Nara Institute of Science and Technology (NAIST)

(University Functions to be Enhanced: 1. Boost academic excellence in specific areas of the university's strength, 2. Generate innovation that can help solve global issues and advance societal reform.)

Participators: Advanced Telecommunications Research Institute International (ATR) , National Institute of Informatics (NII) , National Institute of Information and Communications Technology (NICT) National Institute of Advanced Industrial Science and Technology (AIST) , National Institute for Materials Science (NIMS) , Institute of Science Tokyo (Science Tokyo) , Nara Medical University , University of California, Davis (UCD) Eidgenössische Technische Hochschule Zürich(ETH) , University of Strasbourg (U. Strasbourg) , University of Bonn (U. Bonn) , Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU-EN) , Universitas Gadjah Mada , IPB University Universitas Indonesia , Badan Riset dan Inovasi Nasional , Universiti Malaya , Universiti Sains Malaysia , Universiti Tunku Abdul Rahman , Kasetsart University , Chulalongkorn University , Vietnam National University University of Science , University of Science and Technology of Hanoi , Vietnam Academy of Science and Technology , Institute of Biotechnology , Vietnam Academy of Science and Technology, Institute of Materials Science University of Philippine, Diliman , Ateneo de Manila University

Summary

Vision of the University in 10 years

A graduate school university that leads reform of population-declining societies by developing an AI-assisted autonomous research enhancement and social implementation system composed of three advanced science fields (information, bio, and materials sciences), and by cooperating with ASEAN countries in admitting and providing doctoral human resources.

Strategy 1: Strategic recruitment and development of human resources from Southeast Asian countries

- Systematic recruitment of diverse research talents with high potentials
- Human resource development through internationalized education in collaboration with overseas collaborators and research institutions
- Strengthen relationships by providing human resources to industry, government, and academia in both Southeast Asian countries and Japan.

Strategy 2: Development and sharing of the system for Automated Research Workflow and Industrial Translation (ARWIT)

- Autonomous bioseeds creation using data sharing and AI technology
- Autonomous material synthesis utilizing materials informatics
- Social implementation through data sharing with companies via advanced information security technologies

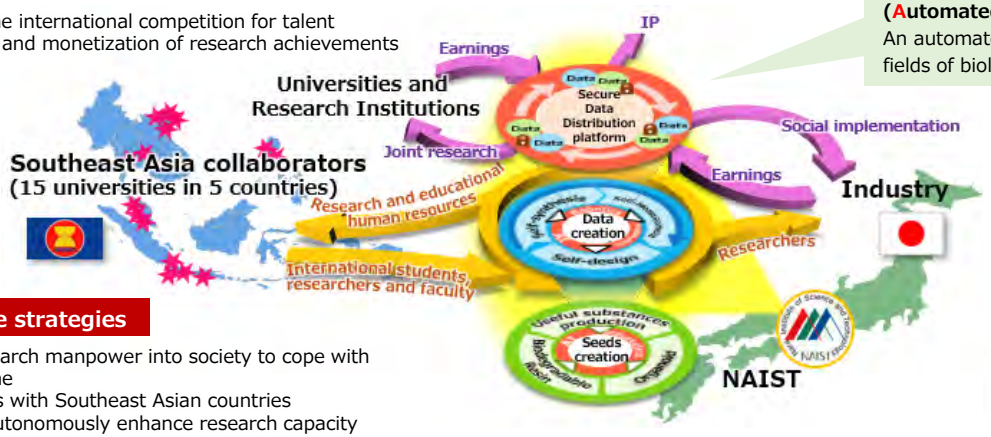
Capabilities to be enhanced in this project

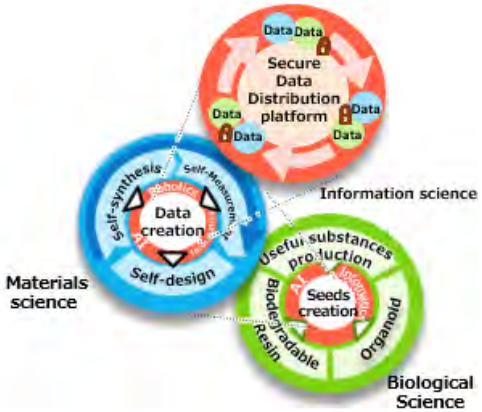
- Ability to succeed in the international competition for talent
- Social implementation and monetization of research achievements

NAIST-ARWIT System

(Automated Research Workflow and Industrial Translation)

An automated research and social implementation system integrating the fields of biological science, materials science, and information science





Expected impact of the strategies

- Securing and bringing research manpower into society to cope with inevitable population decline
- Strengthening partnerships with Southeast Asian countries
- Establishing a system to autonomously enhance research capacity utilizing AI and automation technologies
- Stabilizing university management through end-use-driven research reinforcement and data monetization

University Functions to be Enhanced

① Boost academic excellence in specific areas of the university's strengths
② Generate innovation that can help solve global issues and advance societal reform

Advantages of NAIST

- Volume of research experts focusing on the three areas of advanced science essential for a sustainable society
- Track record of collaborating with top universities in Southeast Asia in admitting international students and training them to become research professionals
- A flexible appointment and training system for early career scientists
- Efficient and rapid reform capabilities unique to a small university

Framework

Board of Officers **President**, Vice President, Director, Administrative Director

Restructuring the entire university organization to align with the vision for the next decade

- To be established in this program
- To be reformed in this program
- Recently reformed or established
- Under reformation

Abbreviated articipators

NAIST-J-PEAKS Promotion Headquarters (Head of the Headquarters: University President)

- Monitoring and evaluating achievements and determining resource allocation

Institute for Research and Innovation Promotion

Research Promotion Division

- Support for obtaining competitive research funds
- Support for fusion research
- Strengthening of technical staff
- Support for research publicity and science art

Innovation Promotion Division

- Industry–University collaboration coordination
- Research Seeds sales
- Intellectual property support
- Co-creation with local community
- Start-up support

ATR, Science Tokyo

Universities and research institutions

Earnings

Joint research

Secure Data Distribution platform

AIST, NII, NICT

Social implementation

Industry

Daikin, Suntory, Yanmar, and JSR, Sumitomo Electric Industries, Hitachi, Sony, Musashi Seimitsu Kogyo

Earnings

Collaborative universities in Southeast Asia

15 universities in 5 countries

Researchers

International students

Researchers

Data creation

NIMS, ETH, FAU-EN U.Bonn, U.Strasbourg

Seeds creation

UCD, Nara Medical University

- International Student Recruitment
- Human Resources Attraction
- International Student Settlement Support
- International Grant Acquisition Support
- Diversity & Inclusion Promotion

- Promotion of International Collaborative Education
- International Career Support
- Student Fellowships
- Study Abroad Support
- Management of Human Resources Bank

International Collaboration Division

Institute for the Promotion of International Collaboration and Human Resource Development

Human Resources Development Promotion Division

Information Initiative Center

- Development and introduction of IoT facilities as infrastructures for research and education

Automated Research Workflow and Industrial Translation (ARWIT) Promotion Center

- Development, implementation, and dissemination of the ARWIT system

Data Science Division

- Promotion of data and AI-driven sciences

Material Synthesis Foundry Division

- Development and operation of a needs-oriented material synthesis foundry

Information Security, AI, and Robotics Division

- Development and operation of elemental technologies for the secure data distribution platform
- Support of robotics technology for automation and autonomy

Life and Materials Research Facility Center

Next Generation Analysis Technology Research and Development Division

- Development and introduction of new analysis technologies and support for collaborative research

Platform Division

- Introduction and operation of advanced experimental and analytical facilities, their utilization to accept outsourcing analysis

Graduate School of Science and Technology

- Integrated education in information science, biological science, and materials science, alongside international human resource development

Center for Digital Green-innovation

- Education and research that integrates the humanities and sciences to solve global environmental and social issues

Medilux Research Center

- Identification and implementation of seeds through the promotion of medical–engineering collaborative research

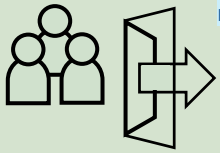
Timeline

Program content	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Development of implementation and support systems	Advisory Board Appointments					Election of Advisory Board				
	NAIST-J-PEAKS Headquarters									
	Kick-off symposium									
	Operation of the ReSIS Research Information System (continuous monitoring of research activities, social implementation, and research funding through collaboration between the system and URA)									
	Self-inspection and external evaluation									
Strategic recruitment of human resources from Southeast Asian countries	Institute for the Promotion of International Collaboration and Human Resource Development									
	Matching and pre-screening (conducted annually)									
	Creation and publication of an international student recruitment website (in English, Chinese, and Korean)									
	Joint WS (Indonesia)	Joint WS (Vietnam)	Joint WS (Malaysia)	Joint WS (Thailand)	Joint WS (Philippines)	Bilateral and multilateral WS				
						International Student Enrolment 35%		International Student Enrolment 50%		
	Center for Digital Green-innovation									

Timeline

Program content	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034

Fostering and producing high-level research personnel



Graduate School of Science and Technology and two affiliated research centers

Overseas Student Dispatch （Conducted annually）

International Students WS （Conducted annually）

Test operation of NAIST Human Resources Bank

Full operation of NAIST Human Resources Bank (monetization)・Expansion of career support for international students

Expansion of the International Collaborative Education Program （intensive lectures by renowned researchers, collaborative seminars using online tools, etc.）・Expansion of entrepreneurial education

Provision of ARW doctoral personnel and collaboration with them

Life Science Collaboration Center (LiSCo)

Center for Materials Research Platform

Life and Materials Research Facility Center

Launch of the SuperTech program（a support system for technical staff to improve their skills and career development according to their job functions）

Institute for Research and Innovation Promotion

Automated Research Workflow and Industrial Translation System (ARWIT)

Provision and operation of the existing flow-type autonomous synthesizer

Data Science Center

(Renamed in FY2030) ARWIT Promotion Center

Holding the ARWIT Symposium

Holding the ARWIT Symposium

Material Synthesis Foundry

Introductions of autonomous synthesis and autonomous measurement equipment

Construction of an integrated operation system

Launch of fully fledged operations

Monetization

Equipment expansion and optimization

Open to core users inside and outside the university → Open to general users within the university and consortium member companies → Open to the public

Expanding the number of users

Secure data Distribution platform

Creation of a bio-seeds implementation roadmap
Finding companies for collaboration
Start of materials development research

Obtaining funds

Social implementation

Development of basic technology for secure data distribution platform infrastructure

Promotion of utilization by other organizations

Monetization

Collection of existing data on campus

Start of collecting data from foundries

Start of sharing with other institutions' databases

100,000 entries achieved

500,000 entries achieved

DB security technology development, robotics/synthesis, measurement machine learning model building

Implementation of a learning model in the foundry

Construction of an autonomous material development system with seed input