Global Zero Emission Research Center

ゼロエミッション国際共同研究センター

https://www.gzr.aist.go.jp/en/

Create the Future, Collaborate Together

MIX
Paper from responsible sources
FSC® C004858

VEGETABLE OIL INK

August 2025

Global Zero Emission Research Center

ゼロエミッション国際共同研究センター

NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

What does a zero emission society look like?

A zero emission society is where CO_2 and other greenhouse gases (GHGs) that have significant adverse effects on the global environment are not emitted.
Despite having a long way to go, we strongly believe that such a zero emission society is achievable.
To bring about this transition to a zero emission society, a research center has been established here in Japan to gather people around the world and to conduct research and development.
Let's build a vision for the future together.

NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY (AIST)

Department of Energy and Environment

Global Zero Emission Research Center

Purpose

Global Zero Emission Research Center conducts environmental foundation research to create innovation that is essential for reducing CO_2 emission in line with Japan's Environment Innovation Strategy.

Carbon Neutrality through the Integration of Technologies

Since its establishment in January 2020, the Global Zero Emission Research Center (GZR) has steadily advanced as an international research hub tackling global-scale challenges. Looking toward the future, GZR continues its bold endeavors.
Dr. Akira Yoshino, Director of the Center, shares the origin and future vision of GZR.

YOSHINO Akira, Ph.D.
Director, Global Zero Emission Research Center

After studying petrochemistry at Kyoto University, he began working at the Asahi Kasei chemical company in 1972. He holds positions as an honorary fellow at Asahi Kasei, a fellow at National Institute of Advanced Industrial Science and Technology (AIST), president of the Lithium Ion Battery Technology and Evaluation Center (LIBTEC), lifetime distinguished professor at Meijo University, and distinguished professor at Kyushu University. He won the 2019 Novel Prize for Chemistry for his work in developing lithium-ion batteries.

In 2020, the Japanese government announced the "Environment Innovation Strategy," a fundamental policy designed to address global environmental issues. This strategy aims to achieve carbon neutrality by 2050. To facilitate the development of innovative technologies needed for this goal, the Global Zero Emission Research Center (GZR) was established at the National Institute of Advanced Industrial Science and Technology (AIST) in 2020.

Despite being affected by the COVID-19 pandemic and shifts in the international landscape, GZR has continued its research with determination and consistency. Some of its research findings are now advancing to the next stage of implementation in society. Nevertheless, numerous challenges must still be overcome in order to reach the 2050 goal. Global environmental problems pose shared challenges for all of humanity, making the establishment of an international cooperative framework essential for their resolution. Since its inception, GZR has been involved in RD20, a global initiative that annually brings together national institutes from G20 member countries around the world to discuss and enhance cooperation.

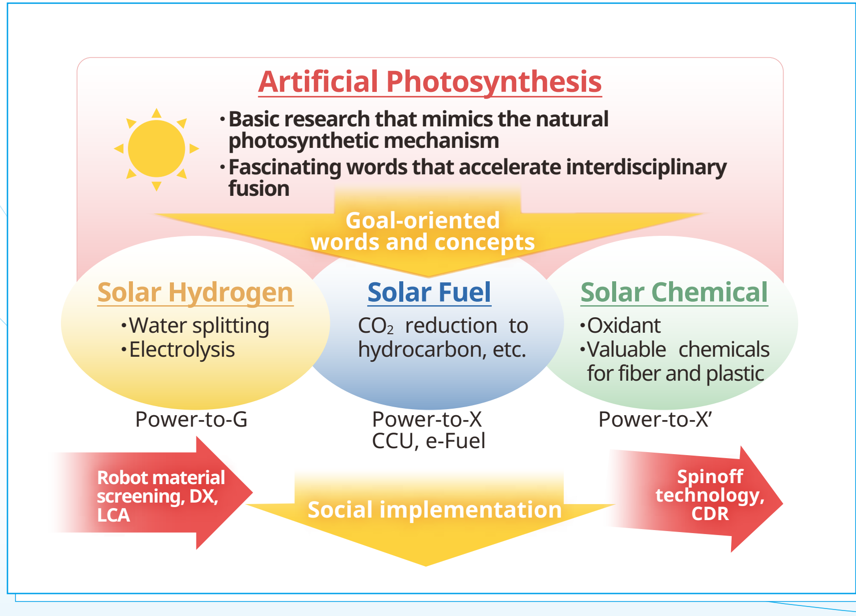
Furthermore, AIST is moving forward in alignment with its The 6th Medium to Long-term Plan, formulated in 2025. Addressing global environmental issues is also identified as a critical priority in this plan. GZR will continue its dedicated efforts toward achieving the 2050 goal.

July 2025

GZR Research Center, AIST Tsukuba West

In the Director's Office

Principal Researchers

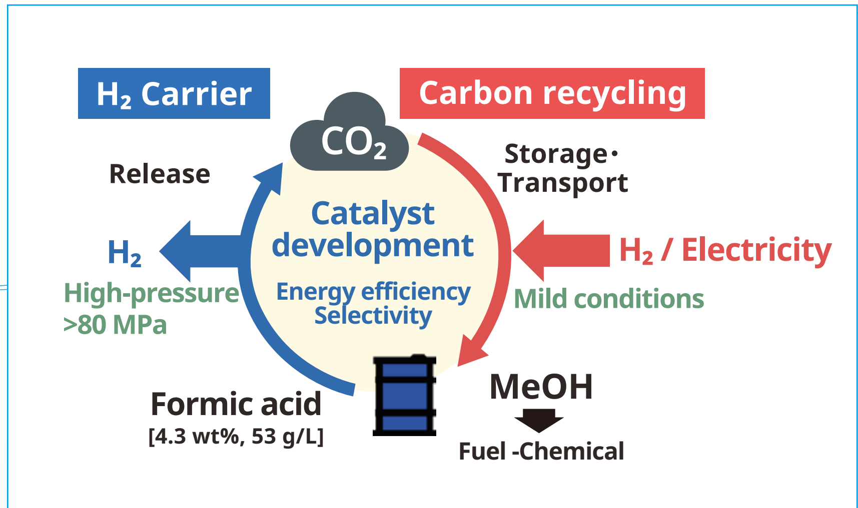


Natural photosynthesis, which converts and utilizes sunlight, provides society with a variety of useful products and is involved in the issue of global warming caused by CO_2. Artificial photosynthesis is the term used to describe basic research that mimics the mechanism of natural photosynthesis, and is a fascinating technology that accelerates the fusion of different fields. Based on artificial photosynthesis using photocatalysts, photoelectrodes, we will contribute to the realization of a carbon-neutral society by fusing various technologies.

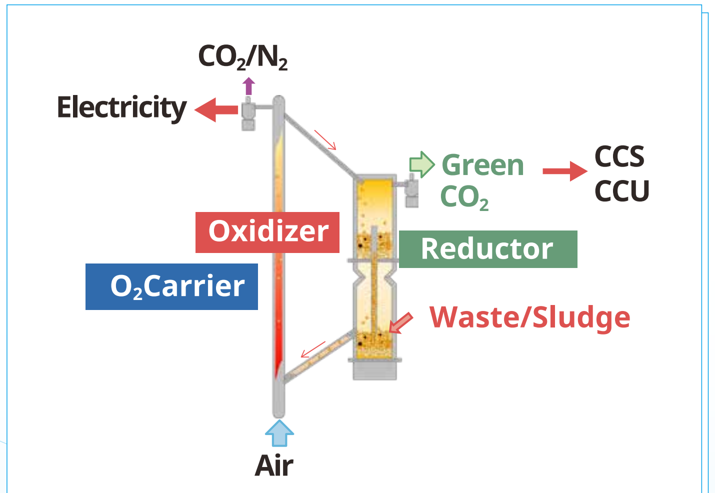
SAYAMA Kazuhiro, Ph.D.
Principal Researcher
Artificial Photosynthesis Research Team

HIMEDA Yuichiro, Ph.D.
Principal Researcher
Carbon-based Energy Carrier Research Team

My research goal is to achieve hydrogen storage and carbon recycling through reactions with CO_2 and hydrogen. What makes my work distinguished is the application of advanced, high-performance molecular catalysts to technologies for high-pressure hydrogen production from formic acid and the synthesis of methanol from CO_2 at low temperatures. We are committed to collaborating with industry to implement technologies in society, along with various domestic and international research partnerships.



Liquid organic hydrogen carrier (LOHC)



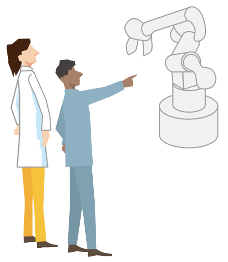
Chemical Looping Technology

My work focuses on chemical looping technology for efficient CO_2 capture, the development of carbon-neutral fuels, and robust Carbon Dioxide Removal (CDR) technologies. I am also deeply involved in green CO_2 production pathways and exploring the permanent storage potential of CO_2 mineral carbonation. Currently, I am leading an exciting pilot-scale project in collaboration with industry that aims to transform sewage sludge into hydrogen and fuel gas. I am passionate about achieving circular carbon economies and net-zero emissions through innovative waste-to-energy technologies.

Atul SHARMA, Ph.D.
Principal Researcher
Carbon Management Research Team

GZR 9 Teams Striving for Carbon Neutrality

By gathering insights from Japan and overseas, GZR engages in research and development to achieve carbon neutrality by integrating GHG reduction technologies and their associated systems assessment. GZR also promotes international collaboration and joint research on standard fundamental technologies that support GX's global development.



- **Thermal Energy Device Research Team** ››› P08
- **Fundamentals of Ionic Devices Research Team** ››› P09
- **Artificial Photosynthesis Research Team** ››› P10
- **Carbon-based Energy Carrier Research Team** ››› P11

- **Data-Driven Smart Society Systems Research Team** ››› P16
- **Environmental and Social Impact Assessment Team** ››› P15

- **Carbon Management Research Team** ››› P12
- **Environmental Impact Research Team** ››› P14
- **Resource Circulation Technology Research Team** ››› P13

Thermal Energy Device Research Team

Advanced Control and Effective Utilization of Thermal Energy

We develop innovative thermal management materials and thermal energy devices to improve waste heat recovery and thermal management.

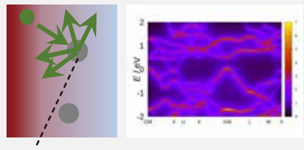
Research themes

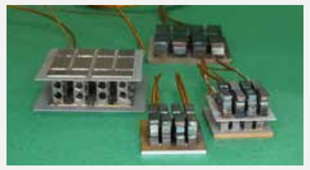
- Thermoelectrics for waste heat recovery and thermal management
- Applications of thermoelectrics power generation to vehicles, biochar economy, and space exploration
- Phase change materials for thermal energy storage and thermal management
- Heat-resistant materials used in high-temperature extreme environment

Research overview

Thermoelectrics

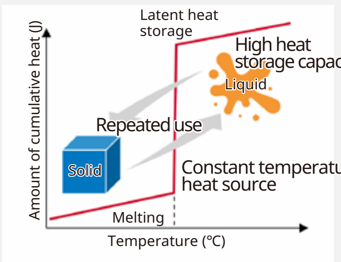
- Synergistic control of heat and electrical transport
- Developed various thermoelectric modules for different application


Inhibiting heat flow



Phase change material

- Thermal long duration energy storage
- Smart thermal management with temperature fluctuation mitigations



Heat resistant

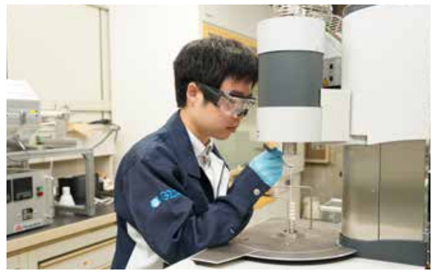
- Heat-resistant components for ammonia-fueled internal combustion engines

Concept for social contributions and implementation

Improved energy conservation through effective use of thermal energy with thermal management, including thermoelectrics conversion, thermal storage, and heat resistance.

Over 60% of primary energy is lost as heat, making efficient thermal management vital for energy conservation and carbon neutrality. Our team develops thermal management technologies across materials, devices, and lab-scale systems, aiming to advance the adoption of innovative solutions through theoretical and experimental insights into heat transport.


Thermal management for biochar production furnace


Developing unique heat storage materials


Developing thermoelectric materials with advanced equipment

Fundamentals of Ionic Devices Research Team

Innovating Electrochemical Devices by Elucidating Electron and Ion Movement

Employing structural control and advanced analyses at the nanolevel to develop electrolyzers, fuel cells, and other electrochemical devices that are crucial for realizing a zero-emission society.

Research themes

- Technologies for highly efficient conversion of CO_2, water, and renewable energy into chemicals
- High-performance solid oxide electrolysis cells (SOECs) and elucidation of their degradation factors
- Development of new electrochemical devices utilizing high-temperature ionic conductors

Research overview

Engineering surfaces/ interfaces of materials

Material design and fabrication process
- Nano-size engineering...
- Interface control...
- PLD, ALD...
- Interface bonding...

Feedback to materials design and development

Elucidation of physicochemical properties of electrochemical devices using state-of-the-art analysis technologies

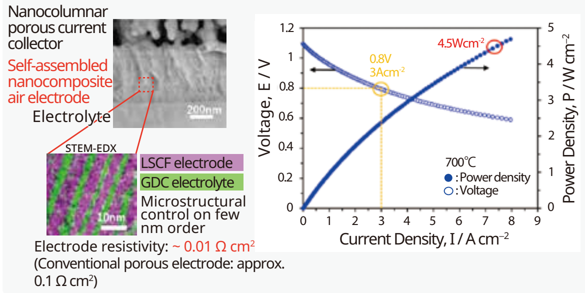
Model interface
High-performance materials

Advanced measurement/ evaluation techniques

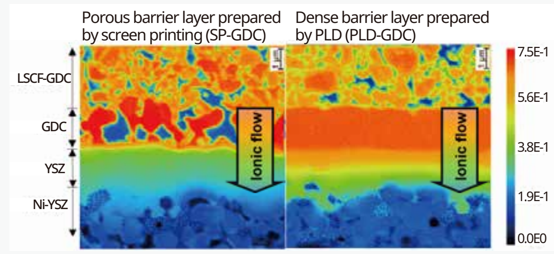
High-precision analysis technologies
- NanoSIMS
- FIB-SEM
- TEM
- X-ray CT...

Operando analysis technologies
- Synchrotron XAS
- Raman, FT-IR ...

Our SOFC single cell with features including a self-assembled nanocomposite air electrode delivers over 4.5 W/cm² at 700℃



Visualization of flow of oxide ion isotope ($^{18}O^{2-}$) using NanoSIMS led to finding that conventional cell fabrication causes inhibition of ionic flow between barrier layer (GDC) and electrolyte (YSZ)



Concept for social contributions and implementation

To realize electrochemical devices with highly efficient energy conversion and contribute to a zero-emission society.

Our team is called "Team FINDER" (Fundamentals of Ionic Devices Research Team). We specialize in uncovering and discovering previously unknown phenomena and elucidating the behavior of ions and electrons.

To create innovations that enhance the performance and functionality of electrochemical devices, thereby contributing to the realization of a zero-emission society, we believe it is essential to promote collaborative research with domestic and global companies and research institutions. If you are interested in our work, please contact us.


FIB-SEM for high-throughput fabrication and high-resolution analysis


SOEC test equipment (with Director Yoshino)


Secondary ion mass spectrometry with high mass and spatial resolution (NanoSIMS)

Artificial Photosynthesis Research Team

Aiming for a Breakthrough in Solar Energy Technology

We pursue all the possibilities of artificial photosynthesis, such as realization of economical hydrogen production and application to the production of valuable products. We also develop fundamental technologies to improve the performance of artificial photosynthesis.

Research themes

- Water splitting into H_2 and O_2 using photocatalysts
- Development of economical hydrogen production technology that combines photocatalysis and electrolysis using redox mediators such as iron ions
- Development of hydrogen and valuable substances production using photoelectrodes and electrode catalysts

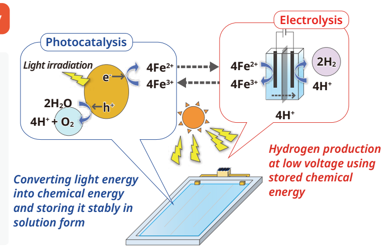
Research overview

Photocatalysis-electrolysis hybrid system

▪Production of low-carbon hydrogen at low cost

AIST's original technology

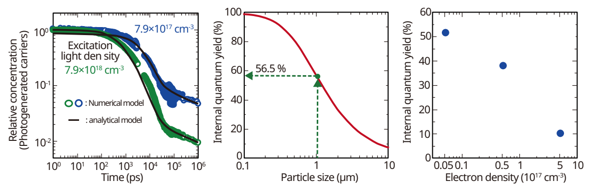
Technology that utilizes the advantages of photocatalysis and electrolysis to overcome their disadvantages



Water splitting over powdered photocatalysts

▪Production of low-carbon hydrogen at low cost

Extraction of physical property data through theoretical chemistry clarifies performance improvement factors and guidelines for high performance



High-throughput robot system

▪Innovation in screening methods for inorganic materials

Data science combining AI and machine learning

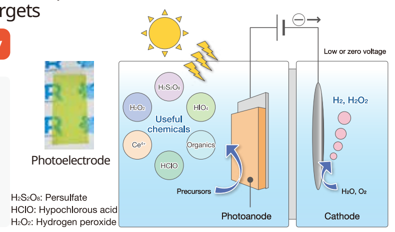
Aiming to create an opportunity to revolutionize the materials development process

Simultaneous production of hydrogen and chemicals

▪Production of low-carbon hydrogen at low cost
▪Expanding into environmental purification, antibacterial, antiviral, etc.
▪Developing attractive targets

AIST's original technology

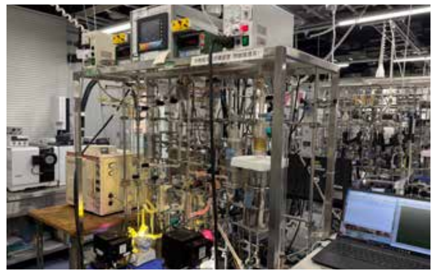
Aiming for early social implementation with various ideas



Concept for social contributions and implementation

- Social implementation of economical hydrogen production methods
- Development of new technologies to expand the solar energy utilization

Artificial photosynthesis is an attractive technology that theoretically can achieve high efficiency as well as that of solar cells and is expected to have a variety of applications. It is a technology that is full of dreams, such as the possibility of pioneering surprising uses and realizing performance that will astound the world for the first time. We aim to implement artificial photosynthesis technology in society as soon as possible while exploring all possibilities. We look forward to hearing from people who would like to discuss the future of artificial photosynthesis.


Automatic analyzer for produced gasses


Automatic controller for atmosphere furnace


Team members

Carbon-based Energy Carrier Research Team

Developing a Hydrogen Carrier System that Recycles CO_2

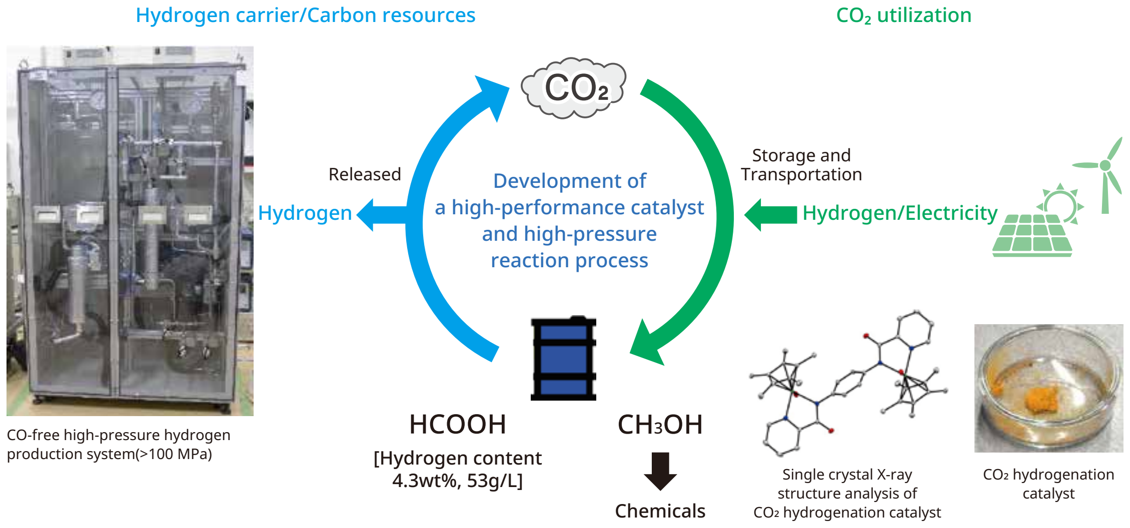
We are engaged in the research and development of energy (hydrogen) storage technologies based on interconversion between CO_2 and formic acid/methanol, for CO_2 utilization. Our research includes developing innovative systems to store and upgrade thermal energy at high temperatures utilizing chemical reactions between hydrogen and metals.

Research themes

- Development of highly efficient catalysts that enable formic acid/methanol to be produced through carbon dioxide reduction (i.e., hydrogenation, electro-reduction), and that allow hydrogen to be produced from formic acid
- Investigation into technologies for producing high-pressure hydrogen from formic acid
- Development of thermochemical energy storage system and chemical heat pump utilizing reaction between hydrogen and metals

Research overview

Formic acid/methanol production through CO_2 reduction



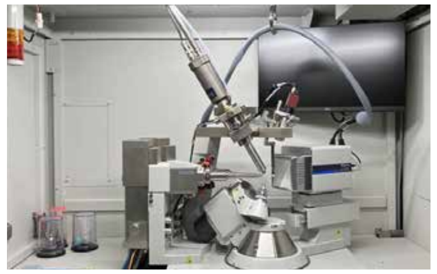
Concept for social contributions and implementation

- Establishment of a hydrogen transport, storage and usage method using formic acid/methanol
- Realization of thermal energy supply without CO_2 emission by using hydrogen as a thermal energy conversion/storage medium

From a carbon-neutral perspective, substances such as formic acid and methanol generated from CO_2 are considered very promising as energy carriers. Our team is working on research toward the social implementation of new technologies using these new energy carriers, collaborating with companies and universities while leveraging the expertise of each researcher. We are also actively engaged in international collaboration.


Hydrogen production from formic acid


High-pressure hydrogen generator


Single crystal X-ray diffractometer

Carbon Management Research Team

Carbon Management through Technological Development, Modeling, and Evaluation

Our team is conducting a series of innovative technological developments related to carbon management, as well as modeling and evaluation for process development and social implementation of technologies.

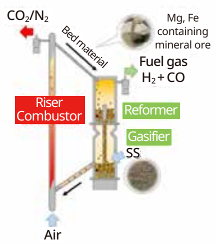
Research themes

- Development of innovative technologies that recycle (convert) CO_2 into minerals or chemical feedstock
  This development leads to the realization of "Beyond Zero" CO_2 emissions
- Development of CO_2 separation, capture, utilization, and fixation technologies that serve as a base of CCUS/carbon recycling/carbon removal
- Process design and evaluation of low-carbon technologies using machine learning modeling
- Development of evaluation tools for low-carbon technologies and scenarios for their social implementation

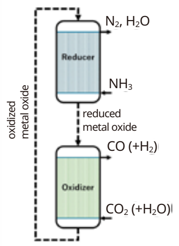
Research overview

Technology development

Development of technologies to achieve zero emission, including hydrogen production from sewage sludge, solid biofuels as a coke substitute, olefin production from CO_2 and ammonia, and enhanced rock weathering.



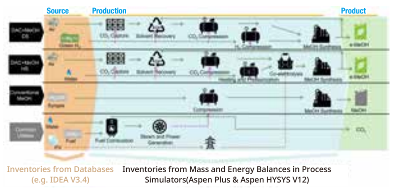
Overview of the Circulating Fluidized Bed Facility



N_2-free syngas (H_2+CO) from CO_2 and NH_3

Modeling

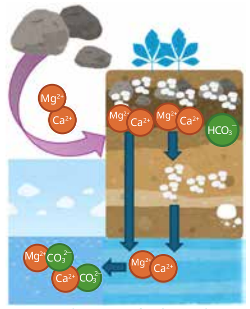
Cost-optimal process design using process simulations and machine learning models, including olefin production, methanol synthesis, chemical looping, and direct air capture (DAC) for CCUS/CDR .



<Research Overview>
(Process and Evaluation Result)
This Cradle-to-gate emissions of two DAC-eMeOH routes and a conventional pathway are compared, showing process contributions and regional grid impacts on overall performance.

Evaluation research

Develop evaluation tools for LC-CO_2 and economic performance based on process design results, harmonize global assessment methodology by clarifying the conditions to implement them into society.


Development of Enhanced Weathering Evaluation Tool

Concept for social contributions and implementation

- Implement a series of innovative technologies that lead to a significant reduction in CO_2 emissions and "Beyond Zero" CO_2 emissions through corporate collaboration
- Develop social implementation scenarios of technologies through zero-emission society scenarios created by a process design and an evaluation tool based on machine learning models

Our team develops innovative carbon management technologies that contribute to CO_2 reduction and removal to create a zero-emission society. We are also developing a process using machine learning models and tools to assess CO_2 reduction effects and economic feasibility. By integrating technological development and assessment, we are promoting the social implementation of these technologies through corporate collaboration and creating promising scenarios for a zero-emission society.


Bench plant for syngas production from NH_3 and CO_2


Modeling and evaluation by process simulation


Catalyst evaluation in a fluidized bed

Resource Circulation Technology Research Team

Efficient Recovery of Critical Metals Essential for a Zero-Emission Society

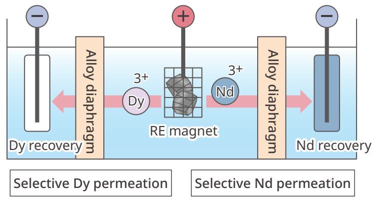
We seek to develop high-efficiency and environmentally friendly recovery technologies for critical metals that are indispensable for producing lithium-ion secondary batteries (LIBs), rare-earth magnets, catalysts, and other products.

Research themes

- Simple rare-earth magnet recycling process
- Recovery of rare-earth elements (REEs) from unconventional sources
- New critical metal recovery process from waste LIBs
- Highly efficient technologies to recover platinum group metals

Research overview

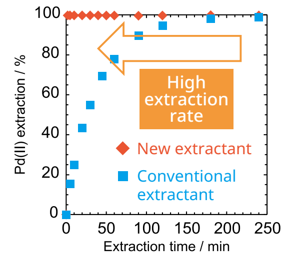
Establishment of a simple recycling process



New process using molten salt and alloy diaphragm

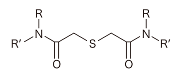
One-step rare-earth separation and recovery
- Reduction of process costs through significant simplification
- ➡ Realization of horizontal recycling in Japan

Highly efficient metal recovery

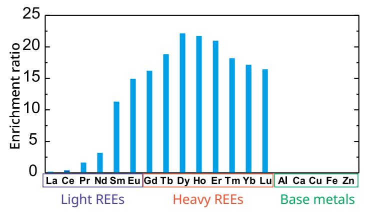


Development of Pd(II) extractant
- Commercially available from a chemical company
- In practical use at metal refineries

New extractant


Thiodiglycolamide

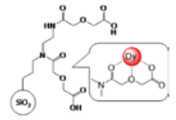
Diversification of REE resources



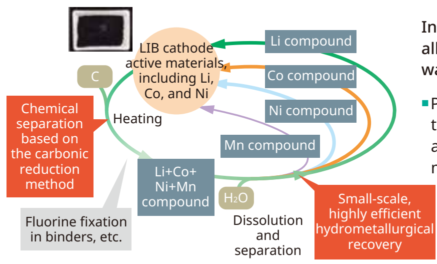
High selectivity for heavy REEs

REE recovery from nontraditional resources

New adsorbent



LIB recycling

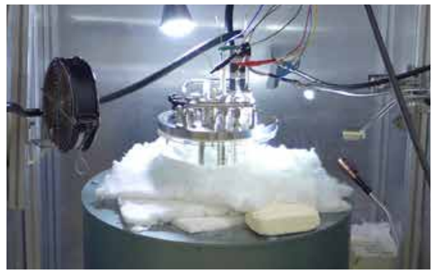


Individually recovering all critical metals from waste LIBs
- Process that combines the pyrometallurgical and hydrometallurgical methods

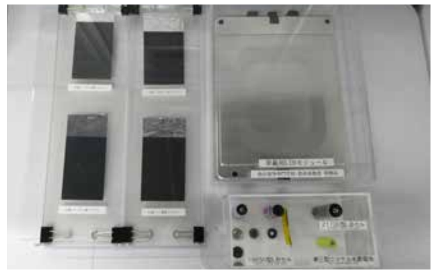
Concept for social contributions and implementation

Our goal is to establish processes for recycling critical metals from urban mines.

The importance of highly efficient metallurgical and recycling processes is growing even more owing to the recent changes in international trends toward decarbonization and a circular economy. Our research team will contribute to the elimination of metal resource constraints in a zero-emission society by establishing processes that can be put to practical use.


Molten salt electrolysis


Solvent extraction of rare metals


LIB components and cells

Environmental Impact Research Team

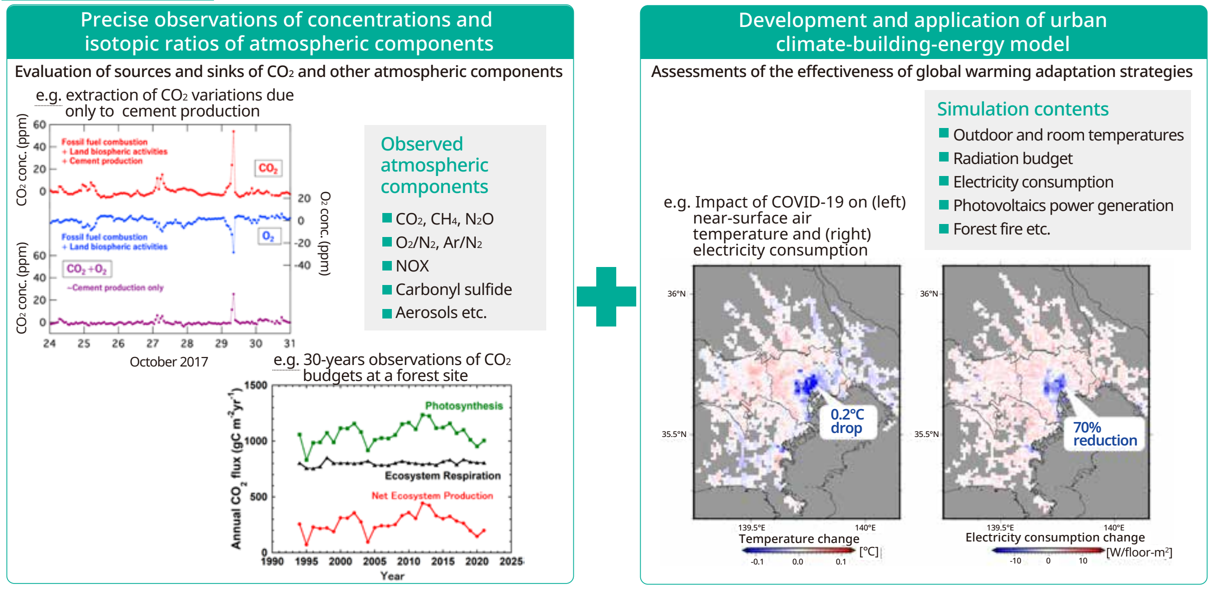
Environmental Dynamics Assessment through Observation and Simulation

We have developed techniques for atmospheric observations and urban environment simulations to evaluate climate change impact.

Research themes

- Evaluations of global, urban, and forest carbon cycles based on precise observations of concentrations and isotopic ratios of atmospheric components
- Evaluations and future prediction of urban environment and electricity consumption based on an urban climate-building-energy model

Research overview



Quantifications of local/global carbon cycles and environmental impact of climate change

Evaluation of the technologies to achieve Carbon Neutrality

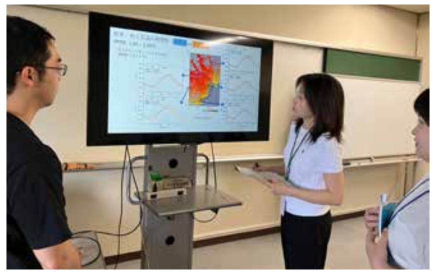
Concept for social contributions and implementation

Evaluations of the technologies for preventing global warming.

We have carried out monitoring and modeling studies for atmospheric environments. Our long-term observations of atmospheric components, e.g. forest CO_2 observations since 1993, are useful for evaluating the impact of climate change on carbon cycles. Our state-of-the-art urban climate-building-energy model makes it possible to evaluate climate change's impact on various social problems, such as increases in heatstroke and energy consumption. We have advanced the studies in collaboration with many research institutes.


Forest observation site


Stable isotope ratio mass spectrometer


Discussion about urban climate-building-energy model

Environmental and Social Impact Assessment Team

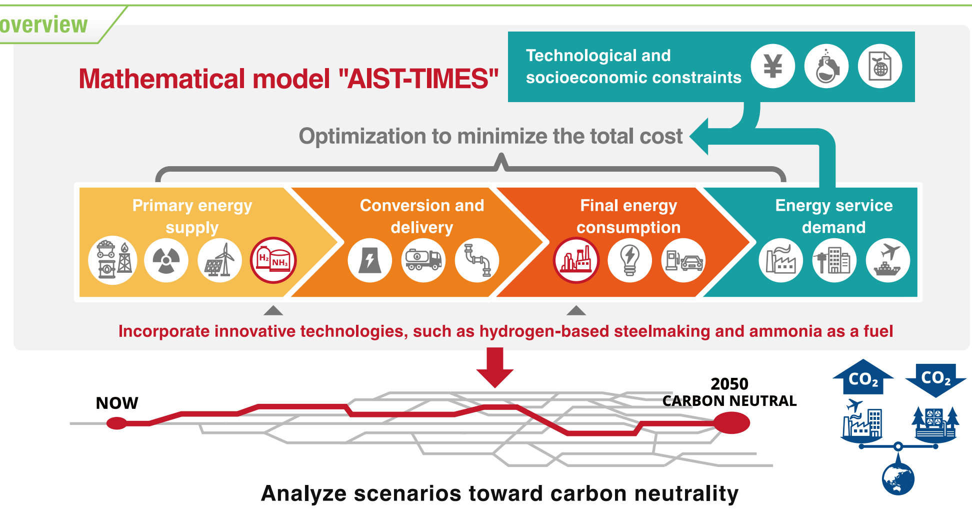
Developing Carbon Neutrality Scenarios through Technology Assessment

We examine the pathways to a zero-emission society by evaluating the impact of new technologies on the environment and society.

Research themes

- Long-term energy scenario analysis using mathematical models
- Assessing technologies based on systems/life cycle thinking
- Sustainable biomass utilization through the Water-Energy-Food (WEF) nexus approach

Research overview



① Long-term energy scenario analysis using mathematical models

- Simulate future energy supply and demand while considering uncertainties in technological development and social circumstances.
- Provide fundamental information for guiding technology development and countermeasures essential for achieving carbon neutrality.

② Technology assessment based on systems/life cycle thinking

- Assess the impact of introducing new technologies by taking a comprehensive view of the entire energy system and supply chain.
- Contribute to the examination of technical components and institutional frameworks necessary for implementing innovative technologies in society.

③ Sustainability assessment of biomass utilization

- Evaluate the long-term environmental and socio-economic impacts of biomass utilization in the Asian region.
- Propose sustainable approaches to biomass utilization by considering the interconnections between water, energy, and food.

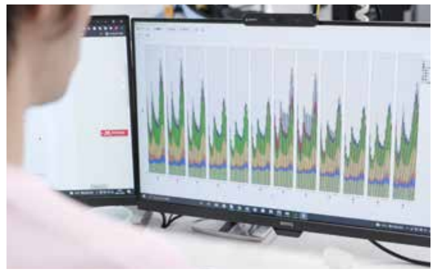
Concept for social contributions and implementation

Our goal is to contribute to the transition toward a zero-emission society by accelerating technology development.

The Environmental and Social Impact Assessment Team is committed to conducting research on innovative technologies that are essential for achieving a zero-emission society.

By leveraging our specialized expertise in technology and maintaining a comprehensive perspective, we assess both environmental and socio-economic impacts of technology adoption. Furthermore, we analyze the role of these technologies within the energy system using mathematical models and develop scenarios toward achieving carbon neutrality.


Long-term energy scenario analysis


Impact assessment of new technologies


Discussion at an international conference

Data-Driven Smart Society Systems Research Team

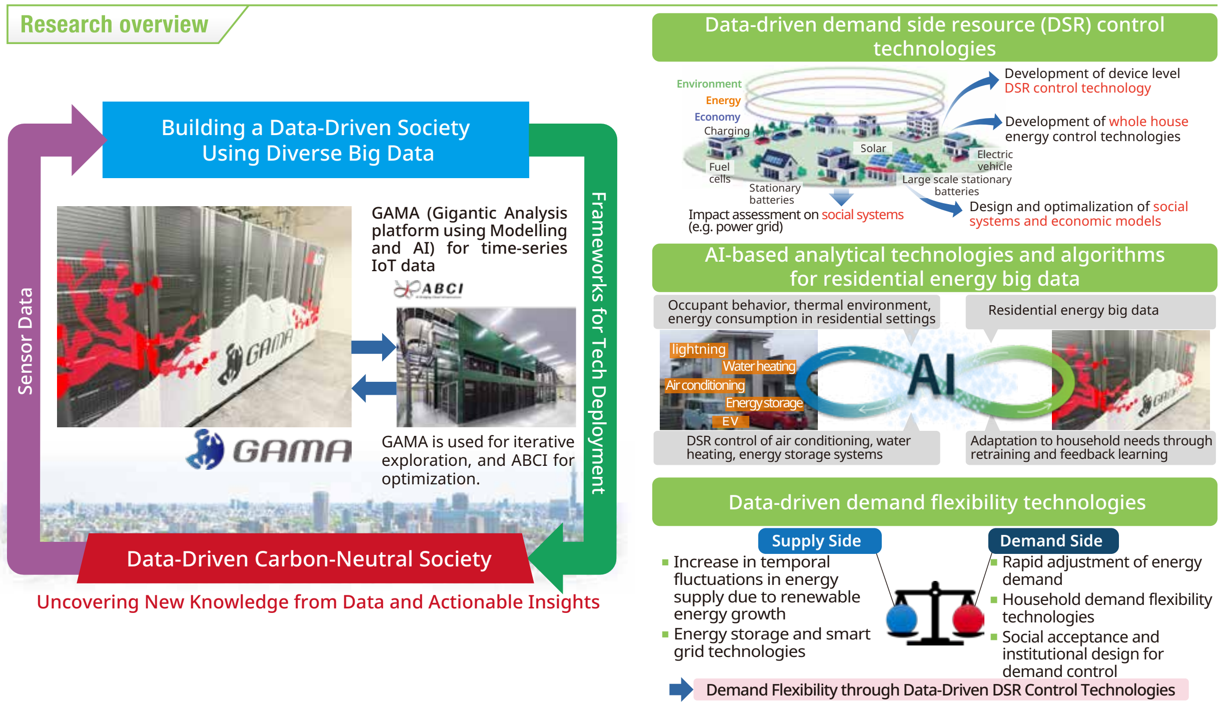
Building a New Society Powered by Data

We harness untapped big data within society to develop innovative technologies and systems that enrich people's lives. Our goal is to contribute to a more sustainable society without compromising daily comfort.

Research themes

- Development of data-driven demand side resource (DSR) control technologies
- Development of AI-based analytical technologies and algorithms for residential energy big data
- Development of data-driven demand flexibility technologies

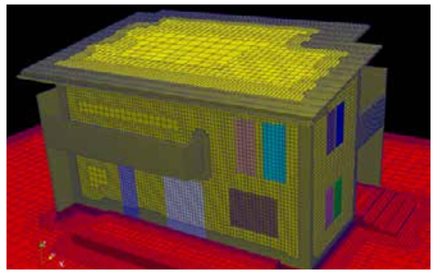
Research overview



Concept for social contributions and implementation

We aim to realize a society where people can enjoy richer and more sustainable lifestyles by utilizing diverse data that monitors daily life, along with advanced analytical technologies, including cutting-edge AI.

Data-Driven Smart Society Systems Research Team promotes the development of data-driven control technologies that utilize the vast amounts of big data accumulated in society. These technologies aim to identify societal needs from data and achieve zero emissions at the societal level while meeting the individual needs of households. In addition, the team also conducts research on institutional design necessary for the acceptance and implementation of such data-driven social systems.


Residential Digital Twin


Analysis Work Scene in GAMA

Server Room with GAMA

Members

Global Zero Emission Research Center

Director (AIST Fellow)	YOSHINO Akira
Deputy Director	KUDOH Yuki, YAMAMOTO Atsushi, YANAGIMACHI Tadashi
Principal Researcher	SAYAMA Kazuhiro, HIMEDA Yuichiro, SHARMA Atul
Principal Research Manager	ISHIDA Takao, NARITA Hirokazu
Technical Senior Officer	KONISHI Yoshinari

Research Teams

● Leader

Thermal Energy Device Research Team
- ● OHTA Michihiro
- INOUE Takahiro
- IMASATO Kazuki
- MIYATA Masanobu
- SAKAI Hiroki
- YAMAMOTO Atsushi

Fundamentals of Ionic Devices Research Team
- ● KISHIMOTO Haruo
- BAGARINAO Katherine
- OKAZAKI Moe

Artificial Photosynthesis Research Team
- ● MISEKI Yugo
- SEKI Kazuhiko
- KUSAMA Hitoshi
- KODERA Masanori
- NANDAL Vikas
- SAYAMA Kazuhiro
- HORIE Hirotaka

Carbon-based Energy Carrier Research Team
- ● ISHIDA Takao
- SAITA Itoko
- ONISHI Naoya
- HIMEDA Yuichiro
- TAKAGI Hideyuki

Carbon Management Research Team
- ● MORIMOTO Shinichirou
- MURAKAMI Takahiro
- KELLER Martin
- GUZMAN Urbina Alexander
- SHARMA Atul

Resource Circulation Technology Research Team
- ● OISHI Tetsuo
- OGATA Takeshi
- KASUYA Ryo
- SUZUKI Tomoya
- KATASHO Yumi
- NARITA Hirokazu

Environmental Impact Research Team
- ● ISHIDOYA Shigeyuki
- MAEDA Takahisa
- NAKAJIMA Ko
- PARK Chaeyeon
- HASEGAWA Asaka
- KAMEZAKI Kazuki

Environmental and Social Impact Assessment Team
- ● KUDOH Yuki
- GONOCRUZ Ruth Anne
- OZAWA Akito

Data-Driven Smart Society Systems Research Team
- ● HONDA Tomonori
- SHIMADA Hideki
- CHO Mincheol

Research Planning Office of Zero Emission

Director	TSUNEMI Kiyotaka
Planning Officer	OZAWA Akito
Officer	MINAMI Anzu
Attached to the Office	YANAGIMACHI Tadashi, YOSHIZAWA Noriko, SHARMA Atul HONDA Tomonori, ANDO Yuji
Collaboration Officer	NISHIO Masahiro

Main Research Equipment

Imaging X-Ray Photoelectron Spectrometer (XPS)

A complex surface analyzer for analyzing the composition of elements consisting of a sample surface, chemical bonding status, etc. This analyzer allows each material and catalyst to be analyzed in detail in conditions that are closer to those of actual use.

Secondary Ion Mass Spectrometry Microprobe for Isotopic and Trace Element Analysis at High Spatial Resolution (nano SIMS)

A secondary ion mass spectrometer that allows analysis with the minimum beam diameter of 50 nm. This spectrometer, allows for imaging analysis of elements, including microelements and isotopes.

High Resolution, Nondestructive 3D X-ray Microscope (X-ray CT)

An X-ray CT system that allows for nondestructive observation inside the device with its high resolution and contrast features. This system allows for high speed imaging at a submicron scale.

Gigantic Analysis platform using Modelling and AI (GAMA)

A supercomputer system originally installed by GZR. This system is used for analyzing large scale time series data accumulated within society, AI-based analysis, scenario simulations, etc.

Initiatives for Strengthening Collaboration In and Outside of Japan

Through the following two activities, GZR has been strengthening collaboration with various stakeholders in and outside of Japan.

RD20

Research and Development 20 for Clean Energy Technologies

We hold conferences of leaders from research institutes in the carbon neutral field in G20 member countries. Sharing R&D activities, experiences and ideas, we pursue possibilities for new international joint research.

The 6th RD20 Conference (2024)

For more details, please visit the following site:
https://rd20.aist.go.jp/

Zero-emission Bay

Tokyo Zero-emission Innovation Bay

With the aim of establishing the Tokyo Bay region as the world's first zero emission innovation area, we have been pursuing a wide range of activities including strengthening collaboration with parties in industry, academia, and government, planning and promoting R&D and demonstration projects, and disseminating information using area maps.

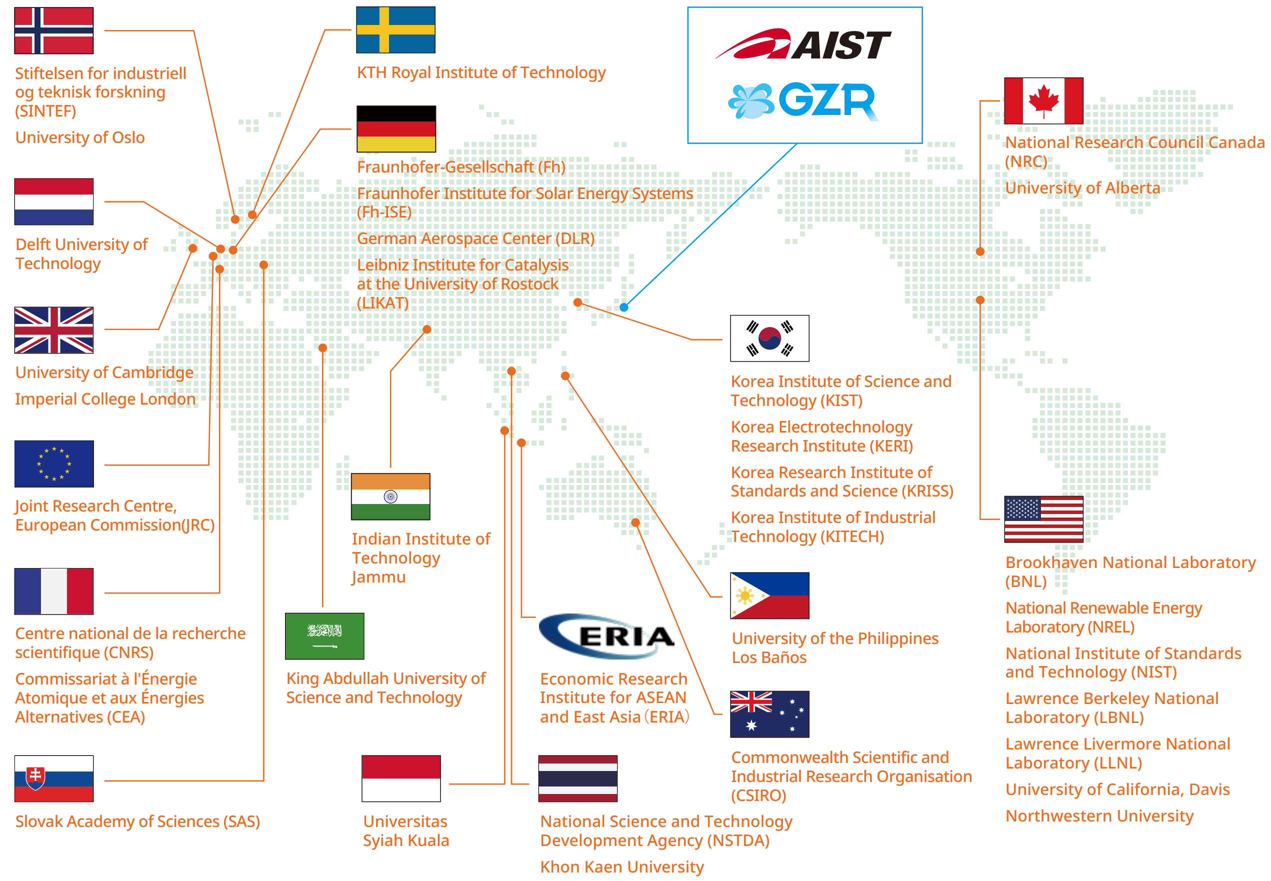
"Zero-emission Bay" map (as of April 30, 2025)

For more details, please visit the following site:
https://unit.aist.go.jp/gzr/zero_emission_bay/en/

Collaboration for Global Solutions

(As of August 2025)

We conduct international joint research projects with overseas research institutes that carry out zero emission related research activities, and we strengthen international collaborations through RD20 and other efforts.

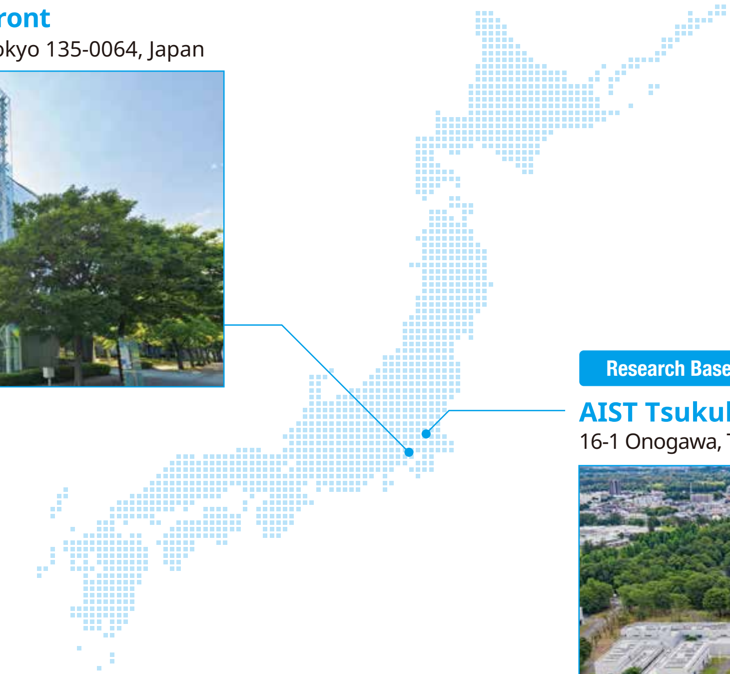


Main Bases

Headquarters

AIST Tokyo Waterfront

2-3-26 Aomi, Koto-ku, Tokyo 135-0064, Japan



Research Bases

AIST Tsukuba West

16-1 Onogawa, Tsukuba, Ibaraki 305-8569, Japan

The following site contains information about access options and directions:
https://www.gzr.aist.go.jp/en/access/