Emerging Researcher Profiles 2021-2022

Chemistry, Materials

Solar energy conversion using solid photocatalysts

Kazuhiko Maeda School of Science

Our group has been studying heterogeneous photocatalysis for water splitting and CO_2 fixation toward solar to chemical energy conversion. Through the use of artificial solids and molecules that can be obtained under controlled conditions, we are creating an efficient photocatalyst that is active for desired reactions.

Rotaxane-based supramolecular mechanophores

Yoshimitsu Sagara School of Materials and Chemical Technology

We are working on the development of supramolecular mechanophores utilizing rotaxanes, which have been well investigated in supramolecular chemistry. The mechanophores can visualize tiny mechanical forces.

Developments of sensors with controlled Bio-Nano interfaces

Yuhei Hayamizu School of Materials and Chemical Technology

We are researching new nanobiotechnology to connect biology and electronics. By using designed proteins with graphene, a promising new electronic material, we are developing new interfaces to convert biological information into electronic information in a controlled manner.

Conversion of carbon dioxide into chemicals on alloys

Tomoaki Takayama School of Science

Using nanoparticulate alloys consisting of metals and half-metals of the d- or p-block elements as catalysts, carbon dioxide is converted into useful chemicals under mild conditions utilizing renewable energy and waste thermal energy.

Aromatic polymers and carbons for catalysis

Yuta Nabae School of Materials and Chemical Technology

I am working to develop a solid catalyst using organic materials based on keywords such as non-platinum catalysts, fuel cells, polyimides, hyperbranched polymers, organometallic complexes, and carbon materials. The goal is to realize a low-carbon society by developing a catalyst capable of efficiently promoting various reactions.

Development of new catalytic reactions by heterogeneous catalysts

Yusuke Kita Institute of Innovative Research

Promotion of the use of renewable resources is required to build a sustainable society. I am focusing on heterogeneous catalysts that synthesize high value-added compounds from non-edible biomass such as corn stalks that do not compete with food issues.

Signal-amplification sensing with smart chemosensors

Gaku Fukuhara School of Science

We have so far proposed a new amplification sensing methodology defined as “supramolecular allosteric signal-amplification sensing (SASS)”, enabling to sense various analytes that are difficult to discriminate in a complex mixture.

High mobility semiconducting polymers

Tsuyoshi Michinobu School of Materials and Chemical Technology

Crystalline organic semiconducting polymer thin films are capable of carrying electricity by properly controlling the intermolecular interactions and carrier generation. I aim to create a new organic semiconducting polymer by using precise molecular design and an efficient synthesis method, and to realize high-performance solar cells and transistors.

Microstructure control for improving mechanical properties of metallic materials

Nobuo Nakada School of Materials and Chemical Technology

The characteristics of metallic materials can be dramatically improved by properly controlling their microstructure. In our group, we are researching the relationship between the microstructure and mechanical properties, and optimal thermomechanical treatment processes aiming for creating ideal microstructures capable of innovatively improving the strength and toughness of metallic structural materials such as ferrous materials.

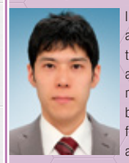
Rational nanospace design and its functions

Masahiro Yamashina School of Science

We are constructing molecular assemblies with nanospaces and exploring their spatial functions, by strategically combining various chemical bonds and organic molecules. Recently, we have succeeded in constructing a caged molecule based on an anti-aromatic molecule and elucidating its properties. In the future, we will explore for undiscovered molecules and chemical reactions that can only be observed in the nanospace.

Development of materials informatics technique and its application

Yu Kumagai Institute of Innovative Research



I am working on developing an advanced auto-calculation program for calculating the various characteristics of materials along with its application. Also, through machine learning based on acquired big data, I am developing a technique for quickly predicting characteristics, and clarifying the origins of physical properties.

Search for novel compounds focusing on anion

Takafumi Yamamoto Institute of Innovative Research

By using anion as a parameter, I am synthesizing new solid state compounds with novel structure and properties, which cannot be accessed by conventional solid state reaction focusing on cation.

Development of novel catalysts for low-temperature ammonia synthesis

Masaaki Kitano Materials Research Center for Element Strategy

I am working to develop a novel ammonia synthesis catalyst that can work under much more mild conditions at lower temperature and pressure than existing industrial ammonia synthesis processes, which require high temperature and pressure. In particular, I am focusing on developing a novel catalyst material that utilizes abundant elements and uses as little precious metals as possible.

Development of metal oxide catalysts for selective chemical processes

Keigo Kamata Institute of Innovative Research

We investigate the rational design and synthesis of metal oxide catalysts with a wide variety of crystal structure based on both theoretical and experimental approaches. Through the development of novel nanostructure control methods, we create highly functionalized catalysts with much superior activity than previously-reported catalysts for various types of catalytic reactions such as selective oxidation, acid-base reaction, and biomass conversion.

Anion-engineering for novel electronic functional materials exploration

Satoru Matsuishi Materials Research Center for Element Strategy

Focusing on “mixed-anion compounds” containing multiple types of anions and “electrides” in which electrons behave as anions, we are searching for novel functional materials such as superconductors, and electron conductors whose properties are changed by photo-irradiation.

Life Science and Technology

Heat resistant alloy design based on microstructure control

Satoru Kobayashi School of Materials and Chemical Technology

We are working on basic research on physical metallurgy such as phase diagram and microstructure control with a final goal to design high performance heat resistant metallic materials with high creep resistance and low thermal expansion coefficient etc for increased temperature of jet engines and high fluctuation load/temperature operation of power plants in future.

Advanced rare metal recycle technology using nanochemistry

Takehiko Tsukahara Institute of Innovative Research

We have developed a novel environmentally-friendly chemical system, which enables to separate/detect and recycle efficiency rare metal elements, by means of functional nanomaterials, nanospaces, and nanosensing technologies. This system can realize waste reduction, low environmental burden, and resource recycling of various wastes generated from chemical and nuclear engineering facilities.

Exosome in disease etiology and detection

Ayuko Hoshino School of Life Science and Technology

Exosomes mediate cell-cell communication in physiology and disease. We aim to elucidate exosome driven disease pathology and develop novel treatments.

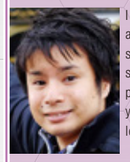
Effective utilization of carbon resources by zeolite catalyst

Toshiyuki Yokoi Institute of Innovative Research

We aim to create innovative zeolite catalysts that can make efficient use of diverse resources and that can contribute to the development of green production of chemical feedstocks and value-added chemicals.

Precision self-assembly of crystallizable polymers

Tomoya Fukui Institute of Innovative Research



I investigate the precision self-assembly of functional polymers. I have succeeded in controlling the self-assembly of π-conjugated polymers by kinetic control, thereby yielding the nanofibers with controlled lengths from nano to micrometer.

Elucidation of intestinal environment dynamics

Takuji Yamada School of Life Science and Technology

We have been engaged in elucidating the relationship between gut microbiome and diseases based on community structure analysis of the bacteria that live in the human intestines. In addition, we also focus on the research for the dynamics of the microbial community structure during the food fermentation process, data visualization of the metabolic pathway database, and a new analysis method.

Search for solid electrolyte materials using machine learning

Kota Suzuki School of Materials and Chemical Technology

The novel lithium ion conductors could enable the development of all-solid-state lithium batteries; however, the efficiency of material discovery is slow. In this study, we are developing an efficient new materials search method by combining classical materials search and machine learning techniques.

Degradable polymers via precision polymerization

Tomohiro Kubo School of Materials and Chemical Technology

The development of on-demand degradable plastics for a circular economy is imperative as environmental concerns loom large. I aim to construct a guiding principle for degradable polymeric materials through unveiling novel synthetic strategies toward environmentally benign polymers.

Study on molecular mechanisms underlying autophagy

Hitoshi Nakatogawa School of Life Science and Technology

Autophagy, a major degradation system within cells, plays important roles in the maintenance and regulation of various biological functions, and its failure has been linked to different human diseases. We aim at clarifying mechanisms underlying autophagy at the molecular level.

Photocatalytic fine organic synthesis

Takashi Koike Institute of Innovative Research

Photocatalysis is an attractive tool that can realize thermodynamically unfavorable chemical reactions. Sunlight, LEDs, and fluorescent lights are recognized as common light sources. Using such readily available light sources, I am working on the development of novel and environmentally-friendly photocatalytic reaction systems that will contribute to the development of pharmaceuticals, agrochemicals, and organic functional materials.

Functional materials based on cyclic topology

Daisuke Aoki School of Materials and Chemical Technology

Cyclic topologies are ubiquitous in a variety of chemical compounds and the compounds with cyclic topology exhibit unique functionality derived from their topology. In this research, based on the effective method for synthesizing cyclic molecules, we aim for establishment of a guideline for new material design using cyclic molecules as a tool for developing functional materials.

Cell editing and cell design

Fumi Kano Institute of Innovative Research

I am creating a platform for editing and designing cells based on our two technologies: semi-intact cells system and cell-resealing technique for delivering molecules into cells, and image-based analytical method for creating the covariation network.

Creation of aromatic nanospace as functional nano tools

Michito Yoshizawa Institute of Innovative Research

In nature, protein-based nanospaces demonstrate highly selective recognition and efficient reactions in water under mild conditions. Inspired by such biosystems, we have studied “aromatic nanospaces” as new nano tools usable in water. The tools provide unique functions for the development of novel molecular science.

Redox chemistry for molecular conversion technology

Shinsuke Inagi School of Materials and Chemical Technology

Focusing on the features of bipolar electrochemistry such as wireless nature, gradient potential and reduced electrolyte, novel molecular conversion technology based on redox chemistry is developed to produce useful and functional materials.

Nexus of nano, bio and electronics

Toshinori Fujie School of Life Science and Technology

Minimally invasive medicine is expected for human healthcare and biomedicine. Our group envisions the smart biodevice with integrated nano, bio, electronics.

Emerging Researcher Profiles 2021-2022

Life Science and Technology

How energy organizes chemistry into life

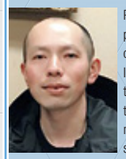
Shawn McGlynn Earth-Life Science Institute


Photo: Nerissa Escanlar

In biology, material (molecules) are organized by energy flow. My lab works on multiple systems – from molecules in the lab to hot springs in the field- with the goal of understanding how organization is governed by energy transfer reactions.

Redox-based regulatory network for controlling plant functions

Keisuke Yoshida Institute of Innovative Research



Plants must control their own physiological functions in response to changes in environmental conditions. I focus on redox regulation as a key to control plant functions. I am trying to comprehensively understand its molecular basis and physiological significance.

Driven to discover: Polymer-drugs equipped with smart functionality

Yutaka Miura Institute of Innovative Research

Our areas of research features the development of polymer-drug discovery and biomaterials created through well-defined synthesis, control of stereochemistry, and nanotechnology for medical applications such as drug delivery and imaging.

Molecular design of thermoresponsive polymers for biomaterials

Naohiko Shimada School of Life Science and Technology

Polymers that change physicochemical properties in response to changes in temperature are referred to as thermoresponsive polymers. We have developed very rare thermoresponsive polymers that dissolve when heated under physiological conditions. The goal is to apply these to medicine and biotechnology.

Engineering of *in cell* protein crystals

Satoshi Abe School of Life Science and Technology

I am focusing on protein crystallization reactions and am developing functional materials by complexation of various molecules and rapid structural analysis methods. In particular, I am pursuing the possibility of biofunctional materials that overturn conventional wisdom by using protein crystal engineering in living cells.

Development of innovative surgical robot systems

Kotaro Tadano Institute of Innovative Research

Based on robotics and control engineering, we are researching surgical robot systems and remote control for realizing effective work support for humans and advanced interactions between humans and machines.

Drug delivery systems for photodynamic therapy and neutron capture therapy

Takahiro Nomoto Institute of Innovative Research

Photodynamic therapy and neutron capture therapy have attracted recent attention as promising techniques for treating intractable diseases including multiple and diffuse cancers. We develop light/neutron-responsive drug delivery systems to extend their application.

Establishing groundbreaking robotics through cutting–edge actuators

Hiroyuki Nabae School of Engineering

It can be difficult for general robot systems that use electromagnetic actuators to work properly in extreme environments such as confined spaces and where there is high load disturbance. We are working to create new robotics that can resolve such issues based on research into new actuators.

Analysis of human metabolism for medical applications

Shunichiro Ogura School of Life Science and Technology

Humans maintain their health through various metabolic processes. However, if these metabolic processes become abnormal, it can lead to disease. In our laboratory, such abnormalities with metabolic processes are being studied chemically in order to determine a methodology for normalizing metabolic processes.

Surface reaction design in electrodes for carbon recycling

Hirotatu Watanabe School of Engineering

I am working on developing a fuel cell for carbon recycling. In this work, surface reaction design is developed through first-principle calculation and multi-scale visualization for reaction selectivity enhancement on an electrode.

Mechanical Engineering, Civil Engineering, Architecture

Advanced laser diagnostics and reactive fluid engineering

Masayasu Shimura School of Engineering

I am working to understand turbulence, turbulent heat transfer, and combustion phenomena using advanced laser measurements and numerical analysis targeting gas turbine engines and internal combustion engines used in aircraft and for power generation, and am also working on development of sensing and control techniques for reactive fluids that can contribute to improved safety with these.

Turbulent reacting flow modeling with supercomputing and machine learning

Yuki Minamoto School of Engineering

Direct numerical simulations of turbulent reacting flows and investigation to obtain physical insights. Data-oriented (AI) physical modelling for non-linear phenomena based on large-scale numerical simulation database. Development of machine learning platform for quantitative prediction of physical phenomena.

Mechanism design and control of robotic and mechanical systems

Yusuke Sugahara School of Engineering

Based on the problem of consciousness, i.e., "how to design, what kind of robot system, to make the world better for living", I am pursuing the design and integration of various robots and mechanical systems. Specific research topics include: human-powered robotics, cable-driven parallel robots, locomotion mechanism, etc.

Systems and control theory for future energy management

Takayuki Ishizaki School of Engineering

Based on the foundation of systems and control theory, we challenge ourselves to advanced research topics for future smart energy management. In particular, we focus on developing modular design theory for large-scale decentralized control systems.

Functional-continuity buildings and cities that withstand earthquakes

Shoichi Kishiki Institute of Innovative Research

While working on further development of existing passively vibration control and seismic isolation technology, I am working to establish a technique for reducing damage to partitions, ceilings, and equipment comprising indoor spaces in order to realize functional and business continuity of buildings and cities via a monitoring system.

Electrical and Electronic Engineering, Computer Science

Pursuing comfortable and healthy urban thermal environment

Takashi Asawa School of Environment and Society

The research fields of our lab are urban and built environmental engineering. Final goal of our research fields are realizing comfortable and healthy cities and buildings with less energy use. The research topics are urban remote sensing, thermal environment simulation, environmental effects of urban greening, and passive design.

Design method of high-rise building against huge earthquakes and typhoons

Daiki Sato Institute of Innovative Research

This laboratory aims to develop a design method that considers both seismic and wind loads for buildings with applied advanced vibration technologies such as passive control and base isolation systems by using observation data, experiments, and simulations. It also develops method for estimating performance of different dampers used in passive control and base-isolation systems.

New approach to architectural planning using big data and AI

Takuya Oki School of Environment and Society

We are developing new architectural planning methods to acquire knowledge from various big data, applying image processing, natural language processing, and spatiotemporal information processing methods based on AI. The data include building interior/exterior images from in-vehicle cameras and aerial photographs, real estate property information, SNSs, people's flows, eye tracks, and so on.

Challenge to wind and snow related issues for urban environment

Tsubasa Okaze School of Environment and Society

We are investigating the mechanisms of wind gust at pedestrian space, pollutant dispersion, snow drifting, and other problems caused by wind and its related diffusion phenomena within built-up environments, and proposing countermeasures with CFD (computational fluid dynamics), which can predict the flow fields with computer simulation.

Design and maintain the next generation infrastructure

Nobuhiro Chijiwa School of Environment and Society

I am developing a method for properly evaluating the performance of existing infrastructures and for selecting optimal maintenance methods, and developing innovative infrastructure materials, designs, and maintenance methods through field fusion in order to realize a resilient and smart next-generation society.

World's fastest millimeter-wave transceiver

Kenichi Okada School of Engineering

I am working on research and development of millimeter-wave phased array transceivers for 5G and future wireless technologies through collaborative research with many companies. I am also studying terahertz and satellite communications, and circuit design techniques using CMOS integrated circuits.

Diamond quantum technologies

Takayuki Iwasaki School of Engineering

Spin defects formed in diamond function as quantum sensors, and they are also expected to be used as solid-state quantum light sources for quantum network. I am proceeding with research on high-sensitivity magnetic and electric field sensors using NV centers, and studying new quantum light sources using Group IV elements.

Ultralow power spintronic devices

Nam Hai Pham School of Engineering

We develop novel materials such as topological insulators, topological half metals, and ferromagnetic semiconductors to realize ultralow power spintronic devices, including magnetoresistive random access memory, racetrack memory, and spin transistor.

Terahertz electronics and applications

Safumi Suzuki School of Engineering

The terahertz frequency band is expected to be used for various purposes such as next-generation wireless communication. In our laboratory, we will open up the future of terahertz technology by researching extreme semiconductor devices capable of terahertz operation, giving them various functionality, and applying them to the various terahertz applications and actually showing the operations.

Semiconductor lasers and photonic circuits using heterogeneous integration technology

Nobuhiko Nishiyama School of Engineering

Using semiconductor lasers and photonic integrated circuits based on heterogeneous semiconductor integration and nanofabrication technologies, we aim to realize ultra-high-capacity optical communication transceivers and sensors. We also focus on ultra-low power photonic integrated circuits using semiconductor thin films to realize future photonic-electric convergence LSIs.

Periodic nanostructures opening a new field of photonics

Tomohiro Amemiya Institute of Innovative Research

We are exploring the potential of "metamaterials" and "topological photonics" for opening a new field of photonics.

High-efficiency solar cells and optical power converter for optical power transmission

Shinsuke Miyajima School of Engineering

A production process of silicon solar cells without explosive and toxic gases are investigated for low-cost silicon solar cells. Hybrid tandem solar cell using silicon and a perovskite material and blue-light optical power converter for optical power transmission system are also our important topics.

Custom computing machine for deep learning applications

Hiroki Nakahara School of Engineering

Custom computing machine for deep learning applications
I am researching the development of high-speed hardware exclusively for machine learning and AI processing including deep learning along with its applications.

Augmented reality using high speed vision and projection

Yoshihiro Watanabe School of Engineering

We explore the possibilities to invoke a new sense of reality based on the advanced technology centering on visual sensing and projection. The key is speed transcending the human capabilities. We believe the next reality is driven by the technological control of the unseen moment.

Computational neuroscience to understand neural mechanism of human motor control

Hiroyuki Kambara Institute of Innovative Research

To advance the knowledge about how our brain generates accurate and sophisticated motions, I am currently doing researches on the neural mechanisms underlying human motor control of a simple movement like reaching and a complex movement like juggling.

Emerging Researcher Profiles 2021-2022

Electrical and Electronic Engineering, Computer Science

Hardware accelerators for AI applications

Van Thiem Chu Institute of Innovative Research

Many AI applications have a high demand for computing performance and efficiency, which conventional general-purpose processors cannot provide. My research aims to address this issue by developing novel domain-specific hardware accelerators.

Data-driven Intelligent Robotics

Asako Kanezaki School of Computing

We develop a robotic system that recognizes the real world and learns behavior. Robots collect data using various sensors and predict the optimal behavior through the knowledge they gather and interactions with humans. We are researching recognition technologies and machine learning methods for this purpose.

Exploration of new elementary particles unveiling the mystery of space-time

Hideyuki Oide School of Science

Although the Standard Model representing the state-of-the-art of our understanding of particle physics is known to be incomplete, it is experimentally unbroken so far. Discovery of un-predicted new particles would unveil the mystery of the Standard Model, and I am propelling new particle searches using the LHC accelerator realizing scrutiny of particle interactions at the ever highest energy scale.

Artificial intelligence for understanding and generating human language

Naoaki Okazaki School of Computing

Language is more than a communication tool. It is also a source for intellectual activities including thinking and logic. Incorporating linguistics, statistics, machine learning, and recent deep learning, I am working to achieve intelligent computers that can speak languages to communicate with others, as we human beings do.

Singular solutions of nonlinear parabolic partial differential equations

Jin Takahashi School of Computing

The main target of my research is parabolic partial differential equations such as diffusion equations based on the keyword "Singularity." More precisely, I am classifying and constructing solutions with singularities and high-dimensional singular sets, and analyzing the solvability of problems that include singular initial values and nonhomogeneous terms.

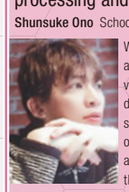
Probing the fundamental laws of nature with elementary particles

Yohei Yamaguchi School of Science

I am working to recreate the environment of the early universe using the world's highest energy LHC accelerator, and studying the nature of a vacuum filled with Higgs field. Elementary particles gained mass when the Higgs field symmetry was broken in the early universe. I am working to clarify the dynamics of the early universe by measuring the nature of the Higgs field.

Leverage math for sensing data processing and analysis

Shunsuke Ono School of Computing



We are developing signal processing algorithms for extracting and analyzing valuable information from noisy and degraded sensing data by leveraging sparse modeling and mathematical optimization. In addition, we are actively engaged in the application of these algorithms to remote sensing and biomedical engineering.

Mathematical optimization: theory and applications

Makoto Yamashita School of Computing

Mathematical optimization provides solutions using mathematical approaches for the optimal selection under many constraints, for example, numerical methods for train route searches and shift scheduling. We study theoretical aspects of mathematical optimization and apply numerical methods to various practical problems.

Out-of-equilibrium dynamics in isolated quantum many-body systems

Takato Yoshimura School of Science

I am interested in how quantum mechanical particles collectively behave when the system is far from equilibrium.

Vision augmentation by computation

Yuta Itoh School of Computing

How strong will the relationship between people and computers be in the future? Our aim is to extend the way people are in the computer society of the future. We thus research technologies to calculate and interfere interaction between people and the real world.

Improvement of usability of TSUBAME supercomputer

Akihiro Nomura Global Scientific Information and Computing Center

I am working to improve the job scheduling policy and software environment so that more researchers and students will be able to use Tokyo Tech's TSUBAME3.0 more efficiently and conveniently.

Ultraviolet Time-domain Astronomy with small satellites

Yoichi Yatsu School of Science

Time-domain Astronomy is a new category which focuses on transient celestial phenomena.
We are surveying those transient events by making use of AI and unique small satellites. Currently we are developing a micro-satellite for the ultra-wide field UV transient explore mission to be launched in 2022.

Biophysics on DNA nanotechnology and artificial cells

Masahiro Takinoue School of Computing

Living systems are autonomous, intelligent, non-equilibrium material systems that exhibit behaviors such as replication and evolution, which are not found in other material systems. In addition to constructing intelligent DNA nanodevices and molecular robots, and artificial cells inspired by these systems, we are also trying to understand their physical mechanisms.

Cohomology in algebraic geometry

Shane Kelly School of Science

I research various mathematical concepts of space, specifically, cohomology theories in algebraic geometry. These describe in an abstract way the presence of data or "holes" in different dimensions in a "space". These theories are used in a wide catalogue of applications and areas of science, for example condensed matter theory, quantum gauge theories, string theory, cryptography and data analysis.

Macroscopic quantum physics with single nanoparticles in vacuum

Kiyotaka Aikawa School of Science

By using ultracold single nanoparticles laser-trapped in a vacuum, we investigate whether macroscopic objects follow quantum mechanics, which has been successful with microscopic particles such as electrons and atoms. We also aim at developing applications of our system in sensing.

Transdisciplinary Science and Engineering, Humanities and Social Science

Understanding solar system bodies via theory and exploration

Hidenori Genda Earth-Life Science Institute

I am studying how the characters of solar system bodies were formed mainly using logic and numerical simulations. I am also establishing future plans for solar system explorations. My ultimate goal is to understand the universality and specialities of our Earth by comparing the characters of planets.

Update current practices by designing human-technology interaction

Takumi Ohashi School of Environment and Society

I am trying to contribute to a sustainable society by designing interactions between humans and technology. Specifically, I involve and analyze events from various fields such as the livestock industry, caregiving, education, and drug discovery, and am working to reflect the results back to actual fields to co-design solutions for people in these fields.

Nationalism and religion found in contemporary politics

Takeshi Nakajima
Institute of Innovative Research/Institute for Liberal Arts

I am studying the relationship between politics and "mental" issues such as nationalism and religious faith. I am mainly looking at Japan and India. In both countries, a "rightward trend" that links religion and nationalism has been seen. Why are non-scientific phenomena expanding as science and technology are progressing? I am studying this mechanism.

Quest for exoplanets

Bunei Sato School of Science

I am attempting to discover extra-solar planets, which are planets that orbit stars other than the Sun, using ultra-high precision observations with a large telescope, and to clarify their characteristics. What kinds of planets exist in the universe? Is our solar system special? Are there other planets like Earth? I am working to answer such fundamental questions of humankind.

Environmental toxicology and plasma reforming technology

Shuo Cheng School of Environment and Society

My research investigates the uptake and effects of microfibers on the indoor aquatic microcosm system with three trophic levels. The research results can provide an essential basis for the environmental risk assessment of microplastics.

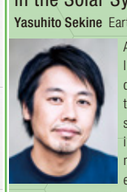
Analyzing visual culture of celebrity constructed by media

Kyohhei Kitamura Institute for Liberal Arts

In the 20th century, the appearance of celebrities such as movie stars and idols completely changed due to movies and television, and in the 21st century, new celebrities including YouTubers and VTubers appear over the internet. I am studying "celebrity" that is created through media and its visual culture.

Finding habitable worlds in the Solar System

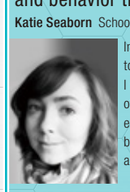
Yasuhito Sekine Earth-Life Science Institute



Are there planetary bodies that support life in the universe? On Mars, the rover drives over mud that was once a lake. On the icy satellites of Jupiter and Saturn, seawater erupts from subsurface oceans into the space. Through experiments and models, I am studying the origin and the evolution of these planetary bodies, and the possibility of life.

Studying methods of changing attitudes and behavior through interaction design

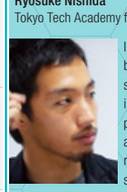
Katie Seaborn School of Engineering



Interactive technology can be designed to influence, motivate, and provoke. I research the design and evaluation of interactive agents, interfaces, and experiences that use attitude and behavior change methods for personal and social good.

The relation of new technology and social and political issues

Ryosuke Nishida
Tokyo Tech Academy for Leadership / Institute for Liberal Arts



I handle the multifaceted relationship between new information technologies/services and politics (elections), institutions, and society through policy analysis, historical research, and quantitative analysis, etc. Recent research is on policy processes and the social impact of COVID-19 measures. A recent publication is "Sociology of the Corona Crisis" (2020, Asahi Shimbun Publications Inc.).

Adaptive and flexible coastal disaster mitigation

Hiroshi Takagi School of Environment and Society

I am engaged in a variety of integrated research, based on survey, experiment, and numerical analysis, in order to realize a living shoreline in urban coastal areas. This concept expects the synergistic effect of a hybrid structure composed of ecological and manmade elements for achieving a low-maintenance disaster countermeasure.

Mechanism of historical human capital formation

Kota Ogasawara School of Engineering

Ogasawara laboratory focuses on the mechanisms of human capital formation during industrialization. Utilizing unique long-term historical socioeconomic statistics with properly designed cliometrics, the lab studies how people accumulated human capital in the economic development process, especially from the economics viewpoint.

Research on educational practice, policy, and school reform

Yuta Suzuki Institute for Liberal Arts

I am engaged in educational research with the emphasis on learning from school sites and listening to school sites. In particular, I am interested in the learning of teachers, who are the change agent in reform of teaching and schooling. "Formation and Development of Teachers' Professional Community: A Genealogy of Research on School Reform in the United States" (Keisoshobo, Tokyo, 2018).

Waste recycles promoted by additional value creation and psychological approaches

Fumitake Takahashi School of Environment and Society

My team studies waste management and recycles from generation to final landfill disposal. They include psychological analysis of waste sorting, design analysis for waste separation, value-added technology development for waste recycles, and geochemical conversion of landfilled wastes to soil.

Leveraging innovations to build a sustainable society

Yuya Kajikawa School of Environment and Society

I am developing and practicing methodologies for innovation. In particular, I am working on research and development management, planning for new businesses, analysis of business models and business ecosystems, extraction of social issues including potential issues, and designing and practicing evidence-based policies