



都市デザイン学部
SCHOOL OF SUSTAINABLE DESIGN

School of Sustainable Design

•
Department of
Earth System Science

•
Department of
Civil Design and Engineering

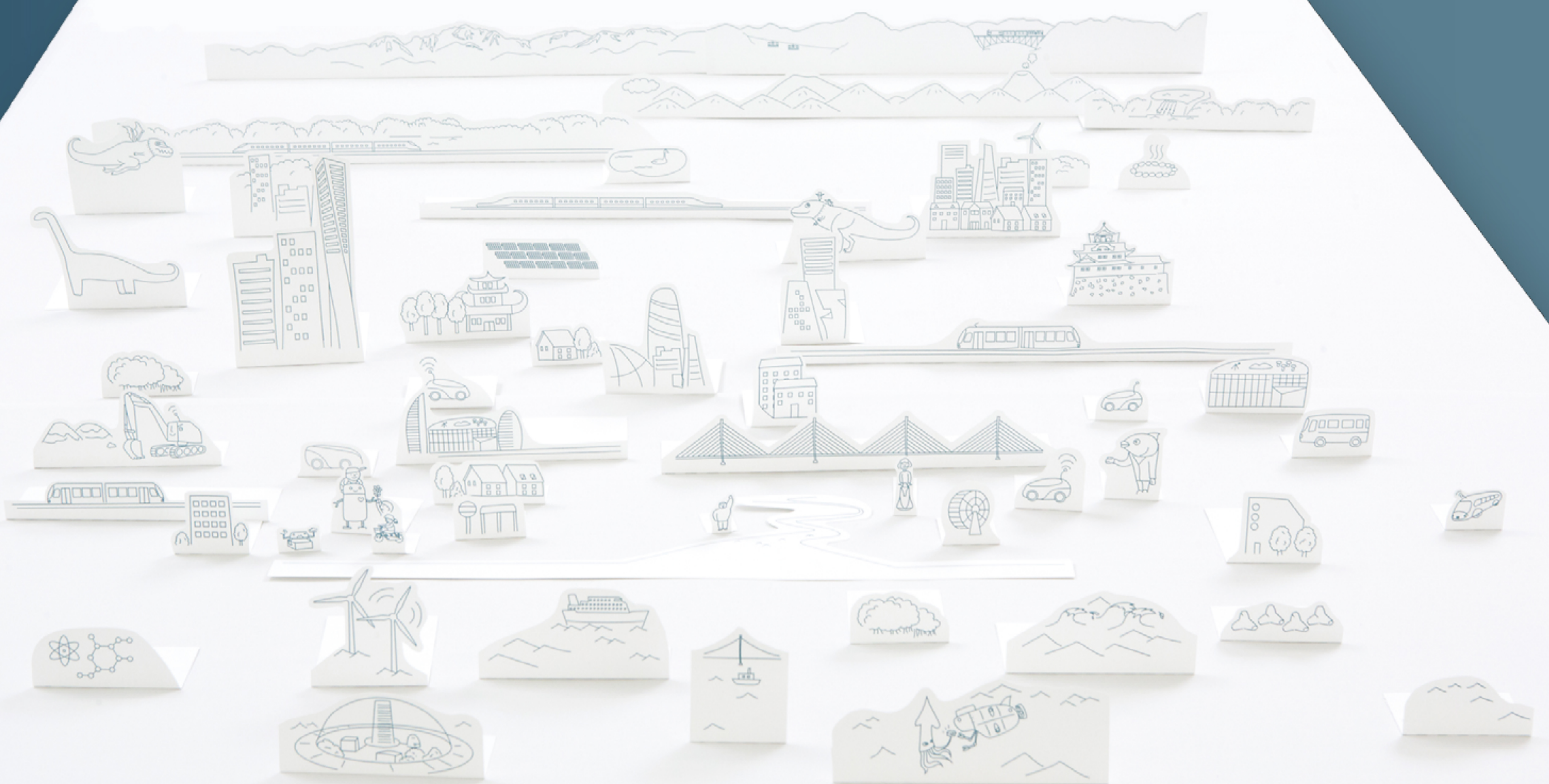
•
Department of
Materials Design and Engineering

This learning experience will enhance
the future of the city.



School of Sustainable Design, the 9th School in University of Toyama, was founded in April 2018. The mission of our School is to create safe, secure and comfortable cities and towns to realize sustainable society. In order to achieve this, three departments are involved: Department of Earth System Science, Department of Civil Design and Engineering, Department of Material Design and Engineering. A wide range of problems related to civic design can be studied: geology, meteorology, infrastructure, traffic system, microstructure and physical properties of materials, etc. We are now confronted by the decline and aging of population and related matters. Innovation is required to solve these matters for the realization of sustainable society. We believe that the collaboration of three departments will produce new ideas.

Dean WATANABE, Tohru



Realize sustainable society through creating safe, secure and comfortable cities and towns.

Goal

School of Sustainable Design conducts international level research and education concerning 1) prediction and risk management of natural disaster, 2) civil and traffic planning/design, 3) infrastructural materials development. We provide students with academic opportunities which enable them to have creativity through “Design Thinking” and senses to find and resolve issues. We will encourage them to contribute to human society in harmony with natural environment.

“Design” for future sustainable cities.

Our civic design must be based on local nature, history, culture and industry, together with basic infrastructure. Cities must be safe, secure and comfortable both in hard and soft aspects. Moreover, civic design must boost local power. School of Sustainable Design merges three disciplines; 1) Earth Science, 2) Civil and Traffic Planning/Design and 3) Materials Science and Engineering. We provide students with academic opportunities which enable them to contribute to the development of safe and secure cities and to enhance local vitality. Toyama has spectacular landscape ranging from 3,000 m high mountains to 1,000 m deep sea. Toyama plays leading roles in advanced civic design, which are top level in Japan and known internationally. Having Toyama as an ideal field for practice, students can acquire knowledge and skill essential for civic design.

Linking of three departments

Students can study 1) Earth Science, 2) Civil and Traffic Planning/Design and Architecture, and 3) Materials Engineering to acquire comprehensive knowledge and experiences required for sustainable design.

Department of Earth System Science

Students can study the Earth from atmosphere and ocean to the Earth's interior. We will provide students with academic opportunities which enable them to have view points of global and local and to resolve social issues such as natural disasters.

Department of Civil Design and Engineering

Students can acquire basic skills for planning of social infrastructure and construction. Based on these skills, you can conduct international level study and research on progressive civil and traffic planning and enhancement of local vitality. You can also take classes of architecture.

Department of Materials Design and Engineering

Students can conduct comprehensive study and research from basic to industrial application on 1) material planning ranging from atomic and molecule sized electronic parts to massive architecture, 2) strong materials for safety and security, and 3) materials for disaster prevention, and so on.

keyword

Sustainability



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Let's learn “Earth System Science”
for implementing and achieving
the Sustainable Development Goals
(SDGs).





The Department of Earth System Science (ESS)

Natural disasters such as earthquake, volcanic eruption, tsunami, massive flood, landslides, typhoon, heat wave, and droughts etc. kill about 70,000 people and cause about US\$ 140 billion worth of economic damage every year (annual 2006-2015 average). The number of people affected by disasters and estimated economic losses tend to increase, and the situation is getting worse. For sustainable development of a local community, disaster preparedness is necessary from a different angle. In order to encompass the sustainable development from global perspective, the Department of Earth System Sciences (ESS) aims at broadening and deepening research on Earth system. Covering all of the Earth's "spheres" (atmosphere, hydrosphere, cryosphere, geosphere, pedosphere, lithosphere, biosphere, and magnetosphere), the ESS department consists of two main research groups; geological science group (e.g., mineralogy, paleontology, petrology, structural geology and volcanology), and geophysical science group (e.g., geo-electromagnetic physics, physics of rocks, glaciology and meteorology). The ESS department offers undergraduate and graduate degree programs which center upon course work in "Earth System Science." Involving field study, experimental research, data analysis and numerical modeling, our earth science programs are designed to prepare students for careers in earth science-related professions (such as, green power industry, government offices for disaster prevention and forecasting, geological and environmental consultants, civil engineering and construction industry, mining companies, museums and so on).

Features of our program

1. Unraveling various wonders of the Earth through the power of science.
2. Experiencing the earth's dynamism through overlooking unique local geographic (comprising deep ocean (>1000m) and 3000m-class mountains over the small area).
3. Maintaining a broader perspective through working alongside diverse specializations on ESS.

faculty members

Professor
WATANABE, Tohru

[Research Expertise]

1. Physical properties of rocks and minerals

Watanabe is interested in seismic velocity and electrical conductivity of fluid-bearing rocks to understand the distribution of fluids in the crust and mantle. Although the amount of fluids is quite low (< 1%), the fluids must play important roles in geodynamic processes including earthquakes, magmatism, etc. He tries to interpret geophysical observations based on high pressure experiments.



Professor
OTOH, Shigeru

[Research Expertise]

1. Structural Geology
2. Tectonics

Shigeru Otoh studies the evolution of three-dimensional geological structures and the surface environment of the Eurasian continent. He is particularly interested in the ancient plate motion that formed map-scale geological structures and caused the provenance change of clastic rocks in Japan and East Asia.



Associate Professor
YASUE, Ken-ichi

[Research Expertise]

1. Earthquake Geology

Yasue is interested in: 1) field research of tectonic deformation by geomorphological and geological methods; 2) research and development on dating technique of unconsolidated deposits; and, 3) empirical study about community design using the Geo-story created based on landform and geology of regional scale.



Professor
YASUNAGA, Kazuaki

[Research Expertise]

1. Mesoscale Meteorology
2. Tropical Meteorology

Yasunaga does research aimed at understanding interactions between cumulus convection and large-scale flow. Examples include cloud organization (associated with Madden-Julian Oscillation (MJO) and equatorial waves) in the tropics as well as severe weather along the coastal areas of the Sea of Japan.



Professor
SUGIURA, Konosuke

[Research Expertise]

1. Glaciology
2. Cryosphere Science
3. Environmental Earth Science

Sugiura's research interests include the cryosphere variation and the interaction between snow cover and vegetation/soil/atmosphere/sea ice on a global scale by means of field observation, remote sensing, data analysis, numerical model and large cold room experiment.



Associate Professor
HAMADA, Atsushi

[Research Expertise]

1. Satellite Meteorology
2. Applied Meteorology

Hamada does research aimed at describing the statistical characteristics of cloud and precipitation in macroscopic sense, and relating them to their background atmosphere. He's especially interested in the role of environmental moisture field in the precipitation formation processes, including extreme precipitation.



Associate Professor
KAWASAKI, Kazuo

[Research Expertise]

1. Environmental Magnetism
2. Paleomagnetism

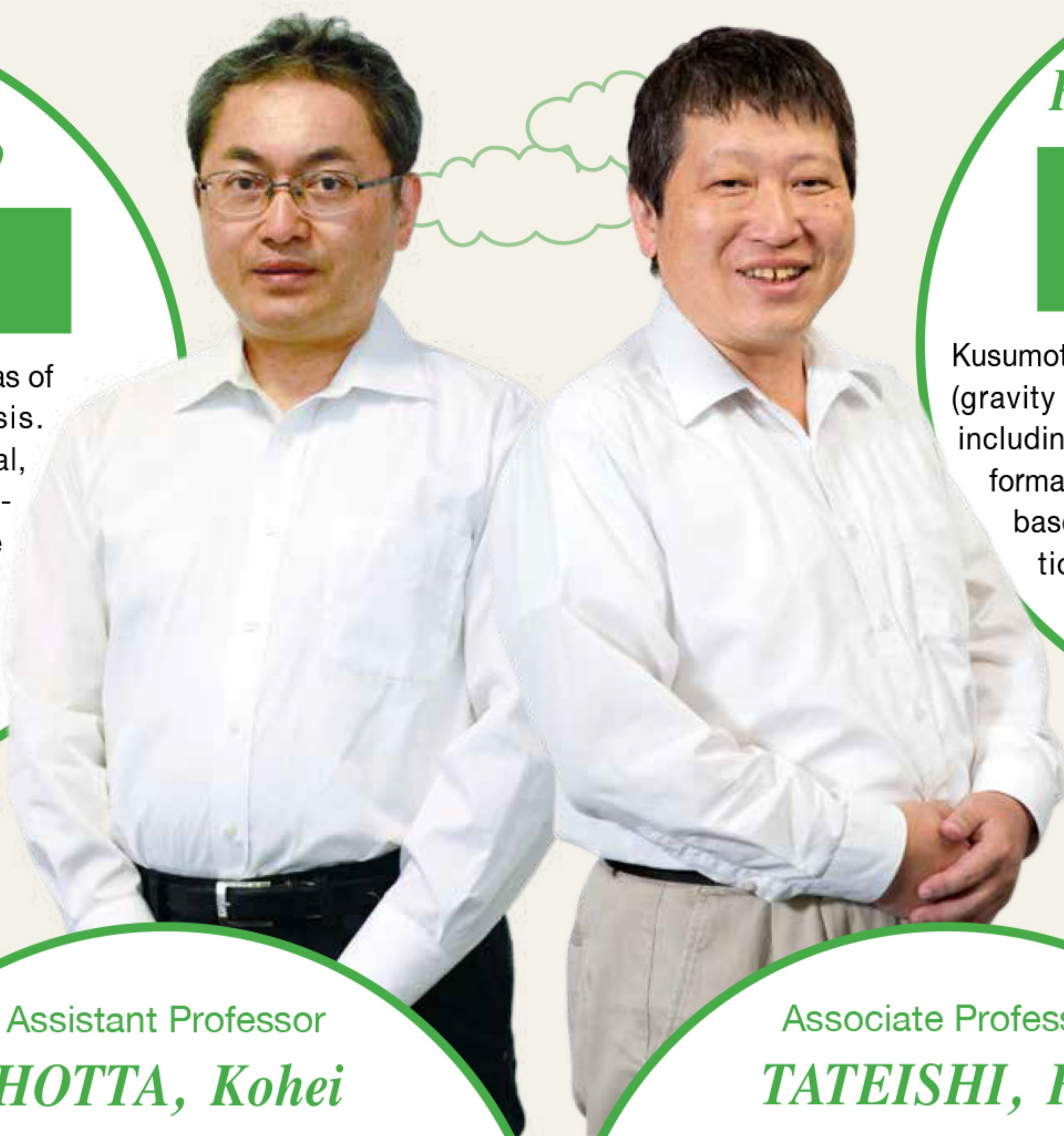
Kawasaki is interested in: 1) environmental magnetic monitoring of heavy metal contents related to mine waste, air pollution or roadside pollution; and, 2) paleomagnetic and rock magnetic applications to hydrothermal deposits in order to understand their ore genesis and paleoenvironment.



Professor
ISHIZAKI, Yasuo

[Research Expertise]
1. Volcanology

Ishizaki's research interests are in the areas of volcanology and igneous petrogenesis. Specifically, he uses field, chronological, mineralogical and geochemical information as tools to delineate and quantify the generation and storage of magmas, the evolution of magmas in shallow plumbing systems, and their behavior during volcanic eruptions.



Professor
KUSUMOTO, Shigekazu

[Research Expertise]
1. Applied geophysics
2. Tectonophysics

Kusumoto's present speciality is applied geophysics (gravity and gravity gradient) and tectonophysics, including volcanic activity. He has investigated the formation and/or propagation processes of dykes based on fracture mechanics and the estimation and evaluation of the deformation zones of sedimentary layers and areas created by the motion of buried faults.

Assistant Professor
HOTTA, Kohei

[Research Expertise]
1. Physical Volcanology

Hotta is interested in ground deformation around active volcanoes associated with accumulation, migration or emission of magma; and trying to understand style and process of magma intrusion mainly based on geodetic data such as GPS or precise leveling survey.



Associate Professor
TATEISHI, Ryo

[Research Expertise]
1. Hazardous Geology
2. Sedimentary Geology
3. Tectonic Geomorphology

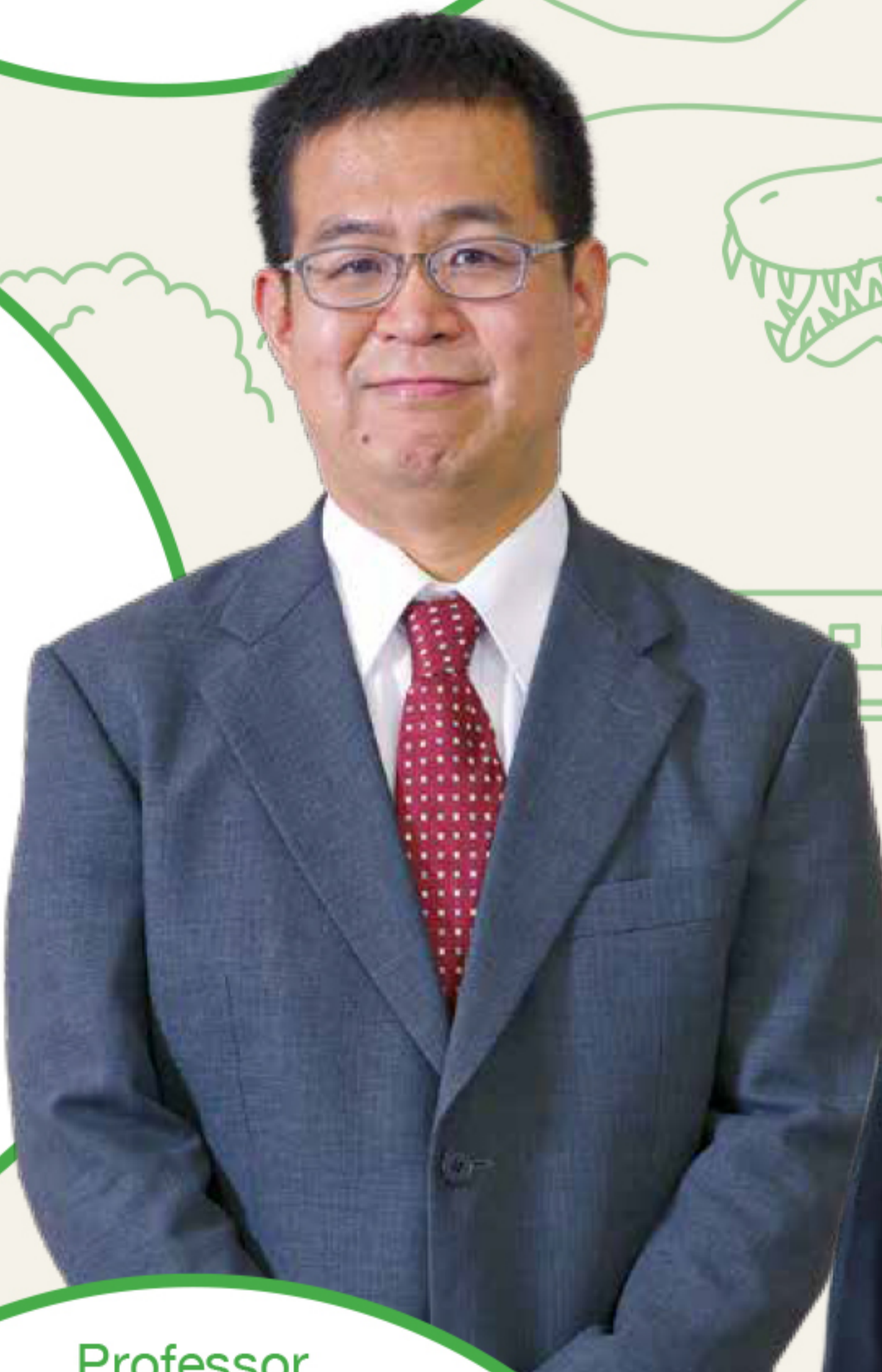
Tateishi does research aimed at predicting time, space and magnitude of natural hazards like earthquakes, tsunamis and landslides to reduce the damage by using quantitative analysis such as terrain analysis, physical simulation and multivariate analysis.



Professor
SANO, Shin-ichi

[Research Expertise]
1. Paleontology
2. Earth System History

Sano would like to understand the co-evolution of the Life and the Earth, mainly based on the paleontology and stratigraphy. Now he focuses on the research topics such as the evolution of carbonate platform (reefal) biota in the Pacific and terrestrial ecosystem in East Asia in the Mesozoic (= the age of dinosaurs).



Professor
TAGUCHI, Bunmei

[Research Expertise]
1. Physical Oceanography
2. Ocean-Atmosphere Interaction

Taguchi studies oceanic adjustments and their influences on the atmosphere that are crucial for climate and its variability. He hopes to deepen our understanding of inter-regional climate linkage between tropics and mid-to-high latitudes on seasonal to decadal time-scales, and thereby contribute to the improvement of its prediction.



Professor
KOMURO, Kosei

[Research Expertise]
1. Economic Geology 2. Resource Geology
3. Ore Mineralogy

Komuro is interested in genesis of metallic ore deposits, including present sea-floor hydrothermal deposit and manganese crust. He tries to understand the formative processes and geochemical environment of ore formation based on geology, mineralogy, petrology and geochemistry.

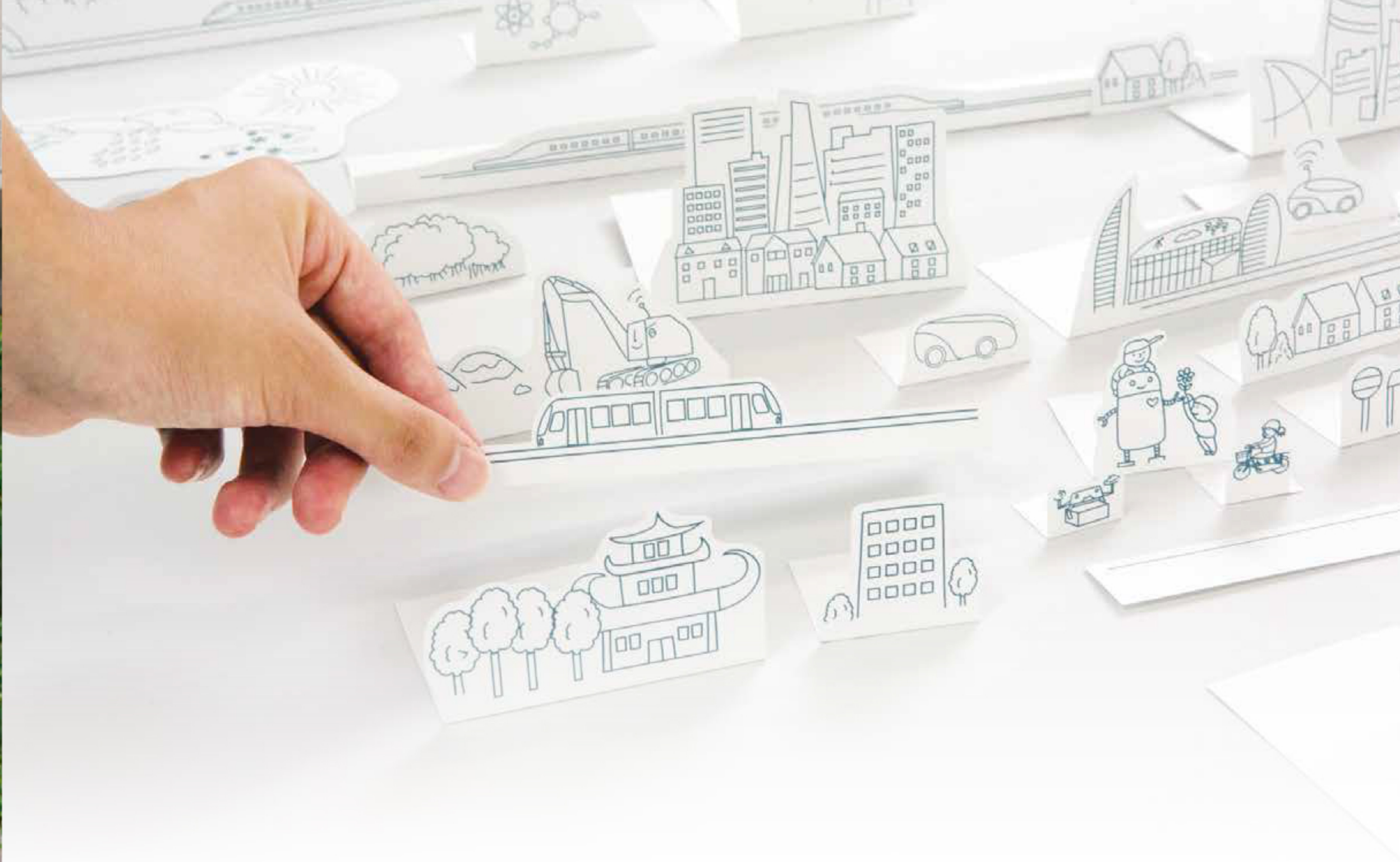


Professor
ISHIKAWA, Naoto

[Research Expertise]
1. Rock magnetism

Research interest is magnetic informations (e.g., directions and intensities of remanent magnetizations, magnetic properties) in rocks and sediments, which are useful for investigating geomagnetic variation, tectonics and climate change.





Let's work together to build attractive cities for the future !

To develop a sustainable city, it is necessary to implement hardware and software systems following cutting-edge disaster prevention measures and create adequate infrastructures that constitute the core of the city. At the same time, it is important to make good use of local resources to support and revitalize local communities and rural areas. We think that cities and transportation systems are human activities and we have designed a program to foster young talents able to contribute to the development of a sustainable city. Our innovative curriculum encourages creativity and strategic thinking while providing an education that encompasses a combination of natural science, engineering technology, and social science.

At our department, according to the international-level educational programs accredited by the Japan Accreditation Board for Engineering Education (JABEE), from the first year, we offer a cross-disciplinary education which links and integrates various subjects, including engineering, science, arts and cultural studies. This kind of education is not limited to theoretical studies, but it includes more concrete practices such as field trips in the area of Toyama, widely known for its compact city policy centered on the public transportation systems.

Students graduating from DCDE will:

- 1. Understand and conceptualize the design of beautiful and safer cities resilient to natural disaster.**
- 2. Develop skills that will facilitate city and transport planning based on the understanding of urban culture and working mechanism of the economy, government, and society.**
- 3. Obtain the exam eligibilities for Japanese national licensing, including the First-class Registered Architect, and private licenses, as well as, for department graduates, acquisition of qualifications of Associate Professional Engineer and Assistant Land Surveyor.**

faculty members



Professor
HARA, Takashi

[Research Expertise]

1. Risk management for disaster mitigation
2. Development of new geotechnical design and practice
3. Estimating behavior of the structure built on/in ground

Development of effective disaster prevention system and practice.

Professor
KUBOTA, Yoshiaki

[Research Expertise]

1. Planning and design methodology for infrastructures
2. Urban landscape design
3. Public procurement system

Development of planning and design methodologies and social systems to create better urban environment.



Professor
YAGUCHI, Tadanori

[Research Expertise]

1. Industrial Design
2. Universal design

Capture the essence of things and convert it to what matches the needs of the times, between tradition and innovation.

Associate Professor
HARUKI, Takayuki

[Research Expertise]

1. Plasma Physics
2. Numerical Simulation

Study of elementary processes in plasma physics using a particle-in-cell code.



Assistant Professor
AKUI, Kohei

[Research Expertise]

1. Landscape theory
2. Urban planning
3. Urban design
4. Urban formation history

Urban space planning and design of reconstructed urban and landscape figure in the time axis from the past to the future.

Assistant Professor
TATTA, Naoki

[Research Expertise]

1. Geotechnical engineering
2. Soil mechanics
3. Earth reinforcement

Development of durable earth structure with reinforcements and development of technology to protect soils from disasters.



Professor
HORITA, Yuukou

[Research Expertise]

1. Media Information and Communication Technology
2. Intelligent Transport System (ITS)
3. Quality of Experience (QoE) using Brain Activity

Understanding crowd behavior from sensing proximity human behavior using multiview camera; bus location system for delivering service information and advertising information to bus stops, buses in service, and bus users.

Associate Professor
INOI, Hiroto

[Research Expertise]

1. Urban planning
2. Traffic engineering
3. Community participation

Public deliberation for sustainable public transport and paratransit system.





Professor
HORI, Yuji

[Research Expertise]

- 1. Urban Environmental Design
- 2. Building Facilities Design
- 3. Energy Conservation

Environmental design, facility design and energy management. Energy demand and energy conservation of cities and buildings.

Professor
NAKAGAWA, Dai

[Research Expertise]

- 1. Transportation Policy
- 2. Urban Planning

Practical study for smart city and transportation, including a development of information and communication technology system and urban modeling.



Professor
KIMURA, Ichiro

[Research Expertise]

- 1. Hydraulics
- 2. River Engineering
- 3. River Morpho-dynamics
- 4. CFD (Computational Fluid Dynamics)

Computational modeling on driftwood motions during flood in rivers. Disaster mitigation. Three-dimensional modeling of coherent structures of turbulence in open channel flows. Computations on river morpho-dynamics and river meandering. New efficient computational schemes for simulating large scale flood with inundation.



Associate Professor
INOUCHI, Munenari

[Research Expertise]

- 1. Behavioral Disaster Management
- 2. Service and Information Science
- 3. Life Reconstruction Support

Action research about design of harmonious collaboration between human and ICT for effective personal and institutional behavior against disaster.



Associate Professor
KOUNO, Tetsuya

[Research Expertise]

- 1. Geotechnical engineering
- 2. Concrete engineering
- 3. Design and maintenance of structures

Evaluation for characteristics of soil, materials and members; development of design and maintenance method of structures.



Professor
KANAYAMA, Yoichi

[Research Expertise]

- 1. Railway Legal System, such as Vertical Separation
- 2. Railway Engineering and Planning. Public Transport Policy
- 3. Project Knowledge of Social Infrastructure Development (especially Shinkansen)

The Study of Railway Future Vision and its Realization Policy for urban improvement, with a focus on Declining population, Inbound tourism, natural disasters (i.e. earthquakes), IoT, etc.



Associate Professor
TAKAYANAGI, Yuriko

[Research Expertise]

- 1. City Resources and Behavioral science
- 2. Walkable City Planning
- 3. Pedestrian-based Street Space Planning

Evaluation of urban streets as living spaces. Re-design of urban planning and urban transportation planning process.



Associate Professor
SUZUKI, Yasuo

[Research Expertise]

- 1. Structural Mechanics & Engineering
- 2. Steel Structure

Rationalization and soundness evaluation of bolted joints of steel structural members. Development of new type of structure using Fiber Reinforced Polymer.



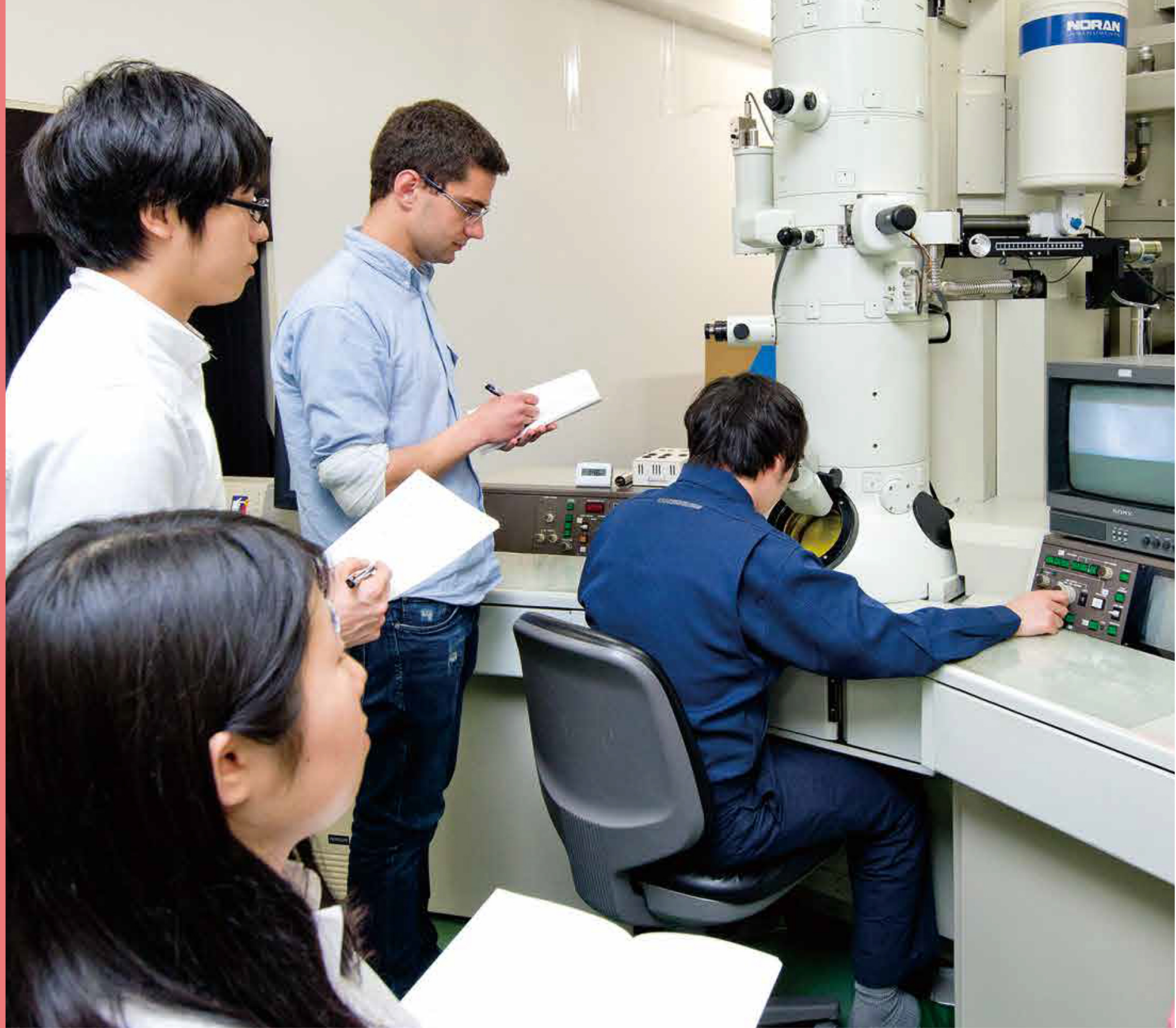
Professor
HONDA, Yutaka

[Research Expertise]

- 1. Urban planning
- 2. Transportation policy
- 3. Construction administration

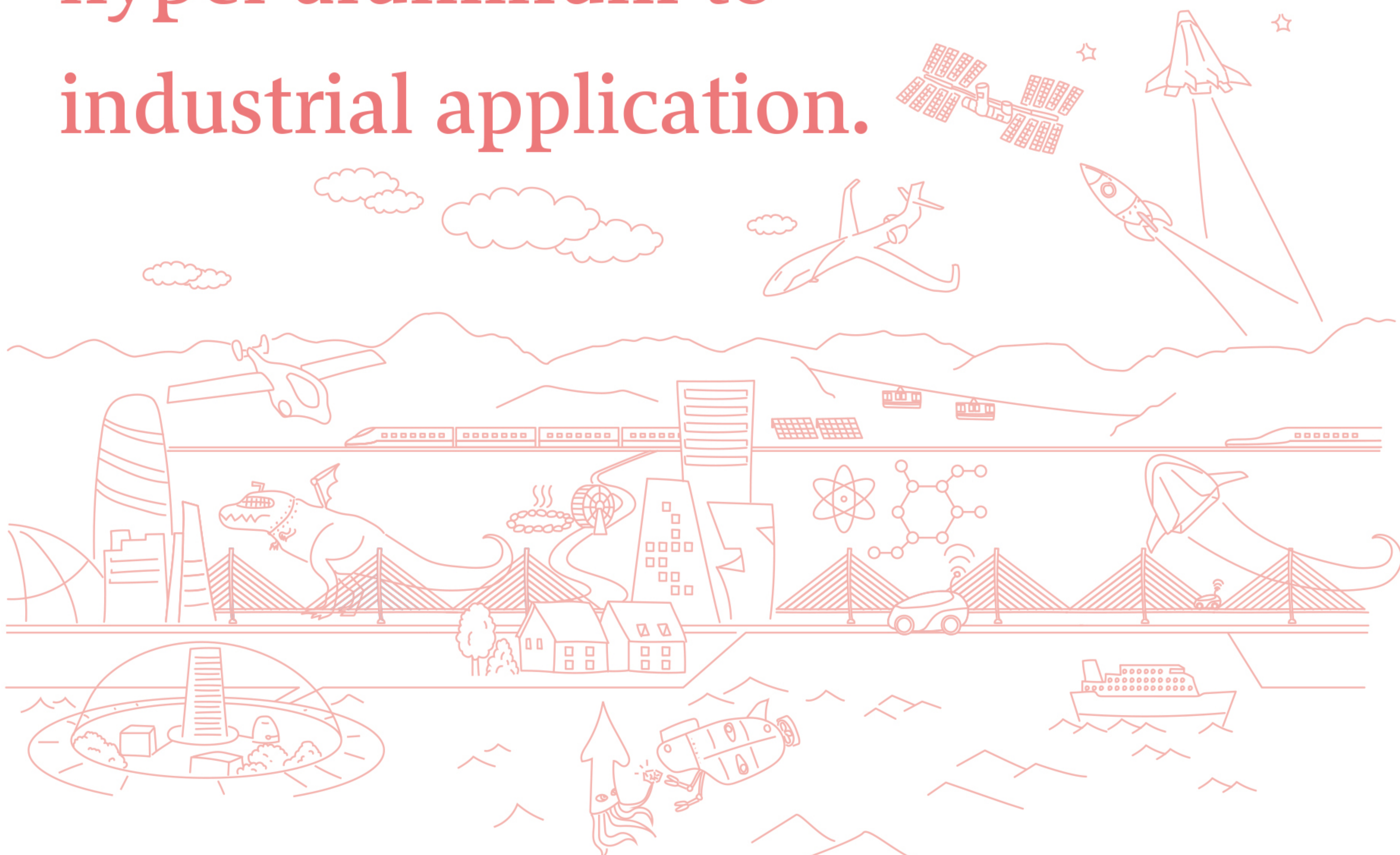
Integrated transportation policy, urban infrastructure development and institutional design to realize improvement of the quality of life.





Conduct research and development on future materials ranging from atomic to gigantic structures with a broad perspective.
Foster global material engineers through international academic exchanges.

From basic research on hyper aluminum to industrial application.



(一社)軽金属学会第12回軽金属国際ワークショップ
富山大学第2回先端材料研究フォーラム
(富山大学工学部附属先端材料研究センター設置記念)
平成28年10月13日(木)~10月14日(金)



4th Forum of Center for Advanced Materials Research and International Collaboration (CAMRIC-FORUM4), University of Toyama, Japan, October 31 - November 1, 2018



Newcomer camp



Let's design future materials that will sustain our lives and society !

The department of materials design and engineering conducts education and research focusing on metals and metallurgy, which is only available here in Hokuriku area. Students acquire extensive knowledge and the improvement of problem-solving abilities for society through comprehensive study and research from basic for understanding the essence of materials to industrial application of 1) material design ranging from atomic and molecule sized electronic parts to massive architecture, 2) strong materials for life safety and security purpose, and 3) materials for disaster prevention, and so on. Students also learn how to discover study tasks and draft solutions from a global view point, and make and accomplish a research plan on their own initiatives. Japan Accreditation Board for Engineering Education (JABEE) has approved that these learning objectives and educational programs of this department meet social / industrial requirements on an international standard. This department invites multinational research groups of material fields and form an international research base to promote global advanced researches utilizing the regional characteristics. At the Graduate School of Science and Engineering for Education, we also work on providing educational programs in English and developing internationally accepted human resources.

Learning features:

1. Building expertise and learning design techniques on light metal materials.
2. Researching and developing materials for preventing and reducing disasters.
3. Receiving education and conducting research that contribute to the key and aluminum industries in Toyama region.

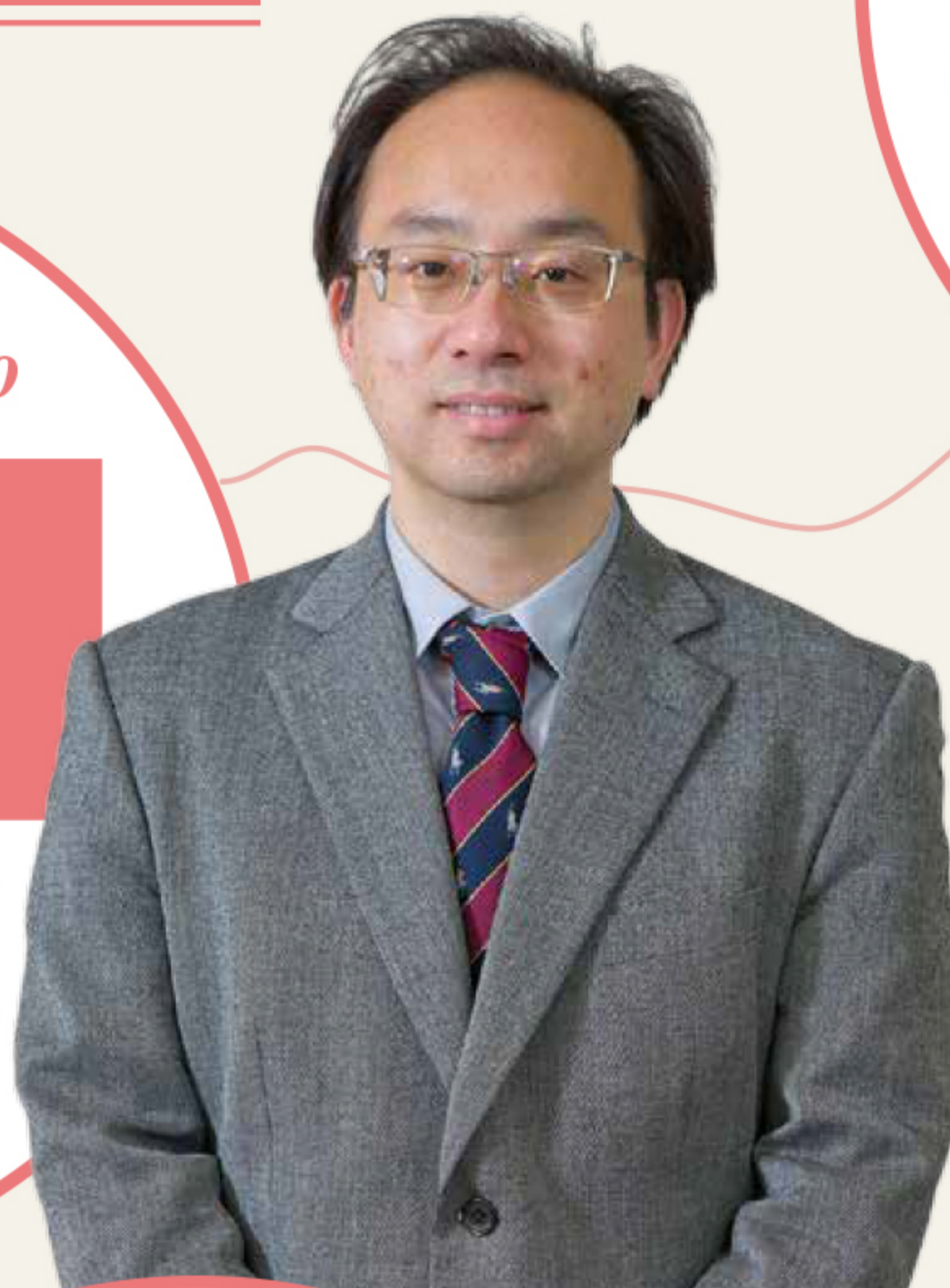
faculty members

Associate Professor
NAMIKI, Takahiro

[Research Expertise]

1. Condensed Matter Physics
2. Materials Engineering
3. Magnetisms
4. Superconductivity

My main research theme are about electronic properties of condensed matter physics such as magnetism and superconductivity.



Professor
NISHIMURA, Katsuhiko

[Research Expertise]

1. Solid State and Materials Science

Research targets are exploring new magnetic materials and superconductors, and elucidating natural aging effect on physical properties of aluminum alloys .



Professor
SAIKI, Atsushi

[Research Expertise]

1. Ceramics
2. Thin Films and Functional Materials

Education and synthetic research are conducted on the functional materials of ceramics, electronic devices and new complex materials through designing micro structures, combining additives such as rare earth metals and improving fabrication processes.



Professor
SAIKAWA, Seiji

[Research Expertise]

1. Casting
2. Die casting

I develop aluminum and magnesium alloy for casting to lightweight plane and vehicle, the study in improvement of the overall foundry including the die-casting and the new manufacturing method.



Professor
MATSUDA, Kenji

[Research Expertise]

1. Microstructure Controlling of Light Metals

The scope of my lectures is to understand the structural analysis of aluminum alloy, magnesium alloy, copper alloy using high-resolution electron microscope in atomic level, and to develop the multifunction hybrid aluminum (or magnesium) based composite materials.

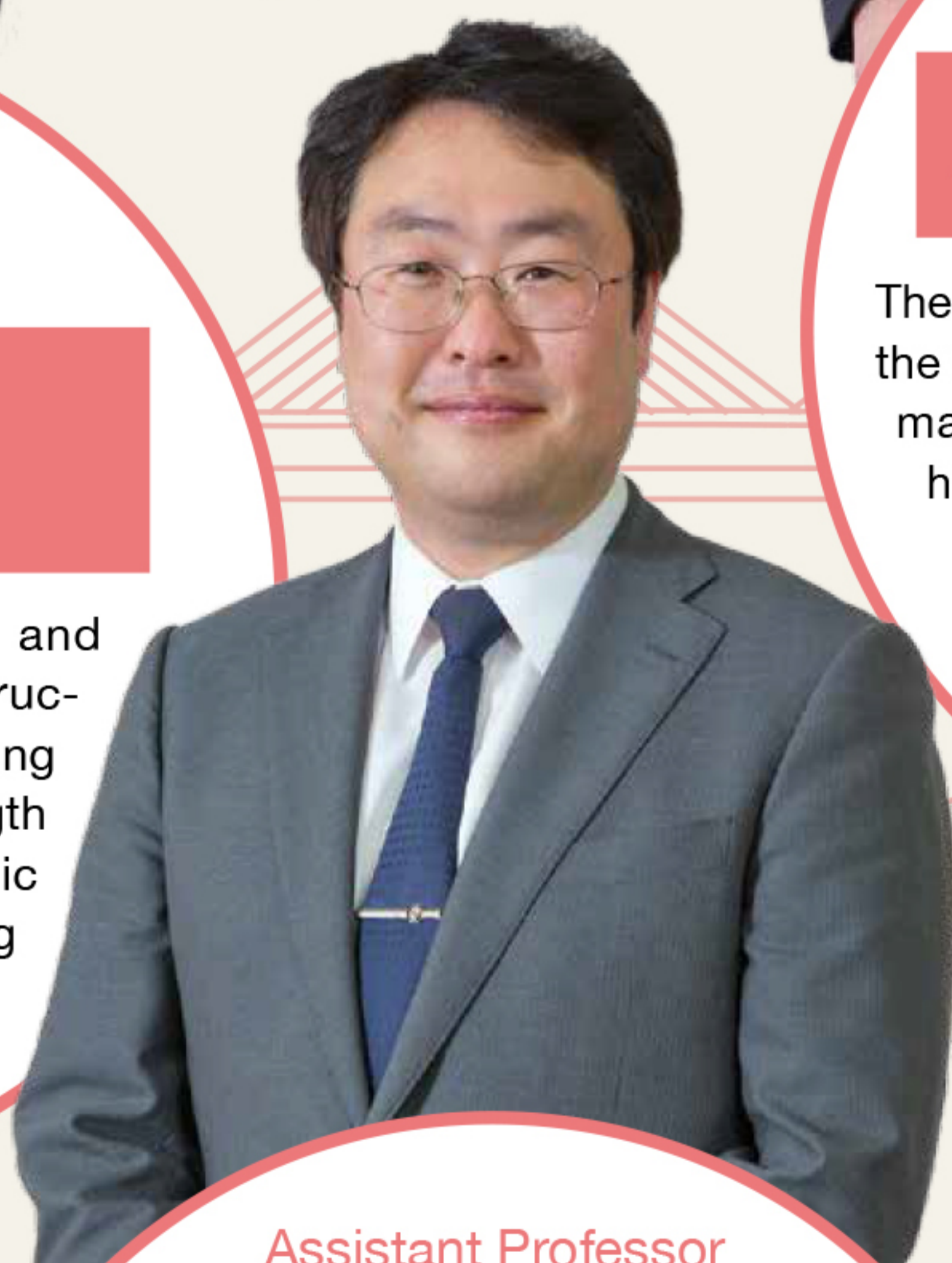


Associate Professor
LEE, Seungwon

[Research Expertise]

1. Severe Plastic Deformation (SPD)
2. Precipitation Hardening

My lecture focuses on improvement and develops new Al alloys using microstructure controlling. Especially, I am making efforts to a fabrication of high strength Al alloys by means of severe plastic deformation (SPD) and aging treatment.



Assistant Professor
TSUCHIYA, Taiki

[Research Expertise]

1. Microstructure Controlling of Ferrous and Non-Ferrous Casting Alloys

Current research focuses on precipitate controlling in Al alloys fabricated by casting. HRTEM reveals the internal structure of nano- or micron-sized precipitates formed during heat treatment.

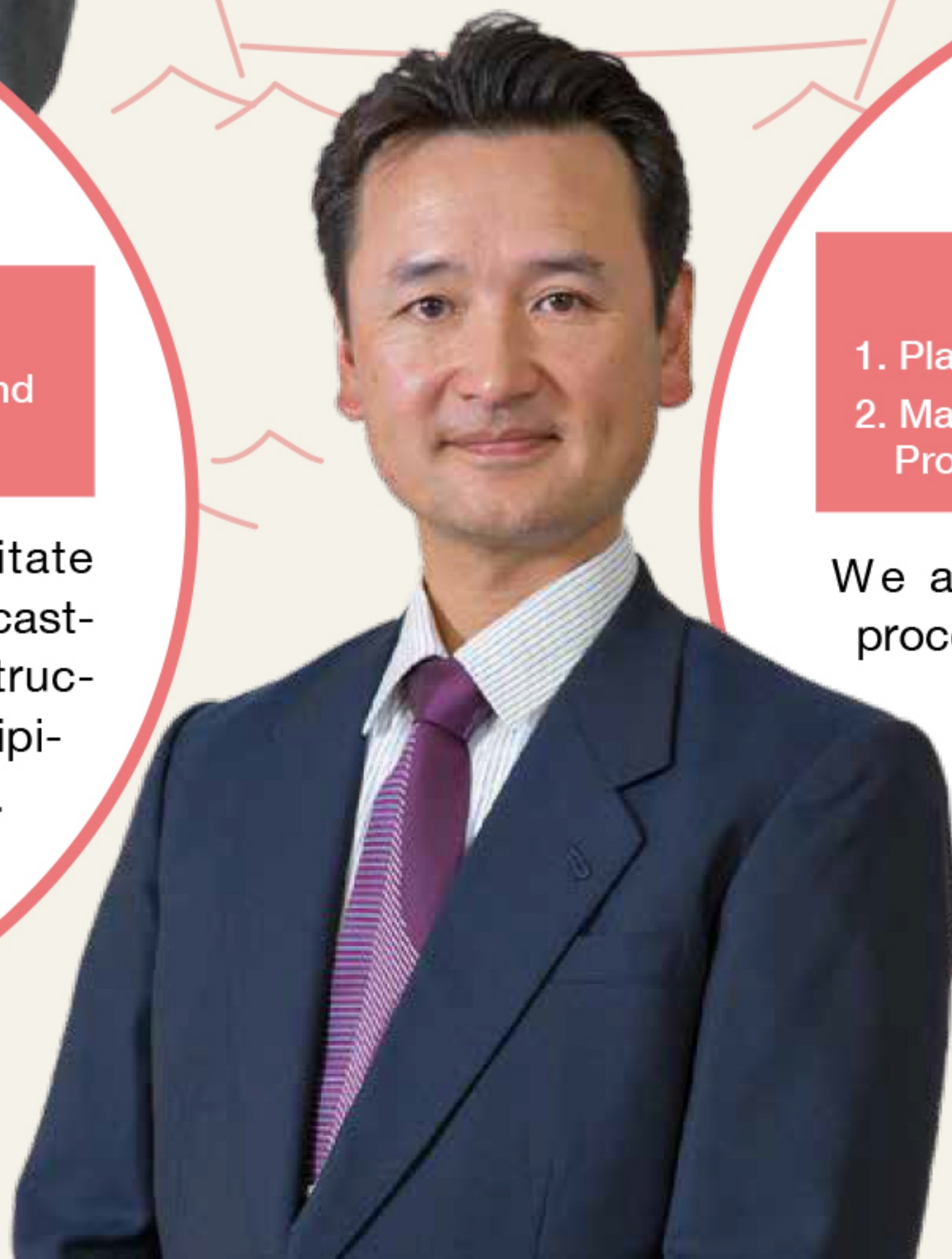


Professor
AIDA, Tetsuo

[Research Expertise]

1. Plasticity Engineering
2. Material Manufacturing and Plasticity Process

We are researching plasticity and processing including molding processing of magnesium alloy and aluminum alloy, microstructure control, injection molding of resin and mold design.



Professor
SUNADA, Satoshi

[Research Expertise]

1. Corrosion Science
2. Metal Electrochemical

We study about mechanism on corrosion behavior of Mg alloys, ant-nest corrosion of copper, magnets and so on.



Associate Professor
HATAKEYAMA, Masahiko

[Research Expertise]

1. Corrosion Science
2. Metal Electrochemical

Recently, we investigated about the effect of Al-rich α phase on corrosion behavior of Mg-Al alloys which are widely used as structural material. In addition, we are interested in solution segregation around defects.

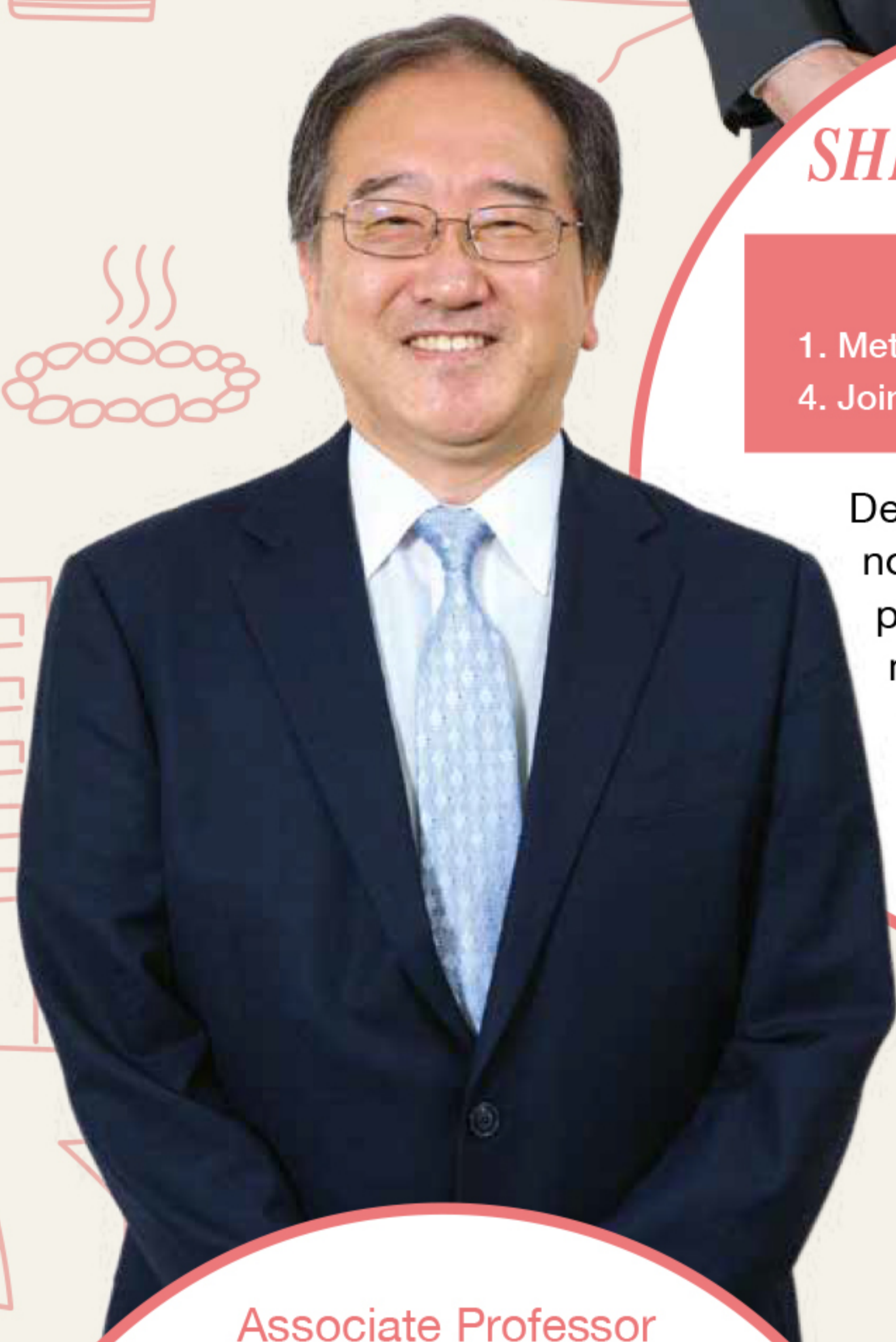


Professor
SHIBAYANAGI, Toshiya

[Research Expertise]

1. Metals
2. Ceramics
3. Resins
4. Joining and Welding
5. Interfaces

Development of novel joining technologies and optimization of joining processes based on interface, microstructural control, high temperature deformation, and transfer phenomena.



Assistant Professor
YAMANE, Takeshi

[Research Expertise]

1. Heat, Mass and Fluid Engineering

The purpose of my research is to clarify simultaneous transport phenomena of heat, mass and momentum occurring in the material manufacturing process by using various visualization techniques, and to present process control guidelines.

Associate Professor
YOSHIDA, Masamichi

[Research Expertise]

1. Materials Process Engineering

The purpose is to make a manufacturing process of a material more efficient and to optimize operating conditions of the process through experimental and numerical analysis of heat, mass and momentum transfer occurring throughout the manufacturing process.

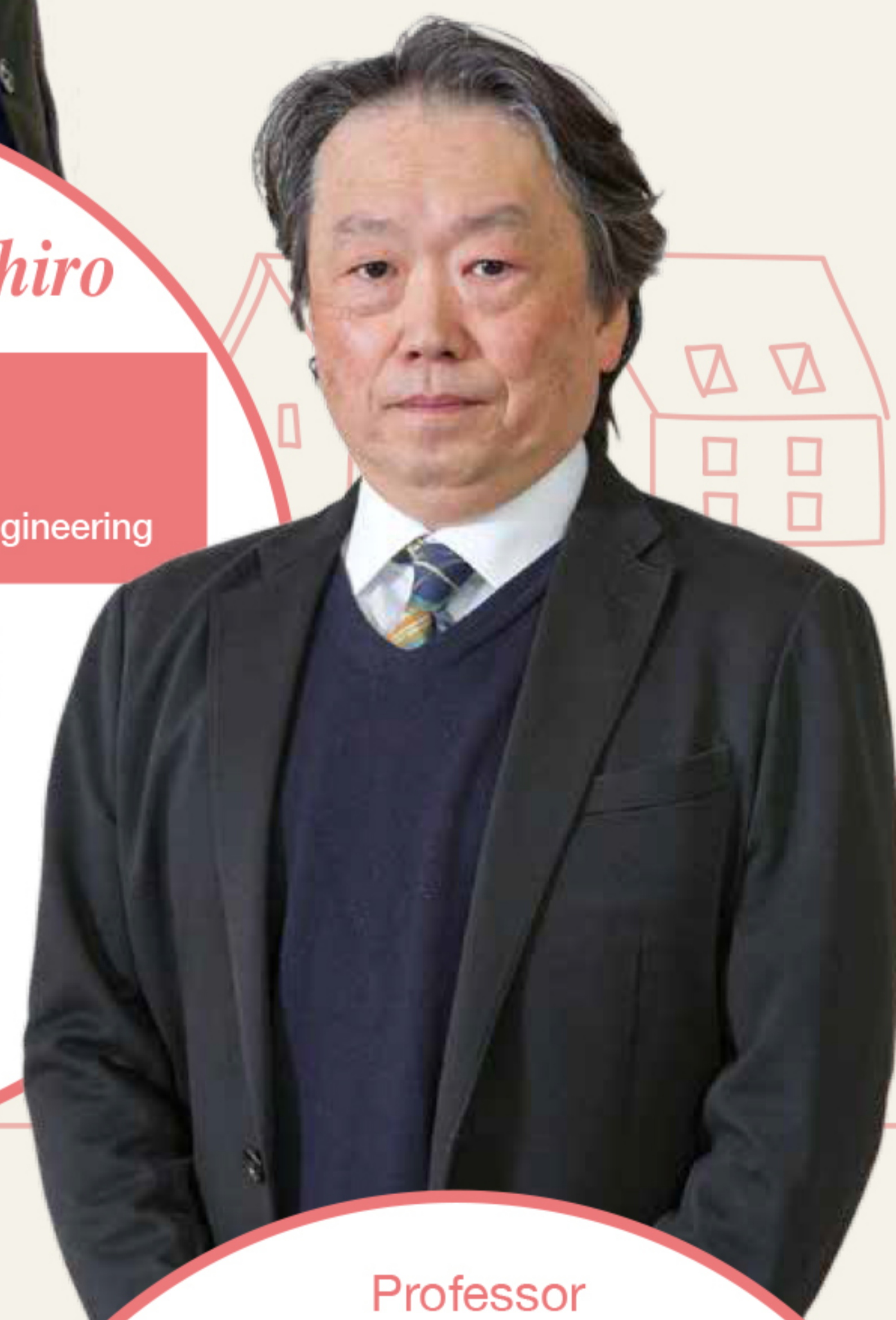


Professor
HOSHINO, Kazuhiro

[Research Expertise]

1. Biomaterial Engineering
2. Biological Resource Utilization Engineering

We are conducting research related to efficient production of useful biochemical substances from natural products, and elucidation of the function of intercellular environmental regulators and its efficient production.

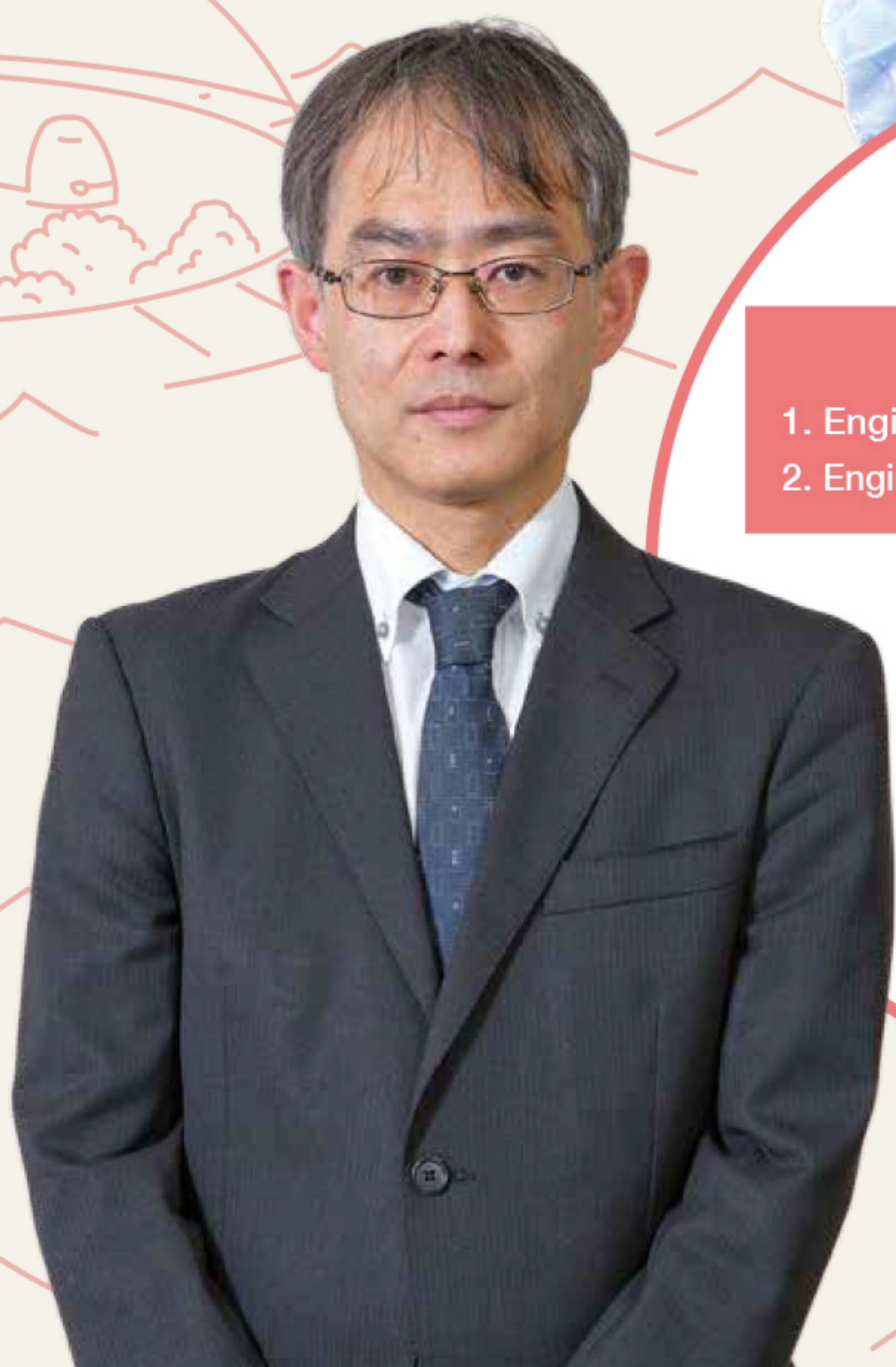


Professor
NUNOMURA, Norio

[Research Expertise]

1. Materials Science
2. Computational Science

Computational study of electronic structures and properties for materials. Materials design, structure analysis and function prediction from atomic and nano scales using state-of-the art computational methods.

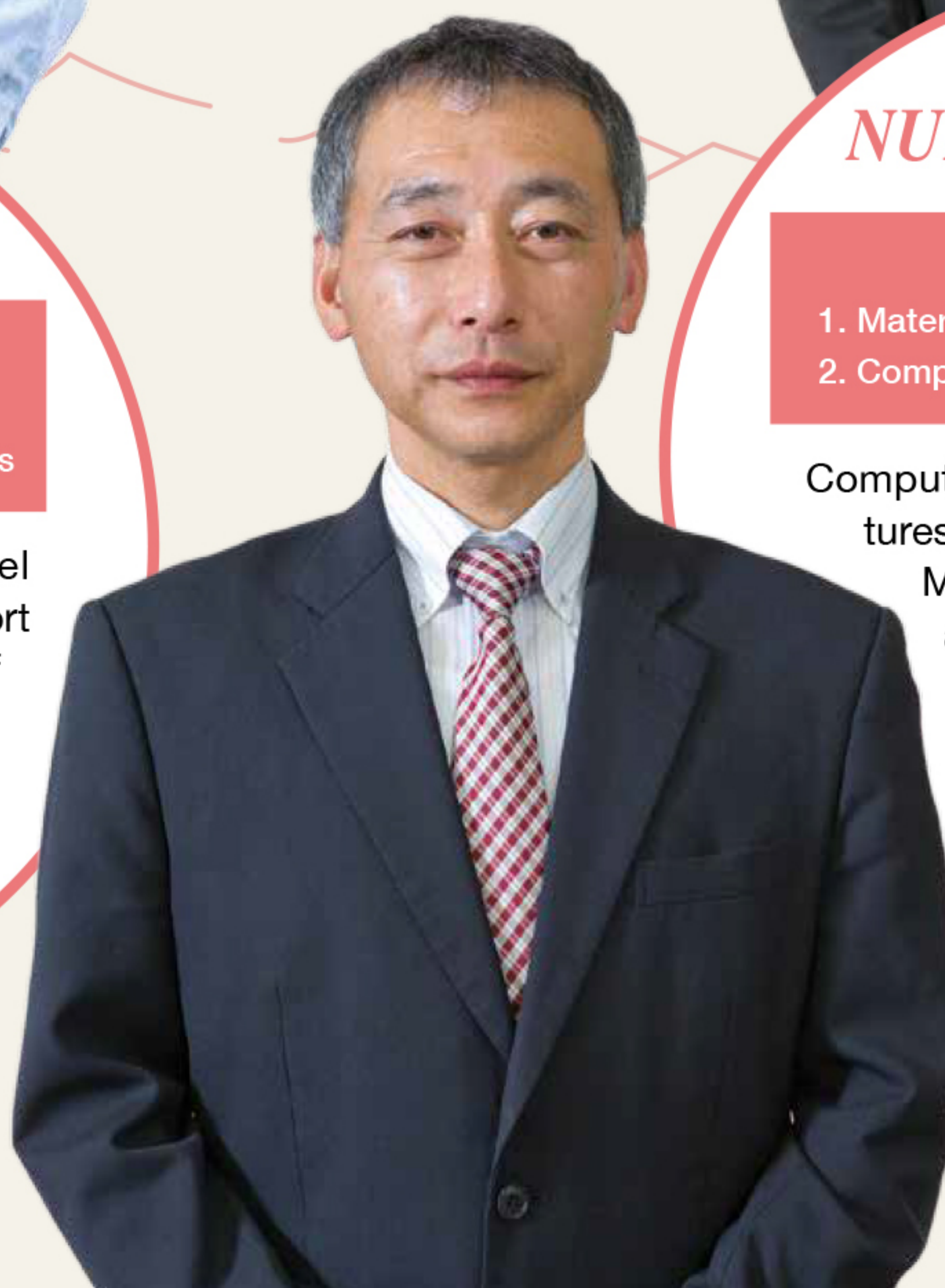


Professor
ONO, Hideki

[Research Expertise]

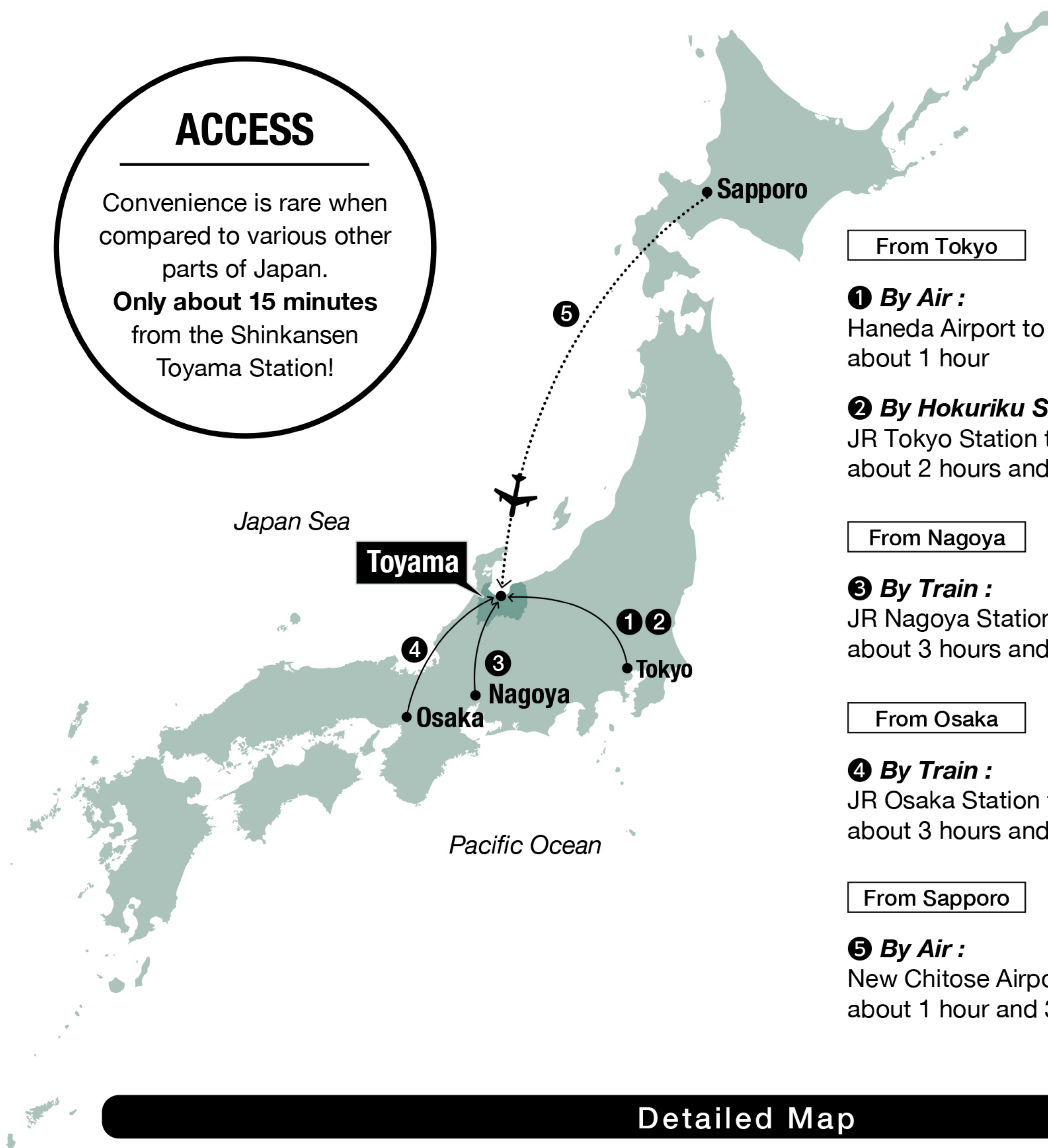
1. Engineering of Iron and Steel Materials
2. Engineering at High Temperature Processes

Toward the realization of novel system and structure to support our society, the production of high performance iron and steel materials are designed and created.



ACCESS

Convenience is rare when compared to various other parts of Japan.
Only about 15 minutes from the Shinkansen Toyama Station!



From Tokyo

- ① **By Air :**
Haneda Airport to Toyama Kitokito Airport : about 1 hour
- ② **By Hokuriku Shinkansen :**
JR Tokyo Station to Toyama Station : about 2 hours and 10 minutes

From Nagoya

- ③ **By Train :**
JR Nagoya Station to Toyama Station : about 3 hours and 20 minutes

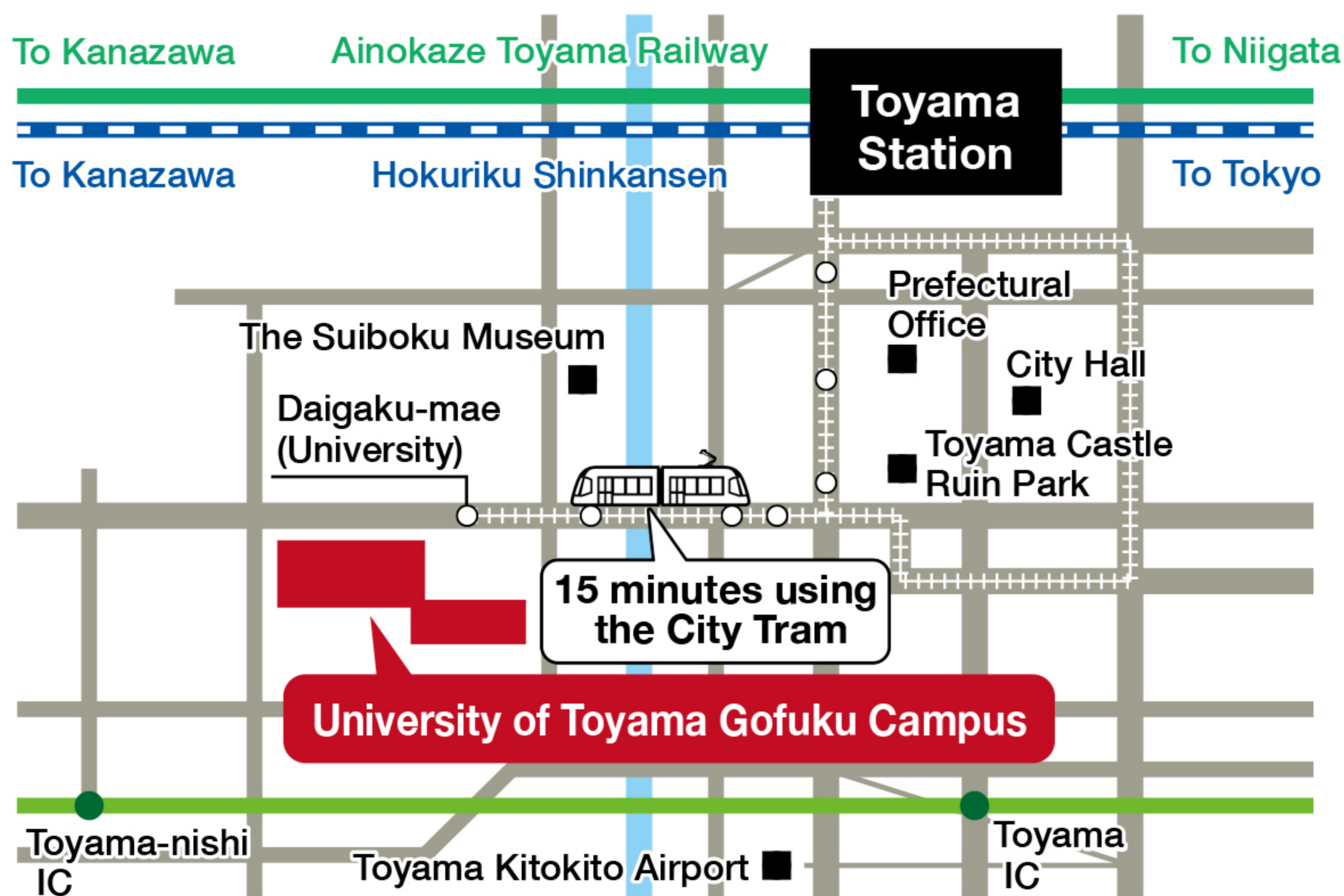
From Osaka

- ④ **By Train :**
JR Osaka Station to Toyama Station : about 3 hours and 20 minutes

From Sapporo

- ⑤ **By Air :**
New Chitose Airport to Toyama Kitokito Airport : about 1 hour and 30 minutes

Detailed Map



From Toyama Station

[By City Tram]
 Take the tram
 “To Daigaku-mae (University)”
 to the last station “Daigaku-mae (University)” :
 about 15 minutes

[By Bus]
 Take the bus
 “To University of Toyama” (from Terminal 3)
 to the “University of Toyama” bus station :
 about 20 minutes



website



facebook



Twitter



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<https://www.sus.u-toyama.ac.jp/>