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

2020 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 develops various services, such as building and operating the Science Information NETwork (SINET5), and providing academic content and service platforms.

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.
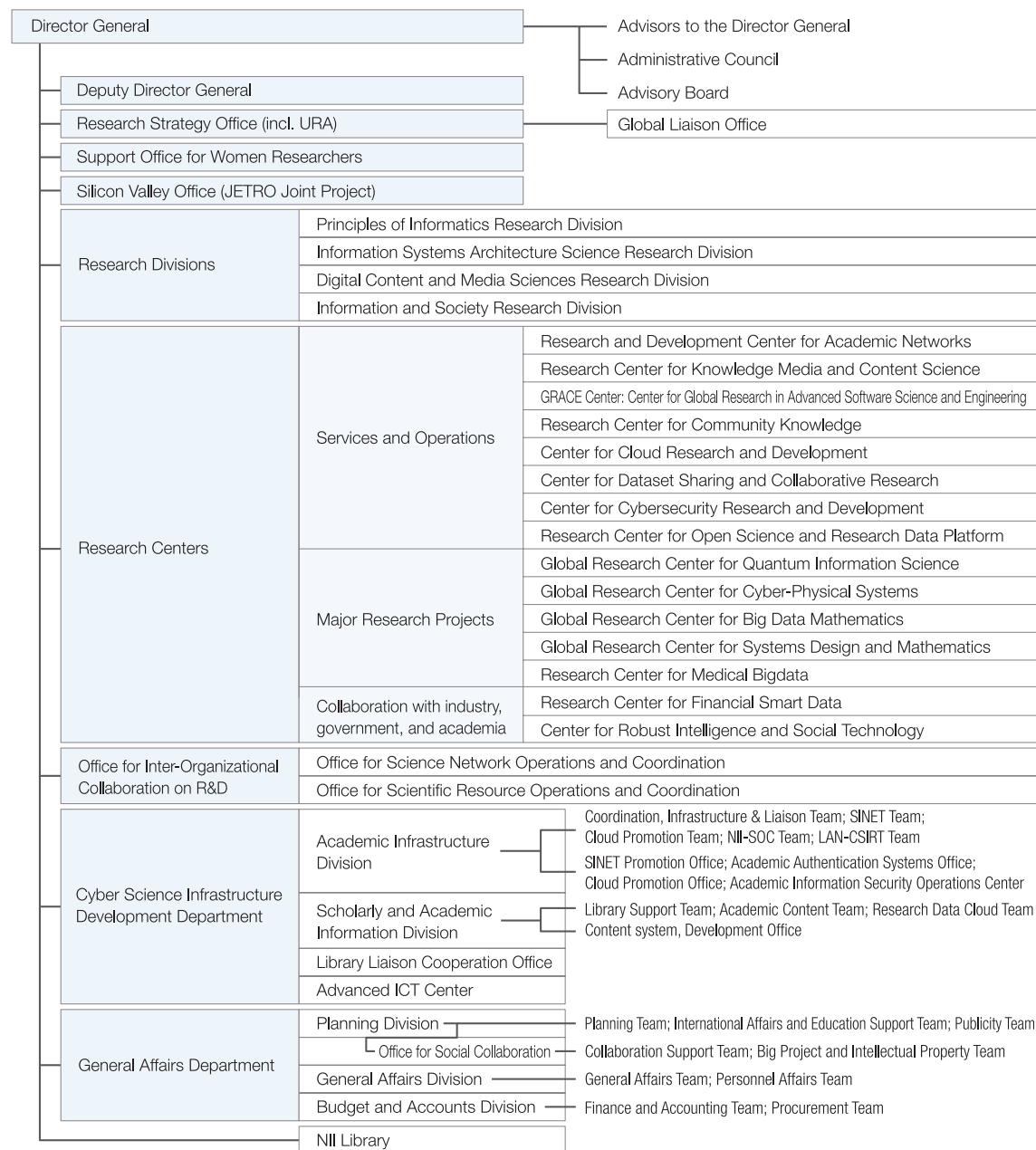
Collaboration with Industry, Government, and Academia

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).
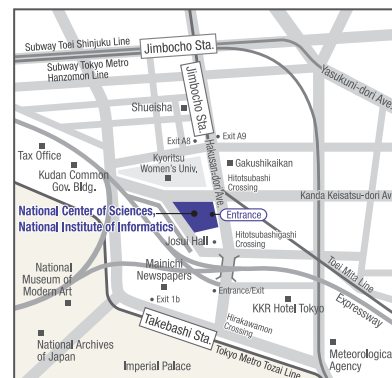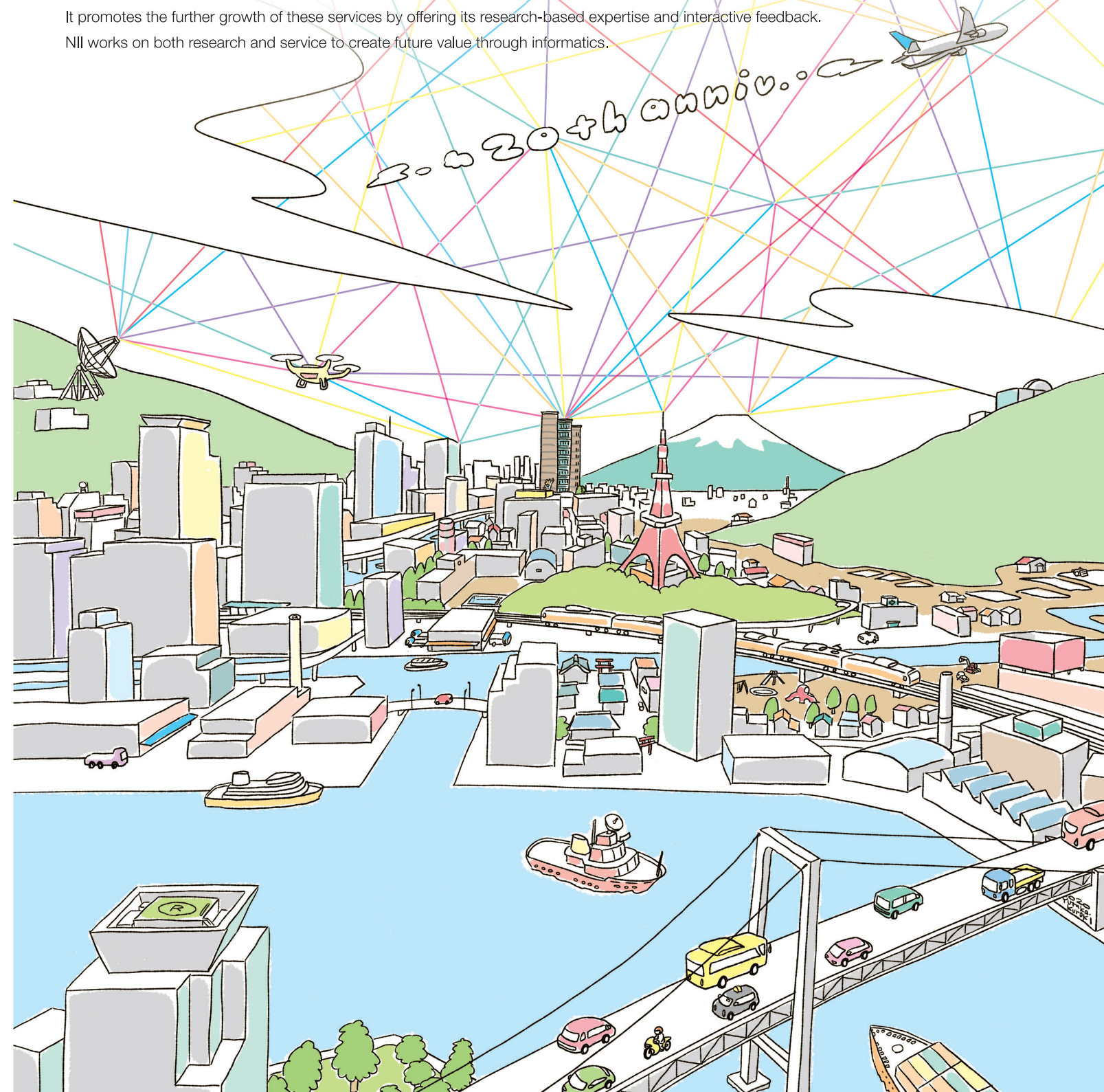
Organization

- **Director General**
  - Advisors to the Director General
  - Administrative Council
  - Advisory Board
  - **Deputy 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
    - **Collaboration with industry, government, and academia**
      - Research Center for Financial Smart Data
      - Center for Robust Intelligence and Social Technology
  - **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/

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

Research
Comprehensive research from basic theory to cutting-edge technology
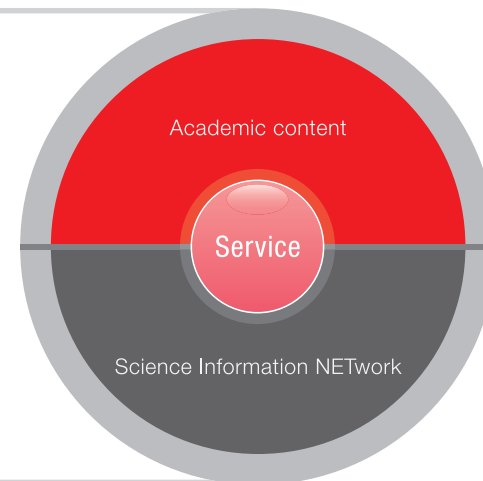
Merging computer science and information engineering with the humanities, social sciences, life sciences, and many other disciplines, informatics is a new domain of study that is involved in all aspects of society. Having established four Research Divisions and 15 Research Centers, NII is carrying out 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 into international exchange and collaboration with overseas universities and research institutes, as well as collaboration between industry, government, and academia in order 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

15 Research Centers

Research

Graduate Program

Education

Academic content

Service

Science Information NETwork

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 SINET5 network's ultra-high speed, high reliability, and multifunctionality, NII contributes to academic research and education by developing and providing an authentication federation platform, cloud adoption and utilization supports, and an academic content platform, as well as by working to advance open science. In addition, NII Security Operation Collaboration Services help build the framework enabling national universities and other academic institutions to quickly respond to cyber security incidents and other issues.

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

- 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 Center for Financial Smart Data
- 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

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

SINET5

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).

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.

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

Amsterdam · New York · Los Angeles · Singapore

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.

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.

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.

Academic content platform

CiNii (NII academic information navigator)

The database service that allows users to search for academic information in Japan. It provides access to research papers (CiNii Articles), book collections at university libraries (CiNii Books), and doctoral dissertations (CiNii Dissertations).

JAIRO Cloud (Shared repository service)

The cloud service for the institutional repositories at universities, research institutions, and other academic institutions. The NII-developed repository software WEKO makes it easy for institutions to set up and manage institutional repositories. More than 650 institutions in Japan employ this service.

GakuNin RDM (Research Data Management infrastructure)

The service for researchers to manage and share research data with collaborators. The modification record of research data automatically saved in the system ensures the research integrity of work. The service allows researchers to easily set up their research environment in line with their affiliated institution's institutional security and data management policies.

NII Research Data Cloud (NII RDC)

NII RDC facilitates open science and supports the research data lifecycle through the combination of CiNii Research (discovery), JAIRO Cloud (publication), and GakuNin RDM (management). Each system is developed through international collaborations.