NII
Inter-University Research Institute Corporation
Research Organization of Information and Systems
National Institute of Informatics
2021 Summary

Creating Knowledge from Information

The National Institute of Informatics (NII) is the only academic research institute in Japan focused on the field of informatics, with a comprehensive range of research activities that covers everything from long-term basic research to real-world studies that attempt to address current social issues.

As an inter-university research institute, NII also deploys various services, such as building and operating the Science Information NETwork (SINET), providing academic content and service platforms, and developing research data infrastructures. It promotes the further growth of these services by offering its research-based expertise and interactive feedback. NII works on both research and service to create future value through informatics.
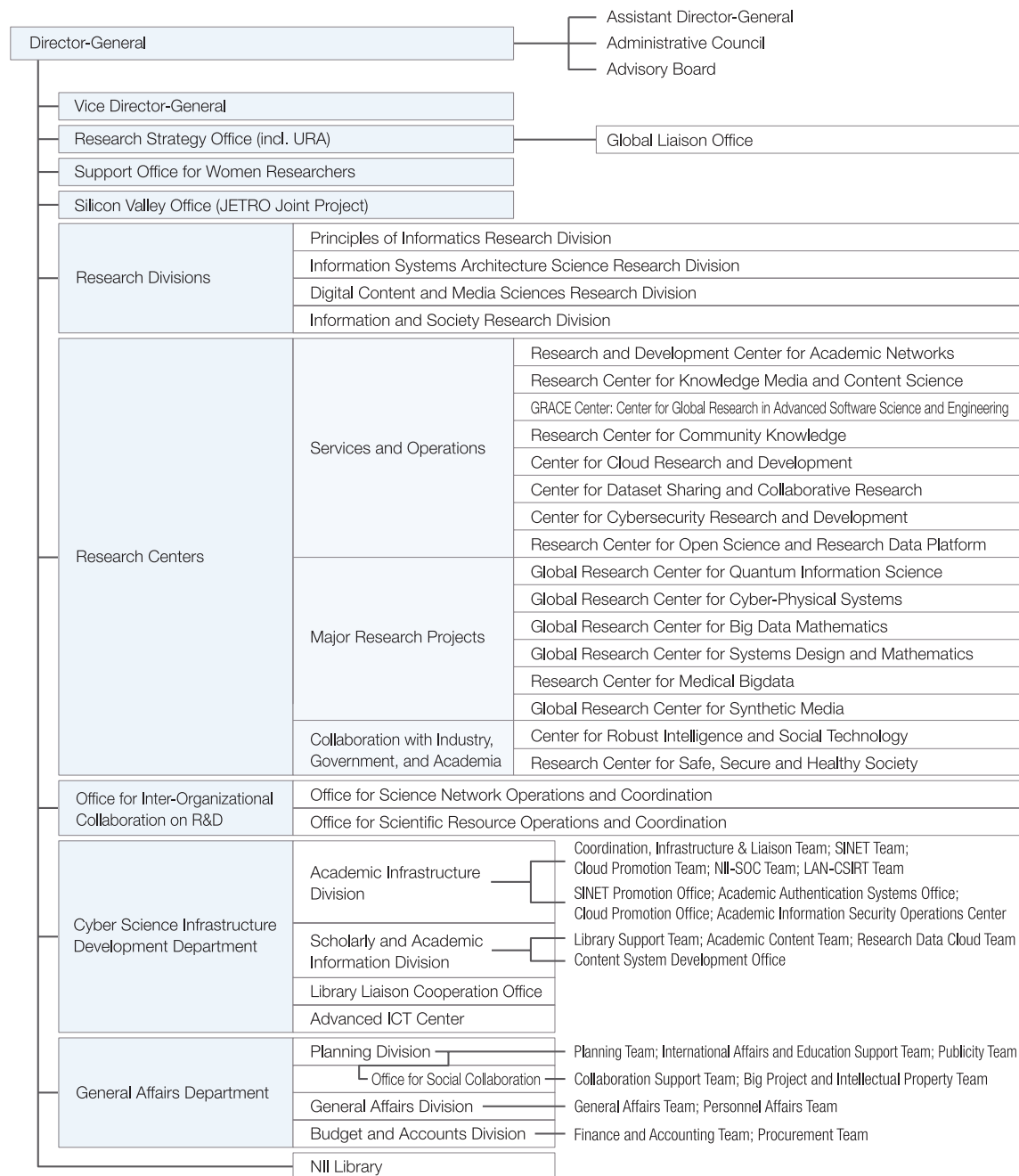
Collaboration with Industry, Government, and Academia

NII carries out goal-oriented research and development to address real social issues and fosters collaboration between industry, government, and academia to help implement its research achievements in the real world. NII actively promotes collaborative work between industries, local governments, and universities using a system that includes open collaborative research, comprehensive partnerships, and joint research units that are set up to operate special research laboratories under corporate partnerships. To create new collaboration and licensing opportunities for its research accomplishments, NII holds seminars to present the seeds of its cutting-edge research and to discuss corporate and social needs. It also engages in academic consulting by researchers and human resource development for the IT sector.

International Exchange

To promote organization-wide international research exchange with overseas universities and research institutes, NII set up the Global Liaison Office (GLO), which conducts various activities that include forming international exchange agreements through Memorandum of Understanding (MOU) and handling the MOU Grant for research exchange assistance, and the NII International Internship Program. In addition, NII holds the NII Shonan Meeting, a series of seminars where top-class researchers from around the world come to Japan for intensive discussions on the field of informatics. NII is also actively accepting researchers through the German Academic Exchange Service (DAAD) and the Japanese-French Laboratory for Informatics (JFLI).

Organization

- Director-General
  - Assistant Director-General
  - Administrative Council
  - Advisory Board
- Vice Director-General
- Research Strategy Office (incl. URA) — Global Liaison Office
- Support Office for Women Researchers
- Silicon Valley Office (JETRO Joint Project)
- Research Divisions
  - Principles of Informatics Research Division
  - Information Systems Architecture Science Research Division
  - Digital Content and Media Sciences Research Division
  - Information and Society Research Division
- Research Centers
  - Services and Operations
    - Research and Development Center for Academic Networks
    - Research Center for Knowledge Media and Content Science
    - GRACE Center: Center for Global Research in Advanced Software Science and Engineering
    - Research Center for Community Knowledge
    - Center for Cloud Research and Development
    - Center for Dataset Sharing and Collaborative Research
    - Center for Cybersecurity Research and Development
    - Research Center for Open Science and Research Data Platform
  - Major Research Projects
    - Global Research Center for Quantum Information Science
    - Global Research Center for Cyber-Physical Systems
    - Global Research Center for Big Data Mathematics
    - Global Research Center for Systems Design and Mathematics
    - Research Center for Medical Bigdata
    - Global Research Center for Synthetic Media
  - Collaboration with Industry, Government, and Academia
    - Center for Robust Intelligence and Social Technology
    - Research Center for Safe, Secure and Healthy Society
- Office for Inter-Organizational Collaboration on R&D
  - Office for Science Network Operations and Coordination
  - Office for Scientific Resource Operations and Coordination
- Cyber Science Infrastructure Development Department
  - Academic Infrastructure Division
    - Coordination, Infrastructure & Liaison Team; SINET Team; Cloud Promotion Team; NII-SOC Team; LAN-CSIRT Team
    - SINET Promotion Office; Academic Authentication Systems Office; Cloud Promotion Office; Academic Information Security Operations Center
  - Scholarly and Academic Information Division
    - Library Support Team; Academic Content Team; Research Data Cloud Team
    - Content System Development Office
  - Library Liaison Cooperation Office
  - Advanced ICT Center
- General Affairs Department
  - Planning Division
    - Office for Social Collaboration
    - Planning Team; International Affairs and Education Support Team; Publicity Team
    - Collaboration Support Team; Big Project and Intellectual Property Team
  - General Affairs Division — General Affairs Team; Personnel Affairs Team
  - Budget and Accounts Division — Finance and Accounting Team; Procurement Team
- NII Library

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■ NII video channel
Watch lectures and research presentations by NII.
https://www.nii.ac.jp/event/videos/

■ NII Today
Provides accessible information on the latest research at NII.
https://www.nii.ac.jp/en/about/publications/today/

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Working on Both Research and Service to Create Future Value through Informatics

Research

### Comprehensive research from basic theory to cutting-edge technology

Merging computer science and information engineering with the humanities, social sciences, life sciences, and many other disciplines, informatics is a new domain of study that is involved in all aspects of society. Having established four Research Divisions and 16 Research Centers, NII is carrying out research comprehensively on everything from the basic theory of informatics to cutting-edge fields such as artificial intelligence, big data, the Internet of things, and information security. NII is also focusing its efforts to promote international exchange and collaboration with overseas universities and research institutes, as well as collaboration between industry, government, and academia to help implement its research achievements in the real world.

4 Research Divisions
- Information Systems Architecture Science Research Division
- Digital Content and Media Sciences Research Division
- Principles of Informatics Research Division
- Information and Society Research Division

16 Research Centers

Research

Graduate Program

Education

Service

Supporting academic research infrastructure and education

In collaboration with universities and research institutions as well as research communities, NII builds and operates the Science Information NETwork (SINET). Leveraging the SINET network's ultra-high speed, high reliability, and multifunctionality, NII works to expand and provide an authentication federation platform, cloud adoption and utilization supports, and an academic content platform, as well as to promote open science and develop next-generation academic research platforms. Furthermore, NII Security Operation Collaboration Services contribute to building the framework enabling national universities and other academic institutions to respond quickly to cyber security incidents and other issues.

Academic content

Service

Science Information NETwork
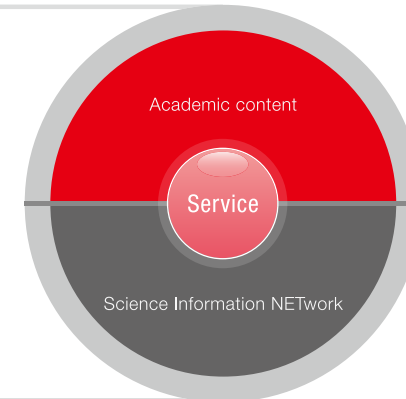
Research Divisions

Principles of Informatics Research Division

Seeks new principles and theories of informatics using algorithms and computational complexity, as well as artificial intelligence, robotics, and quantum computing. Conducts research to develop new technologies that will sustain societies of the future and break new ground in the field of informatics.

Information Systems Architecture Science Research Division

Aiming at boosting the performance, quality, and functionality of computers and networks, the building blocks of information and communication systems, conducts research ranging from creating groundbreaking technologies in software and hardware architectures, to implementing their working systems.

Digital Content and Media Sciences Research Division

Carries out research on analyzing and generating content and media, including symbolic and patterned media; storing, retrieving, and organizing content with platform technologies; and analyzing social media and interactions among humans and knowledge.

Information and Society Research Division

Conducts cross-disciplinary research based on emerging information technologies such as Big-data analytics to achieve the required levels of trustworthiness in a cyber-physical society where the cyberspace and real-world phenomena are related more closely than before.

Research Centers

Researchers with various expertises collaborating to work on special research domains

- Research Center for Safe, Secure and Healthy Society
- Center for Robust Intelligence and Social Technology
- Global Research Center for Systems Design and Mathematics
- Research Center for Medical Bigdata
- Research Center for Open Science and Research Data Platform
- Center for Cybersecurity Research and Development
- Research and Development Center for Academic Networks
- Research Center for Knowledge Media and Content Science
- GRACE Center: Center for Global Research in Advanced Software Science and Engineering
- Research Center for Community Knowledge
- Center for Cloud Research and Development
- Center for Dataset Sharing and Collaborative Research
- Global Research Center for Quantum Information Science
- Global Research Center for Cyber-Physical Systems
- Global Research Center for Big Data Mathematics
- Global Research Center for Synthetic Media

Graduate Program

Fostering new leaders for an advanced information society

The graduate program at NII is carried out in three ways: (1) participating in the Graduate University for Advanced Studies, SOKENDAI, (2) collaborating with other graduate schools, and (3) accepting research students for special collaboration. SOKENDAI is the first graduate university in Japan established to foster original world-class academic research that transcends traditional disciplines and to pioneer advanced fields of study that create new lines of scientific inquiry. NII has joined with SOKENDAI to establish the Department of Informatics in the School of Multidisciplinary Sciences to offer graduate programs with three-year and five-year Ph.D. courses. The Department of Informatics has six research fields; at the Department, students can take lectures and research advice according to their field of study.

Science Information NETwork (SINET):
An ultra-high-speed network supporting over 900 universities and research institutions across Japan

Innovative connectivity

Uses leading-edge technology, such as advanced optical transmission technology, for ultra-high-speed full-mesh connectivity to all prefectures in Japan and network slicing for secure services.

Ultra-high speed

Delivers an ultra-high speed high-performance network by minimizing transmission delay and using 100 Gbps on all lines between nodes (400 Gbps between Tokyo and Osaka).

Multifunctionality

Authentication federation platform development and provision

Develops and provides an authentication federation platform for the Academic Access Management Federation in Japan (GakuNin), UPKI Digital Certificate Issuance Service, and eduroam JP (a global wireless LAN roaming platform for academia) so that universities and research institutions can have safe and secure access to web services, computing resources, and networks for education and research.
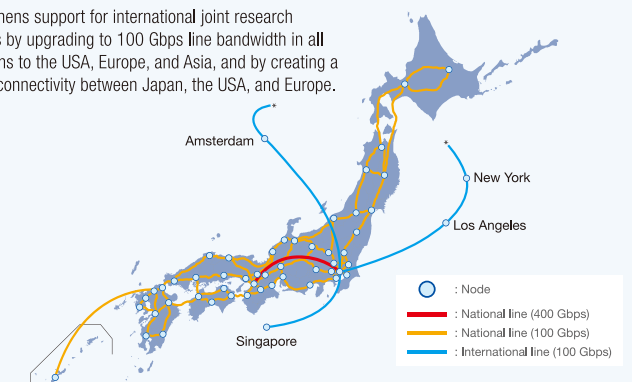
Cloud adoption and utilization support

Offers cloud adoption and utilization support services to universities and research institutions. GakuNin Cloud Adoption Support Service provides information on cloud adoption and utilization. GakuNin Cloud Gateway Service provides one-stop access to cloud services. GakuNin Cloud On-demand Configuration Service provides support for setting up a cloud environment.

Robust and reliable

Adopts a multilayered advanced network architecture with redundancies configured at each layer and both bottleneck avoidance and bypassing systems, which are all linked together to create and provide a highly robust and reliable network.

Global reach

Strengthens support for international joint research projects by upgrading to 100 Gbps line bandwidth in all directions to the USA, Europe, and Asia, and by creating a ring of connectivity between Japan, the USA, and Europe.

- Amsterdam
- New York
- Los Angeles
- Singapore

○ : Node
— : National line (400 Gbps)
— : National line (100 Gbps)
— : International line (100 Gbps)

NII Security Operation Collaboration Services (NII-SOCS):
Creating an inter-university collaborative information security framework

NII helps national universities and other academic institutions create a framework for rapid response to security incidents, accidents, and other issues. In collaboration with national universities and other academic institutions, NII builds a system on SINET that monitors, detects, and analyzes cyberattacks. Furthermore, NII provides them with information to meet the level of risk and urgency of attacks based on data shared by related foreign and Japanese organizations, as well as training for cybersecurity officers to enhance their capacity to counter cyberattacks.

NII Research Data Cloud (Research data infrastructure):
Service to manage, publish, and search research data to promote open science

GakuNin RDM (Research data management infrastructure)

This service is designed for researchers to manage and share their data with collaborators, and enables them to quickly establish their research environment in line with institutional data management policies. The data saved into the system is automatically traceable, ensuring research integrity.

### JAIRO Cloud (Research data publishing infrastructure/Shared repository service)

This service provides institutional repository functionality for academic institutions. Built on the repository software WEKO, it enables researchers to easily self-publish their research results. Nearly 700 academic institutions in Japan use this service.

CiNii (Research data search infrastructure/NII academic information navigator)

This service allows users to search for academic information in Japan. It provides access to research data and comprehensive scholarly information (CiNii Research), research papers (CiNii Articles), book collections at university libraries (CiNii Books), and doctoral dissertations (CiNii Dissertations).
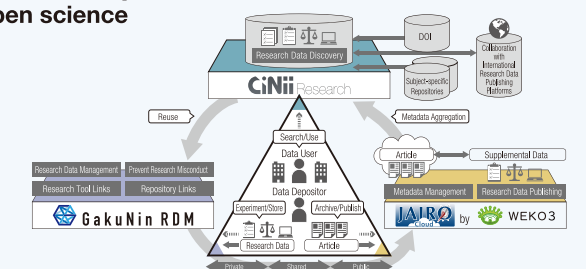
GakuNin LMS (Research data management training course)

The Learning Management System helps researchers and staff, who provide research support services such as at libraries, URAs, and infrastructure centers, develop skills in research data management. This system can provide academic institutions with the functionality to manage users' learning statuses and digital badges are issued to those who complete the courses as certification of completion.