



TOHOKU UNIVERSITY

New Industry Creation Hatchery Center



Greeting from the Director of NICHe



We propose models of industry-academia collaborations that promote the practical application of research findings.

The mission of the New Industry Creation Hatchery Center (NICHe), which was established in April 1998, is to propose practical applications of new technologies and products for society and to create new industries that meet society's needs by utilizing Tohoku University's world-leading research seeds. To achieve this goal, NICHe has launched cutting-edge research projects selected from all fields in Tohoku University. Staff in the Planning Office for Development work with project leaders to promote projects and to implement technological development and its social application.

Industry-academia collaboration is now very common in most universities and departments, but the structure of NICHe, which can be described as a community of industry-academia collaborative projects spearheaded by faculty members devoting themselves to research and development, is an original idea of NICHe. Management is characterized by a flexible personnel system with external funding, in addition to securing dedicated research space with an emphasis on security, such as access control and high-performance information network systems.

We also have a comprehensive support system that includes practical application-oriented R&D planning, such as securing external funding and entrepreneurship, research integrity management such as conflict of interest and security, and appropriate fund management.

Research projects in NICHe were redefined in FY2022 and have been promoted under a new system since FY2023. There are five types of projects: (1) research and development projects that in principle last five years (full-fledged type); (2) projects in the preparatory stage (preliminary type); (3) human resource development for the purpose of re-educating and skill-upgrading and training of working people (educational type); (4) academic activities that contribute to improving the research status of Tohoku University (academic type); and (5) challenges that are expected to "make it big" thereafter (dawn type). A total of 21 projects, both old and new, are underway in FY2025.

Tohoku University was accredited as the first University for International Research Excellence in November 2024. The "University for International Research Excellence" is a new system under which the Japanese government recognizes and supports universities that are expected to develop internationally outstanding research and use research results to make a difference in the economy and society. A 3GeV Synchrotron Radiation Facility (called "Nano Terasu") has been constructed on the new Aobayama Campus and the coalition beamline has been fully-operational since April 2024. The public beamline has been in operation since March 2025. From these developments, the university with backing from the public will further strengthen its international competitiveness in a wide range of research fields and develop many new types of applications. We envisage that NICHe will challenge to stimulate and nurture industry-academia collaborations and to develop advanced research with even greater effectiveness and social impact than before.

NICHe is located near the entrance of the subway (Aobayama Station) on the Aobayama campus of the University, which is only two hours from Tokyo Station. We hope you will take advantage of this facility, as it is conveniently located for access to the Nano Terasu and university departments and it is physically well-equipped for project research in many areas.

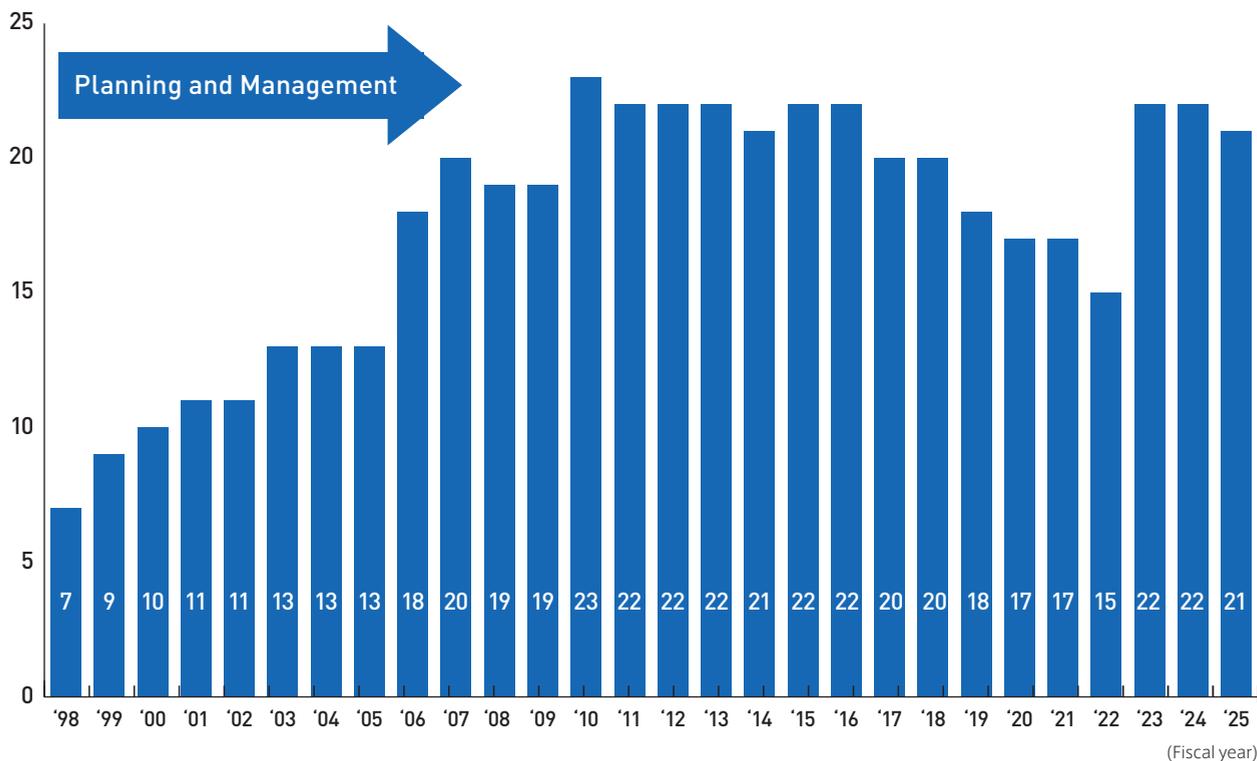
Please come to see us to learn about opportunities at NICHe and to catch a glimpse of the future.

April 2025

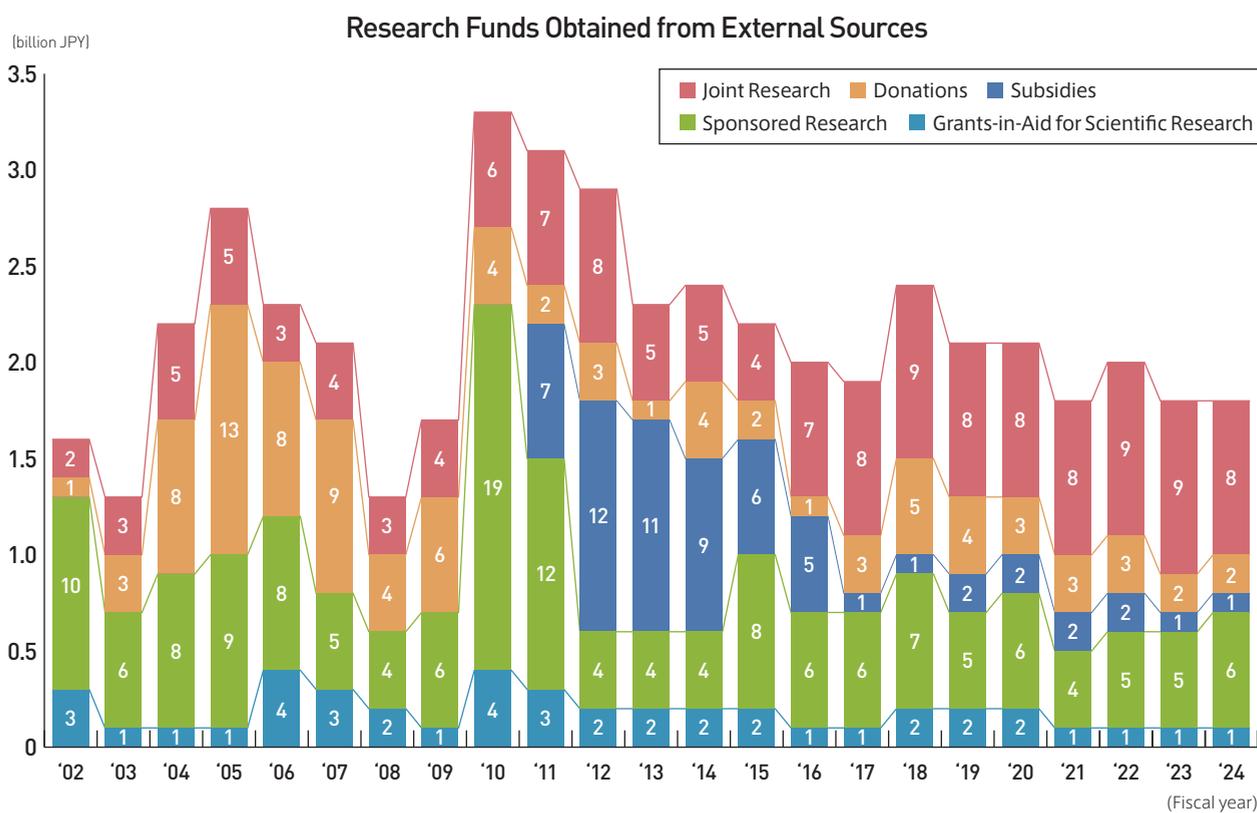
Director, **Dr. Hiroo Yugami**

Tohoku University, New Industry Creation Hatchery Center

Number of Project



Research Funds





New industry creation hatchery center(NICHe) is an inter-departmental institute of Tohoku University established in 1998 with the purpose to develop regional enterprises from laboratory breakthroughs in collaboration with industry. Projects initiated with NICHe emphasize economic value and innovation in developing products, processes and manufacturing techniques.

Facilities

NICHe has three reseach buildings on the Aobayama Campus of Tohoku University as described below.

New Industry Creation Hatchery Center

Main Building

[OUTLINE] NICHe's center (6 stories, 4,600m²) is built for establishing joint industry-university research:
Floor(1F): Planning & Development/Administration
Floor(2F): Enterprise Partnerships
Tohoku Techno Arch Corporation (TLO)
Floors(3F-6F): Joint Industry-university research
Entry and exit to each floor are monitored 24 hours per day to ensure secure research settings.

[FEATURES] The Head Office of Enterprise Partnerships and Tohoku Techno Arch Corporation(TLO) is located on the second floor along with Tohoku University Collaboration Business Incubator(T-Biz) to provide a centralized facility for Industry-academia collaboration. Security card gates are installed on each room on the laboratory floor to control entry and exit.



Fluctuation-Free Facility

for New Information Industry

[OUTLINE] NICHe Fluctuation-free Facility(6 stories, 6,400m²) was constructed to bring about a leap forward in technological advances (fluctuation-free power, vibration, contaminant control) for Japan's semiconductor and flat panel display field. The creation of this facility was supported by industry for the "New Semiconductor / Display Industry Project" developed by Tohoku University.

[FEATURES] NICHe Fluctuation-free Facility offers ultra fine processing and high precision measurements on a nano-meter level, control of variants such as detection of contamination, monitoring power-supply voltage fluctuations and just about any other types of fluctuations such as power or vibrations, while maintaining energy conservation measures. This facility is available for use from planning, designing and manufacturing and for conducting tests with a uniform basis. There are two clean rooms with clean spaces (605m² and 692m²), faculty and conference rooms, CAD equipment, measurement and evaluation rooms as well as free space for researchers.



New Industry Creation Hatchery Center

Annex

[OUTLINE] NICHe Annex was constructed by a grant from the Ministry of Economy, Trade and Industry under the title of the "2008 Grant for Public Facilities for Promoting the Attraction of Enterprises to Regions". To put the outcomes of research into practical use quickly, researchers are engaged in activities in collaboration with parties from large companies and small to medium-sized enterprises(SMEs), especially for domestic SMEs aiming to be global NICHe players.

[FEATURES] NICHe Annex(5 stories, 3,500m²) houses large-scale research activities with each floor(446m²) having no partitions. Partitions can be erected according to space requirements. Entry and exit management are thoroughly maintained by keeping electronic records to ensure security and to prevent unauthorized entry or loss of information.





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<https://www.niche.tohoku.ac.jp/>



[Subway Tozai Line]

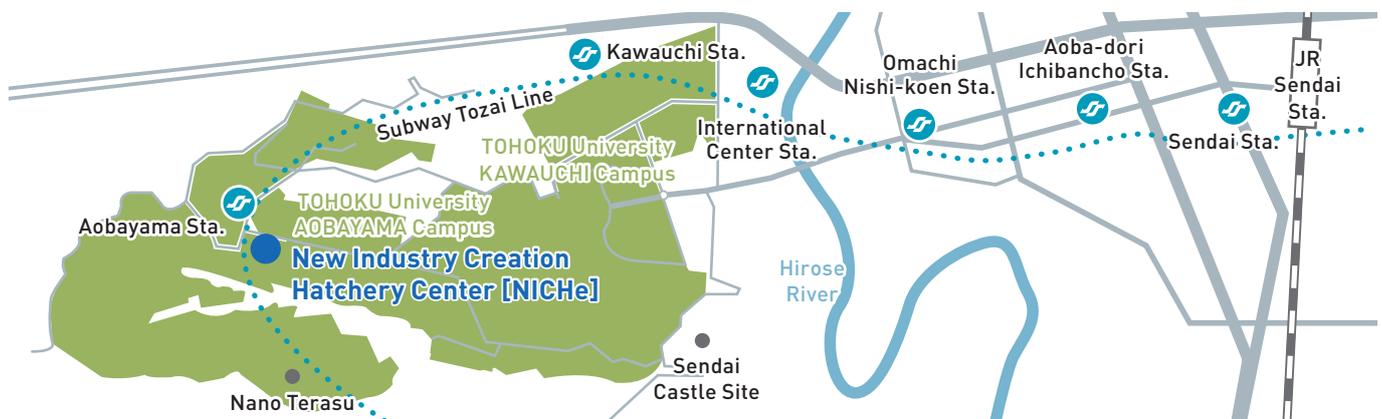
Time / 9 minutes

From "Sendai" station, take the (East-West) Tozai Subway bound for "Yagiyaama Zoological Park",
Get off at "Aobayama" station.

[Taxi]

Time / 20 minutes

Taxis are available at Sendai Station for travel to NICHe.



The CO₂ Emission from Printing

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Atsuyoshi Koike

Industry Creation Section

Full-fledged Type

Life Science

Applied Oxygen Physiology Project
Professor Norio Suzuki

Advanced Food Biotechnology Research Project
Professor Teruo Miyazawa

Environment

Research and Development of Tough Robotics and AI Technologies for Real World Applications
Professor Kazunori Ohno

Establishment of R&D Hub for Environmental Sentinel Technologies Enabling Mass Disease Monitoring
Professor Daisuke Sano

Development of Environmentally Sustainable Devices with Combined Mechanical and Electrical Properties
Specially Appointed Professor Toshiyuki Hashida

Nanotechnology and Materials

Supercritical Technology for Nanomaterials
Professor Tadafumi Adschiri

Super-Large-Scale Computational Science Simulations for Industrial Development
Professor Momoji Kubo

Molecular Interface Engineering
Senior Research Fellow Kazue Kurihara

Joint Research Project on Interconnect Advanced Technology
Specially Appointed Professor Junichi Koike

Development of New Materials Based on New Metal Additive Manufacturing Technology
Specially Appointed Professor Akihiko Chiba

Development of Advanced Metallurgical Processes for Next Generation
Professor Tetsuya Nagasaka

Research and Development of Micro Systems for Safety and Security
Specially Appointed Professor Kazuhiro Hane

Development of Crystals and Application Devices Contributing to Sustainable Society
Professor Akira Yoshikawa

Innovative Technology Development for Diverse Risk Management
-Towards Safe and Sustainable Society-
Professor Yutaka Watanabe

Information and Communication

Development of Advanced Semiconductor Integrated Circuit Manufacturing Technologies Based on Innovative Image Sensors and Metrology
Professor Rihito Kuroda

Research on Crystal Growth, and Optical and Electrical Devices of Nitride Semiconductors
Specially Appointed Professor Tetsuya Suemitsu

Development of Evaluation Technology Contributing to the Creation of Materials and Devices for Next-Generation Innovative Power Electronics Using Scanning Nonlinear Dielectric Microscopy
Specially Appointed Professor Yasuo Cho

Center for Holistically Integrated and Packaged System(TOHOBU CHIPS)
Professor Takafumi Fukushima

Educational・Academic Type

Fundamental Improvement in Theoretical Materials Science and its Applications, and Enlightenment to Companies and Societies
Senior Research Fellow Yoshiyuki Kawazoe

Academic Type

Understanding and Treating Sarcopenia
Specially Appointed Professor Hideo Higuchi

Dawn Type

NICHe Strategic Projects
Planning Office for Development

