

Nara Institute of Science and Technology

GUIDE BOOK
2026 - 2027



NAIST
Graduate School in Japan

About NAIIST

Nara Institute of Science and Technology (NAIST) was founded as a unique Japanese national university consisting solely of graduate schools in the three areas of information science, biological science, and materials science to redefine graduate-level education. In 2018, to push forward the boundaries of advanced science and technology, the three graduate schools merged to create the Graduate School of Science and Technology with Education Programs in the original three research areas and two of their interdisciplinary areas. At present, over 1,200 students—roughly 25% from overseas—are supervised by approximately 200 NAIST faculty.

With its cutting-edge facilities and a high student-to-faculty ratio, NAIST’s world-leading research and education are a direct result of its rich, global environment and supportive infrastructure. Moreover, NAIST’s faculty and students’ outstanding achievements are shared world-wide through patents, licenses, spin-off companies, and active international exchange. As a result, NAIST has quickly established itself as a world-class research and education center where young research scientists and engineers become tomorrow’s global leaders.

From its establishment, NAIST has developed education programs and research that begin with NAIST and spread across research fields through our extensive global network of NAIST graduates and international partner institutions. This network is not only key to our research activities, which are undertaken spanning the globe to promote collaboration at the forefronts of science and technology, but a central part of NAIST’s global education programming, allowing students to experience today’s international trends and environments.

NAIST eagerly promotes admission of students from both Japan and overseas who have strong basic academic capabilities, regardless of their academic backgrounds, and actively admits researchers, engineers and others currently working in society with strong enthusiasm for advanced scientific research and clearly defined aspirations for the future.



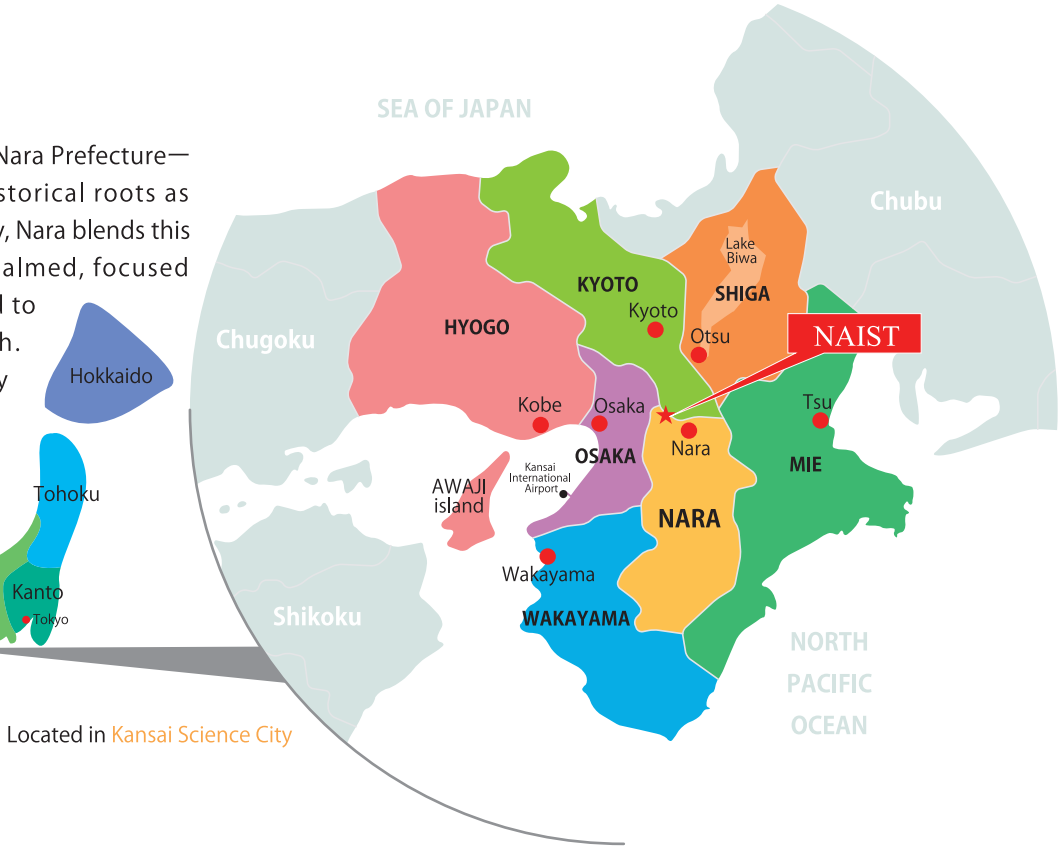
President’s Vision 2030

NAIST celebrated its 30th anniversary in 2021 and the President, Dr. Kazuhiro Shiozaki, issued his vision of what NAIST should be in 2030. Upon the foundation laid by its prominent achievements over the past three decades, NAIST will build a campus community that strives for the new development in research and education through “co-creation” with diverse stakeholders. Please use the QR code to view the President's Vision 2030 to learn how NAIST will pursue co-creation to fulfill its mission as a national postgraduate institution.

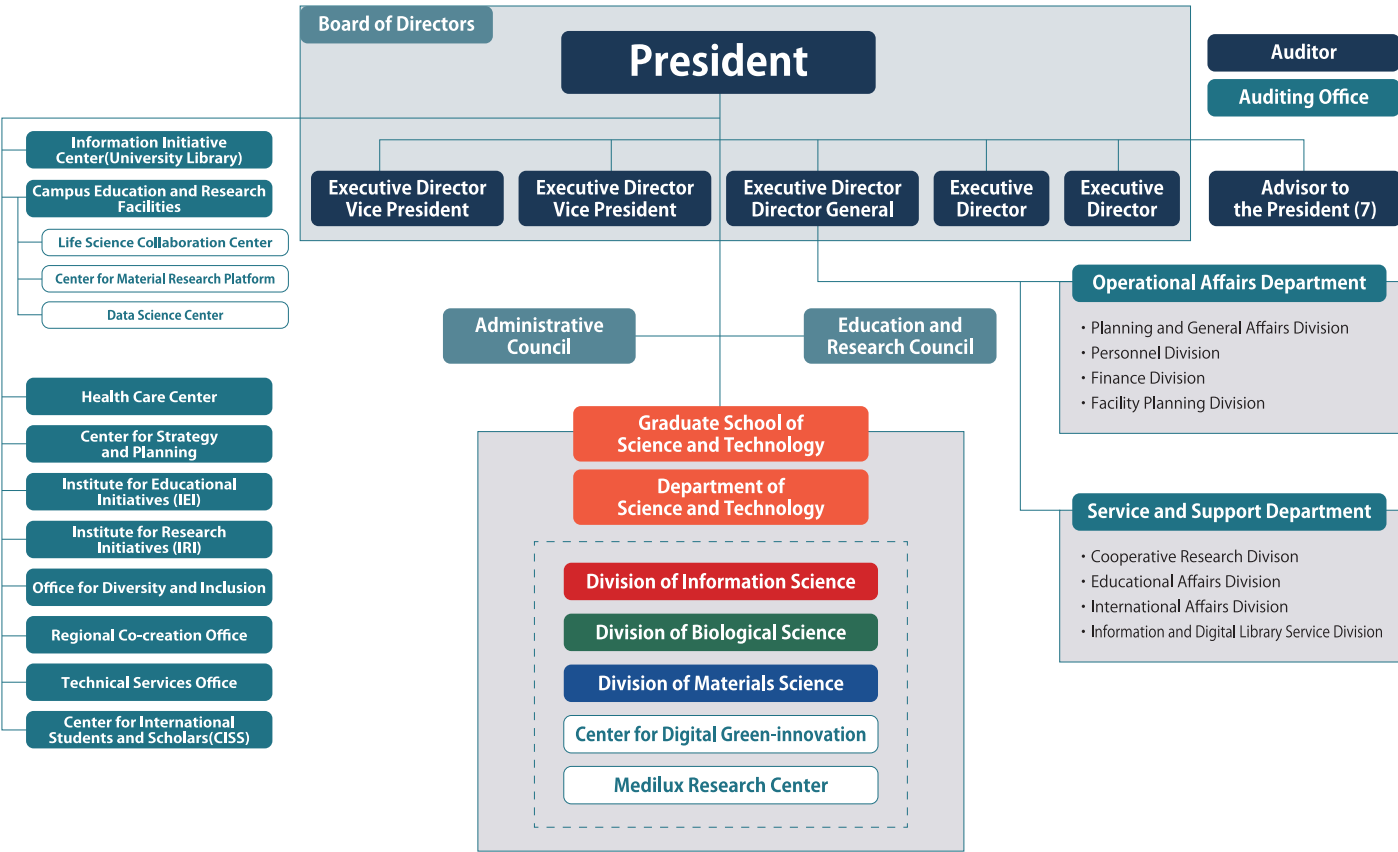


Location

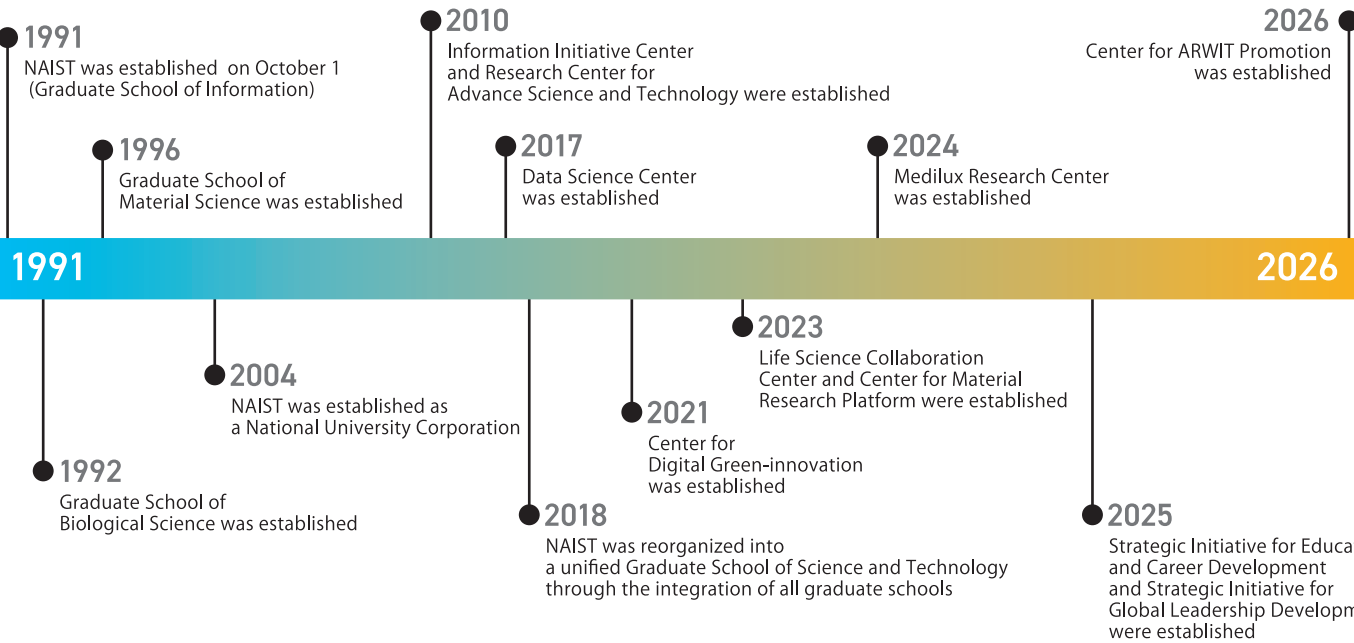
NAIST is located in Ikoma City, Nara Prefecture—an area known for its deep historical roots as Japan's first ancient capital. Today, Nara blends this rich cultural heritage with a calmed, focused environment that is well suited to advanced study and research. Kyoto and Osaka are both easy reach by train, while Kansai International Airport is approximately one hour from campus, ensuring convenient access for international travel.



Organization

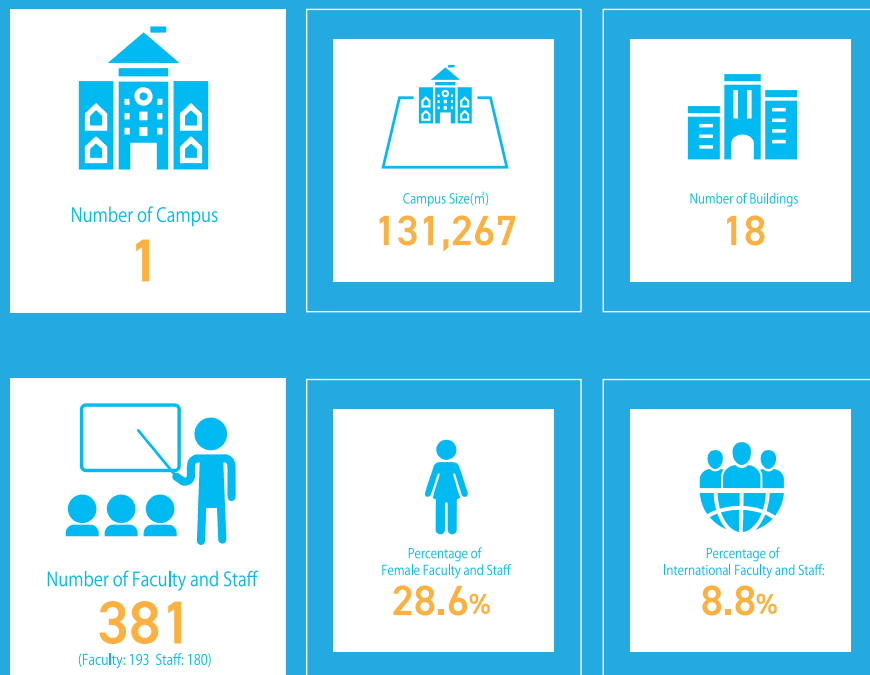


NAIST History

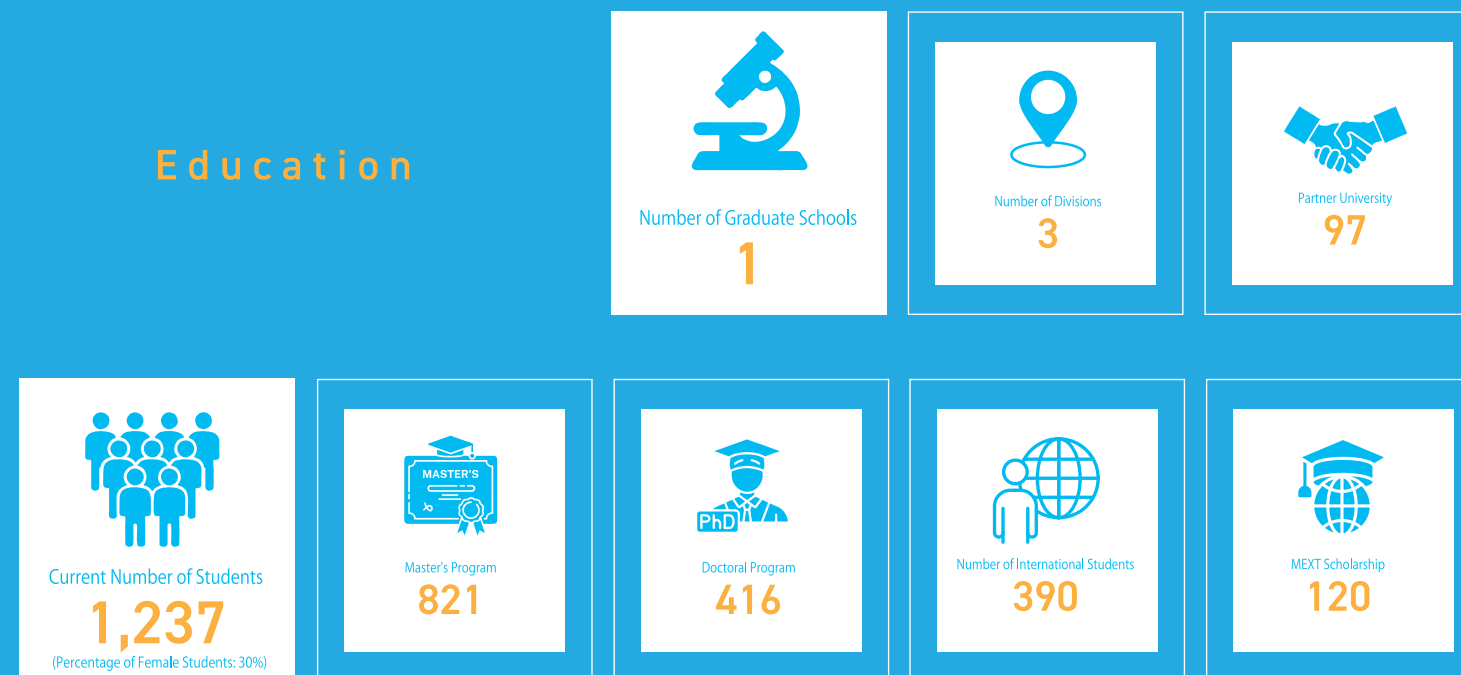


NAIST Numbers

Overview of NAIST



Education



As of April 1, 2026

NAIST Highlights

J-PEAKS

(Program for Forming Japan's Peak Research Universities)

NAIST has been selected for the "J-PEAKS" program (FY2025-2029), receiving funding of 5.5 billion yen over a five-year period.

Under this program, we have established a 10-year vision of becoming "A graduate school university that contributes to the sustainable development of a society with a declining population through the promotion of social implementation of research seeds using digital technology and international collaboration."

Based on this vision, the efforts will focus on two key strategies to strengthen our research capabilities, accelerate talent development and social implementation, and contribute to Japan's sustainable development.



Strategy 1

Strategic Recruitment and Development of Human Resources from Southeast Asian Countries



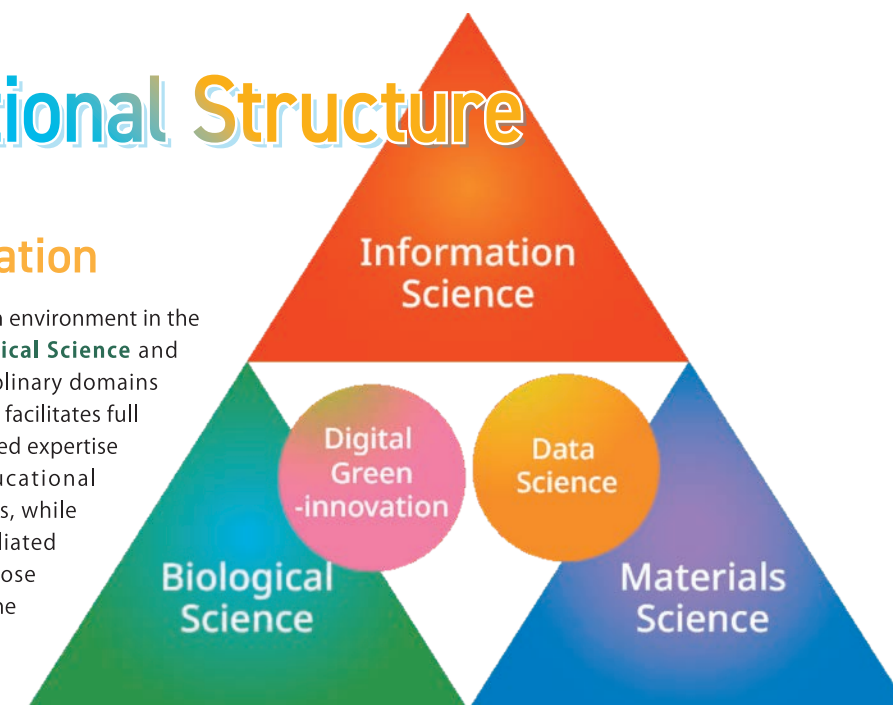
Strategy 2

Development and Sharing of the System for Automated Research Workflow and Industrial Translation (ARWIT)

NAIST Educational Structure

Research-Driven, Interdisciplinary Education

NAIST has established an outstanding research environment in the three fields of **Information Science**, **Biological Science** and **Materials Science**, as well as in the interdisciplinary domains underpinning them, building a framework that facilitates full immersion in research. Students acquire advanced expertise and a broad perspective through five educational programs, including interdisciplinary domains, while engaging in world-class research in their affiliated laboratories. In an open environment with close faculty-student relationships, NAIST cultivates the drive to take on challenges and convergence knowledge to lead future generations of science and technology.



MSTeC NARA (General Incorporated Association Medical Science and Technology Collaboration NARA)



This organization, jointly established by Nara Institute of Science and Technology and Nara Medical University (Kashiwara, Nara Prefecture), promotes close collaboration in medicine, engineering, and related fields to enhance education and research, strengthen university functions, and foster innovation in next-generation healthcare and advancements in medical technology. It also organizes joint seminars and workshops led by faculty from both universities. It is officially certified by the Minister of Education, Culture, Sports, Science and Technology as a University Collaboration Promotion Corporation.

- ▶ Establishment of hubs for Digital and Molecular Medicine, and promotion of industry-academia collaboration
- ▶ Development of new industries and continuing professional education programs
- ▶ MD-PhD program to train future physician-scientists, including "the next Shinya Yamanaka"
- ▶ Creation of interdisciplinary graduate programs in science, engineering, health, and welfare
- ▶ ICT-based remote healthcare initiatives in rural Nara, with nationwide expansion planned

Digital Medicine: Evidence-based software and hardware products for measuring and intervening to improve human health.

Molecular Medicine: A field of medicine that develops diagnostic and therapeutic methods for diseases by understanding how genes, proteins and other cellular molecules function.

MD-PhD: A program in which medical students also pursue graduate studies to earn both an MD and a PhD.

Educational Programs Facilitating Research in Leading-edge Science and Technology

In addition to three programs grounded in information science, biological science and materials science, NAIST also offers programs focused on interdisciplinary domains. Flexible course selection is available to match individual interests and aspirations.



Entrance Examination Schedule for Fall 2026 and 2027 Admission

Foreign nationals (except for those holding Permanent Resident or Special Permanent Resident status in Japan) must complete the Pre-application procedure for the NAIST Entrance Examination.



Screening of International Students by Special Recommendation (Master's and Doctoral Courses)

In addition to the regular entrance examination, NAIST offers a special entrance examination for students, faculty members, research or graduates of our partner institutions.



The Advanced Information Specialist Course



Exchange Partners

Academic Exchange Agreement:97 Overseas Institutions in 24 Countries/Regions

(As of April 2026)

International Partner List

Asia (51)	
Korea	Habnat National University
	College of IT Engineering, Kyungpook National Univesrity
China	Institute of Genetics and Developmental Biology, Chinese Academy of Sciences
	Tianjin University of Technology
	School of Chemistry and Chemical Engineering, Nanjing University
	Liaoning University
	Northeast Normal University
	School of Information Science and Engineering, Yunnan University
	College of Life Sciences, Nanjing Agricultural University
Taiwan	School of Life Sciences, Nanjing University
	National Yang Ming Chiao Tung University
	Institute of Biophotonics, National Yang Ming Chiao Tung University
	The National Taiwan University of Science and Technology
	National Cheng Kung University
Vietnam	National Taipei University of Technology
	Institute of Biotechnology, Vietnam Academy of Science and Technology
	Institute of Materials Science, Vietnam Academy of Science and Technology
	University of Science and Technology of Hanoi (USTH)
	Hanoi University of Science, Vietnam National University [VNU University of Science]
	VNU University of Engineering and Technology, [Vietnam National University, Hanoi, University of Engineering and Technology]
	Faculty of Electronics and Telecommunications, University of Science, Vietnam National University Ho Chi Minh City
	Vietnam National University Ho Chi Minh City, University of Information Technology
	University of Science, Hue University [Hue University of Sciences]
	Hanoi University of Science and Technology
Thailand	Mahidol University
	Chulalongkorn University
	Kasetsart University
	Chiang Mai University
Malaysia	King Mongkut's University of Technology Thonburi
	Universiti Sains Malaysia
	University of Malaya
	Universiti Teknologi Malaysia
Philippines	Universiti Tunku Abdul Rahman
	Universiti Kebangsaan Malaysia
	Ateneo de Manila University
	University of the Philippines Diliman
Indonesia	De La Salle University
	Universitas Gadjah Mada
	IPB University (Bogor Agricultural University)
	Universitas Indonesia
	Universitas Hasanuddin
	Institut Teknologi Bandung
	Universitas Jenderal Soedirman
	Electronic Engineering Polytechnic Institute of Surabaya (Politeknik Elektronika Negeri Surabaya (PENS))
	Institut Teknologi Sepuluh Nopember
	Universitas Muhammadiyah Surakarta
India	National Research and Innovation Agency
	Indira Gandhi Delhi Technical University for Women (IGDTUW)
Bangladesh	SRM Institute of Science and Technology
	Bangladesh University of Engineering and Technology
	School of Health and Life Sciences, North South University

Europe (33)	
U.K	University of Edinburgh
	Faculty of Science, Leiden University
Netherlands	Univesité Toulouse
	École Polytechnique
	École Normale Supérieure Paris-Saclay
	Telecom SudParis
	École Supérieure d'Ingénieurs en Électrotechnique et Électronique (ESIEE) Paris
	École Nationale Supérieure d'Ingénieurs de Caen(ENSICAEN)
	Telecom Paris (Telecom ParisTech)
	Sorbonne Université
	Université Paris-Saclay
	University of Rennes
France	Ecole Normale Supérieure de Lyon (ENS de Lyon)
	Universite de Picardie Jules Verne
	Faculty of Engineering, RheinMain University of Applied Sciences
	RWTH Aachen University
	Justus Liebig University Giessen
	Karlsruhe Institute of Technology
	Faculty of Engineering and Computer Science, University of Ulm
	University of Regensburg
	Department of Informatics, Technical University of Munich
	Department of Electrical and Computer Engineering, Technical University of Munich
Germany	Coburg University of Applied Sciences and Arts
	Faculty of Mathematics and Natural Sciences, Heinrich Heine University Düsseldorf
	DFKI (The German Research Center for Artificial Intelligence)
	Lamarr Institute for Machine Learning and Artificial Intelligence, University of Bonn
	University of Cagliari
	University of Trento
	Politecnico di Torino (PolITO)
	Faculty of Medicine, University of Turku
	Institute of Solid State Physics, Graz University of Technology
	Bern University of Applied Science
Italy	University of Zurich, Faculty of Science
Finland	
Austria	
Switzerland	
North America(7)	
Canada	Faculty of Science, University of British Columbia
	Queen's University at Kingston
U.S.A.	Biotechnology Institute, University of Minnesota
	University of California Davis
	Macromolecular Science & Engineering program, University of Michigan
	University of California, San Diego
	Lawrence Berkeley National Laboratory (LBNL), Joint Genome Institute (JGI)
South America(4)	
Brasil	Universidade Federal de São Paulo
	The University of San Paulo Center of Nuclear Energy in Agriculture
	The University of San Paulo Higher School of Agriculture "Luiz de Queiroz"
	The University of San Paulo Institute of Mathematics and Statistics
Africa (1)	
Senegal	Cheikh Anta Diop University
Oceania (2)	
Australia	The University of Newcastle
New Zealand	Unitec Institute of Technology

Globalization

Double Degree Program

The double degree program allows students to be enrolled simultaneously at NAIST and one of its partner institutions. Under joint research guidance from faculty at both universities, students complete the program and receive degrees from both institutions. NAIST currently offers a master's course double degree program with Kasetsart University and doctoral course double degree programs with nine international partner universities.

- National Yang Ming Chiao Tung University (Taiwan)
 - Chulalongkorn University (Thailand)
 - Kasetsart University (Thailand)
 - Mahidol University ((Thailand)
- Université Toulouse (France)
 - Université Paris-Saclay (France)
 - École Normale Supérieure de Lyon (France)
 - Ulm University (Germany)
 - SRM Institute of Science and Technology (India)



Overseas Offices

- Indonesia Office
 - Thailand Office
 - UGM-NAIST Collaboration Office
- Located: IPB University Alumini Building

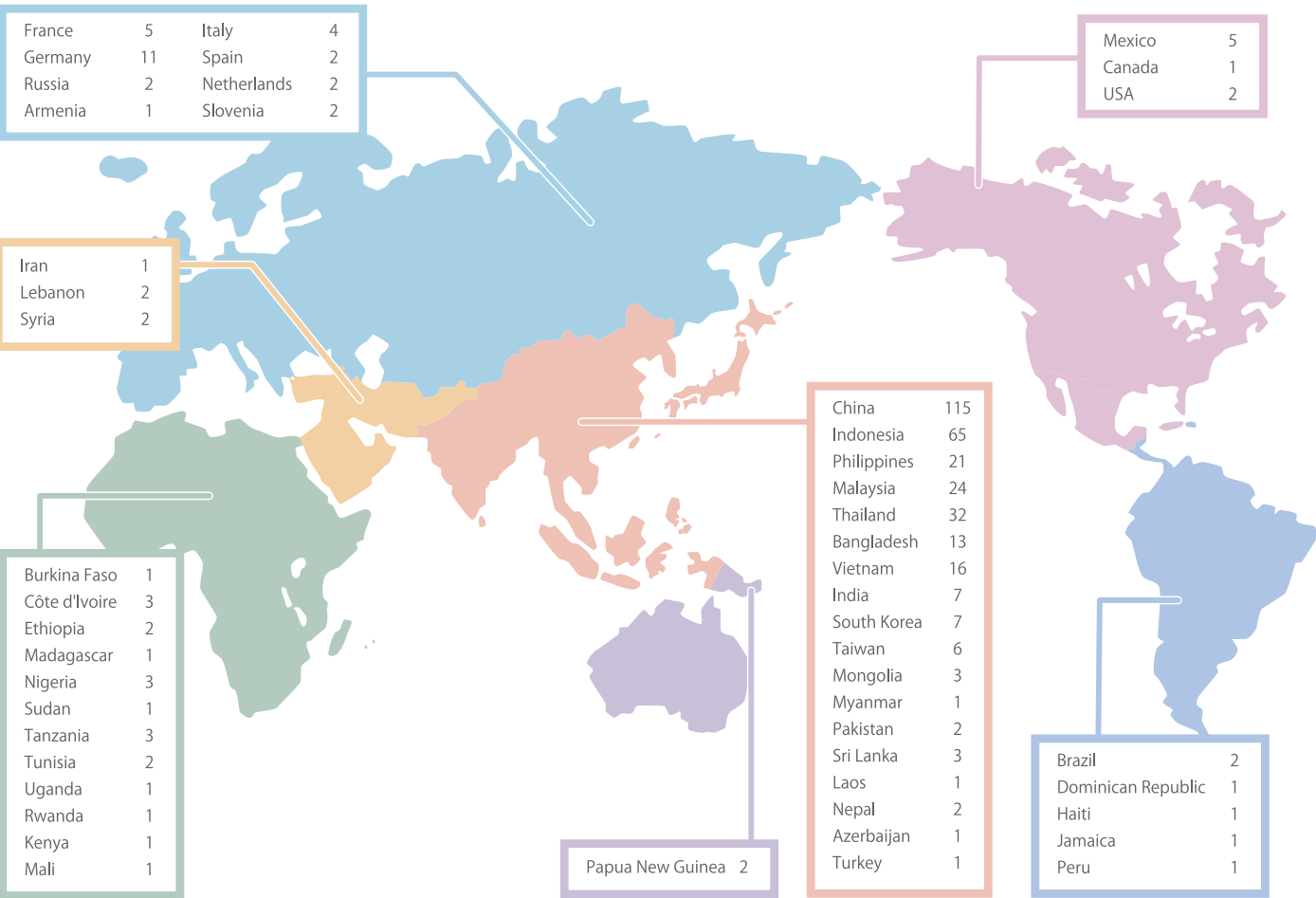
Located: Kasetsart University Faculty of Engineering

Located: Gadjah Mada University Biotechnology Research Center



Breakdown of International Students by Country of Origin

(As of April 2026)





The Division of Information Science at NAIST advances education and research in computer science and its related fields, aligned with both Japan's national Society 5.0 initiative and the United Nations' Sustainable Development Goals (SDGs). We are deeply committed to the realization of Society 5.0—a human-centric society that harmonizes economic advancement with the resolution of social challenges by seamlessly integrating cyber and physical spaces.

We cultivate a vibrant research environment that empowers young scholars to unleash their individual talents across diverse fields, including computer science, media informatics, robotics, and data science. By doing so, we foster outstanding research outcomes while cultivating the next generation of researchers and engineers equipped with advanced, high-level expertise.

Hot topic 1 Pioneering AI-Driven Scientific Discovery

Supported by NAIST's university-wide J-PEAKS initiative, our division is a core contributor to the development of the NAIST-ARWIT System—an AI- and data-driven platform designed for automated research workflows and industrial translation. Building on our decades of foundational excellence in natural language processing, robotics, data-driven science, and information security, we aim to accelerate scientific discovery, secure data circulation, and drive social implementation. We pursue these goals in close collaboration with universities, public research institutes, and industry partners, while strictly safeguarding data security, trustworthiness, and intellectual property.

Hot topic 2 Expanding Frontiers: New Research Laboratories

In line with this automation strategy, two new laboratories have been established within the fields of Computer Science and Artificial Intelligence to strengthen the foundations of trusted, AI-driven workflows: Secure Systems, led by Prof. Daisuke Fujimoto, and Pervasive Intelligence, led by Prof. Ismail Arai. Joining forces with our leading laboratories in computer architecture, distributed systems, communication networks, software engineering, and information security, these new teams will push the frontiers of modern technological innovation.

Hot topic 3 Global Reach & International Collaboration

We also remain deeply committed to fostering international research collaborations with global partners. In the past year alone, the Division of Information Science collectively co-authored 327 international academic publications, dispatched 40 students to partner institutions abroad, and hosted 82 international visiting students. Reflecting our vibrant global community, international scholars comprised 39.4% of our doctoral cohort and 18.3% of our master's students.



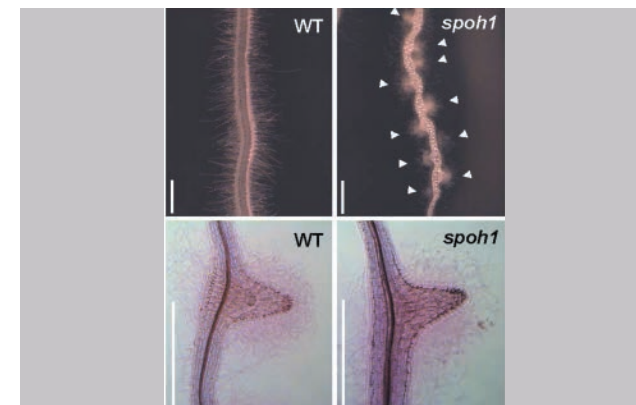
The Division of Biological Science at NAIST brings together cutting-edge research and graduate education spanning molecules, cells, organisms, and ecosystems. Our faculty and laboratories pursue internationally recognized work in genome analysis, neural regeneration, plant secondary metabolism, yeast and metabolic regulation, and bioengineering, while promoting industry and regional partnerships to translate discoveries into practice. Graduate training emphasizes both rigorous research skills and practical experience; students benefit from seminars, internships, and outreach programs that prepare them for careers in academia, public research institutes, and industry. Recent highlights include collaborative projects on yeast TORC1 and sake aroma, high-profile awards for neural regeneration research, and multiple student presentation prizes, all of which are regularly posted on the division's news and events pages.

Hot topic 1 Winning Recognition Across the Field



NAIST Biological Science continues to strengthen its global presence through outstanding achievements by students and faculty. Associate Professor Taito Matsuda received the NEDO-NEP2025 Best Award for neural regeneration research. International student Yanghee Kim earned the Outstanding Poster Presentation Award at the JSBBA Kansai Forum, while Mana Ieda and Maoka Koike received major national presentation prizes, showcasing the division's diverse and internationally engaged research community.

Hot topic 2 Uncovering Self-Avoidance in Parasitic Plants



A NAIST research team has uncovered the world's first molecular mechanism of "self-avoidance" in parasitic plants, explaining how species such as *Striga* and *Phtheirospermum* recognize and avoid parasitizing close relatives. This discovery, published in *Science*, opens new possibilities for developing innovative and sustainable control strategies against devastating parasitic weeds.

Hot topic 3 Discovering the Microbes Behind Nara-zuke



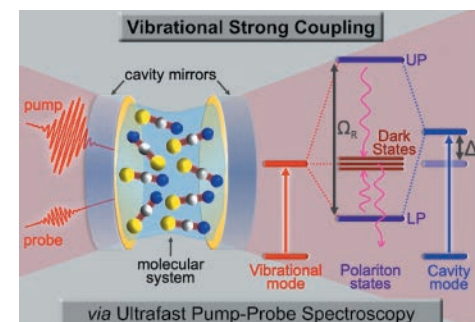
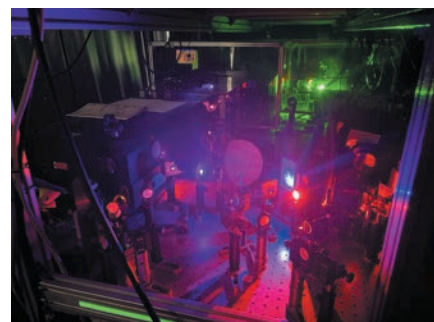
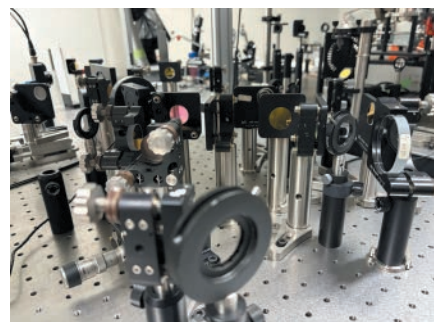
Nara-zuke is a fermented food-lactic acid bacteria that thrive in high-alcohol mash. Researchers at NAIST have identified lactic acid bacteria capable of growing in the unusually high-alcohol environment of sake lees used in traditional Nara-zuke production. Their findings reveal a unique, long-hidden fermentation process that has shaped this thousand-year-old food culture, providing new insights into microbial adaptation and fermentation biology.

Materials Science



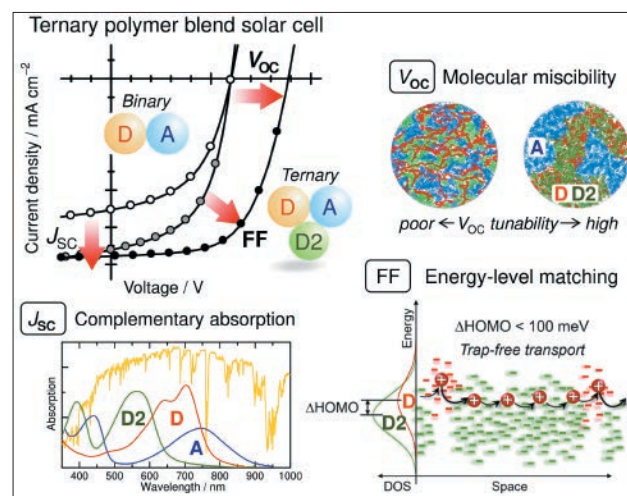
The Division of Materials Science at NAIST studies the structure, properties, and functions of materials from electronic, atomic, and molecular viewpoints. Its goal is to create materials and devices for a sustainable society. The Division covers physics, device engineering, chemistry, biomaterials, polymers, and data-driven science, encouraging students to work across traditional boundaries. Shared research facilities for microscopy, spectroscopy, X-ray analysis, clean-room processing, and physical-property measurements support research from fundamentals to applications. Topics include quantum phenomena, photonic devices, advanced measurement, functional molecules, polymers, protein materials, and materials informatics. Through digital approaches promoted under NAIST's J-PEAKS initiative, students from Japan, Southeast Asia, and many other regions develop new knowledge and technologies together with faculty and technical staff in an international graduate-school environment.

Hot topic 1 Quantum Photo-Science



We investigated the ultrafast decay dynamics of heat-bath states formed by strong coupling between photons and molecular vibrations, known as vibrational polaritons. Mid-infrared transient spectroscopy revealed the decay pathways of optically inactive states, providing a basis for understanding the novel physical and chemical properties of vibrational polaritons.

Hot topic 2 Organic Electronics



Polymer solar cells use donor and acceptor polymer semiconductors to convert sunlight into electricity and are attracting attention as a next-generation technology for a low-carbon society. By combining nanoscale control of polymer blend structures with advanced characterization, we established design guidelines for high-performance ternary blend devices and clarified their photovoltaic mechanism, advancing polymer solar cells toward practical and commercial use.

Hot topic 3 Nanomaterials & Polymer Chemistry



Toward a sustainable society, we develop next-generation polymers and biomaterials through advanced macromolecular science. We recently created recyclable aliphatic polycarbonates that reach ultrahigh molecular weights up to 5.6×10^5 g/mol within minutes at room temperature. These materials show high thermal stability (270–340 °C), elongation up to 1670%, and strength up to 33 MPa, balancing softness and toughness.

Information Science

Computing Architecture

Dependable System

Ubiquitous Computing System

Large-Scale System Management

Software Engineering

Software Design and Analysis

Cyber Resilience

Information Security Engineering

Secure Systems

Network System

Internet Architecture and Systems

Pervasive Intelligence

Computer Science and Artificial Intelligence

Applied Artificial Intelligence and Robotics

Collaborative Laboratories

Natural Language Processing

Human-AI Interaction

Social Computing

Interactive Media Design

Optical Media Interface

Cybernetics and Reality Engineering

Human Robotics

Robot Learning

Mathematical Informatics

Biomedical Imaging Intelligence Laboratory

Computational Systems Biology

Computational Behavioral Neuroscience

Biomedical Data Science

Communication

(NTT Communication Science Laboratories)

Computational Neuroscience

(ATR International)

Humanware Engineering

(Digital & AI Technology Center, Panasonic Holdings Corporation)

Symbiotic Systems

(NEC Corporation)

Multilingual Knowledge Computing

(Fujitsu Limited)

Optical and Vision Sensing

(Technology and Intellectual Property H.Q., OMRON Corporation)

Molecular Bioinformatics

(National Institute of Advanced Industrial Science and Technology)

Digital Human

(National Institute of Advanced Industrial Science and Technology)

Formal Verification

(National Institute of Advanced Industrial Science and Technology)

High Reliability Software System Verification

(JAXA's Engineering Digital Innovation Center, Japan Aerospace Exploration Agency)

Multicultural and Multimodal Natural Language Processing

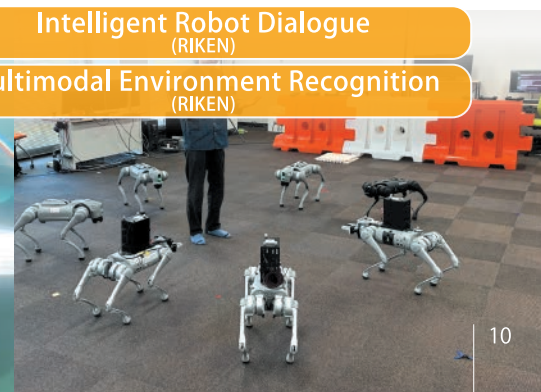
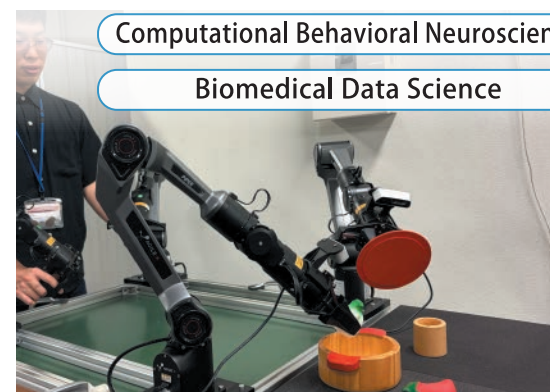
(National Institute of Information and Communication Technology)

Intelligent Robot Dialogue

(RIKEN)

Multimodal Environment Recognition

(RIKEN)





Computer Science and Artificial Intelligence

Computing Architecture	The Computing Architecture Laboratory focuses on next-generation computing systems beyond conventional von Neumann architectures. The laboratory studies AI accelerators, neuromorphic computing, FPGA-based systems, blockchain accelerators, and energy-efficient edge computing platforms. Researchers explore hardware–software co-design techniques to achieve high performance and low power consumption for future intelligent systems. The lab also investigates analog and stochastic computing methods for compact and efficient AI processing. By combining computer architecture, circuit design, and machine learning technologies, the laboratory aims to develop scalable and practical computing platforms for real-world applications such as IoT devices, image processing, and scientific computing.
	Non-von Neumann Computing, Neuromorphic Computing, AI Accelerators, FPGA and Edge Computing, Low-Power Computer Architecture
Dependable System	Today's information society is supported by advanced technologies at various levels, including applications, networks, computers, and VLSI. The Dependable System Laboratory conducts research on systems that users can rely on at all levels, including distributed systems, multicore computers, VLSI, brain-inspired computers, quantum computing, and security.
	Distributed algorithms, population protocols, mobile agent algorithms, reliability of neuromorphic computers, quantum information science, zero-trust architecture design, differential privacy
Ubiquitous Computing Systems	Our goal is to realize IoT technology to acquire data from things in the real world, AI and digital twin technologies to efficiently and accurately analyze acquired data, and feedback technology to effectively reflect the findings of analysis in the real world, which are necessary for the realization of Society 5.0. Our laboratory conducts education and research from both theoretical and practical perspectives, ranging from basic research on various elemental technologies to the construction of actual systems that use these technologies.
	IoT/CPS, ubiquitous computing, mobile computing, edge computing, participatory/social/mobile sensing, behavior change, federated learning, digital twin, affective computing, privacy protection, small language models, computational social science, digital well-being
Large-Scale Systems Management	The Large-Scale Systems Management Laboratory research aims to develop mathematical modeling and simulation techniques for optimal design, control and architecture of large-scale systems such as computer/communication networks, with which the resulting systems achieve high performance, low vulnerability and high energy efficiency.
	Queueing theory, game theory, machine learning, mathematical analytics, network optimization, blockchain, incentive mechanism design, zero-knowledge proof
Software Engineering	Our laboratory performs research and education on the fundamentals and innovative technological trends of software engineering, including how contemporary software development teams make and maintain software, especially when using open source software. Topics include code analysis at the project level for automated tool support, empirical mining software artifacts to test assumptions, and human communication at both project and larger ecosystem levels. We strive to help build, use and maintain software to benefit society.
	Program analysis, programming education, open source software, software ecosystems, empirical studies, artificial intelligence, mining software repositories, software libraries, software security
Software Design and Analysis	We conduct research on the methods and technologies which support the design/development of software and cloud computing systems, focusing on the analysis/improvement of the software development process. Software technology is increasingly present in our daily lives, including various software-embedded machinery and electronic devices for homes, mobile telephones, and social infrastructures represented by cloud computing systems.
	AI-assisted software development, repository mining, software design & verification, automated software testing, software processes
Cyber Resilience	Our laboratory pursues resilience of ICT-based society together with lab members and colleagues around the world. Our research ranges from theoretical to practical, and spans across broad fields, from binary code, methodology, to even law.
	Cybersecurity, Internet technology, IoT/CPS, privacy, edge computing, applied machine learning, software defined technology, operating systems, distributed systems, industrial control systems (ICS)
Information Security Engineering	Our laboratory conducts research on hardware security, the root of trust for the entire system, as well as methods to ensure system-level security, including the upper layers. In addition to students from information science fields, we welcome students who majored in electrical or mechanical engineering and wish to study the information field.
	Hardware security, cryptographic hardware, embedded systems, side-channel analysis, electromagnetic information security, hardware Trojans, cyber-physical system security, sensor security, electromagnetic compatibility
Secure Systems	Our laboratory conducts research focused on how to ensure security and build secure systems within this diversifying information infrastructure. Furthermore, we are working to develop new methods for securing applications by leveraging cutting-edge cryptographic technologies.
	Secure systems, Cyber-physical system security, Cryptography, Multi-party computation, Searchable encryption

Network Systems	The Network Systems Laboratory focuses on the research and development of advanced wireless technologies to build the foundation of a highly connected society. Our core research areas include Beyond 5G/6G mobile communication systems, Radio over Fiber (RoF), intelligent reflecting surfaces (IRS), satellite communications, and highly efficient wireless power transfer systems, including dynamic charging for mobility. Furthermore, we explore the physical layer of wireless networks, ranging from electromagnetic theory and meta-transmission line models to advanced modulation and signal detection. By combining rigorous theoretical analysis with practical system implementations, we dedicate ourselves to solving real-world challenges while educating future innovators.
	Beyond 5G/6G communications, wireless power transfer, wireless sensors, satellite communications, wireless signal processing
Internet Architecture and Systems	Our research goal is to realize the next-generation ICT infrastructure technologies and services beyond current systems such as the Internet, Wi-Fi networks, and cloud systems, which can be used securely and conveniently. In order to achieve this, our research methods are not only computer simulations but also using actual systems and equipment operated in Information Initiative Center (ITC).
	Computer/network operation technique, disaster relief computing/networking, HPC, cyber security, Internet of Things
Pervasive Intelligence	Pervasive Intelligence Laboratory explores how intelligence can operate naturally within real-world environments. We integrate sensing, networking, and security technologies to design reliable, system-level intelligence infrastructures. Our research spans urban mobility, indoor localization, and mobile sensing platforms, aiming to develop intelligence that works seamlessly in society.

Applied Artificial Intelligence and Robotics

Natural Language Processing	We conduct research on natural language processing, computational linguistics and machine learning. Our primary focuses are on the fundamental techniques for language analysis, language generation and information extraction, and on the end applications, such as machine translation, summarization, question answering and grammatical error correction. We also work on language technologies that intersect with other areas, e.g., vision.
	Natural language processing, computational linguistics, machine learning, language modeling, syntactic analysis, semantic analysis, information extraction, language generation, language grounding, machine translation, summarization, geography and language, vision and language
Human-AI Interaction	We conduct cutting-edge research to develop communicative AI that listens, speaks, sees, and understands – across languages, modalities, and contexts. Our work spans multisensory interaction, simultaneous speech translation, spatially aware language AI, and diverse interactive systems including intelligent dialog systems with robots, interactive avatars, tele-existence systems, and AR/VR systems. Inspired by human development, we explore unsupervised and continual learning alongside multilingual and multimodal generative AI. We strive to build a future of collaborative intelligence where humans and machines interact seamlessly and meaningfully.
	Human–machine interaction, zero-resource speech technology, GeoNLP, simultaneous speech translation, multilingual multimodal generative AI, collaborative intelligence
Social Computing	We are an interdisciplinary laboratory specializing in social media data mining and natural language processing (NLP), including large language models (LLMs), to address a wide range of social challenges. Our research spans medical informatics—including clinical and pharmaceutical informatics—, mental health and well-being estimation from crowd-sourced episodes, information recommendation systems, AI-powered conversational safety evaluated from medical, legal, and ethical perspectives, and human-AI collaboration. By combining computational methods with domain knowledge, we aim to generate actionable insights that contribute to socially impactful and responsible technologies.
	Social computing, natural language processing, medical informatics, artificial intelligence, web engineering, machine learning, computational social science, information recommendation, geographic information system
Interactive Media Design	Our vision is to introduce augmented reality, interactive robots, and comfortable self-driving cars into the everyday lives of everyone on this planet. We aim to develop truly practical methods and systems using these technologies in cooperation with experts in various fields, focusing on medicine, sports, and industry.
	Augmented reality, virtual reality, human computer interaction, human robot interaction, computer vision, computer graphics, training systems, support systems, user interfaces, self-driving cars
Optical Media Interface	The research topics in our laboratory include Computer Vision, which understands scenes based on visual information captured by a camera, and Computer Graphics, which generates rich visual information for humans. We aim to realize a novel interface that enables humans and machines to interact through optical media based on cutting-edge research.
	Computer vision, computer graphics, computational photography, development of sensing systems, deep learning, optical measurement, 3D shape reconstruction
Cybernetics and Reality Engineering	We conduct research to create the “tools of the future” to realize an inclusive society where all people can maximize their abilities and help each other. In particular, by manipulating various sensations such as vision, we aim to live more conveniently, more comfortably, or more securely by offering “personalized realities” which empathize with each individual.
	Virtual and augmented reality, human augmentation, wearable computing, affective computing, cognitive science, psychology, computer vision, human and environmental sensing, artificial intelligence, display hardware

Human Robotics	We conduct research studies on the intellectualization of robots, understanding human perception-action loops based on information science, and human machine system/human robot collaboration by combining them. We are aiming to define the quality of operational feeling and motion comfort in intelligent mechanical systems that interact with humans. Research questions include "What determines easiness of walking with an artificial leg?"
Prof. Takahiro Wada Assoc. Prof. Hailong Liu Assist. Prof. Yasuaki Orita Assist. Prof. Sumitaka Honji Affiliate Prof. Toshihiro Hiraoka Postdoc. Researcher Eito Sato	Human robot collaboration, robotics, human machine systems, human modelling, human machine interaction, cooperative control, biological cybernetics, motion perception, motion sickness
Robot Learning	Our laboratory performs research and educates students in robot learning (machine learning for robot intelligence), an interdisciplinary field of various fields such as machine learning, artificial intelligence, robotics, control engineering, signal processing, optimization, mechatronics, and multi-robot coordination.
Prof. Takamitsu Matsubara Assoc. Prof. Kazuki Shibata Assist. Prof. Hikaru Sasaki Assist. Prof. Cheng-Yu Kuo Assist. Prof. Yuki Kadokawa Assist. Prof. Tomoya Uho Assist. Prof. Gahee Kim	Reinforcement learning, imitation learning, deep learning, active perception, multi-agent system, smart manufacturing, human-assistive technology (exoskeleton robots, EMG interface), industrial applications, vehicle autopiloting
Mathematical Informatics	Our laboratory studies mathematical models in various fields such as computer science, mathematical biology, and applied informatics. Computer science includes machine learning and statistical science. Mathematical biology includes neuroscience, medical science, cognitive science, and bioinformatics. Applied informatics includes biomedical engineering, graph signal processing, computer vision, AI robotics, and materials informatics. Mathematical models are everywhere!
Prof. Kazushi Ikeda Assoc. Prof. Takatomi Kubo Assist. Prof. Yuzhe Li Assist. Prof. Renzo Roel Perez Tan Assist. Prof. Brian Godwin Lim Affiliate Prof. Junichiro Yoshimoto Affiliate Prof. Toshitaka Yamakawa Affiliate Assoc. Prof. Chie Hieida Affiliate Assist. Prof. Chizu Saeki	Mathematical models, machine learning, computational neuroscience, cognitive science, biomedical signal processing, materials informatics
Biomedical Imaging Intelligence	Our laboratory focuses on advancing biomedical imaging intelligence to promote personalized, preventative healthcare. We integrate deep learning, computer vision and statistical modeling with CT, MRI, X-ray and ultrasound data to quantify musculoskeletal structures, detect disease and predict patient outcomes. Current projects include segmentation of anatomical structures, statistical shape analysis, 2D-to-3D shape recovery, and automated assessment of osteoporosis and sarcopenia. Collaborations with hospitals and industry enable large-scale, multi-institutional datasets and clinical validation. By combining rigorous algorithmic innovation with translational studies and regulatory science, we strive to deliver robust, explainable AI solutions that reach real-world medical practice.
Assoc. Prof. Yoshito Otake Assist. Prof. Yi Gu Affiliate Assist. Prof. Mazen Soufi	Biomedical Images, artificial intelligence, medical image analysis, computational anatomy, computer integrated surgery
Computational Systems Biology	We are incorporating state-of-the-art data modeling/manipulating techniques such as deep learning techniques to better our understanding of the system biology of plants. In collaboration with medical hospitals and other academic institutions, we are developing various biomedical technologies based on information technology and deep learning techniques.
Prof. Shigehiko Kanaya Affiliate Prof. Hidehiro Iida Affiliate Prof. Tetsuo Sato Affiliate Prof. Klaus Walter Lange Affiliate Prof. Ming Huang Assoc. Prof. MD. Altaf-UI-Amin Affiliate Prof. Naoaki Ono Assist. Prof. Kamal Nasution Ahmad Affiliate Assist. Prof. Fan Zhang Affiliate Assist. Prof. Ryota Wakayama	System biology, metabolic pathways, drug discovery, digital biomarkers, medical image processing, deep learning, computer aided diagnosis, proactive healthcare
Computational Behavioral Neuroscience	To understand humans, we build behavioral models based on the information processing mechanism of the brain, investigate the principles of human behavior through verification using experimental and data-driven approaches, and conduct educational research on its application to society.
Prof. Saori Tanaka Assoc. Prof. Lin Cai Assist. Prof. Hiroyoshi Ogishima Affiliate Assist. Prof. Wendyam Eric Lionel Ilboudo Affiliate Assist. Prof. Issaku Kawashima	Computational neuroscience, behavioral modeling, neuroimaging, computational psychiatry, reinforcement learning
Biomedical Data Science	The current AI boom relies heavily on the naïve assumption that processing cheaply-collected big data with high-speed computers can produce machines smarter than humans, driving deep learning's popularity. However, this overlooks the importance of human experience, rare or costly-to-obtain data, and the implicit knowledge held by experts. Our research deliberately emphasizes the value of small data, integrating expert insights and real-world knowledge into analyses. By developing new machine learning algorithms, mathematical models, and specialized medical AI systems that harness small data effectively, we aim to create unique value and contribute significantly to foundational advancements in medicine, neuroscience, and healthcare technologies.
Prof. Koichi Fujiwara	Small data analysis, machine learning, biosignal processing, medical device and medical AI development, human-machine interface
Collaborative Laboratories	
Communication (NTT Communication Science Laboratories)	Our laboratory performs research on machine learning and data mining methods that extract valuable knowledge from various types of data. In particular, we are interested in developing methods that can learn from incomplete data, such as a small amount of data, data with many missing values, aggregated data, and noisy data.
Affiliate Prof. Tomoharu Iwata Affiliate Assoc. Prof. Yusuke Tanaka	Machine learning, data mining, deep learning, meta-learning, physics-informed machine learning

Computational Neuroscience (ATR International)	We aim to understand the human brain and to achieve new machine intelligence (artificial intelligence) based on brain information processing functions. We conduct research and educate students on computational neuroscience, cutting-edge machine intelligence and neurotechnology at ATR, an internationally recognized computational neuroscience center.
Affiliate Prof. Motoaki Kawanabe Affiliate Assoc. Prof. Norikazu Sugimoto	Computational neuroscience, machine intelligence, robot learning, brain machine interface, cognitive function, neurofeedback, computational psychiatry, statistical modeling, multi-modal brain imaging, brain decoding
Humanware Engineering (Advanced Technology Research Laboratories, Panasonic Corporation)	This research explores Humanware Engineering, a field that applies artificial intelligence to enhance real-world systems and make AI more accessible in everyday life. The laboratory focuses on algorithms that can recognize and handle uncertainty in real-world AI inputs and outputs, including sensors and actuators, as well as AI algorithms that run on edge devices such as IoT devices and robot controllers. Through practical research themes linked to Panasonic Group applications, the work combines machine learning, deep learning, robotics, and embedded systems to develop robust, efficient AI technologies for social implementation, academic publication, and future industrial innovation.
Affiliate Prof. Masashi Okada Affiliate Assoc. Prof. Yohei Nakata	Robust AI under real-world uncertainty, edge AI for IoT and robotics, robot learning and control, generative and self-supervised AI
Symbiotic Systems (NEC Corporation)	We design solutions that utilize image sensing and recognition technology to solve technical issues that contribute to solving real social issues. We study knowledge acquisition technology for biometrics and object authentication, and conduct research and education from prototypes to practical applications.
Adjunct Prof. Takahiro Toizumi Adjunct Assoc. Prof. Eiki Ishidera	Image recognition, biometrics, knowledge acquisition, fine sensing, visualization
Multilingual Knowledge Computing (FUJITSU LIMITED)	Our laboratory researches technologies for extracting knowledge from large-scale, multilingual information sources and applying it across diverse domains, including highly specialized fields. Our core research topics include multilingual information extraction, knowledge graph construction, and knowledge-graph-powered applications. These technologies form a critical foundation for next-generation AI, including large language models (LLMs). We also emphasize practical knowledge of industry R&D processes and technology development with real-world deployment in mind.
Adjunct Prof. Masaru Fuji Adjunct Assoc. Prof. Hiyori Yoshikawa	Artificial Intelligence (AI), natural language processing, knowledge computing, knowledge graphs
Optical and Vision Sensing (Technology and Intellectual Property H.Q., OMRON Corporation)	Our laboratory performs research and educates students from both theoretical and practical perspectives, ranging from fundamental research to engineering. Our research results are applicable especially in the field of factory automation, healthcare, and social systems.
Affiliate Prof. Masaki Suwa	Physics-based vision, vision-based 3D measurement, robot vision, object detection and recognition
Molecular Bioinformatics (National Institute of Advanced Industrial Science and Technology (AIST))	We are developing bioinformatics methods and tools to explore the functions and mechanisms of biomolecules such as proteins. We aim to discover knowledge in the field of lifescience using information engineering techniques and to provide analysis methods that compensate for information deficiencies in experimental data.
Affiliate Prof. Kentaro Tomii Affiliate Assoc. Prof. Kentaro Kawata	Computational molecular biology, bioinformatics, omics, structural bioinformatics, genomics, data science, databases
Digital Human (National Institute of Advanced Industrial Science and Technology)	Our laboratory researches both humans and robots for realizing inclusive systems where they can collaborate and co-evolve. Our research includes theoretical studies on human behavior and robot control, and empirical studies on practical social systems such as manufacturing factories and small stores where humans and robots co-exist.
Adjunct Prof. Mitsunori Tada Adjunct Prof. Akihito Murai Adjunct Assoc. Prof. Tsubasa Maruyama	Digital humans, robots, digital twins, motion analysis, motion synthesis, computer vision, human-robot collaboration, human-robot co-evolution
Formal Verification (National Institute of Advanced Industrial Science and Technology (AIST))	Formal verification methods are mathematically rigorous techniques for checking the correct behavior of computer systems. We study the formal verification methods using mathematical logic and theorem provers, e.g., to verify and explain the trustworthiness of artificial intelligence systems, and to ensure the safety and security of cyber-physical systems.
Adjunct Prof. Yusuke Kawamoto Adjunct Prof. Reynald Affeldt	Artificial intelligence, programming languages, formal methods, mathematical logic, theorem provers, Rocq, cyber physical systems
High Reliability Software System Verification (JAXA's Engineering Digital Innovation Center, Japan Aerospace Exploration Agency)	Our laboratory is focused on research into software verification methodologies to achieve high reliability and safety in software that must function properly under extreme environmental conditions. The research outcome will be expected to apply to practical use for systems that require high reliability not only in space systems but also in social core infrastructures.
Affiliate Prof. Naoki Ishihama	Highly reliable software systems, safety systems, verification methodology, safety assurance methodologies, reliability
Multicultural and Multimodal Natural Language Processing (National Institute of Information and Communications Technology)	To promote mutual understanding that transcends not only language barriers but also cultural barriers, we research and develop technologies that enable high-context multilingual communication, including multimodal information such as images and audio. Furthermore, we will build the necessary data infrastructure, such as multilingual evaluation data, to realize these technologies.
Affiliate Prof. Masao Utiyama Affiliate Assoc. Prof. Jin Tei	Natural language processing, computational linguistics, multicultural information processing, multimodal information processing
Intelligent Robot Dialogue (RIKEN)	We research dialogue functions and intelligent systems for communication robots, roughly divided into three categories:understanding, control, and generation. To realize dialogue robots working in the real world, multimodal situation understanding (grounding) using language, speech, and images is necessary. The generative system of the robot utilizes multimodal expressions such as text, speech, images, and robot movements. We also study dialogue control mechanisms: reasoning, decision making, and inference on the knowledge base.
Affiliate Prof. Koichiro Yoshino Assist. Prof. Angel Garcia Contreras	Dialogue systems, dialogue robots, natural language processing, language understanding, multimodal processing, knowledge acquisition, inference, dialogue management, language generation, reinforcement learning
Multimodal Environment Recognition (RIKEN)	We promote research on computer vision and pattern recognition using sensors that observe the robot's surrounding environment. In particular, we focus on understanding the 3D environment, recognizing and tracking objects, understanding the details of people around the robot, and integration of multiple modalities.
Affiliate Prof. Yasutomoto Kawanishi Adjunct Assist. Prof. Motoharu Sonogashira	Computer vision, pattern recognition, robot vision, surveillance, environment recognition, object recognition, person recognition, activity understanding, multimodal integration

Biological Science

Plant Biology

Plant Developmental Signaling

Plant Metabolic Regulation

Plant Growth Regulation

Plant Stem Cell Regulation and Floral Patterning

Plant Physiology

Plant Immunity

Plant Symbiosis

Plant Secondary Metabolism

Plant Regeneration and Morphogenesis

Plant Reproductive Design

Biomedical Science

Functional Genomics and Medicine

Molecular Immunobiology

Molecular Medicine and Cell Biology

RNA Molecular Medicine

Stem Cell Technologies

Multicellular Network

Organ Developmental Engineering

Biosystem Dynamics

System Biology

Microbial Interaction

Organelle Control

Environmental Microbiology

Structural Life Science

Gene Regulation Research

Bioengineering

Neural Regeneration and Brain Repair

Data-driven Biology

Protein Design and Engineering

Molecular Microbiology and Genetics
(Research Institute of Innovative Technology for the Earth (RITE))

Discipline of Plant Biology

Plant Developmental Signaling

Prof. Keiji Nakajima
Assoc. Prof. Tatsuki Goh
Assist. Prof. Tetsuya Hisanaga

Our laboratory is working to elucidate the mechanisms underlying root growth optimization and sexual reproduction—two crucial elements for adapting to fluctuating environments. Through the integration of unique microscopic imaging, microengineering, and AI-based image analysis, we aim to unveil the hidden principles of plant growth and reproductive capacity. Our efforts contribute to addressing global challenges such as food production and energy security.

Plant growth regulation, environmental response, roots, sexual reproduction, evolution, epigenetic regulation, Arabidopsis, liverwort, live imaging, artificial intelligence

Plant Metabolic Regulation

Prof. Taku Demura
Assist. Prof. Miya Mizutani

Research and education on regulatory mechanisms of plant cell differentiation, cell wall, and molecule transport, mechanisms to control plant function, metabolism, and dynamics, and the creation of useful GM plants and trees such as light emitting trees, in order to solve environmental and energy problems and contribute to industry, through the utilization of woody biomass.

Woody biomass, plant cell wall, molecular breeding, mechanical property of plant, light emitting plants, poplar, moss

Plant Growth Regulation

Prof. Masaaki Umeda
Assist. Prof. Ye Zhang
Assist. Prof. Nozomi Kawamoto

Our laboratory investigates the autonomous mechanisms that sustain plant tissues and maintain genome stability, with the goal of understanding why plants do not develop cancer. This research will have a significant impact not only in plant science but also in animal biology. We also study how plants conserve energy to survive in changing environments and how they use this energy efficiently by regulating cell division and DNA polyploidization. From an applied perspective, we are developing technologies to enhance woody biomass production, contributing to solutions for global environmental challenges.

Cell cycle, genome maintenance, plant biomass, environmental stress, phytohormone

Plant Stem Cell Regulation and Floral Patterning

Prof. Toshiro Ito
Assoc. Prof. Nobutoshi Yamaguchi
Assist. Prof. Yuko Wada
Assist. Prof. Feng Yihong

We are interested in a holistic view of gene regulation in plant reproduction, which leads to developmental robustness and coordination. We explore signaling and epigenetic control in stem cell maintenance, environmental response and fertilization. Our students work at the frontiers of plant molecular genetics, developing their research, presentation and writing skills.

Flower development, transcription factors, epigenetics, histone modification, hormone signaling, transcriptomes, epigenomes, molecular breeding, chemical biology, synthetic biology

Plant Physiology

Prof. Motomu Endo
Assist. Prof. Akane Kubota
Assist. Prof. Nozomu Takahashi

Focusing on the circadian clock and photoperiodism, our laboratory investigates how plants perceive time and seasons to coordinate physiological responses. Integrating theoretical and experimental approaches, we study the mechanisms of photoperiodic flowering and the transmission of temporal information across organs and tissues. We specialize in developing bioinformatic algorithms to extract rhythms from time-series transcriptomes. Additionally, we explore the mysterious multi-decadal flowering cycles of bamboo. Our research seeks to define how, when, and where plants integrate temporal cues to optimize fitness in fluctuating environments.

Circadian clock, photoperiodism, inter-organ/tissue/cellular communication, time-series transcriptome analysis

Plant Immunity

Prof. Yusuke Saijo
Assist. Prof. Shigetaka Yasuda
Assist. Prof. John Jewish Dominguez

Our laboratory performs research in the areas of plant-microbe interactions, with a focus on immune receptor signaling, signal integration between biotic and abiotic cues, microbes and molecular communications. We wish to elucidate the underlying molecular principles in model plants and crops, and apply the obtained knowledge to promoting sustainable agriculture.

Plant-microbe interactions, receptor signaling, chemical communications, microbiome, microbiology, agriculture

Plant Symbiosis

Prof. Satoko Yoshida
Assist. Prof. Rikako Hirata
Assist. Prof. Takanori Wakatake

Our laboratory focuses on research of parasitic plants, especially Orobanchaceae parasitic plants that cause severe agricultural damage in Africa. We use molecular biology, genetics, microscopy, and bioinformatic techniques to elucidate the mechanisms of plant parasitism. We also work on the other plant-organism relationships, including plant-nematode interaction and herbivory by the golden apple snail on rice.

Parasitic plants, striga, haustorium formation, molecular genetics, microscopy, transcriptome, genome analysis, evolution, chemical biology

Plant Secondary Metabolism

Prof. Takayuki Tohge
Assist. Prof. Shinichiro Komaki
Assist. Prof. Mutsumi Watanabe

Our laboratory focuses on the study of chemical diversity and metabolic polymorphism of plant secondary (specialized) metabolism by translational analysis of genomics, transcriptomics and mass spectrometry-based metabolomics, as well as functional annotation of key genes corresponding to the production of active phytoprotectants moderating environmental stress in plants.

Plant metabolism, chemical diversity, metabolic polymorphism, environmental adaptation, integrative omics approaches, comparative omics, cross-species comparison, genomic synteny, metabolic engineering, model plant to crop

Plant Regeneration and Morphogenesis

Prof. Momoko Ikeuchi
Assist. Prof. Yuki Doll

Why can plants readily regenerate their bodies upon injury? We pursue the secrets of plants' regenerative capacity using molecular genetics, live imaging and single cell transcriptome analyses. Uncovering the secrets of plants' regenerative capacity will potentially benefit human life by improving various aspects of agricultural biotechnology including grafting and tissue culture.

Regeneration, cellular pluripotency, developmental plasticity, tissue cultures, grafting, imaging, transcriptomes, epigenetics, Arabidopsis thaliana

Plant Reproductive Design

Assoc. Prof. Yoko Mizuta

Our research aims to understand how flowering plants produce offspring. Using our unique live and deep imaging, we focus on the regulatory mechanisms of pollen development and differentiation, the acquisition of fertility, and pollen tube guidance. This work is significant not only for elucidating the fundamental genetic engineering principles that govern the "design of life", but also for addressing global challenges such as the food crisis and climate change. We believe that our interdisciplinary research will lead to significant breakthroughs.

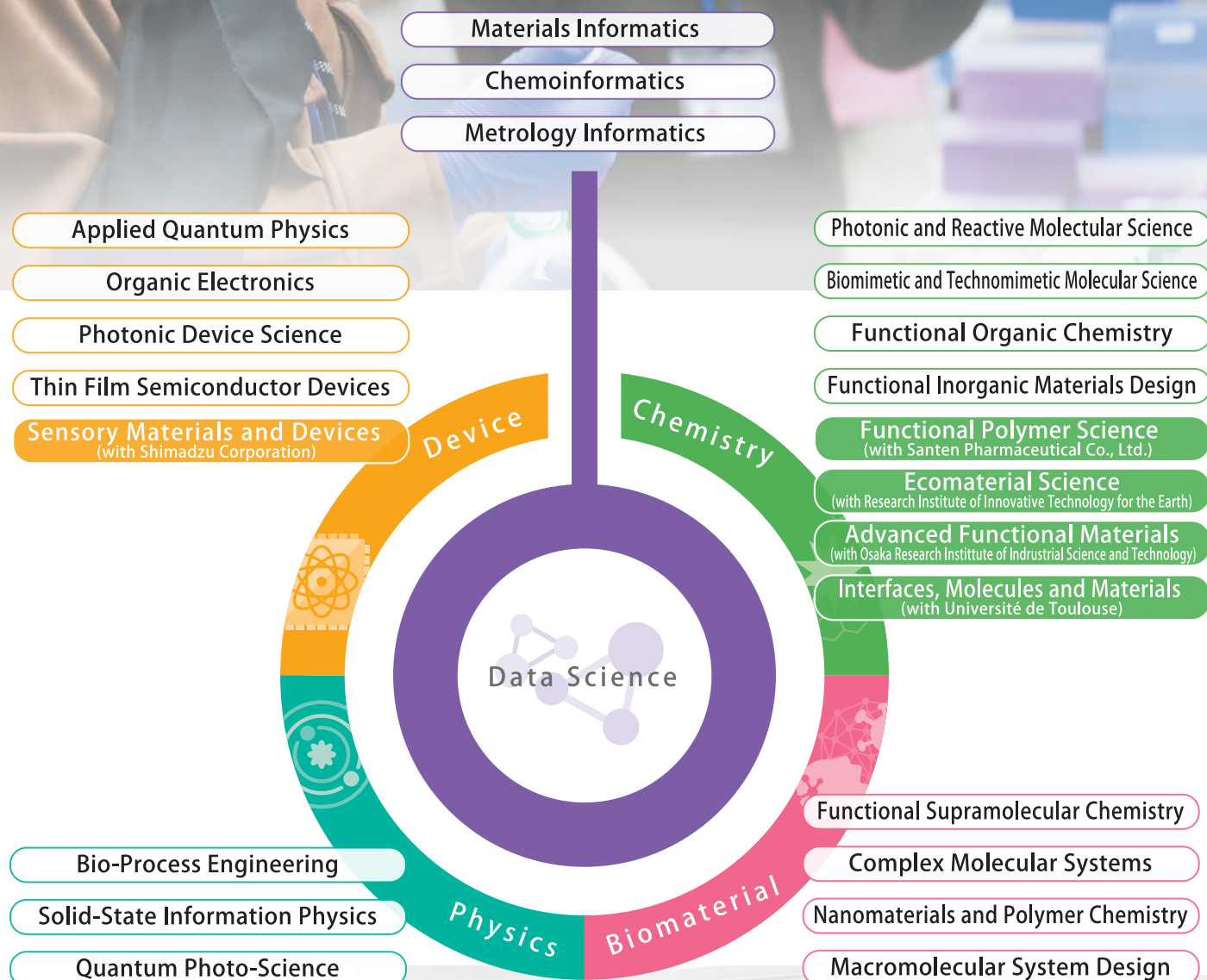
Plant reproduction, pollen development, polyspermy block, imaging, gene introduction



Discipline of Biomedical Science	
Functional Genomics and Medicine	PD-1 is a negative regulator of immune responses, and blockade of its functions in cancer patients sometimes results in the cure of the disease. Since we still don't know the physiological functions of PD-1 well in healthy individuals, our lab investigates them by using mouse models. During neural circuit formation, axons extend and branch, creating synaptic connections with neurons. Appropriate branches and synapses are preserved, whereas unnecessary ones retract and degenerate. However, the mechanisms that selectively regulate individual axon branches remain unclear. We investigate mRNA localization and translational regulation to understand branch-specific axon degeneration.
Assoc. Prof. Yasumasa Ishida Assist. Prof. Toshiaki Shigeoka	PD-1, self-nonsel self discrimination, cancer immunotherapy, local protein synthesis, axon degeneration
Molecular Immunobiology	The innate immune system is the first line of host defense that detects invading pathogens. However, aberrant activation of innate immune responses is closely associated with exacerbation of inflammatory diseases. Our aim is to uncover mechanisms that control innate immune responses using tools of molecular and cell biology, bioinformatics and genetically modified mice.
Prof. Taro Kawai Assist. Prof. Norisuke Kano	Innate immunity, inflammation, vaccines, adjuvant, autoimmunity, macrophages, dendritic cells, cell death, cancer, gene targeting
Molecular Medicine and Cell Biology	Each type of cells has a specific shape that is determined by the plasma membrane. Our lab will focus on the mechanisms connecting the membrane to the cytoskeleton for varieties of cellular functions including migration, proliferation, extracellular vesicles, and various events associated with morphological changes, in various disease conditions. We will integrate cell biology, molecular biology, biochemistry, and biophysics.
Prof. Shiro Suetsugu Assoc. Prof. Tamako Nishimura Assist. Prof. Hiroki Kawana	Molecular cell biology, biochemistry, biophysics, extracellular vesicles
RNA Molecular Medicine	Our laboratory studies gene regulatory mechanisms mediated by small RNAs and RNA-binding proteins to understand how they contribute to human health. We also study the diversity of RNA-mediated antiviral defense mechanisms in invertebrates and its relevance in arthropod-borne diseases.
Prof. Katsutomo Okamura Assist. Prof. Masami Shiimori Assist. Prof. Yuma Hanai	MicroRNA, regulation of miRNA processing, transcriptomes, siRNA, Argonaute, RNA-dependent RNA polymerase
Stem Cell Technology	Our goal is to understand the mechanisms of tissue development from the viewpoint of stem cell differentiation. We are also interested in the tissue regeneration process because the tissue stem cells are activated and initiate differentiation upon damage.
Prof. Akira Kurisaki Assist. Prof. Hitomi Takada Assist. Prof. Atsushi Into	Stem cells, differentiation, 3D culture, organoids, development and regeneration
Multicellular Network	Our laboratory is interested in the molecular mechanisms of development of the vertebrate central nervous system, and use chick, mouse embryos, iPS cells and stem cells as model systems. We also explore the mechanisms for the functional maintenance of mature neurons.
Prof. Noriaki Sasai Assist. Prof. Takuma Shinozuka	Developmental biology, molecular biology, cell biology, central nervous system, neurodegenerative disease, chick, mice, embryonic stem cells, retinal disease
Organ Developmental Engineering	We are researching the formation of organs using interspecies chimeric animals in which mouse and rat cells coexist in one body. Through this research, we investigate the essential factors for organ development and the correct function of organs.
Assoc. Prof. Ayako Isotani Assist. Prof. Tatsuya Nakagawa	Interspecies chimera, organ formation, developmental engineering, regenerative medicine, genome editing
Biosystem Dynamics	In our laboratory, we study how biological systems change over time and space, a concept we call "biosystem dynamics." By combining experiments using cultured cells and animal models with advanced live imaging, we capture dynamic processes from the cellular to organismal level. We further integrate mathematical modeling and machine learning to analyze large datasets, uncover patterns, and identify underlying mechanisms. Through this interdisciplinary approach, we aim to understand how living systems are regulated.
Assoc. Prof. Takaaki Matsui	Cell biology, molecular biology, aging, regeneration
Discipline of Systems Biology	
Microbial Interaction	Traditional fermented foods have long been sustained by empirical knowledge and carefully maintained methods, through which complex microbial ecosystems are reproducibly formed, even though much of the underlying mechanism remains a black box. We aim to explore how microorganisms closely related to humans, such as yeasts, lactic acid bacteria, and koji fungi, behave and interact with other organisms and environmental factors. Our research focuses on understanding microbial diversity from the molecular, metabolic, and cellular to the ecological level, contributing to new developments in food biotechnology and health science.
Assoc. Prof. Daisuke Watanabe Assist. Prof. Naoki Akasaka	Microbial ecosystem, microbial interaction, microbial genetics, food science, traditional fermented food

Organelle Control	Eukaryotic cells carry various membrane-enclosed organelles. The size, shape, and function of organelles vary depending on physiological and environmental conditions. When cells are forced to highly produce secretory proteins, the endoplasmic reticulum (ER) becomes overwhelmed, leading to accumulation of unfolded proteins in the ER. To mitigate such stress conditions, cells enforce and enlarge the ER. We investigate the molecular mechanism of this cytoprotective response, namely the unfolded protein response (UPR), using yeast <i>Saccharomyces cerevisiae</i> . Moreover, through artificial induction of the UPR, we generate yeast strains that abundantly produce commercially variable heterogeneous biomolecules, such as human secretory proteins used as biopharmaceuticals.
Assoc. Prof. Yukio Kimata Assit. Prof. Yuki Kimata	Yeast, stress response, protein secretion, metabolic engineering, gene expression
Environmental Microbiology	We study the unique metabolic capabilities of microorganisms at the cellular and molecular levels. We also aim to develop technologies that help address environmental problems and contribute to a sustainable society by harnessing microbial functions. One of our recent research focuses is the biodegradation of poly(ethylene terephthalate) (PET).
Prof. Shosuke Yoshida Assist. Prof. Yuting Liu Assist. Prof. Kazuo Kobayashi	Microbiology, metabolic engineering, enzymology, imaging, protein engineering, microbial screening, protein structure, bioinformatics, metagenomics
Structural Life Science	In cells, various proteins are involved in a variety of fundamental biological phenomena. To unveil such mechanisms coupled with dynamic interactions and structural changes of biomolecules, including proteins, we conduct basic research through structural biologic analyses in combination with other newly developed methods.
Prof. Tomoya Tsukazaki Assist. Prof. Ryoji Miyazaki Assist Prof. Hidetaka Kohga Assist. Prof. Ken Kitano	Protein science, structural life science, structural biology, protein structure, protein interaction, protein complexes, protein transport, molecular dynamics, molecular mechanisms, crystallography
Gene Regulation Research	We use mice and zebrafish as model organisms to investigate the underlying principles of dynamic biological processes during animal development. By integrating a wide range of approaches—including genetics, molecular biology, bioimaging, bioinformatics, and mathematical modeling—we aim to uncover fundamental mechanisms of life. In particular, our research focuses on the patterning mechanisms of vertebrate segmentation, the organization of the cytoskeleton in epithelial cells, and the differentiation of osteoclasts that regulate bone homeostasis.
Prof. Yasumasa Bessho Assist. Prof. Norihiro Kitagawa Assist. Prof. Yasuko Inaba	Developmental biology, mouse, zebrafish, live imaging, gene editing, transcription factors
Bioengineering	In our laboratory, we are performing research and education on the development of basic technology for efficiently producing useful materials such as biopharmaceuticals in living organisms (plants, yeasts, and algae) and the elucidation of the mechanisms controlling the phenotype of plants in order to contribute to society through biotechnology.
Prof. Ko Kato Assist. Prof. Takehide Kato Assist. Prof. Tomomi Wakabayashi Assist. Prof. Taizo Tamura	Production of useful materials in plants, environmental response in plants, regulation of gene expression, bioinformatics, adaptive evolution in plants
Neural Regeneration and Brain Repair	Our research focuses on repairing the brain after injury by turning immune cells called microglia into neurons. Instead of using transplanted stem cells, we introduce single transcription factor, NeuroD1, to trigger this transformation inside the brain itself. In mouse models of stroke, this method helped replace damaged neurons and improved movement. We also studied how this change happens at the gene and chromatin levels. We believe that this approach could lead to future treatments for neurological diseases.
Assoc. Prof. Taito Matsuda Assist.Prof. Kanae Matsuda	Cellular reprogramming, neurological disease
Data-driven Biology	Our laboratory analyzes experimental biological and medical data to build quantitative mathematical models and provide feedback for experimental design. We work to preprocess the data using domain knowledge, and then use machine learning and mathematical models to extract novel knowledge.
Prof. Yuichi Sakumura Assist. Prof. Toshiya Kokaji Assist. Prof. Kenta T. Suzuki	Cell migration, morphogenesis, tissue formation, multi-omics, gene regulatory network, disease diagnosis, disease risk prediction, machine learning-based analysis, quantitative modeling, mechanobiology, image analysis software development
Protein Design and Engineering	Our laboratory investigates the relationship between protein structure and biological function. By integrating structural biology, biochemistry, and machine learning, we elucidate molecular mechanisms and engineer proteins with enhanced or novel functions. Our current research focuses on two distinct enzyme systems: enzymes that synthesize biodegradable plastics, and enzymes that degrade petrochemical-based plastics. Our goal is to advance sustainable biotechnology and contribute to a circular economy. We provide comprehensive training and foster a creative, collaborative environment, with English as the primary language for communication.
Assoc. Prof. Chek Min Fey	Protein engineering, structural biology, enzymology, biodegradable plastic polyhydroxyalkanoate, protein-protein interactions
Affiliate Laboratory	
Molecular Microbiology and Genetics (Research Institute of Innovative Technology for the Earth (RITE))	Our research and education focus on the development of biorefineries—integrated facilities that convert biomass into sustainable fuels and chemicals. By leveraging "smart cell" technologies—merging digital biotechnology with multi-omics and metabolic engineering—we develop innovative microbial functions to empower diverse industrial applications and a sustainable bioeconomy.
Adjunct Prof. Masayuki Inui Adjunct Assoc. Prof. Takahisa Kogure	Smart cell technologies, applied microbiology, bio-production, high-efficiency bioprocesses, regulation of gene expression, systems biology, molecular biology, genome engineering, culture engineering, metabolomic analysis, metabolic engineering

Materials Science



Core Laboratories

Bio-Process Engineering

Prof. Yoichiro Hosokawa
Assoc. Prof. Yalikul Yaxiaer
Assist. Prof. Yuka Tsuri
Assist. Prof. Naomi Tanga

Our laboratory promotes developmental research on high-precision and fast manipulation methodologies for biological materials, in which state-of-the-art laser technology is combined with microscope technologies. We have the world's top activities on cell manipulation and processing by femtosecond laser and have attracted attention as a pioneer of laser applications for biotechnology.

Femtosecond lasers, atomic force microscopy, micro-fluidic devices, cell manipulation, cell processing, laser-induced shockwaves, bio-applications, cell sorters, fluorescence imaging, photoporation, laser-induced crystallization

Solid-state Information Physics

Prof. Tomohiro Matsushita
Assoc. Prof. Ken Hattori
Assist. Prof. Sakura Takeda
Assist. Prof. Takanobu Jujo
Assist. Prof. Yusuke Hashimoto

Our aim is to clarify atomic structures, electronic states, and derived physical properties for dopants in solids, thin films and interfaces on solid surfaces, and in addition, precisely controlled three-dimensional shapes surfaces by using various equipment and analysis methods (including original development) for materials research and education.

Atomic and electronic structures (dopants, thin films, surfaces, interfaces), three-dimensional shapes surfaces, photoelectron holography, electron diffraction, scanning tunneling microscopy, angle resolved photoelectron spectroscopy, electronic states, magnetism, luminescence, molecule adsorption and desorption, synchrotron radiation

Quantum Photo-Science

Prof. Hiroyuki Katsuki
Assist. Prof. Garrek Danneker Stemo

We develop techniques to manipulate the quantum properties of strongly-coupled systems, such as vibrational polaritons and cavity exciton polaritons. We utilize ultrafast laser pulses and apply optics-based experimental approaches to clarify and manipulate material properties from the viewpoint of quantum physics.

Coherent control, ultrafast spectroscopy, femtosecond laser, vibrational polariton, exciton polariton, two dimensional semiconductor, metal organic frameworks

Applied Quantum Physics

Prof. Takayuki Yanagida
Assoc. Prof. Noriaki Kawaguchi
Assoc. Prof. Daisuke Nakauchi
Assist. Prof. Takumi Kato

Our laboratory studies scintillators and storage phosphors for solid state ionizing radiation detectors, and the coverage is synthesis of materials (single crystal, transparent ceramic, glass, organic-inorganic perovskite, and powder), photophysics and radiation detector properties.

Scintillators, scintillation detectors, dosimeters, thermally stimulated luminescence (TSL), optically stimulated luminescence (OSL), radiophotoluminescence (RPL), radiation detectors, phosphor, photoluminescence

Organic Electronics

Prof. Masakazu Nakamura
Assoc. Prof. Hiroaki Bente
Assist. Prof. Ryota Fukuzawa
Assist. Prof. Anh Ngoc Nguyen

Our laboratory pursues the development of novel electronic devices using organic materials based on applied physics and chemistry. Our research is unique in that we develop original research tools to characterize organic semiconductors, and realize entirely new fabrication methods and structures of devices which are distinctive from conventional ones.

Organic electronics, energy harvesting, thermoelectric generators, solar cells, thin-film transistors, Seebeck effect, scanning probe microscopy, CNT, polymer semiconductors, hybrid perovskite

Photonic Device Science

Prof. Kiyotaka Sasagawa
Assist. Prof. Ryoma Okada

In our laboratory, we are conducting cross-disciplinary research, from the design of original optoelectronic devices based on microelectronics technology to their applications. Specifically, we are developing novel photonic devices and systems such as retinal prosthesis, implantable functional brain imaging devices and visualization of high-frequency electric fields.

Smart CMOS image sensors, implantable devices, retinal prosthesis, optogenetics, near-infrared imaging, lensless imaging, high frequency electric field imaging

Thin Film Semiconductor Devices

Assoc. Prof. Kosuke O. Hara
Assoc. Prof. Juan Paolo Soria Bermundo
Assist. Prof. Takanori Takahashi
Assist. Prof. Candell Grace Paredes Quino

Our research focuses on the development of advanced thin-film semiconductor devices, particularly transistors and solar cells, and on understanding the physical principles that connect material synthesis, material properties, and device performance. We take a flexible research approach by combining experiments, simulations, and data-driven methods, including device fabrication, characterization, and device simulation. Our thin-film synthesis methods include physical vapor deposition, chemical vapor deposition, and solution processing, each requiring knowledge of physics and chemistry. Through this multidisciplinary research, we aim to educate students to become researchers and engineers who can tackle challenges in semiconductor devices and materials from multiple perspectives.

Solar cells, transistors, vacuum process, solution process, virtual screening

Photonic and Reactive Molecular Science

Prof. Tsuyoshi Kawai
Assoc. Prof. Tsumoru Morimoto
Assist. Prof. Wataru Ishii

Our group explores for photo-functional organic molecules and reactions, promoting social progress and protecting the environment. Students join the research activity on organic synthetic chemistry, development of new chemical and photochemical reactions, and photofunctional materials such as organic dyes and coordination substances, and even metal-organic nanomaterials. Our focus encompasses innovative molecules for remote-controlled photo-induced stereo/enantio-selective catalysis, conversion of light information as well as light-energy with molecular photo-response. Furthermore, from the perspective of organic reaction chemistry, our goal is the realization of green chemistry on the basis of carbon neutrality.

Photochromic dyes, photo-triggered reactions, chirality, stereo/enantio-selective catalyses, circularly polarized luminescence, transition metal catalyst, future displays, light emitting devices, lanthanides, fluorine chemistry, carbon neutral, green chemistry, photopolymerization

Biomimetic and Technomimetic Molecular Science

Prof. Gwenaél Rapenne
Assist. Prof. Toshio Nishino
Assist. Prof. Yohei Hattori

We are designing and synthesizing molecules which can act as machines at the nanoscale, including motors, gears, winches and nanocars. The molecules are then studied at the single molecular scale in collaboration.

Molecular machines, organic chemistry, coordination chemistry, gears, nanocars

Functional Organic Chemistry

Prof. Naoki Aratani
Assist. Prof. Ryoko Oyama
Assist. Prof. Haruna Sugimura

We focus on the development of functional organic materials including organic semiconductors, highly fluorescent dyes, near-infrared (NIR) dyes, and carbon nanomaterials. In particular, we are fascinated by beautiful and huge organic structures with high symmetry.

Functional organic materials, nano-carbon chemistry, organic photochemistry, emissive dyes, molecular design

Functional Inorganic Materials Design

Prof. Tomoyo Goto

Our research group focuses on environmentally friendly ceramics synthesis via liquid-phase processes. We aim to develop novel synthesis methods and to finely tune the functional properties of ceramics for advanced applications in the environmental, medical, and energy fields.

Ceramics, functional inorganic materials, environmental purification materials, bioceramics, crystal morphology



Functional Supramolecular Chemistry	We are performing new interdisciplinary research in chemistry, biology, and pharmacy. Based on the chemical knowledge of the functions and structures of biomolecules at molecular level, our laboratory focuses on the elucidation of protein mechanisms and design/application of bio-supramolecules using various analytical methods and protein engineering techniques.
Prof. Shun Hirota Assoc. Prof. Takashi Matsuo Assist. Prof. Tsuyoshi Mashima	Pharmaceutical science, biofunctional chemistry, biophysical chemistry, protein science, coordination chemistry, supramolecules, proteins, metalloproteins, antibody, function control, DDS, enzymatic reactions, catalytic reactions, chemical modification, analytical methods, protein gel, hemoglobin gel, cancer treatment, computer-based protein design
Complex Molecular Systems	Our laboratory focuses on the autonomous assembly-disassembly phenomena exhibited by complex molecular systems of proteins. Based on protein science and biophysics, we conduct research and education on the understanding of protein-molecule complex systems as potential targets for drug discovery and the development of next-generation protein-molecule complex materials.
Prof. Hironari Kamikubo Assoc. Prof. Sachiko Toma Assist. Prof. Yoichi Yamazaki Assist. Prof. Kento Yonezawa	Protein science, biophysics, structural biology, protein design engineering, x-ray solution scattering, x-ray & neutron crystallography, spectroscopy, recombinant DNA technology, structural proteins, protein transport systems, signal transduction systems
Nanomaterials and Polymer Chemistry	Based on the concepts of “molecular technology” and “precise polymerization”, we prepare various polymer structures and create new polymer materials by controlling molecular design, polymer synthesis and polymer-polymer interactions. The target of their application is biocompatible materials, energy related materials, and environmentally friendly materials.
Prof. Hiroharu Ajiro Assoc. Prof. Tsuyoshi Ando Assist. Prof. Nalinthip Chanthaset Assist. Prof. Ryohei Ikura	Biomaterial, degradable polymers, environmentally friendly material, energy related material, polymer synthesis, molecular design, nano structure, stimuli responsive property, gels, films
Materials Informatics	In our laboratory, we study materials informatics. Our goal is to develop informatics analysis methods and their applications to improve material properties. In material science, experiments and theories have developed by interacting with each other. We are particularly interested in the technology that integrates and utilizes them.
Prof. Mikiya Fujii Assoc. Prof. Tomoaki Takayama Assoc. Prof. Yosuke Harashima Assist. Prof. Shogo Takasuga	Machine learning, artificial intelligence, computational materials science, photocatalysts/catalysis, polymers/copolymers, auto-experiments, data-assimilation, generative models,
Core Laboratories (Cooperative)	
Metrology Informatics	We leverage data science to advance materials analysis and metrology techniques for next-generation semiconductor materials and devices. Through these innovative approaches, we seek to address critical technical challenges and uncover fundamental principles that underpin the development of advanced semiconductor technologies.
Prof. Shigetaka Tomiya Assoc. Prof. Zentaro Akase Assist. Prof. Kazunori Iwamitsu	Metrology informatics, materials analysis, data science, electron microscopy, semiconductor materials and devices
Macromolecular Systems Design	We go beyond conventional approaches that focus on the properties of individual polymers, and instead aim to design cooperative interactions among multiple polymers as the primary target of investigation. By treating such collective interactions as an intentional design element, we seek to create unprecedented and previously unexplored functions. From molecular-level design to the construction of supramolecular assemblies, we pursue an integrated strategy to rationally develop macromolecular systems that exhibit novel and emergent functionalities.
Prof. Kazuma Yasuhara Assist. Prof. Qiuyang Huang	Macromolecular systems, Functional polymers, Artificial cells, Automated synthesis, Data-driven molecular design
Chemoinformatics	Chemoinformatics is a research area in which chemical problems are tackled using informatics methods. Our primary mission is to develop practical chemoinformatics methods for experimental chemists and biologists by incorporating theory and data-driven approaches. The methods developed by our group have a wide range of applications from drug discovery to material design.
Prof. Tomoyuki Miyao Assist. Prof. Akinori Sato	Chemoinformatics, drug discovery, in-silico modeling, machine learning, organic reaction prediction
Core Laboratories (Collaborative)	
Functional Polymer Science (Santen Pharmaceutical Co., Ltd.)	Our laboratory focuses on material discovery and formulation design for ocular drug delivery in the treatment of ocular diseases. We explore the innovative DDS platform to efficiently penetrate target ocular tissues and educate students by synthesizing, analyzing, and evaluating novel materials, such as functional polymers and cell-penetrating peptides.
Adjunct Prof. Komei Okabe Adjunct Prof. Mamoru Matsuda Adjunct Assoc. Prof. Kazuhiro Kudo	Drug delivery systems (DDS), ophthalmology, formulation design, chemical synthesis, functional polymers, cell penetrating peptides
Ecomaterial Science (Research Institute of Innovative Technology for the Earth)	The Ecomaterial Science Laboratory, staffed by researchers of the Research Institute of Innovative Technology for the Earth (RITE), provides research and education on fundamental technologies to solve global warming issues. We endeavor to develop advanced materials for CO ₂ capture and H ₂ energy production, such as zeolite and amine-based materials.
Adjunct Prof. Katsunori Yogo Adjunct Prof. Masahiro Seshimo Adjunct Assoc. Prof. Tomohiro Kinoshita	Global warming, CO ₂ capture, CCUS, zeolites, amine-based materials, mesoporous materials, polymeric materials, metal organic frameworks (MOF), inorganic membranes
Advanced Functional Materials (Osaka Research Institute of Industrial Science and Technology)	Polymers, ceramics and metals are materials used widely in industry from structural to a variety of functional uses. We devote our efforts to develop new functional materials from them to be applied in advanced industry. We focus on the development of biomass-based plastics based on fine controlled polymer synthesis, and all-solid-state lithium battery, for realization of environmentally-conscious materials, and next generation electronic, optical, and energy devices.
Adjunct Prof. Joji Kadota Adjunct Prof. Mari Yamamoto Adjunct Assoc. Prof. Shohei Maruyama	Biomass-based polymers, precise polymerization, all solid-state lithium-ion secondary batteries, redox-flow battery, high energy density
Collaborative Laboratories	
Interfaces, Molecules and Materials (Université de Toulouse)	Our laboratory has extensive expertise in the organocatalyzed ring-opening polymerization(ROP) of lactones and cyclic carbonates for the synthesis of tailor-made biodegradable polymers. In recent years, our research has increasingly focused on the design and development of innovative monomer structures. We are actively synthesizing novel lactones and cyclic carbonates, which, upon organocatalyzed polymerization, enable access to new classes of biodegradable polymers featuring diverse pendant functional groups. These structural modifications impart unique physicochemical properties, thereby expanding the application potential of the resulting materials.
Adjunct Prof. Blanca Martin Vaca Adjunct Assoc. Prof. Claire Kammerer	Organocatalyzed polymerization, biodegradable polymers, functionalized polymers, lactones, cyclic carbonates

Research and Innovation

Research Centers and Facilities

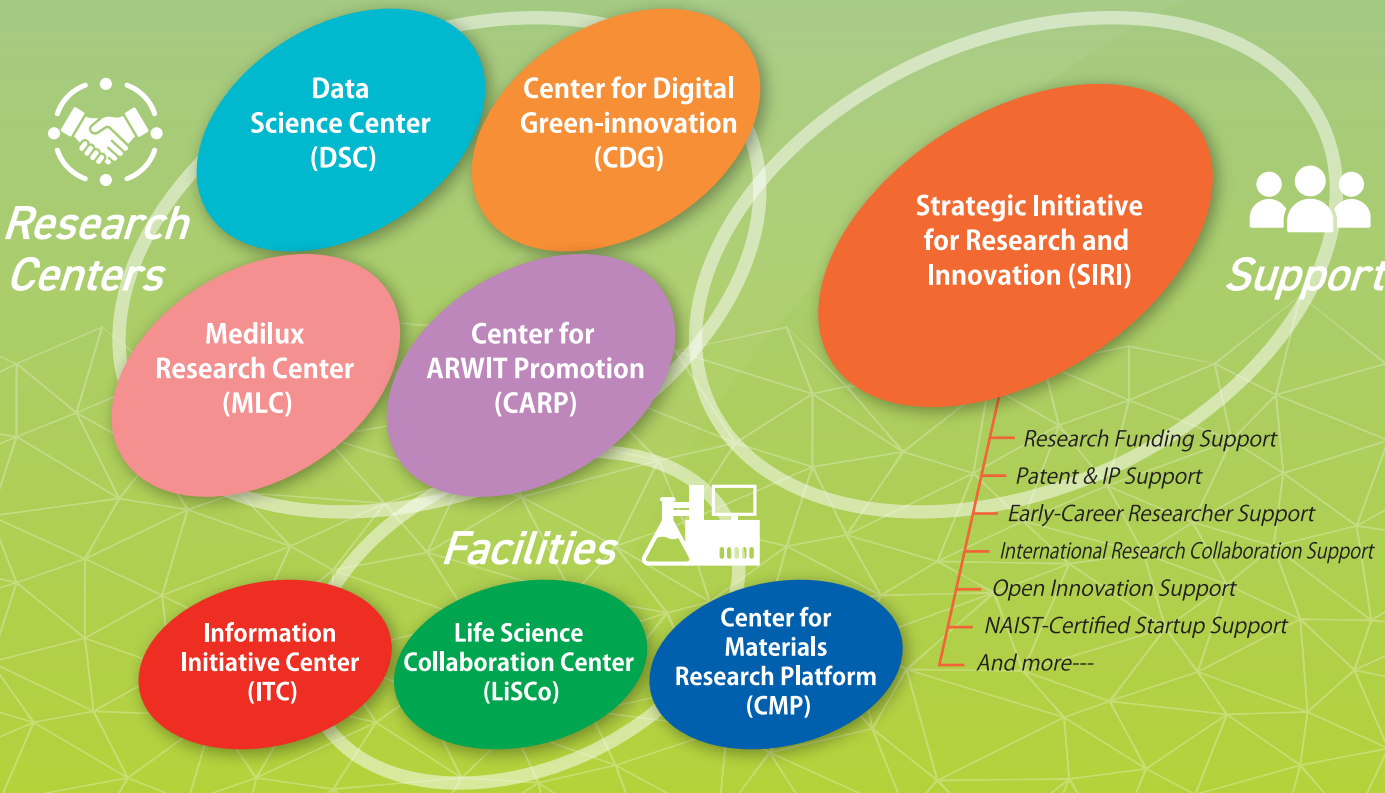
At NAIST, we actively promote interdisciplinary research that goes beyond the traditional fields of Information Science, Biological Science, and Materials Science. To advance these initiatives, NAIST has established four dedicated centers: the Center for ARWIT Promotion(CARP), the Data Science Center (DSC), the Center for Digital Green-innovation (CDG), and the Medilux Research Center (MLC). These centers are designed to advance research and educational activities aligned with specific objectives.

In addition, NAIST has developed advanced research facilities to foster innovative research activities across disciplines, including the Life Science Collaboration Center (LiSCo), the Center for Materials Research Platform (CMP), and the Information Initiative Center (ITC). Together, these centers and facilities create a strong foundation that enables researchers and students to pursue ambitious and impactful research.

Toward Future Innovation

As science and technology continue to evolve and research activities become increasingly diverse and sophisticated, interdisciplinary research, international collaboration, and partnerships among academia, industry, and government are becoming ever more important. At NAIST, we foster an environment where researchers can work across disciplines and pursue new research and innovation through free and creative ideas.

To comprehensively support these activities, NAIST has established the Strategic Initiative for Research and Innovation (SIRI). SIRI facilitates research and innovation activities through securing research funding, managing intellectual properties, fostering international collaborations, promoting startups, and strengthening partnerships with industry and public institutions. It also accelerates the social implementation of research outcomes, contributing to the creation of new value and the resolution of societal challenges. Through these initiatives, NAIST is committed to nurturing the next generation of researchers who will lead the future of science, technology, and society.



Research Centers

Center for ARWIT Promotion (CARP)

The Center for ARWIT Promotion spearheads the "Automated Research Workflow and Industrial Translation (ARWIT)" strategy under NAIST J-PEAKS program. Its mission is to transform scientific research through digital technology, integrating AI and robotics with human expertise. By implementing intelligent platforms for material synthesis and biological assays, supported by secure data-sharing systems, the Center accelerates the discovery of innovative materials and their industrial translation. Ultimately, the Center fosters open innovation to ensure sustainable social development amid declining working-age population.

Launch of the Center

Launched in January 2026 as a strategic command tower, the Center coordinates organizational reforms and next-generation research transformation. It serves as a practical hub driving the scientific innovation of NAIST and its partners.



Kick-off Symposium

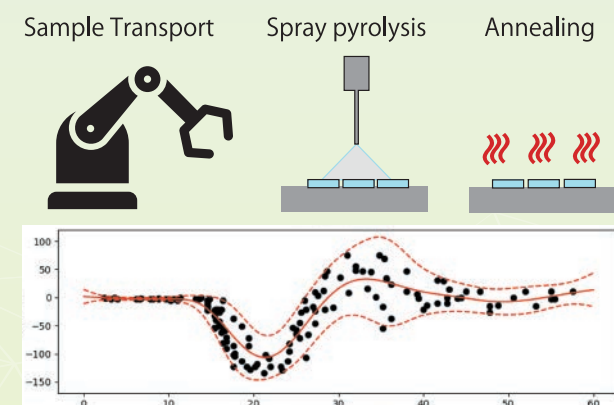
Held in April 2026, this celebration symposium attracted numerous industry and academic stakeholders. Participants shared co-creation schemes to accelerate research transformation and its practical industrial implementation.



Data Science Center

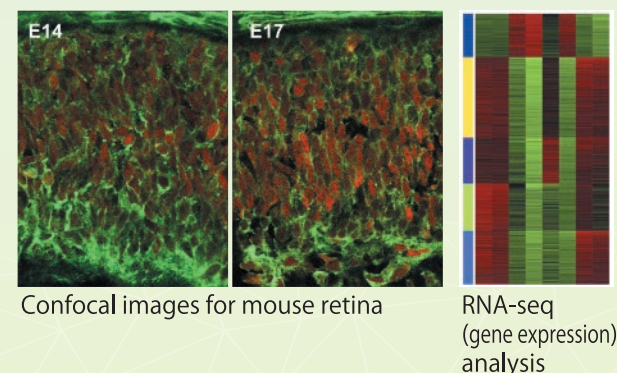
The Data Science Center (DSC) was established to promote data-driven science across Information Science, Biological Science, Materials Science, and their interdisciplinary fields. In recent years, it has expanded its focus to AI-driven science, serving as a university-wide foundation for education and research and playing a central role in the Data Science Program.

Materials Research – Automation Flow



The DSC promotes the RX cycle in materials research by linking automated experiments, data-driven analysis, and eLabFTW-based knowledge management to accelerate discovery.

Life Science Research – Data Integration and Analysis



In life science research, confocal images and RNA-seq data are recorded and organized in eLabFTW, creating a shared knowledge base that connects biological observation, data management, and data-driven discovery.

Center for Digital Green-innovation (CDG)

CDG at NAIST advances sustainable innovation by integrating bioscience and digital technologies, including AI, data science, sensing, and advanced materials. It addresses global environmental and social challenges through research, interdisciplinary education, and industry collaboration. In partnership with SIGL at NAIST, it promotes globally minded talent development, including international students. Its key initiatives, the Digital Green Innovation Program, and the NAIST Green Economy Consortium, develop future leaders and connect academia and industry to accelerate real-world implementation. Together, these initiatives position CDG as a catalyst for global green transformation.



Digital Green Innovation Program



The Digital Green Innovation Program is an interdisciplinary initiative that cultivates future leaders bridging digital technologies and green sciences. Integrating bioscience, information science, and materials science, it provides a comprehensive learning environment emphasizing both project-based learning and collaboration with industry and communities to solve real-world challenges.

NAIST Green Economy Consortium



The NAIST Green Economy Consortium is a collaborative platform bringing together industry partners, researchers, and students to accelerate innovation in the green economy. It fosters joint research, co-creation, and knowledge exchange, bridging academia and industry, while driving sustainable technologies, real-world implementation, and contributing to a resilient, future-oriented global economy.

Medilux Research Center (MLC)

In the lexicon of ancient tongues, "Lux" stands as a beacon of light, a symbol transcending mere luminance, embodying wisdom's might. It is the brilliance of human intellect, gathering society's lore, a radiant culmination of hopes and dreams, forevermore. Here at the Medilux Research Center (MLC), we let "Lux" take flight, in collaborative quests where medicine and technology unite. With AI, Biotech, and Engineering, our origins proudly from NAIST, we shine our "Lux" upon the world, in innovation's ceaseless chase.

Research Project



We pursue interdisciplinary research across the three pillars of Diagnosis, Treatment, and Health, integrating Advanced Photonics, AI, and Biotechnology to pioneer the future of medical-engineering collaboration.

Cooperation



We conduct seminars for working professionals, including individuals who aspire to engage in medical–engineering-related fields, as well as interdisciplinary exchange meetings and industry–academia collaboration support.

Information Initiative Center (ITC)



The Information Initiative Center (ITC) was established to centrally manage all computer network facilities, both hardware and software, at our university, as well as to provide useful service that help users to utilize our facilities. The ITC comprises two specialized groups: one consists of researchers and engineers responsible for the research, development, and operation of next-generation computer network system; the other consists of specialist who manage academic information services, including digital library educational and research activities across various fields at our university while contributing to the development of a highly-advanced information society.

Life Science Collaboration Center (LiSCo)



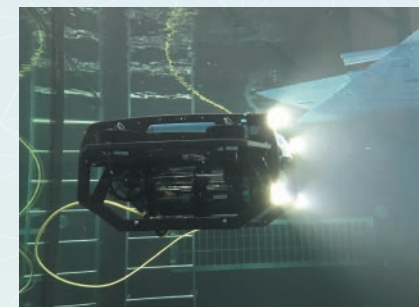
Life Science Collaboration Center (LiSCo) was established in January 2023 with the aim of contributing to the advancement, deepening, and increased efficiency of life science and interdisciplinary research through the development of facilities and equipment as well as the introduction of cutting-edge technologies. In parallel, the center promotes shared use of its resources both within and outside the university and provides research support, thereby contributing to regional and international collaboration, industry-academia partnerships, and human resource development. LiSCo is composed of three division: the Division for Promotion of Life Science Research, the Division for Operation of Facilities and Equipment, and the Division for Research Collaboration Support. Each division is smoothly operated by dedicated researchers and technical staff with specialized expertise.

Center for Materials Research Platform (CMP)



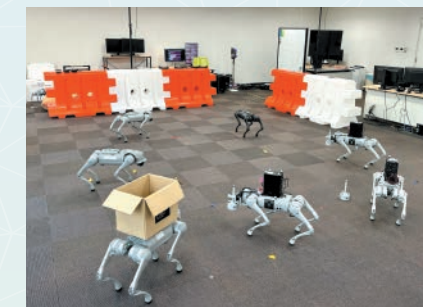
The Center for Materials Research Platform (CMP) provides shared access to approximately 50 state-of-the-art research instruments for users both within and outside NAIST. A technical team of approximately 15 highly skilled staff members provides comprehensive support, helping users make effective use of these advanced facilities. CMP also promotes the collection and effective use of research data and makes selected datasets publicly available through the MEXT-ARIM program. CMP's Electronic Laboratory Notebook (ELN) system securely connects users, staff, and instruments, enabling seamless data sharing throughout the research process.

Information Science



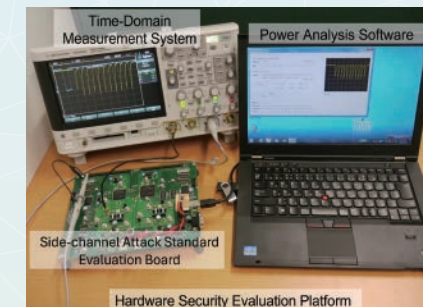
Remotely Operated Vehicle

Our BlueROV2 is a high-performance, highly customizable underwater vehicle designed for infrastructure inspection, advanced robotics research, and diverse marine field work.



Multi-robot Cooperative Experimental Environment

Our multi-robot cooperative environment serves as a versatile platform for human-centered robotics, designed to transition experiments from pure simulation to real-world hardware, sensor, and system integration.



Hardware Security Evaluation Platform

This platform evaluates hardware security anchors — the foundational pillars of system trust — ensuring hardware integrity to safeguard higher-layer software and applications.

Biological Science (LiSCo)



Confocal Laser Scanning Microscopy

We provide several advanced confocal laser scanning microscopy systems for a wide range of biological research applications. These systems support high-resolution fluorescence imaging, 3D/4D imaging, and multi-color imaging.



Mass Spectrometry

We offer comprehensive solutions for proteomics and metabolomics, including protein identification, post-translational modification analysis, and precise metabolite profiling. Integrated with high-performance liquid chromatography and gas chromatography, the system ensures high-throughput, sensitive, and rapid molecular analysis for diverse research needs.



Flow Cytometry

We provide several advanced flow cytometry systems for a wide range of biological research applications. These systems support high-throughput analysis of target cell populations and protein markers, multi-color fluorescence analysis, and detection of rare cell populations. Cell-sorting systems are also available, enabling high-speed isolation of target cells or particles for downstream applications.

Materials Science (CMP)



600MHz NMR

600 MHz NMR spectrometer provides precise structural information on small molecules and polymers. CMP will soon install a new one, equipped with an automated sample changer and a helium-saving unit.



TEM

This TEM provides atomic-resolution imaging and elemental analysis. Its cold field-emission gun with a variable accelerating voltage of 80–200 kV, aberration corrector, and dual EDS detectors enable precise characterization of nanomaterials and interfaces. Cryogenic and in-liquid TEM capabilities are also available.



XPS

This XPS system provides high-resolution surface chemical analysis using monochromatic Al-K α , Mg-K α , and Zr-L lines. It supports charge neutralization for non-conductive substance. Depth profiling and five-axis sample positioning, enabling versatile characterization of conductive, insulating, and advanced materials with high precision.

Student Support

Scholarships

Japanese Ministry of Education , Culture, Sports, Science and Technology (MEXT) Scholarship

The MEXT Scholarship is a government-funded scholarship provided by the Ministry of Education, Culture, Sports, Science and Technology(MEXT) of Japan.

1. Embassy Recommendation

2. University Recommendation *For Information Science field only

What it covers

- Full tuition waiver (including examination fee and entrance fee)
- Monthly stipend (living allowance)
- Round-trip airfare to Japan



Other Government and Private Scholarships

Multiple scholarships specifically for international students are offered by private companies and foundations.



Japan Student Services Organization (JASSO) Scholarships



NAIST International Scholar Program

This program is intended to privately financed international students who have successfully passed the Screening of International Students by Special Recommendation and will be enrolled in a doctoral course at NAIST. (Subject to approval by the President)

What it covers

- Overseas travel expenses from the recipient's home country to Japan
- Enrollment fee exemption
- Tuition fee exemption
- Other support as deemed necessary by the President of NAIST



Other Financial Aid

NAIST Granite Program

Provides research budget and career development support for selected talented students. For further details, please contact the Student Support Section.

Active Support for Overseas Mobility

NAIST supports students' participation in overseas and international research opportunities by providing financial assistance through external research funds and grants.

Priority Consideration for Teaching and Research Assistant(TA/RA)Positions

Financial support equivalent to half of the tuition fee is provided through Teaching Assistant(TA) or Research Assistant (RA) positions. Additional support may be provided depending on the nature of the student's research area.

* Please consult with your academic advisor after enrollment.

Admission and Tuition Fee Exemptions

For students facing financial difficulties, NAIST offers full or partial exemption of admission and tuition fees. Over the past five years, all students who met the university's eligibility criteria have been granted either a full or partial tuition fee exemption.

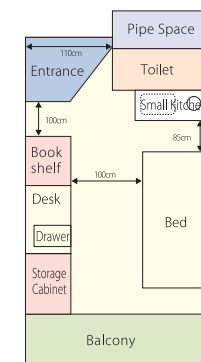
* All applicants are required to undergo a screening process to determine eligibility.

Admission Fee: JPY 282,000

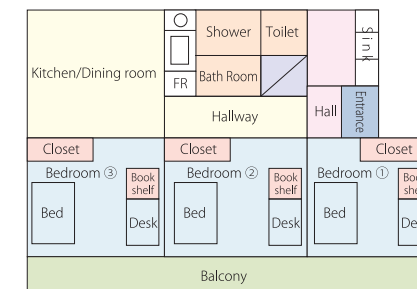
Tuition Fee: JPY 267,900

On-campus Housing

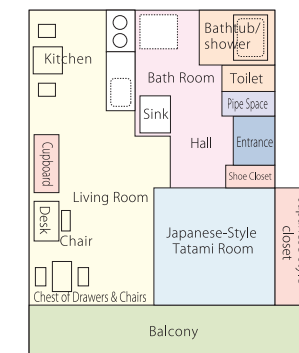
All full-time international students are eligible for on-campus housing.



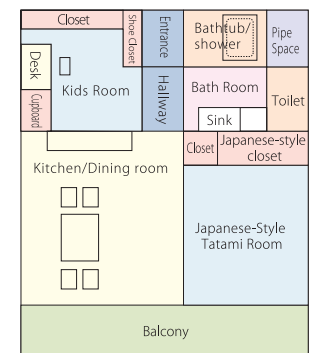
Single housing



Shared apartment-style housing



Couple housing



Family housing



Student Dormitory



Single Room



Couple Room



Shared Type (Private Room)



Shared Type (Shared Room)

International Student Affairs Section (ISAS)

ISAS is the first office that international students deal with when they begin their procedures for studying at NAIST. Starting with admissions assistance and visa procedures, ISAS manages international student registration, offers administrative support for international students concerning their status in Japan and handles Japanese government and other scholarships. The experienced staff also offers advice to students as they live and study at NAIST. Additionally, the section works with a citizen group to maintain a Japanese language program and arranges Japanese cultural excursions every year.



Center for International Students and Scholars (CISS)

CISS was established as part of NAIST's commitment to supporting its growing international community, which includes students, international researchers, and faculty members, along with their families.

CISS work with administrative offices across campus to provide support both on and off campus, and also collaborates with local government offices to help ensure that the international community at and around NAIST can make the most of their time in Japan.



Student Activities and Events



One-Day Excursion



Calligraphy Workshop



Summer Festival



Language Exchange Event



Welcome to NAIST Spring Event





Shape Your Future with Us!! ~Support at Every Step of Your Way~

Reflecting on Your Academic and Career Journey

Explore on how your experiences connect to your future and who you want to become.



- ▶ Individual Career Counseling Sessions
- ▶ Group Career Counseling Sessions
- ▶ Reflective Workshop

Turning Your Research into Career Opportunities

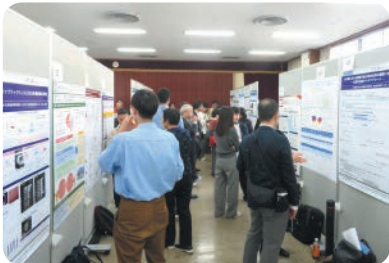
Move beyond explaining what you research by learning how to communicate its impact, who benefits from it and the value it creates.



- ▶ Translating Transferable Skills Sessions
- ▶ Company Visit Program
- ▶ Career Networking Events

Developing Your Professional Identity and Direction

Expand your perspective from the simple choice of "researcher or company employee," and explore what kind of professional you want to become in society.



- ▶ Individual Career Counseling Sessions
- ▶ Career Networking Events
- ▶ Alumni Talks

Adjusting to Life and Work in a New Culture

Rather than teaching a single "correct answer," we support students in understanding cultural differences and finding their own ways to navigate them.



- ▶ Workplace Culture Seminar
- ▶ Networking Practice Sessions
- ▶ Alumni Dialogue

Building Community and Connection in Graduate School

Create a space where international students can share their unique challenges, experiences, and perspectives.



- ▶ Motivation Management Seminar
- ▶ Small Group Dialogue Sessions
- ▶ Alumni Talks

Connecting You with Industry, Academia, and Career Pathways

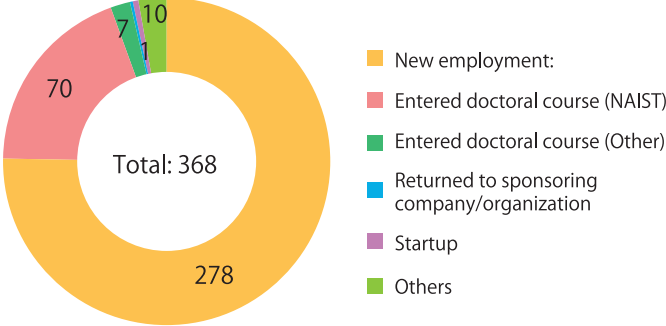
Work with companies and society to support and shape international students' career development.



- ▶ Doctoral Talent Ecosystem Platform

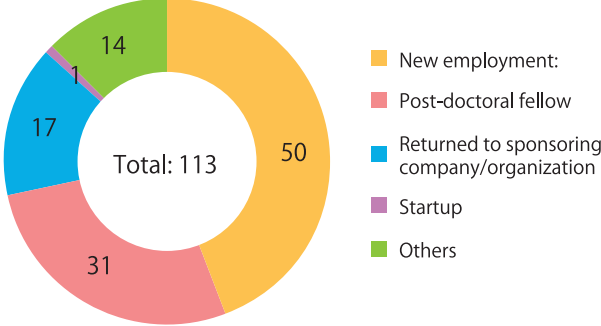
98% Employment Rate: Cultivating Global Leaders

Master graduates in academic year in 2025



Industry Category	Percentage
Manufacturing	42.7%
Information & Communications	21.3%
Food, Pharmaceutical & Biotechnology Manufacturing	15.2%
Service Industry	9.1%
Professional, Scientific & Technical Services	4.9%
Public Sector & Education	3.0%
Utilities & Energy	1.8%
Finance & Insurance	1.8%

Doctoral graduates in academic year in 2025



Industry Category	Percentage
Manufacturing	36.8%
Information & Communications	18.4%
Public Sector & Education	23.7%
Professional, Scientific & Technical Services	13.2%
Food, Pharmaceutical & Biotechnology Manufacturing	5.3%
Utilities & Energy	2.6%

Private Japanese Lessons for International Students

In addition to the Japanese language courses offered in the NAIST curriculum, the Career Services Office provides individualized Japanese language lessons.

- ▶ A year-long program designed to steadily build and strengthen Japanese language skills
- ▶ Flexible lesson scheduling arranged directly between students and instructors

Career Support Lounge Operated by an External Organization

A unique on-campus lounge is operated by an external career support organization, offering:

- ▶ Access to up-to-date job market information
- ▶ Opportunities to connect with companies, alumni, and fellow students through networking events



Meet the Team! /

Students have access to career guidance from advisors with diverse international and professional expertise. Our team includes professionals with international work experience, an internationally certified career advisor, specialists in international student career development, and experts in management and organizational leadership, enabling us to provide comprehensive and personalized career support.



Information Science

Yanis Tahrat

Lab Biomedical Imaging Intelligence Laboratory

Research Topic 2D-3D wrist bone reconstruction from a single X-Ray Image

How did you find out about NAIST?
I first learned about NAIST through a collaboration between NAIST and my previous engineering school in France. After completing an internship in Japan, I became increasingly interested in graduate studies here and learning more about the research opportunities available at NAIST.

How would you describe your research environment and supervision at NAIST?
The research environment is very flexible and encourages independence. I have a great deal of freedom in organizing my schedule and research activities while receiving guidance from my supervisor whenever needed. This balance of autonomy and support has allowed me to develop both my research skills and independence.

How supportive is NAIST for students from different cultural backgrounds?
NAIST has been extremely supportive even before arrival in Japan. The staff always answered my questions about procedures and documents kindly and efficiently. Even after enrollment, they continue to provide help with administrative matters. The ISAS office communicates very well in English, making the process smooth and accessible.



Information Science

Saidah Zahrotul Jannah

Lab Social Computing Laboratory

Research Topic Multilingual Symptom Detection on Social Media, Medical Natural Language Processing (NLP)

What made you choose NAIST graduate program over others?
NAIST is a graduate-school-focused university, which means the academic environment is specialized and research-oriented. I was also attracted by its excellent research facilities, strong collaborations between industry, academia, and government, and the opportunity to study under reputable professors in their respective fields.

How would you describe your research environment and supervision at NAIST?
My lab is very supportive, providing access to research resources, servers for experimental infrastructure, and funding for conferences and publications. We are encouraged to submit our work to prestigious international conferences, collaborate with researchers from different countries, and further develop our work into journal publications after presentation.

Where is your favorite place at NAIST?
My favorite place at NAIST is the pond area. The greenery creates a calm and relaxing atmosphere, and it is also a nice place for my children. They enjoy watching the fish, running around on the grass, and simply exploring nature.



Biological Science

Juping Sun

Lab Molecular Immunobiology

Research Topic Screening of vaccine adjuvants targeting cellular stress signals

Did you change your research field after entering NAIST? If so, how was the experience of changing it?
Since I majored in pharmacy for my undergraduate degree, previous experimental experience was more related to chemistry. Ironically, I first learned extremely basic biological techniques, such as cell culture, only after coming here. I am truly grateful to my professor for giving me this opportunity and opening the door to exploring an entirely new field.

How comfortable is your dormitory?
I live in the couples dormitory building with my wife, and I think it is fantastic. When I open the window, I can see blue sky, forests, and rice fields. I believe that it's one of the best cost-performance accommodations I have ever experienced in my life.

How much Japanese language ability do you need to study comfortably at NAIST?
If you only focus on research, Japanese is not necessary since communication with professors and courses can be done in English. However, Japanese becomes extremely important when communicating with lab members, joining local community activities, and especially for job hunting and employment.



Biological Science

Anne Wanjiru Mbugua

Lab RNA Molecular Medicine

Research Topic Dissecting Tick-Virus Interactions to Reveal Antiviral Pathways and Host Factors Involved in Tick-Borne Encephalitis Virus (TBEV)

How did you find out about NAIST?
When applying for the MEXT Scholarship through the Japanese Embassy, I reviewed several universities with research opportunities related to my interests. After exploring their websites, I found that NAIST best matched my academic goals and research interests. NAIST was also featured in informational materials available at the Embassy of Japan, which further strengthened my interests in the university.

What is a typical day like for you as a NAIST student?
I am a biological student which means I have to run experiments on a daily basis based on several objectives I have outlined from my research.

What made you choose NAIST graduate program over others?
The NAIST website provides detailed information about each laboratory, including professors, research topics, members, publications, and photos. Much of it is available in English, making it easy to understand and compare labs. This helped me evaluate them and choose where I want to study and conduct research.



Materials Science

Rivaldo Marsel Tumbelaka

Lab Solid-state Information Physics

Research Topic Development of a quantitative surface characterization method using reflection high-energy electron diffraction (RHEED) for sub-nanometer roughness evaluation on three-dimensional material surfaces.

What made you choose NAIST graduate program over others?
I chose NAIST because of its excellent research environment, advanced facilities, and strong focus on science and technology. I was especially interested in interdisciplinary research while receiving close support from professors and researchers.

How much Japanese language ability do you need to study comfortably at NAIST?
It is possible to study comfortably at NAIST even without advanced Japanese skills because NAIST is an international graduate school where English is widely used in research and academic activities, though Japanese helps in daily life and interacting with Japanese students.

Was it difficult to adapt to life in Japan/ NAIST? What helped you?
At first, adapting to a new culture and environment was challenging, especially because of language and lifestyle differences. However, support from friends, laboratory members, and NAIST's international community, especially CISS, helped me adjust smoothly and feel comfortable.



Materials Science

Aian Briones Ontoria

Lab Organic Electronics

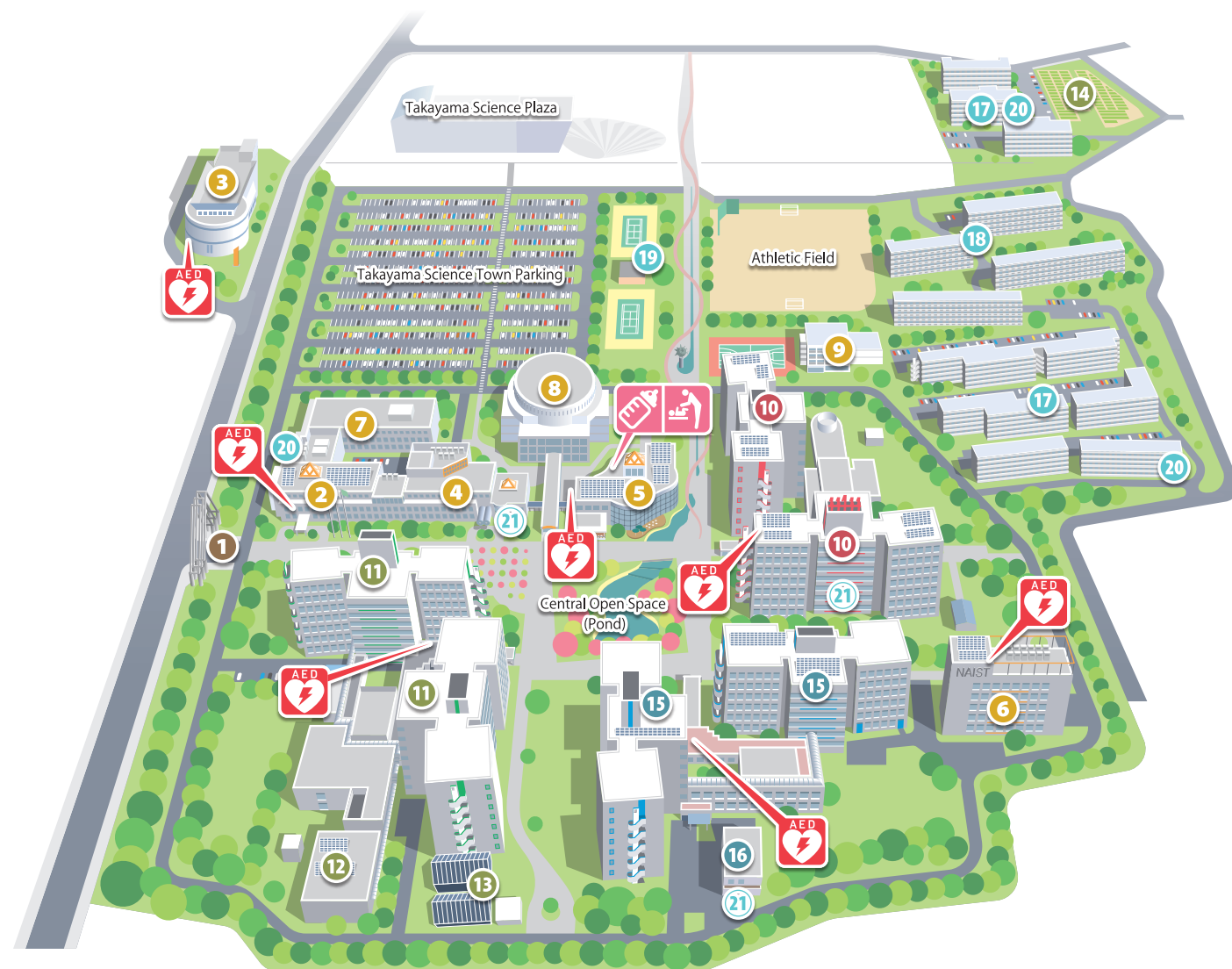
Research Topic Development of an AI-Advisor for the Fabrication Conditions of Carbon Nanotube Thermoelectric Yarns

Did you change your research field after entering NAIST? If so, how was the experience of changing it?
Yes. My background is experimental materials science, but I became interested in machine learning and AI. With support from my advisor and secondary advisor from the Material Informatics Laboratory, I was able to combine experimental research with data-driven approaches.

What is a typical day like for you as a NAIST student?
As a student with a family, my day starts by helping my two children get ready for school. At the lab, I spend time studying Japanese, learning new AI/ML concepts, and working on my research. After work, I return home and spend time with my family.

How do you manage your time between research and personal life?
I try to keep my research work at the laboratory and maintain a clear separation between work and family life. When necessary, I coordinate with my advisor and work remotely from home.

Campus Map & Facilities



- ① Main Entrance
- ② Administrative Bureau
- ③ Administrative Bureau Annex
- ④ NAIST Library
- ⑤ University Union / Health Care Center
- ⑥ Interdisciplinary Frontier Research Complex No. 1 / Data Science Center / Center for Digital Green-innovation
- ⑦ Interdisciplinary Frontier Research Complex No.2
- ⑧ Millenium Hall
- ⑨ Guesthouse Sentan / NAIST daycare Scitech
- ⑩ Information Science Complex / Information Initiative Center
- ⑪ Biological Science Complex / Life Science Collaboration Center
- ⑫ Animal Experiment Facility
- ⑬ Botanical Greenhouses
- ⑭ Green Lab
- ⑮ Materials Science Complex / Center for Materials Research Platform / Medilux Research Center
- ⑯ Bio-Nano Process Laboratory (*Bio Nano)
- ⑰ Student Dormitories
- ⑱ Staff Residences / Childcare Room Sentan
- ⑲ Sports Facilities
- ⑳ HELLO CYCLING
- ㉑ Car-sharing project III



⑤ Convenience Store

The on-campus convenience store is open seven days a week and offers a wide selection of food, beverages, daily necessities, and convenient payment services.



⑤ Health Care Center

The Health Care Center is staffed by a doctor, nurses, and a counselor who provide medical care, health guidance, and mental health counseling for students, faculty, and staff.



⑨ Guesthouse Sentan

The guesthouse offers affordable short-term accommodation on campus for visiting students and researchers, helping foster collaboration with both domestic and international partners.



⑲ Sports Facilities

NAIST offers free sports facilities, including tennis courts, a basketball /volleyball court, and a sports ground, with equipment available for various sports.



⑨ NAIST daycare Scitech

On-campus daycare is available for faculty, staff, and students with young children, subject to capacity limits. It accepts children aged 0-2, including some from outside NAIST. From age 3, children transition to nearby Takayama Kodomo-en or Gakken Mayumi Hoiku-en.



⑱ Childcare Room Sentan

This room was established as part of NAIST's initiatives to support work-life balance for faculty and staff, alongside a variety of childcare and family support programs.



㉑ HELLO CYCLING

"HELLO CYCLING" is a bike-sharing service that enables users to reserve, unlock, and pay for bicycles through a mobile app available 24/7. Bikes can be rented at stations on and off campus, providing a convenient option for commuting and short-distance travel.



㉑ Car-sharing project III

NAIST operates a car-sharing service using two electric vehicles (EVs), with pick-up and return stations located on campus. The objective of this project is to analyze driving behavior and usage data collected from the vehicles in order to estimate individual user characteristics and behavioral tendencies, and to design personalized nudging strategies based on those characteristics.



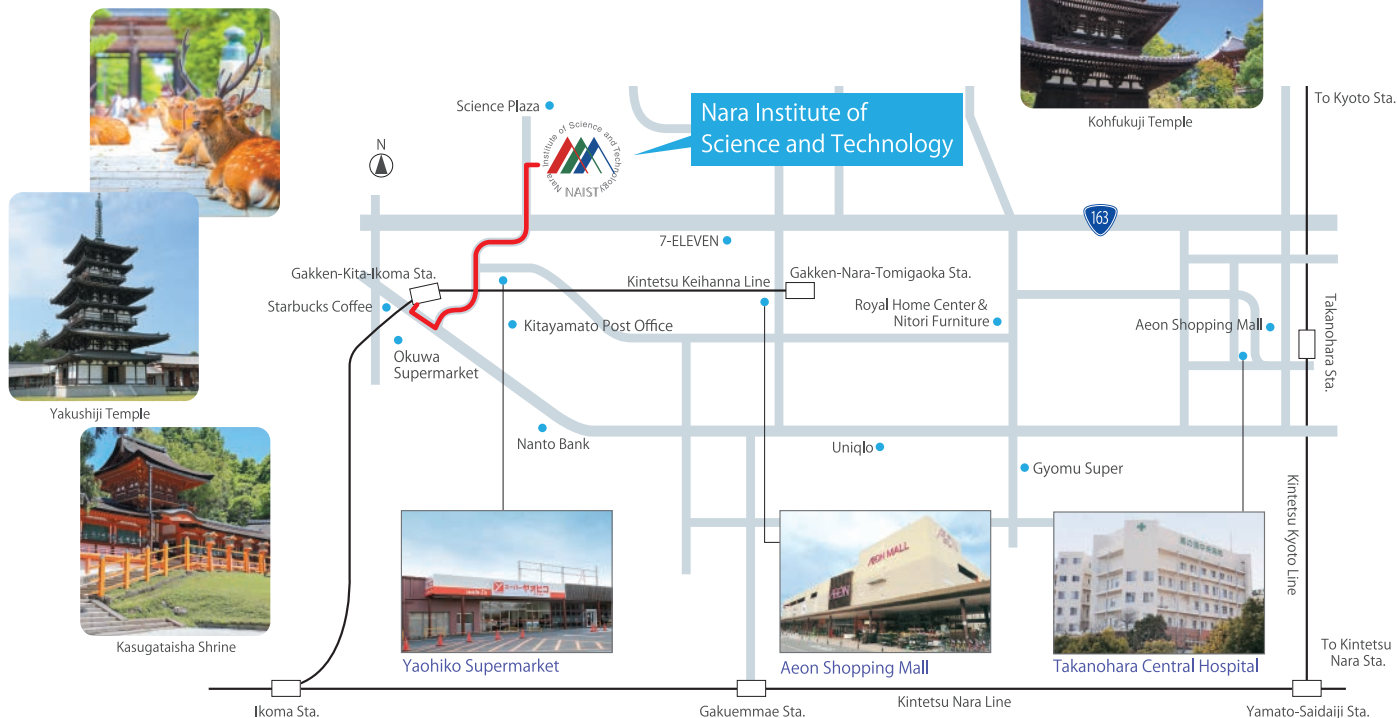
④ NAIST Library

The NAIST Library supports education and research through its advanced digital library system, giving students and researchers access to lecture videos, dissertations, e-books, and electronic journals anytime and anywhere.

Beyond its extensive online resources, the library also offers comfortable on-site facilities with printed materials, audiovisual collections, and innovative learning spaces such as the Multimedia Lounge — perfect for both focused study and collaborative learning.

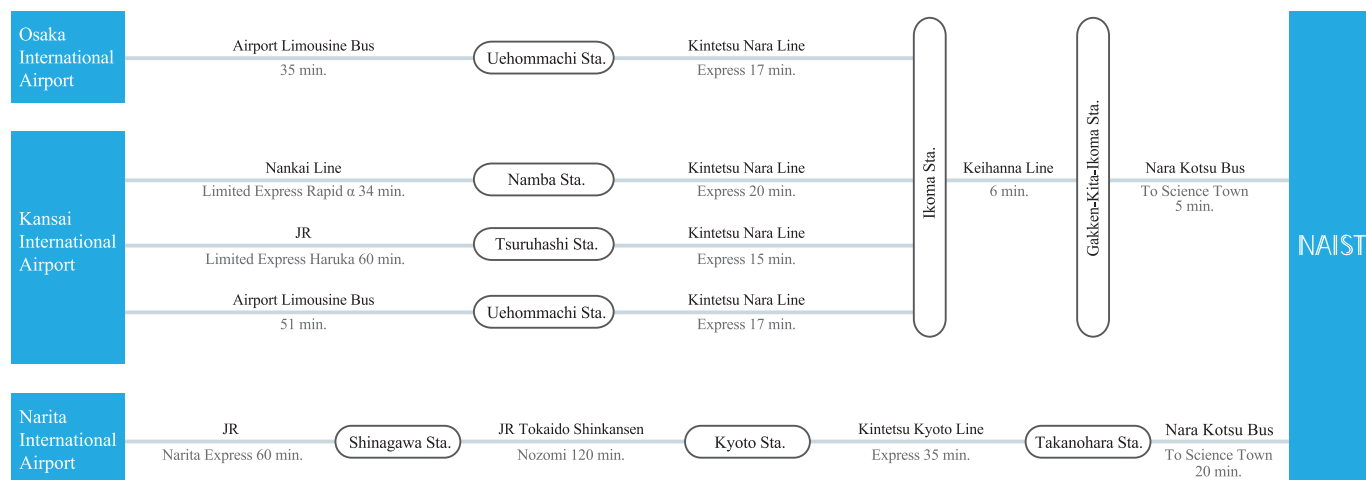
Around Campus

— 20 min. on foot
— 5 min. by bus



Reaching NAIST from Domestic Airports

NAIST is only 1.5 hours away from Osaka International Airport and Kansai International Airport



Nara Institute of Science and Technology

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NAIST Website



Division of Information Science



Division of Biological Science



Division of Materials Science



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