

Inter-University Research Institute Corporation

2007-2008

*Where the latest trends in academic research
come together*

**National Institutes
for the Humanities (NIHU)**

**National Institutes
of Natural Sciences (NINS)**

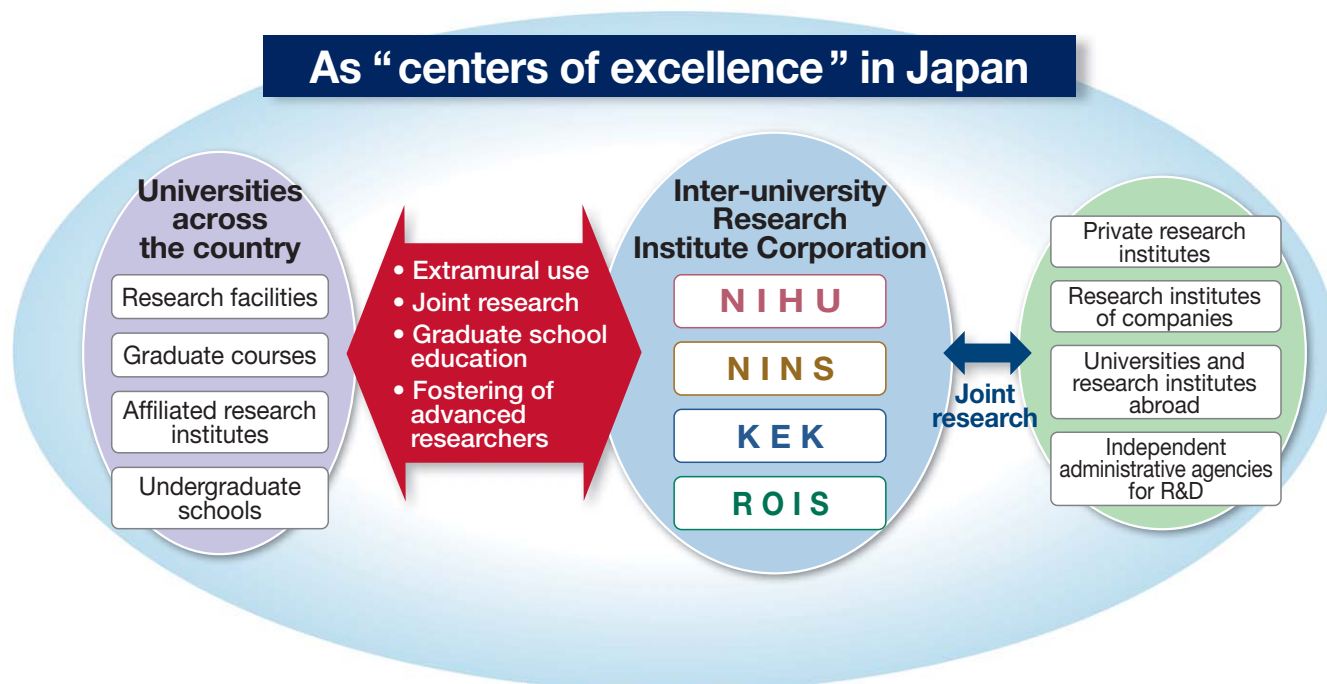
**High Energy Accelerator
Research Organization (KEK)**

**Research Organization
of Information and Systems (ROIS)**

The World's Leading Research Institutes in Japan

Japan is aiming to become a “nation built on the platform of scientific and technological creativity,” and to contribute to the development of the country and society through the promotion of science and technology. To achieve this, world-class academic research is necessary. Academic research is an intellectually creative activity in the pursuit of truth and the creation of a new culture. It also serves as a basis for the development of science and technology, industry, the economy, education, and society. The four Inter-University Research Institutes, NIHU, NINS, KEK and ROIS are centers of excellence that promotes academic research by fulfilling the needs of researchers involved in universities across the country and by cooperating extensively with researchers abroad.

As “centers of excellence” in Japan



Major Activities of the Inter-University Research Institutes

In the most advanced research areas, it is becoming difficult for any one university to maintain experimental and observatory facilities due to the increase in scale and sophistication of such facilities. Therefore, the Inter-University Research Institutes develop and prepare large-scale experimental and observatory facilities and collections of valuable research sources and data in consultation with the users and make them available to researchers in Japan and abroad to encourage effective and advanced joint research.

1 Extramural use of large-scale and special experimental and observatory equipment

2 Collecting, researching and releasing of reference materials and data

3 Ensuring and providing intellectual properties that are the results of the most advanced research

4 Fostering of researchers, including dedicated courses of the Graduate University for Advanced Studies (SOKENDAI)

5 Promoting research exchange

Four Inter-University Research Institute Corporations

Dynamic and comprehensive development of academic research

Promotion of flexible and strategic research management

Enhancement of comprehensive functions to support research

Collaborative Research Activities

National Institutes for the Humanities

Comprehensive promotion of research programs in the humanities and of area studies

- Sharing of research resources: Establish an information environment to enable the extramural sharing of research resources.
- Promotion of joint research: Conduct joint research with research organizations outside the institute to create new fields of study.
- Inter-institutional exhibition: Utilize cultural resources and exhibit research themes collaboratively.
- The Promotion of Area Studies is a new program to develop research bases and networks in collaboration with other institutions and universities for the comprehensive understanding of current situations and problems in selected regions of the world.

High Energy Accelerator Research Organization

Comprehensive support program for the promotion of accelerator science and technology

- A program for collaboration with and support of universities and other institutions: Support of research and educational programs in accelerator science and technology.
- A program for training of accelerator scientists and engineers: Support of endeavors such as the training of accelerator scientists and engineers and research and development of accelerator technologies.

National Institutes of Natural Sciences

Cooperation between different fields and creation of new fields in natural science

- Formation of an international COE for the purpose of generating a new research community.
- Formation of an interdisciplinary COE through cooperation beyond the borders of fields of study in natural science.
- Creation of research in each of NINS' institutes that transcends academic fields, cooperating with and forming new areas of study.

Research Organization of Information and Systems

Promotion of research from the perspective of systems and information

- Connecting research projects from fields such as the life and earth sciences that produce large amounts of data with fields such as informatics and the mathematical sciences that realize in the processing of data.
- The Transdisciplinary Research Integration Center (TRIC) promotes collaborative research among institutes and universities aiming at the development of a new paradigm in the area of 'Information and Systems'.
- Database Center for Life Science (DBCLS) is a newly established organization for integrating various repository databases and enabling a broad-based view of related knowledge resources, and establishing a new knowledge infrastructure.

Facilitating and improving the development of new fields of study and their efficient management within the entire university sector

Association with Universities

Inter-university research institute

Resource sharing / joint research

Graduate education / fostering of advanced researchers

Universities and graduate schools across the country

Graduate University for Advanced Studies

National Institutes for the Humanities

<http://www.nihu.jp/>

National Institutes for the Humanities consists of five inter-university research institutes, and promotes basic research in each institute on cultural activities by human beings and on relationships between humans and society, and humans and nature. It also develops comprehensive and diversified research on human culture through cooperation between each institute, and aims to contribute to the progress of academic culture.

National Museum of Japanese History

The museum conducts integrated research on Japanese history and culture, under the cooperation of three different disciplines: *history*, mainly through the study of written documents, *archaeology* that seeks the history of mankind through relics and remains, and *folklore* that surveys people's oral and life traditions. By this interdisciplinary approach, the museum collects, preserves, and researches cultural resources and presents research findings through exhibitions, web, and other means to the public.



When Did the Yayoi Period Begin ?
- Frontier of Dating Research -

National Institute of Japanese Literature

The Institute is engaged in comprehensive research on old books, as well as pre-modern and modern records of Japanese Literature and History. The extensive collection is open to the public in digitized and microfilm forms and is also available through an online database for academic research. In this way the institute serves a role as the information center for studies on Japanese literature.



Ko-otoko-no sōshi
The Early Edo period

International Research Center for Japanese Studies

The Center focuses on research projects concerning Japanese culture and society. An international perspective is emphasized, and interdisciplinary and comprehensive studies are conducted through joint research methods, with many researchers in Japan and abroad. It also provides information and reference material for research on Japan and cooperates with scholars and research institutes globally.



Information collected, including books on studies of Japan written in foreign languages, are compiled in a database and made available for wide use among researchers in related fields.

Research Institute for Humanity and Nature

To solve global environment problems, the Institute promotes research projects to consolidate a wide range of fields of study from human science, social science to natural science, in cooperation with research organizations in Japan and abroad, in order to establish global environmental studies from a comprehensive perspective that goes beyond the borders of existing fields of study.



The photo shows accumulated salt in the desert of the Xinjiang Uygur Autonomous Region. This area is thought to have been covered with abundant green plants about a thousand years ago. Due to the continuous overuse of water for agriculture, however, it has turned into unproductive land.

National Museum of Ethnology

As a research center for anthropology and various other related sciences, the Museum conducts surveys and studies on various cultures and societies. As one of the inter-university research institutes, it not only promotes collaborative research projects and the sharing of materials and information, but it also cooperates with society through its activities as a Museum.



Fieldwork is the source of all information for anthropology and ethnology. Interviews and participative studies are conducted by field workers living with local people. The photo shows construction of a fishing boat in Madagascar.

National Institutes of Natural Sciences

<http://www.nins.jp/>

National Institutes of Natural Science (NINS) aims to improve our understanding of nature and to contribute to the development of society through the cooperation of inter-university research institutes responsible for studies in a wide range of natural science fields including space, energy and life. It also aims to become one of the critical international bases for natural science.

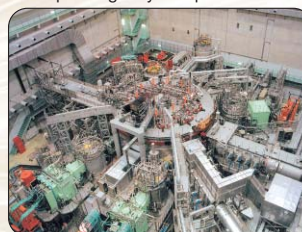
National Astronomical Observatory of Japan

NAOJ is the national center of astronomical research in Japan. It aims at developing astronomy and related sciences by promoting the open use of its state-of-the-art Observation facilities such as the Subaru Telescope, organizing various joint-research programs, and encouraging versatile international cooperation.

The Subaru Telescope, 8.2 meters in aperture, is located at the summit of Mauna Kea of Hawaii Island (4,200 meters above sea level).



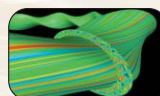
The Large Helical Device (LHD) developed originally in Japan



Inside of the Large Helical Device (LHD)



Simulation of Ion Temperature Gradient Turbulence



National Institute for Fusion Science

For the realization of controlled thermonuclear fusion, an ideal new energy source that is safe and environmentally-friendly, the Institute promotes basic research on hot plasmas and reactor engineering in forms of domestic and international joint research, mainly using Large Helical Device experiments and simulations.

National Institute for Basic Biology

The earth is filled with various living organisms. Animals and plants have acquired diverse forms as well as astonishing abilities that enable them to endure and thrive in a constantly changing environment. At NIBB, we continue to study the common basic principles underlying the survival strategies of organisms, while sustaining collaborative research activities with scientists throughout the world.



The NIBB is the Resource Center of the Medaka fish, an organism that was developed as a research material in Japan, thus promoting the National Bioresource Project initiated by the MEXT.

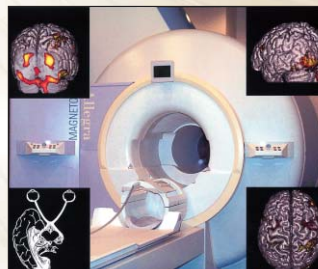
Top: Medaka inbred strain Hd-rR, which was used for the genome sequencing project.

Middle: Transformed medaka that expresses Ds-Red fluorescent protein all over the body.

Bottom: Quintet strain medaka with a transparent body.

National Institute for Physiological Sciences

The institute is a research center established for the purpose of "understanding the function of the human body", and its research area covers a wide scope including physiology, biophysics, morphology, biochemistry, pharmacology, molecular and cell biology, information science and so on.



Neuronal activities in the human visual areas (bottom left) depicted by functional MRI using high Tesla (3T) machine (center). The primary and association visual cortices of the blind subject are activated during tactile discrimination of the Braille (top left, top right, and bottom right). This is an example of cross-modal plasticity of human brain due to early visual deafferentation.

Institute for Molecular Science

The Institute conducts research on the structure, function, and reactivity of molecules and molecular assemblies that are the basis for matter. Discovery of a new function of molecules is utilized in creation of a new matter and effective utilization of resources and energy.



920-MHz NMR facility providing highest resolution in the world.

High Energy Accelerator Research Organization

<http://www.kek.jp/>

The High Energy Accelerator Research Organization (KEK) is for wide range of advanced fields in science, utilizing high energy particle beams and synchrotron light sources. Established in 1971, KEK serves as a center of excellence for domestic and foreign researchers, providing various kinds of research opportunities. In addition to the activities on Tsukuba Campus, KEK is now constructing a high intensity proton accelerator facility (J-PARC) in Tokai village, jointly working with Japan Atomic Energy Agency.

Institute of Particle and Nuclear Studies

What are the building blocks of our universe? What kinds of interaction govern our world? These fundamental questions are being pursued by the particle and nuclear physicists of the world. "B Factory", a 3km circumference electron-positron collider, generating pairs of B-mesons at the world's highest rate, solves the puzzle of matter and antimatter imbalance (CP-violation). Many other types of experiments, including the next generation neutrino oscillation experiment (T2K), are also underway.

Institute of Materials Structure Science

Accelerated neutrons, photons, muons and positrons are new powerful tools to probe the nano-scale structures and characteristics of materials. Three dimensional structures of protein molecules, magnetic responses of new materials, real-time observations of chemical reactions on the surface of catalyst and so forth are obtainable by our cutting edge apparatus. We offer unprecedented opportunities to scientists and engineers in wide range of scientific interests.

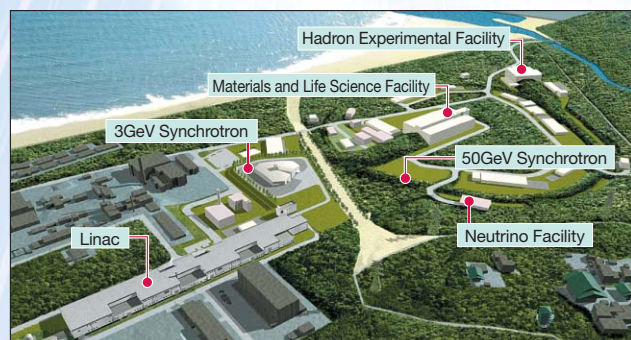
Accelerator Laboratory

Particle beams have been a powerful and effective tool to explore the sub-microscopic world since the discovery of nuclei by Rutherford. Efficient accelerator technologies are the results of our dedicated researches and developments. This laboratory designs and builds new generation of accelerators fully utilizing the experiences from the operation of our existing accelerators.

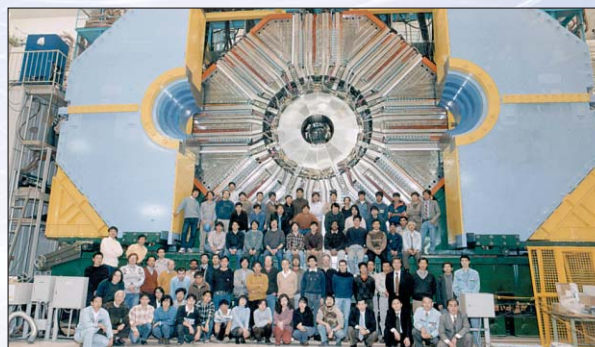
Applied Research Laboratory

Researches using accelerators require highly advanced technical supports in computing, networking, mechanical engineering, cryogenics and radiation control. This laboratory provides such essential supports, while pursuing cutting edge technologies for the further advancement.

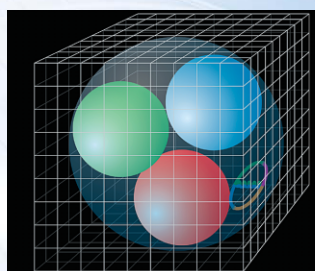
Rendering of High Intensity Proton Accelerator Facility (J-PARC), which KEK and Japan Atomic Energy Agency are jointly working on the construction in Tokai village.



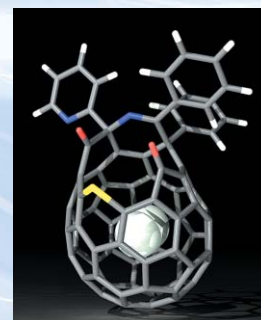
The world-highest beam intensity electron-positron collider, "B factory," generates massive amounts of B meson and anti-B meson pairs.



"Belle Detector," a large particle detector for precise measurement of B meson and anti-B meson decays.



Numerical calculation of Lattice QCD using a supercomputer, to simulate the behavior of quarks in 4-dimensional space and time.



Synchrotron radiation revealed a hydrogen atom was successfully placed in an open basket of Fullerene C60 molecule.



J-PARC 50GeV Synchrotron

Research Organization of Information and Systems

<http://www.rois.ac.jp/>

Research Organization of Information and Systems studies the complex subjects, such as life, the earth, environment and society, from the perspective of information and systems. It generates massive data through experiments and observations, and constructs databases. Furthermore, it conducts a wide range of interdisciplinary research by extracting knowledge from such information to provide scientific resources and infrastructure to researchers in universities. In order to achieve this goal, it has established the "Transdisciplinary Research Integration Center" and "Database Center for Life Science" to promote research activity that is beyond the framework of research institutes, and aims to create new fields of study.

National Institute of Polar Research

The Antarctic and the Arctic regions are characterized by the polar environments and phenomena in global context. Working on the unique natural systems through field studies in the regions, the institute promotes comprehensive scientific researches on the earth and solar systems in various time scales.

Deep ice core drilling in the ice sheet at Dome Fuji Station



National Institute of Informatics

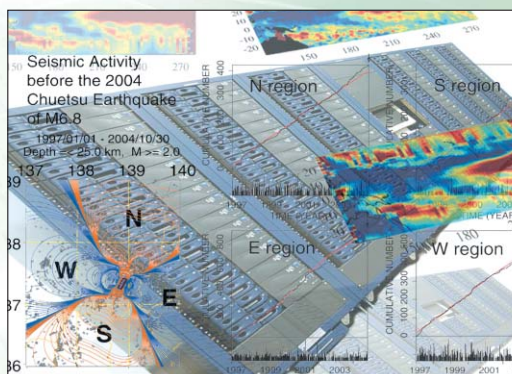
Seeking to create future value in the new discipline of informatics, the National Institute of Informatics (NII) seeks to advance integrated research and development activities in information-related fields, including networking, software, and content. These activities range from theoretical and methodological work to applications. NII promotes the creation of a state-of-the-art academic-information infrastructure (the Cyber Science Infrastructure, or CSI) that is essential to research and education within the broader academic community, with a focus on partnerships and other joint efforts with universities and research institutions throughout Japan, as well as industries and civilian organizations.



The Institute of Statistical Mathematics

The key to solving the various risk problems of modern society is the development of the ways of dealing with the uncertainty of phenomenon and the incompleteness of Information. The research on how to gather reliable data and how to make an inference from the obtained data is being conducted.

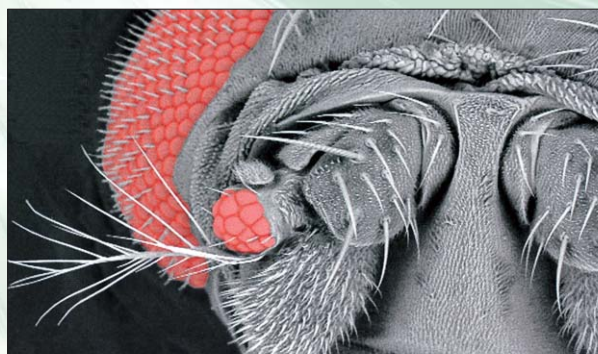
The developments in modeling and computational methods make it possible to extract useful information from the large amount of data generated from complex systems.



National Institute of Genetics

Genetics plays the central role in life sciences. In this Institute, research groups carry out comprehensive studies on molecular genetics, cell genetics, developmental genetics, evolutionary biology, genomics and bioinformatics. In addition, this Institute is in charge of development of databases and bioresources essential for leading life science.

Ectopic eye formed on antenna by misexpression of the *Drosophila* eyeless gene. Ectopic expression of a gene can reveal relationships between organogenesis and positional information.



National Institutes for the Humanities

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National Museum of Japanese History ①

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National Institute of Japanese Literature ②

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<http://www.nijl.ac.jp/>

International Research Center for Japanese Studies ③

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Research Institute for Humanity and Nature ④

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<http://www.chikyu.ac.jp/>

National Museum of Ethnology ⑤

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National Institutes of Natural Sciences

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National Astronomical Observatory of Japan ⑥

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National Institute for Fusion Science ⑦

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National Institute for Basic Biology ⑧

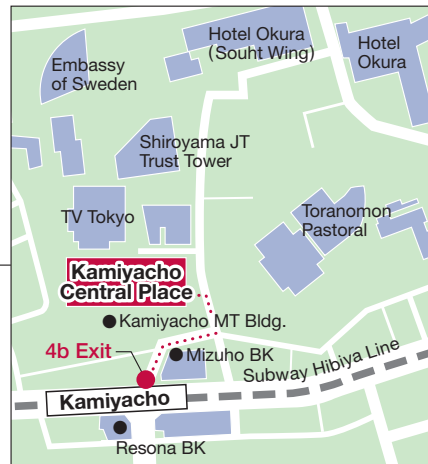
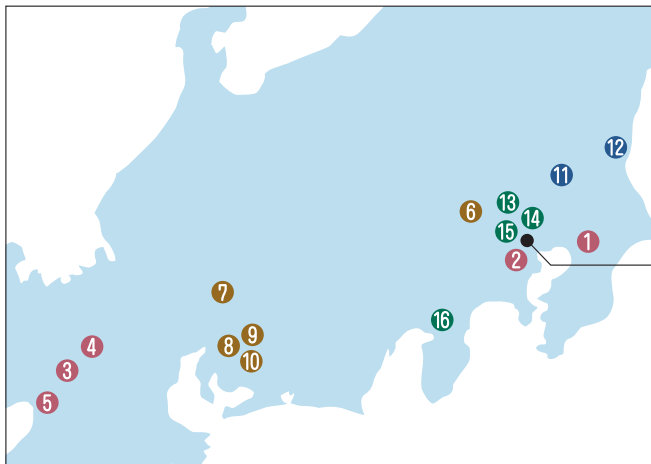
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National Institute for Physiological Sciences ⑨

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Institute for Molecular Science ⑩

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<http://www.ims.ac.jp/>



- National Institutes for the Humanities
- National Institutes of Natural Sciences
- High Energy Accelerator Research Organization (Tokyo Office)
- Research Organization of Information and Systems

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About 2 minutes

High Energy Accelerator Research Organization

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Institute of Particle and Nuclear Studies

Institute of Materials Structure Science

Accelerator Laboratory

Applied Research Laboratory

Tokai Campus ⑫

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National Institute of Genetics ⑯

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