

kawaji.h.aa ● m.titech.ac.jp

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

Yoshitaka Kitamoto

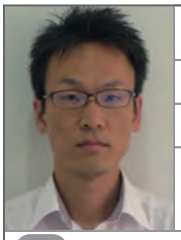
Professor

kitamoto.y.aa ● m.titech.ac.jp

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

Yu Kumagai

Associate Professor

kumagai ● msl.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Computational Materials Science / Inorganic Material Science / Electronic Structure

Current Research Projects: Development of new first-principles calculation technique / Point defects physics in inorganic materials

Yutaka Majima

Professor

majima ● msl.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Molecular devices / Single-electron devices / Scaninnng 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 (Lecturer)

matsuda.a.aa ● m.titech.ac.jp

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

Associate Professor

matsuishi ● mces.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Solid state chemistry / Inorganic functional materials / Electronic Structure Analysis

Current Research Projects: Functional mixed-anion materials / Inorganic phospher materials / Superconductor / Electrides

Nobuhiro Matsushita

Professor

matsushita.n.ab ● m.titech.ac.jp

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 / Nanostrucure fabrication for solid oxide fuel cells / Surface modification for nanostructured bioactive interface / Sensors device using cramics electrode

Inorganic Materials

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Sachiko Matsushita

Associate Professor

matsushita.s.ab ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Energy conversion / Colloid / Thermoelectric / Plasmon

Current Research Projects: Sensitized thermal cell / Plasmonic color

Masahiro Miyauchi

Professor

mmiyauchi ● ceram.titech.ac.jp

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

Akira Nakajima

Professor

anakajim ● ceram.titech.ac.jp

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

nakamura.k.ai ● m.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Solid state physiics with laser / Laser science / Ultrafast phenomena / Inorganic materials science

Current Research Projects: Coherent control of electron-phonon coupled system

Fumiyasu Oba

Professor

oba ● msl.titech.ac.jp

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

Takao Sasagawa

Associate Professor

sasagawa ● msl.titech.ac.jp

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.

Takeharu Tsuge

Associate Professor

tsuge.t.aa ● m.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Materials Science and Engineering

Research Field: Bio-based plastic / Biodegradable polymer / Bioprocess / Chemolithotrophic bacteria

Current Research Projects: Biosynthesis and characterization of structurally new microbial polyesters

Takaaki Tsurumi

Professor

ttsurumi ● ceram.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Dielectrics / Ferroelectrics / Piezoelectrics / Electroceramics

Current Research Projects: Development of energy storage capacitor / Development of high temperature capacitor / Reliability of multi-layered capacitor/Development of ultrasonic transducers

Takafumi Yamamoto

Associate Professor

yama ● msl.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Solid state chemistry / Topochemical reaction / High pressure reaction / Structural analysis

Current Research Projects: Topochemical synthesis / High pressure synthesis / Anion engineering

Tetsuji Yano

Professor

tetsuji ● ceram.titech.ac.jp

Major: Materials Science and Engineering

Research Field: Inorganic glass materials / Photonic materials / High-temperature chemistry / Ion dynamics in materials / Nuclear waste vitrification

Current Research Projects: Conbinatorial material processing / In situ vitification analysis / Chemical strengthening of glass / Optical MEMS

Inorganic Materials

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Kouichi Yasuda

Associate Professor

kyasuda ● ceram.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

Research Field: Engineering ceramics and composites / Solid mechanics / Fracture mechanics / Statistical mechanics / Weibull statistics/ Reliability

Current Research Projects: 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

Katsumi Yoshida

Associate Professor

k-yoshida ● lane.iir.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

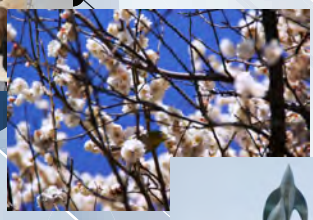
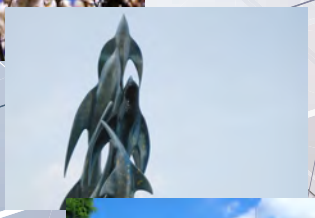
yoshimoto.m.aa ● m.titech.ac.jp

Major: Materials Science and Engineering / Energy Science and Engineering

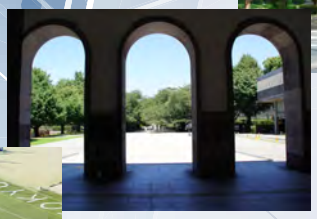
Research Field: Solar cells / Inorganic thermoelectric materials / Surface nano-functionalization / Superconducting / Magnetic materials

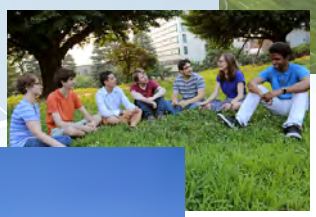
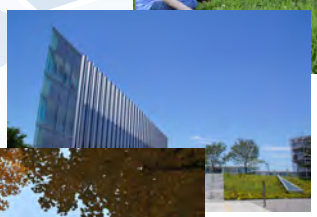
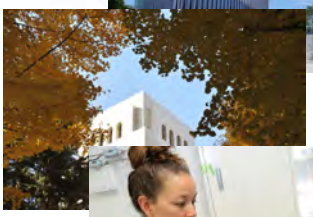
Current Research Projects: UV Solar cells / Flexible glassy thermoelectric materials / Development of novel uniaxilal pressure-induced thin film crystallization process

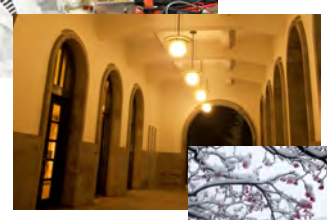
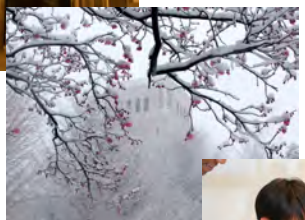







Department of Chemical Science and Engineering

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 different chemically processed materials. The clothes we wear, the plastic on computer components, the medicine we take and the fuel we use in our cars are some examples of what humans have created to make our lives better. In order to maintain and develop our society we must find sustainable ways to obtain these materials. It is the goal of the Department of Chemical Science and Engineering to deeply understand chemical phenomena in all their forms, from research into 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.

Synthesis and Transformation

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

Munetaka Akita

Professor

makita ● res.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Organometallic chemistry / Organic chemistry / Photochemistry / Catalytic chemsitry

Current Research Projects: photoredox catalysis / organometallic molecular device

Shinsuke Inagi

Associate Professor

inagi ● echem.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

Takashi Ishizone

Professor

tishizon ● polymer.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 heterocyles toward functional materials, Low-coordinated phosphines for (chiral) gold catalysis

Gen-ichi Konishi

Associate Professor

gkonishi ● polymer.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Polymer science / Photochemistry / Bioimaging / Physiology

Current Research Projects: Functional Fluorescent Dye / Bioimaging / Polymer synthesis

Tetsuro Murahashi

Professor

mura ● apc.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

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

Reiko Saito

Associate Professor

rsaito ● polymer.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

satoh ● cap.mac.titech.ac.jp

Major: Energy Science and Engineering / Chemical 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

Koichiro Takao

Associate Professor

ktakao ● lane.iir.titech.ac.jp

Major: Nuclear Engineering / Chemical Science and Engineering

Research Field: Coordination chemistry of actinides / Ionic liquids / Nuclear fuel cycle / Treatment and disposal of nuclear wastes

Current Research Projects: 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

Synthesis and Transformation

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Hiroshi Tanaka

Associate Professor

thiroshi ● apc.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Natural product chemistry / Synthetic organic chemistry / Chemical biology / Carbohydarate chemistry

Current Research Projects: 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

Major: Human Centered Science and Biomedical Engineering / Chemical Science and Engineering

Research Field: Synthetic Chemistry / Natural Products Chemistry / Glycochemical Biology / In Vivo Chemistry

Current Research Projects: 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

ktanaka ● apc.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Organic synthesis / Organometallic chemistry / Asymmetric catalysis

Current Research Projects: (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

Ikuyoshi Tomita

Professor

tomita ● echem.titech.ac.jp

Major: Energy Science and Engineering / Chemical 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

Michito Yoshizawa

Professor

yoshizawa.m.ac ● m.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Supramolecular chemistry / Nanospace chemistry / Material chemistry

Current Research Projects: Development of functional polyaromatic nanospaces

Functions and Physical Properties

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Hidemine Furuya

Associate Professor

furuya ● cap.mac.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

masahara ● echem.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

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

Taro Hitosugi

Professor

hitosugi.t.aa ● m.titech.ac.jp

Major: Chemical Science and Engineering / Materials Science and Engineering

Research Field: solid-state chemistry / solid-state electrochemistry / thin films / surfaces and interfaces

Current Research Projects: solid-state Li batteries / functional oxide thin films / hydride thin films / scanning tunneling microscopy

Fusao Kitamura

Associate Professor

kitamura ● echem.titech.ac.jp

Major: Energy Science and Engineering / Chemical Science and Engineering

Research Field: Fundamental electrochemistry / Spectroscopic analysis of electrochemical processes / Design of functional electrodes / Electrode catalyst for fuel cells

Current Research Projects: Catalyst sysnthesis for polymer electrolyte fuel cells / In situ spectroscopic study of electrochemical reaction processes / Development of electrochemical evaluation techniques for battery performance

Shoichi Kubo

Associate Professor

kubo ● res.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

Ken Nakajima

Professor

knakaji ● mac.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

Akira Ohtomo

Professor

aohtomo ● apc.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

Takeshi Serizawa

Professor

serizawa ● polymer.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 informatices 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

yshimo ● chemeng.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

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Atsushi Shishido

Professor

ashishid ● res.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

Materials Structure and System

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

Shinji Ando

Professor

sando ● polymer.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

saoki ● chemeng.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

Takanori Fukushima

Professor

fukushima ● res.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

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.

Masatoshi Kubouchi

Professor

mkubouch ● chemeng.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

Shigeki Kuwata

Associate Professor

skuwata ● apc.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Coordination chemistry / Organometallic chemistry / Homogeneous catalysis

Current Research Projects: Synthesis and catalytic application of metal-ligand cooperative bifunctional molecular catalysts / Synthesis of metal cluster compounds / Redox conversion of nitrogenous compounds

Junko Nomura

Associate Professor

jnomura ● res.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Catalystic reaction chemistry / Infrared spectroscopy / Ordered porous materials / Reaction mechanism

Current Research Projects: Fabrication of ordered porous catalysts, Clarification of reaction mechanisms on solid surfaces

Hideyuki Otsuka

Professor

otsuka ● mac.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

Yoshiaki Shoji

Associate Professor

yshoji ● res.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

Masatoshi Tokita

Professor

mtokita ● polymer.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Polymer structures / Polymer properties / Polymer liqid crystals / Soft materials

Current Research Projects: 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

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Toshiyuki Yokoi

Associate Professor

yokoi.t.ab ● m.titech.ac.jp

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

Nano and Device

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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

Masaaki Hirayama

Professor

hirayama ● echem.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-genenation batteries (all solid-state battery / Li-ion battery / photo-rechargeable battery)

Manabu Ihara

Professor

mihara ● chemeng.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

Takane Imaoka

Associate Professor

timaoka ● res.titech.ac.jp

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

Ken Motokura

Visiting Professor

motokura ● chemenv.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Chemical Science and Engineering

Research Field: Catalysis / Organic chemistry / Carbon dioxide transformation / Multifunctional catalyst surface

Current Research Projects: Catalysis for highly efficient molecular transformation / Design of multifunctional catalytic surface for organic synthetic reactions / Catalytic transformation of carbon dioxide to valuable chemicals

Manzhos Sergei

Associate Professor

Major: Energy 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.

Kota Suzuki

Associate Professor

suzuki.k.bf ● m.titech.ac.jp

Major: Energy Science and Engineering / Chemical Science and Engineering

Research Field: Solid State Chemistry / Energy Conversion Materials / Novel Energy Storage Device, and Material Search by Machine Learning

Current Research Projects: 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

Toshiro Takao

Associate Professor

takao.t.aa ● m.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Organometallic chemistry / Coordination chemistry / Cluster chemistry / Chemistry of catalysis

Current Research Projects: Development of cluster catalysis / Sythesis of mixed-ligand polyhydrido cluster / Synthesis of hetermometalic cluster / Activation of small molecules using polyhydrido cluster

Izumi Taniguchi

Associate Professor

itaniguc ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Nanostructure material processing / Energy storage device / Aerosol technology / Powder enginering / Chemical engineering

Current Research Projects: Synthesis of nanostructured electrodes for lithium sulfur and lithium ion batteries by using areosol and powder technologies / Development of novel energy storage devices

Takehiko Tsukahara

Associate Professor

ptsuka ● lane.iir.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: Microflidic-based analysis and separation of radionuclides / Creation of photonic crystal polymer for metal ion sensing / Novel phase-transition-based solvent extration of target radionucleides

Nano and Device

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Hiroyuki Wada

Associate Professor

wada.h.ac ● m.titech.ac.jp

Major: Energy Science and Engineering / Human Centered Science and Biomedical Engineering / Chemical Science and 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

Kimihisa Yamamoto

Professor

yamamoto ● res.titech.ac.jp

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

Professor

yamanaka.i.aa ● m.titech.ac.jp

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

Environment, Catalysis and Process

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Tetsuro Fuchino

Associate Professor

fuchino ● chemeng.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

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

Yukitaka Kato

Professor

yukitaka ● lane.iir.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

Yuichi Manaka

Visiting Associate Professor

manaka.y.aa ● m.titech.ac.jp

Major: Human Centered Science and Biomedical Engineering / Chemical Science and Engineering

Research Field: Renewable energy / Carbon dioxide utilization / Catalyst /Enzyme

Current Research Projects: Catalytic reaction in nitrogen cycle

Hideyuki Matsumoto

Associate Professor

matsumoto.h.ac ● m.titech.ac.jp

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

smori ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Plasma chamistry / Plasma surface modification / Plasma reforming / Nanomaterial synthesis

Current Research Projects: Synthesis of nanocarbon materials / Plasma surface modification / Plasma CO2 reforming / Ammonia synthesis by non-thermal plasma

Ryuhei Nakamura

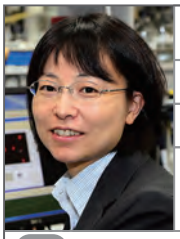
Professor

nakamura.r.am ● m.titech.ac.jp

Major: 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



Mina Okochi

Professor

okochi ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Biotechnology / Peptide technology / Bioelectronics / Biomedical engineering

Current Research Projects: Peptide-based biosensors / Screening of functional peptides / IgE epitope analysis for allergy analysis

Shinichi Ookawara

Specially Appointed Professor

sokawara ● chemeng.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

Hidetoshi Sekiguchi

Professor

hsekiguc ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Plasma processing / Reaction enginering 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

Environment, Catalysis and Process

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Teruoki Tago

Professor

ttago ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Chemical engineering / Catalysis and reaction engineering / Petrochemical / Biomass

Current Research Projects: Synthesis of metal-encapsulated zeolites and their application for catalytic reaction / Synthesis of carbon supported metal catalysts and their application for biomass conversion

Takanori Tamaki

Associate Professor

tamaki.t.aa ● m.titech.ac.jp

Major: Chemical Science and Engineering / Energy Science and Engineering

Research Field: Chemical engineering / Systematic material design / Fuel cell / Bio-inspired materials

Current Research Projects: Improving the performane of polymer electrolyte fuel cells / Development of electrodes and membrane electrode assemblies for solid alkaline fuel cells with liquid fuels / High-power-density enzymatic biofuel cells / Molecular recognition gating membrane using DNA-conjugated thermoresponsive polymer

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

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 isotpic signatures

Takeo Yamaguchi

Professor

yamag ● res.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

Shiro Yoshikawa

Associate Professor

syoshika ● chemeng.titech.ac.jp

Major: Chemical Science and Engineering

Research Field: Transport phenomena / Membrane separation / Mixing operation

Current Research Projects: 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

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