



**NAGOYA UNIVERSITY**

Furo-cho, Chikusa-ku, Nagoya, 464-8601, Japan

Phone: +81-52-789-2044

<http://www.nagoya-u.ac.jp/en/>



**名古屋大学**

Profile 2011-2012

**NAGOYA UNIVERSITY**





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## Greeting from the President

As the President of Nagoya University, I offer you my most sincere greetings. I feel the magnitude of responsibility of this office, which I assumed in April 2009.

Throughout its history, Nagoya University has done its utmost to maintain a free and vibrant academic culture. As an educational institution, we aim to cultivate what we call “courageous intellectuals”: social contributors endowed with the powers of rational thought and creative imagination. Today, we are taking new steps to become a globalized university where students are able to acquire comprehensive knowledge, develop personal ethics, and aspire to international careers.

Nagoya University is one of the institutions selected under the Global 30 Program sponsored by the government of Japan, and expected to play a major role in globalizing Japanese higher education, increasing both the number of foreign students studying in Japan and the number of Japanese students studying abroad. We have increased the number of degree programs taught entirely in English for the Global 30, and we began to accept students in this brand-new program from October 2011.

Even today, I still sense how my three years as a research student in New York has significantly changed my life. My time abroad exposed me to knowledge and experiences that went far beyond what I had encountered in Japan. It broadened my horizons and brought me to feel and think about things that had never occurred to me before.

The Hamaguchi Plan comes from a desire to provide students with the same opportunities for personal growth I enjoyed in New York as well as a wish to develop a student body that will emerge as the global leaders of tomorrow.

I cordially invite you to join us at Nagoya and explore the “traditional” free and vibrant academic culture in the very central part of exciting Japan.

### Dr. Michinari HAMAGUCHI

#### Educational Background and Professional Experience

- 1980 M.D., Ph.D., Nagoya University  
Research Associate, Cancer Research Facility, School of Medicine, Nagoya University
- 1993 Professor, Pathological Control Research Facility, School of Medicine, Nagoya University
- 2002 Director, Pathological Control Research Facility, School of Medicine, Nagoya University
- 2003 Professor, Center for Neural Disease and Cancer, Graduate School of Medicine, Nagoya University
- 2004 Director, Center for Medical Education Research and Support, Graduate School of Medicine, Nagoya University
- 2005 Dean, Graduate School of Medicine and School of Medicine, Nagoya University
- 2009 President, Nagoya University

**Area of Expertise** Cancer biology, cancer biochemistry, cellular biology

**Area of Research** Molecular mechanism in cancer invasion and metastasis

**Hobbies** Music appreciation, drawing, gardening

### Dr. Michinari HAMAGUCHI

President  
Nagoya University



## The Hamaguchi Plan

### Education, Research, and Social Contribution

#### Cultivation of Globally Effective Leaders

- Improving the core curriculum : Strengthening the Institute of Liberal Arts and Sciences and improving learning support systems
- Improving English proficiency of Japanese students
- Emphasis on the development of knowledge, social awareness, and critical thinking skills
- Augmenting programs for international students : Establishment of programs taught in English with a target of over 2,000 international students within 5 year
- Organizing a linguistics consortia with area universities
- Substantial increase in scholarships through a variety of funding sources

#### Conducting World Class Research

- Conducting cutting-edge research through, among other initiatives, the Global COE Project
- Exploring new frontiers in research through the use of High Voltage Electron Microscope and Synchrotron Radiation equipment
- Proactively applying for large research grants in support of world class research
- Support the development of graduate students, postdoctoral fellows, and junior faculty
- Encouraging inter-disciplinary interaction through collaborative research

#### Internationalization of Nagoya University

- Bolstering relationships with partner institutions as well as institutions within Academic Consortium 21 (AC21) : Encourage the exchange of students and junior researchers and faculty
- Establishing joint international degrees and programs
- Recruiting outstanding international students
- Internationalizing support services within the campus

#### Industry, Government, and Community Relations

- Strengthening cooperation with industry, and government entities : Innovation through joint research, technology transfer, and creation of centers of excellence with industry
- Strengthening collaboration with local government : Bolstering research projects and communicating and sharing research outcomes through the “Knowledge Hubs” Project
- Expanding the “Center for the Development of Human Resources for Contribution to Society” : Developing human resources through the cooperation with industry and government
- Strengthening ties with media agencies to improve external communication
- Strengthening ties with Alumni, Parents, and Community Organizations

### Transforming Nagoya University to a World Class Institution

#### 1. Cultivation of Globally Effective Leaders

Through our core curriculum, Global 30 Project, and the increase in international students to over 2,000 within 5 years

#### 2. Conducting World Class Research

Conducting cutting-edge research through, among other initiatives, the Global COE Project, developing internationally recognized young researchers, and in particular, exploring new frontiers in research through the use of High Voltage Electron Microscope and Synchrotron Radiation equipment

#### 3. Organizational Reform

Establishing a graduate program focused on drug discovery and development, reorganizing educational and research functions, and evaluating collaborations with other universities

#### 4. Expanding Alliances with and Further Contributing to the Local and Regional Communities

Collaborating with the “Knowledge Hubs” Project and revitalizing community health systems

#### 5. Fundraising

Raising 500 billion yen within 5 years for use towards scholarships, improvements to facilities, internationalization of the campus, etc.

### University Affiliated Hospital and Senior and Junior High Schools

#### Solidifying the University Hospital as a Nationally Recognized Institution

- Delivery of high-quality medical care with utmost priority on safety : Establishing a comprehensive prenatal center and increasing beds in ICU by 50%
- Actively contributing to the cultivation of the next-generation healthcare professionals : Establishing a clear career path for healthcare professionals, fortifying Nagoya University’s network of postgraduate clinical training, and taking leadership with community health programs
- Developing innovative solutions for use in the healthcare industry : Practicing translational medical research and establishing support centers for state-of-the-art medical technology
- Developing IT systems towards globalization of healthcare

#### Improvements to Affiliate Senior and Junior High Schools

- Improve management through the School Council
- Improving education through closer collaboration between the schools and the university
- Establishing international exchange programs

### Administration and Finance

#### Making Administrative and Support Functions More Efficient to Enable Effective Education and Research

- Evaluating and reorganizing functions to ensure optimization
- Creating a “Graduate School of Pharmaceutical Science” and the “Institute for the Origin of Particles and Universe”
- Expanding cooperative relationships with universities
- Reinforcing integrity through university administration
- Improving educational and research facilities : Expansion of administrative support and services, and consolidating functions and faculty meetings
- Promoting gender equality

#### Maintaining Financial Stability

- Maintaining the highest integrity with regard to the use of research funds
- Maintaining sound financial management practices at University affiliated Hospital
- Perennial fundraising to increase endowment : Raising 500 billion yen within 5 years for use towards scholarships, improvements to facilities, internationalization of the campus, etc.

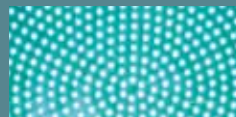
#### Evaluation, Benchmarking, and External Communication

- Assessing institution-wide academic activities every three years
- Increase publicity of faculty profiles and achievements
- Publicizing outstanding research projects and innovative courses
- Continuous assessment of all University functions by the International Advisory Board
- Maintaining our presence in the top 100 of world university rankings

#### Facilities, Safety, and Other Aspects

- By cooperating with local government agencies, further enhancing the eco-friendliness of the campus
- Effective and efficient management of campus-wide plant and equipment
- Optimization of campus space and facilities
- Increase living accommodations for international students by 2-fold, and upgrading the same for foreign faculty
- Enhancing core research and education facilities and upgrading the general campus environment
- To be equipped to respond in a timely manner to harassments and other complaints
- Maintain proper use and storage of high-risk chemicals including radioactive materials in accordance with government regulations
- Maintain strict occupational health and safety measures in accordance with government regulations
- Compliance with regulations pertaining to disaster prevention and crisis management

# Excellence in Research Fostered by a Free and Vibrant Academic Culture



Professor Isamu AKASAKI and Blue Light-emitting Diodes



Four Nobel Laureates Demonstrate Nagoya University's World-class Research Excellence



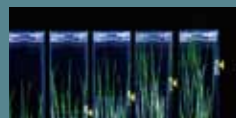
New Flagship Research Initiatives

The Kobayashi-Maskawa Institute for the Origin of Particles and the Universe (KMI)  
Nagoya University Green Mobility Collaborative Research Center—Realizing a Low-Carbon Society—  
Disaster Mitigation Research Center (DMRC)  
Nagoya University Young Leaders Cultivation Program (YLC Program)



Global COE Programs at Nagoya University

Prof. Gen SOBUE, Graduate School of Medicine  
Prof. Naoshi SUGIYAMA, Graduate School of Science  
Prof. Toshio FUKUDA, Graduate School of Engineering  
Prof. Tetsuzo YASUNARI, Hydrospheric Atmospheric Research Center



Other Research Achievements

自由闊達な空気が生む際だつ研究力

## Professor Isamu AKASAKI and Blue Light-emitting Diodes



Dr. Isamu AKASAKI

### Producing a New Light Source for the 21st Century

Thinking it would be too difficult to realize within the 20th century, many researchers abandoned development of high-performance blue light-emitting diodes (LEDs). However, Nagoya University professor Isamu Akasaki remained steadfast in his research for 20 years. In 1989, he succeeded in becoming the first to achieve the goal of producing a new light source for the 21st century.

Professor Akasaki achieved this by using the compound gallium nitride (GaN), revolutionizing the field of semiconductor research. Blue LEDs offer immeasurable benefits to society, and are utilized today in a wide range of technologies such as traffic lights, large-scale display monitors, next-generation optical memory discs, and even home lighting. The applicability of GaN and related semiconductors does not end with its use in light sources. It is also expected that they can be applied to such technologies as ultra high-speed, high-power transistors and UV detectors, which will be indispensable in an IT-based society.

During his life as a researcher, Professor Akasaki held fast to his idea that "Once you've resolved to accomplish something, never give up."

Among the many awards he has received, in 2004, in honor of the research results he achieved with such unwavering resolve, he was recognized as a Person of Cultural Merit by the Japanese government for his significant contributions to culture.



## Four Nobel Laureates Demonstrate Nagoya University's World-class Research Excellence



### Nobel Prize in Chemistry, 2001

In October 2001, the Royal Swedish Academy announced its award of the Nobel Prize in Chemistry to Dr. Ryoji Noyori and Dr. W. S. Knowles (USA) for their work on chirally catalyzed hydrogenation reactions, and to Dr. K. B. Sharpless (USA) for his work on chirally catalyzed oxidation reactions. Their research – an important topic of study in the 20th century – enabled Dr. Noyori and his fellow laureates to realize their dream of making possible the artificial and preferential production of enantiomers. Enantiomers are molecules existing in many organic compounds that are mirror images of each other but not identical, i.e., with a right- and left-side relationship but with each side having a different character. While one side could become a promising medicine, the other could equally become a dangerous toxin. It has therefore become a major issue in chemistry to find ways to preferentially produce right- and left-side products. Dr. Noyori's research makes it possible to artificially produce right- and left-side molecules using catalysts. This research has tremendous potential in the creation and production of

medicines, aromatic chemicals, and materials in harmony with the natural environment.

In 1957, Dr. Noyori entered the Undergraduate School of Industrial Chemistry, Faculty of Engineering at Kyoto University, and later was appointed associate professor at Nagoya University, involved in synthetic organic chemistry. After switching his research base from Nagoya University to Harvard for postdoctoral work, he returned to Nagoya University and became a full professor in 1972. The research contacts he made with many renowned chemists offered him expanded opportunity to continue his search for the development and application of new methodologies in the field of organic chemistry. Presently, Dr. Noyori is an organic chemist based at Nagoya University and president of the RIKEN and continues to realize remarkable achievements in the field of organic chemistry through his collaborations with numerous researchers worldwide.



**Dr. Ryoji NOYORI**

1967 Ph.D., Kyoto University  
1968 Associate Professor of Chemistry, Nagoya University  
1997-1999 Dean, Graduate School of Science, Nagoya University  
2003-University Professor, Nagoya University



**Dr. Osamu SHIMOMURA**

1960 Ph.D., Nagoya University  
1963 Associate Professor, School of Science, Nagoya University  
2008-Distinguished Invited University Professor, Nagoya University  
2009-University Professor, Nagoya University



**Dr. Toshihide MASKAWA**

1962 Graduated from School of Science, Nagoya University  
1967 Ph.D., Nagoya University  
Research Associate, School of Science, Nagoya University  
2007-Distinguished Invited University Professor, Nagoya University  
2009-University Professor, Nagoya University



**Dr. Makoto KOBAYASHI**

1967 Graduated from School of Science, Nagoya University  
1972 Ph.D., Nagoya University  
2008-Distinguished Invited University Professor, Nagoya University  
2009-University Professor, Nagoya University

### Nobel Prize in Physics, 2008

In October 2008, the Academy announced its award of the Nobel Prize in Physics to three esteemed scientists: Yoichiro Nambu (USA), and Nagoya University graduates Toshihide Maskawa, a Distinguished Invited University Professor at Nagoya University, professor emeritus at Kyoto University, and professor of physics at Kyoto Sangyo University, and Makoto Kobayashi, professor emeritus at the High Energy Accelerator Research Organization (KEK). The two Nagoya University scientists received the Nobel Prize for forecasting, over three decades ago, "the discovery of the origin of the broken symmetry which predicts the existence of at least three families of quarks in nature." In 1972, the two presented their Kobayashi-Maskawa theory, which states that CP symmetry violation can be explained with six types of quarks, one of the subatomic particles that constitute matter. This theory was proved in 1995 with the discovery of the sixth quark, known as the top quark. Among the numerous theories attempting to explain CP symmetry violation, the Kobayashi-Maskawa theory remains the most concise and well-formed, and today is one of the key components of the standard model of particle physics.

Professor Maskawa graduated from Nagoya University's School of Science in 1962. After completing his doctoral course in science in 1967, he continued his career as a research associate in the science department, then as a professor of the Institute of Nuclear Study at the University of Tokyo and later as a professor at Kyoto University's Yukawa Institute for Theoretical Physics (YITP). In 2003, he became a professor at Kyoto Sangyo University's Faculty of Science, and in October 2007 was appointed Distinguished Invited University Professor at Nagoya University.

Professor Kobayashi graduated from Nagoya University in 1967 and, after completing his doctoral course in science in 1972, became a research associate at Kyoto University's Faculty of Science. He later became a professor at KEK, the High Energy Accelerator Research Organization, and then director of the Institute of Particle and Nuclear Studies at KEK before becoming a professor emeritus at the same institute.



Dr. Maskawa and Dr. Kobayashi while attending graduate school



At a party hosted by Theoretical Particle Physics Group (E-ken), Graduate School of Science



At the 3rd Yoshimasa Hirata Memorial Lecture

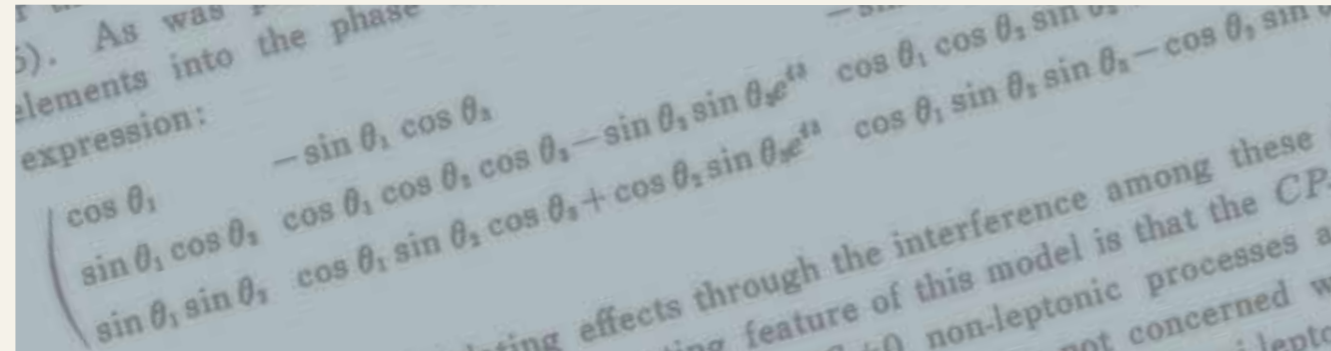
### Nobel Prize in Chemistry, 2008

It was great news in October 2008 when organic chemist and marine biologist Professor Osamu Shimomura from Nagoya University was announced as one of three distinguished scientists to receive the 2008 Nobel Prize in Chemistry, sharing it with Martin Chalfie of Columbia University and Roger Y. Tsien of the University of California, San Diego. They received this award for the discovery and development of the green fluorescent protein, GFP. Professor Shimomura was the first to discover and successfully refine GFP in luminous jellyfish. Using this GFP as a marker, it is now possible to directly observe protein behavior in living cells. This significantly contributes to the development of molecular biology and biosciences.

Professor Shimomura spent two and a half years at Nagoya University's School of Science as a research student and received his PhD in Sciences in 1960. In that same year, he went to Princeton University as a Fulbright scholar, then returned to Japan and for two years beginning in 1963 was an associate professor in the School of Science at Nagoya University. Today he is a professor emeritus at Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts and Boston University Medical School.



## The Kobayashi-Maskawa Institute for the Origin of Particles and the Universe (KMI)



On April 2010, the Kobayashi-Maskawa Institute for the Origin of Particles and the Universe (KMI) was inaugurated at Nagoya University. The President of Nagoya University, Michinari Hamaguchi, caligraphed the Institute's inauguration banner for this occasion. KMI, headed by Nobel Prize winner and University Professor Toshihide Maskawa, pursues the ambitious goal of shedding light on the very origin of our Universe and the particles that constitute it.

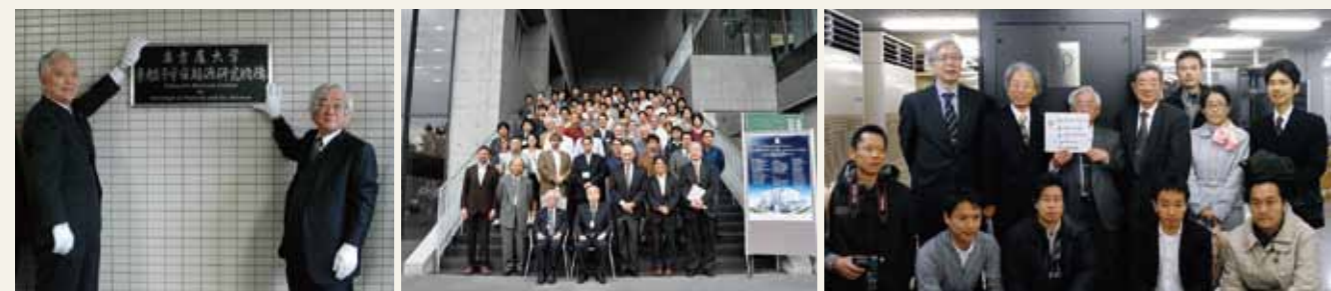
The institute moved to a brand-new office in the Engineering and Science (ES) building in 2011. In commemoration of the inauguration of KMI and the new building, KMI Inauguration Conference (KMIIN) was held on October 24-26, 2011 in ES building. More than 120 researchers from all over the world participated in the conference, and discussed perspectives of various fields in both theoretical and experimental studies of particle physics and astrophysics, which are the main target of KMI's research activity.

KMIIN was followed by the two-day conference, Shoichi Sakata Centennial Symposium (SAKATA100) to celebrate the 100th anniversary of the birth of Shoichi Sakata, late professor of physics at the Nagoya University. Shoichi Sakata made many great achievements, such as "two-meson theory", "Sakata model", and "Maki-Nakagawa-Sakata theory", and many

physicists, including University Professor Maskawa, were influenced by him in their earlier career.

One of flagship projects of KMI aims to reveal the nature of the Universe, especially the origin of masses of elementary particles. Due to the complicated nature of the problem, it has been recognized that numerical simulations is becoming more and more important for such studies. For this reason, the high performance computing system "phi" with a theoretical peak performance of 62 TFlops (62 trillion floating point operations per second) was installed at KMI, and began its operation on March 2011. Several projects which utilize phi have just started, and those are expected to open a breakthrough toward understanding of the nature of our Universe.

Physicists in KMI also play leading roles in particle physics experiments, such as the SuperKEKB/Belle II experiment at KEK, ATLAS and LHCf experiments at CERN, and the CERN-Gran Sasso neutrino oscillation experiment at OPERA. These experiments are starting to provide fresh new results, which will lead to discovery of new phenomena beyond the Standard Model, and provide insights to the origin of particles and the Universe, together with the X-ray astronomical observations.



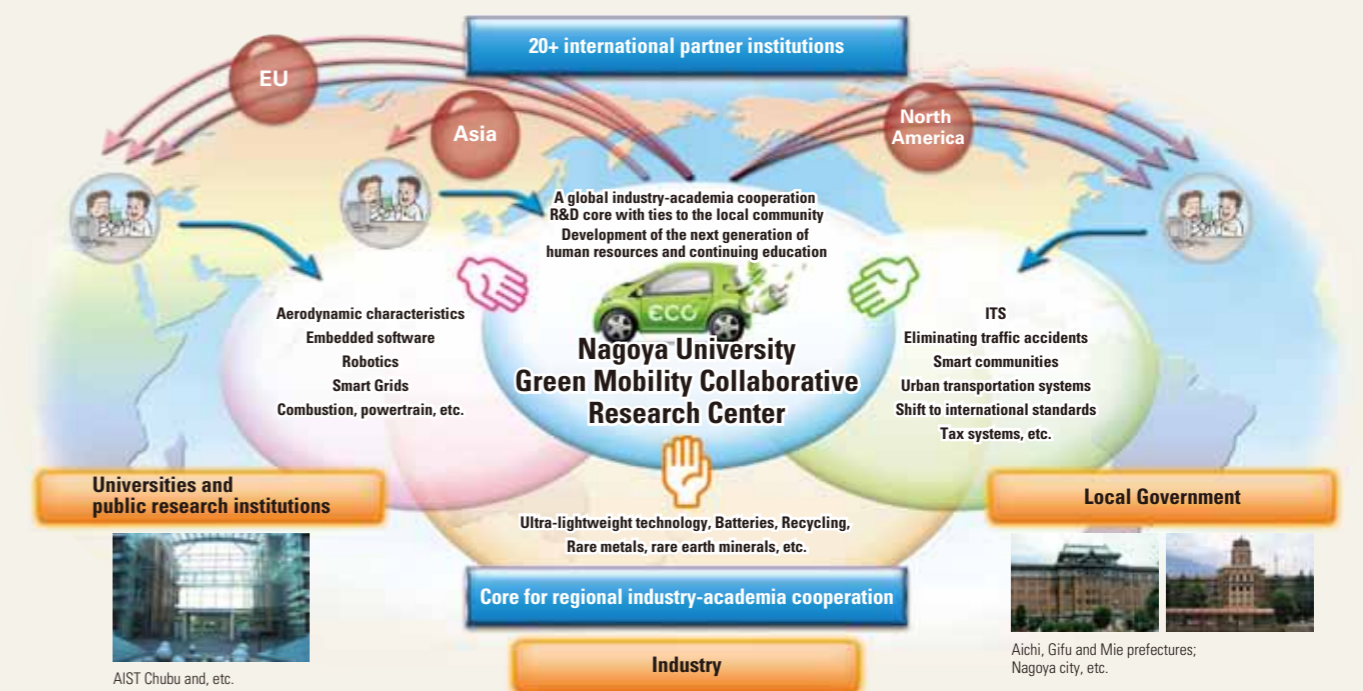
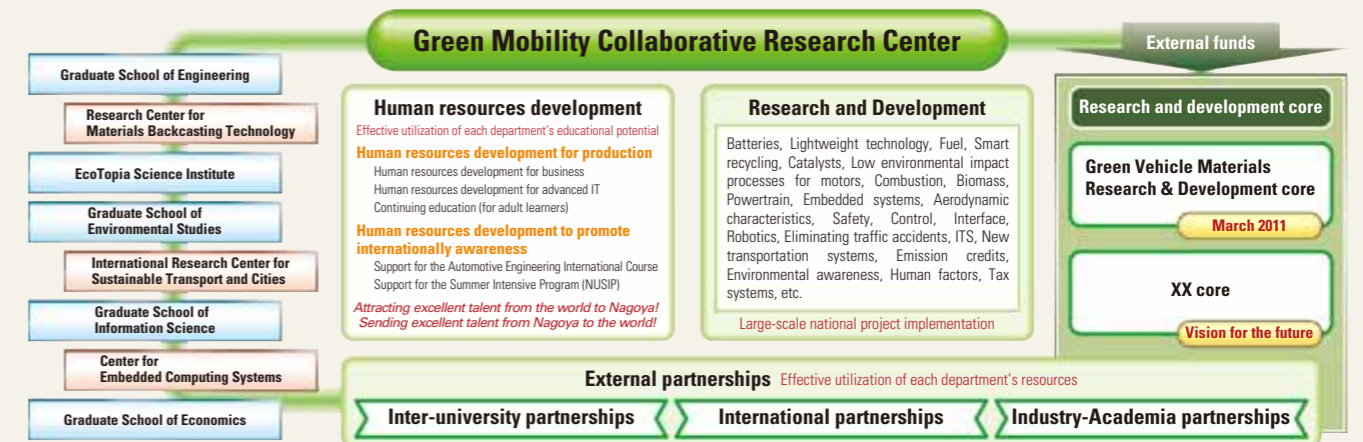
## Nagoya University Green Mobility Collaborative Research Center –Realizing a Low-Carbon Society–

Knowledge in the field of Green Mobility engineering at Nagoya University is concentrated in the Green Mobility research group.

An international-level Green Mobility research hub has been established to sharpen and refine international research relating to the environment, energy, safety, security, robotics, and control systems, to collaborate with organizations outside the university, to develop human resource, and to make comprehensive contributions to society at large.

Benefits of Establishing the Center

- (1) High-risk Basic Research for Green Mobility Innovation
- (2) Strengthened Collaboration in Research between Industry and Academia for Green Innovation
- (3) Formation of Research Core in Advanced Fusion Areas for Green Mobility Innovation
- (4) Globalization and Research Core Development to Take Advantage of Regional Characteristics and Uniqueness
- (5) Human resource Development for Green Mobility
- (6) Japan's Leading Role in International Standardization





## New Flagship Research Initiatives

### Disaster Mitigation Research Center (DMRC)



On January 1, 2012, the Disaster Mitigation Research Center (DMRC) was founded at Nagoya University. Nagoya City and the surrounding Chukyo area are vulnerable to natural hazard risks due to large earthquakes along the Nankai Trough plate boundary, which are repeated almost every century. The Japanese government estimates the probability of the occurrence of a large earthquake in this area during the next 30 years at 70%, and the worst case scenario predicts that economic loss will reach as much as 81 trillion yen. The area also has a history of damaging floods and storms associated with global warming. Since this area is the center of industrial production in Japan, the natural hazard risks may cause a serious crisis at a national level. Thus, the DMRC promotes cooperative multidisciplinary research for developing a state-of-the-art disaster mitigation model, and applying it to ensure the local community is safe and secure. The DMRC provides a cooperative framework for local government, companies, and citizens to improve the preparedness of the local community for future natural hazards. In addition, the DMRC offers disaster mitigation training courses for local public officers and volunteers.

For these purposes, academic staff from the Graduate School of Environmental Studies, Graduate School of Engineering, Graduate School of Medicine, and Graduate School of Education and Human Development joined the DMRC. In addition to 6 full-time staffs, approximately 30 additional staffs are working together at the DMRC.



### Nagoya University Young Leaders Cultivation Program (YLC Program)



The securing of outstanding young faculty members, quantitatively as well as qualitatively, is vital for the sustainable development of research and education at Nagoya University. Based on the recognition of this fact, and under the initiative of the University President, the University implemented the Young Leaders Cultivation Program (YLC Program), a strategic program aiming at recruiting and supporting young researchers in a planned and consistent manner.

So far, 17 young scholars have been recruited under the YLC program. During their appointment (3 years) they are

affiliated with the Institute for Advanced Research (IAR), and are expected to grow into independent researchers with international experience upon the completion of the program. YLC faculty members also organize the interdisciplinary YLC seminars (bimonthly), which are attended by the University President and the Director of IAR.

The YLC Program attracts a great deal of attention from many young researchers as a unique approach to advance their careers.





## Global COE Programs at Nagoya University

Nurturing next-generation leaders with original research projects and quality postgraduate education

### Integrated Functional Molecular Medicine for Neuronal and Neoplastic Disorders

**Program Leader: Prof. Gen SOBUE, Graduate School of Medicine**

#### Promoting interdisciplinary research and leading molecular target-based treatments that transform next-generation medicine

The most important challenge for medicine in the 21st century is conquering cancer and neurodegenerative diseases such as Alzheimer's disease. Previously, research into neurodegenerative diseases caused by the death of specific nervous cells, and cancer, which is abnormal growth of cells, used to be conducted separately because of their differences. At this Center, however, for more than ten years now, researchers of these two types of disease have been collaborating following the discovery of functional molecules common to neurodegenerative disorders and cancer, hoping to apply research results on each side to diagnosis and treatment on the other. Other research centers have since followed this Center's example, making it the world's leader in the field for its foresight.

This Center's ultimate objective is to develop molecular target-based treatments of neurodegenerative disorders and cancer. A number of treatment methods targeted at functional molecules common to the pathogenesis of the two disease types are currently in the clinical testing stage, only one step away from application to human patients, with this Center's research results attracting attention from all over the world. This Center's program is characterized by its full scope of research from fundamental studies to practical application. Collaborations with the National Center for Geriatrics and Gerontology and the Aichi Cancer Center, Japan's top research centers specializing in neurodegenerative disorders and cancer, also add strength to the educational and research functions of the Program.



The Global Center of Excellence (Global COE) Program of the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT) supports universities in establishing internationally competitive education and research so as to nurture future world-leading researchers through projects conducted at the world's highest standards. Nagoya University, recognized as an educational and research center worthy of the support, has had seven of its research projects designated as Global COE Programs between academic years 2007 and 2009. In fact, these projects had already produced internationally acclaimed results before their Global COE designation and have remained

at the world's front line of interdisciplinary collaboration in their respective fields. Given the rapid development of globalization and innovative research, fostering next-generation researchers represents a national strategy whose results can determine the country's future. Nagoya University plays an important role in this vital task, supporting Japan's and the world's progress into the future through its original research projects and quality postgraduate education. The following pages offer an overview of four of the seven Global COE research projects selected for special funding in 2008-2009.

### Quest for Fundamental Principles in the Universe: from Particles to the Solar System and the Cosmos

**Program Leader: Prof. Naoshi SUGIYAMA, Graduate School of Science**

#### Collaborating with research centers worldwide in interdisciplinary research covering the entire universe

Throughout the universe, diverse forms of matter and structures exist, from the smallest, such as elementary particles, to the largest, such as planets, galaxies and larger-scale structures. Because of this diversity, research on the cosmos has been carried out in separate segments. It is necessary, however, to understand this diversity comprehensively on an overall scale if basic laws common to all matter and structures are to be identified. Accordingly, this Center works in an interdisciplinary manner, covering the entire universe from elementary particles to the solar system and the rest of the cosmos. The Center comprises mathematical physicists, planetary science specialists, and researchers from a variety of disciplines including the Division of Particle and Astrophysical Science of the Graduate School of Science, which conducts research into elementary particles, space observation and theoretical studies, and the

Solar-Terrestrial Environment Laboratory, engaged in direct observation of solar and terrestrial phenomena.

This Center is characterized by its leading international research activities in the world's most advanced projects in various areas. It leads projects at the NANTEN Telescope in Chile and the OPERA Experiment testing neutrino oscillation in Italy, and participates in the Suzaku project (X-ray telescope-equipped satellite), CERN's LHC Experiment using the world's largest particle accelerator in Switzerland, and ESCAT radar observations. This Center also conducts interdisciplinary research projects on such themes as particle acceleration, dark matter and energy, the origin of interstellar matter and structures, and the origin of matter, space and time, in order to cultivate "seeds" for new research.





## Global COE Programs

	Field	Program Title	Program Leader
2008	Medical Sciences	Integrated Functional Molecular Medicine for Neuronal and Neoplastic Disorders	Graduate School of Medicine Prof. Gen SOBUE
	Mathematics, Physics, Earth Sciences	Quest for Fundamental Principles in the Universe: from Particles and to the Solar System and the Cosmos	Graduate School of Science Prof. Naoshi SUGIYAMA
	Mechanical, Civil Engineering, Architectural & Other Fields of Engineering	COE for Education and Research of Micro-Nano Mechatronics	Graduate School of Engineering Prof. Toshio FUKUDA

	Field	Program Title	Program Leader
2009	Interdisciplinary, Combined Fields, New Disciplines	From Earth System Science to Basic and Clinical Environmental Studies	Hydrospheric Atmospheric Research Center Prof. Tetsuzo YASUNARI

### COE for Education and Research of Micro-Nano Mechatronics

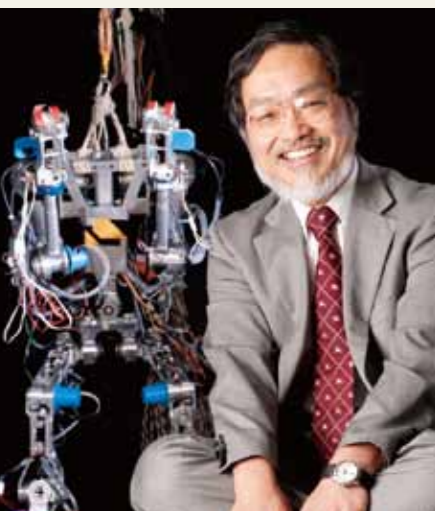
**Program Leader: Prof. Toshio FUKUDA, Graduate School of Engineering**

#### Creating new materials, developing new systems and realizing practical applications in advanced biomedicine

Micro-nano mechatronics technology is applied in a wide range of fields from game machines and automobiles to medical inspection and robotics. This Center has developed as Japan's pioneer in micro-nano mechatronics research, based on research achievements by the Department of Micro-Nano Systems Engineering of the Graduate School of Engineering, the first graduate program of its kind, and with support from the industrial community which uses such achievements. At present, the Center continues its world-level research with UCLA as its partner and UCLA researchers as members of the Center.

This Center gathers together researchers in materials science, mechanical science, system measurement/control engineering and biomedicine to participate in research concerning new functional materials and mechatronics. Research achievements in these areas are then integrated for system development. The Center conducts its research with

an eye toward practical application in regenerative medicine and other advanced biomedical areas. The Center's research is characterized by its approach, which covers not only devices but also system development. Practical application is also included in the Center's research scope so as to respond to society's needs.



### From Earth System Science to Basic and Clinical Environmental Studies

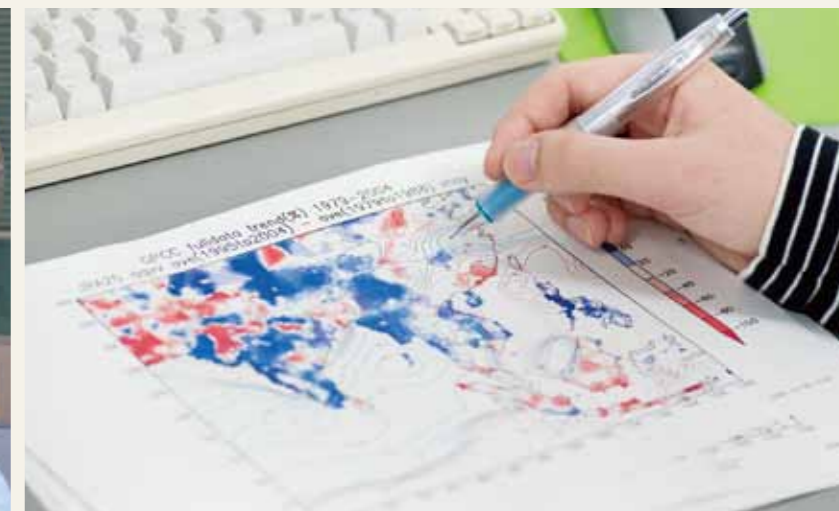
**Program Leader: Prof. Tetsuzo YASUNARI, Hydrospheric Atmospheric Research Center**

#### Creating an innovative approach to earth science and environmental studies

The Global COE Program "From Earth System Science to Basic and Clinical Environmental Studies" is an educational and research program that takes over, and attempts to further develop, the achievements of the 21st Century COE Program "Dynamics of the Sun-Earth-Life Interactive System (SELIS-COE)" (2003-2007). This program aims at forming a center for new environmental studies that brings together previously separate diagnostic disciplines (science) and treatment disciplines (engineering, agriculture, etc.) upon the foundation of the new earth system science developed within the framework of SELIS-COE. The program's pillars are clinical environmental studies that comprehensively diagnose regional environmental problems, and basic environmental studies that examine common inter-regional problems and universal challenges through interdisciplinary approaches.

This program promotes world-leading research and education in environmental studies. In its research aspect, the Study Consortium for Earth-Life Interactive System (SELIS), an internal organization of Nagoya University making use of

results of SELIS-COE, serves as a base for domestic and international joint research in environmental studies. Its educational aspect focuses on a special doctoral course in integrated environmental studies associated with the Global Environmental Leaders Program of the Graduate School of Environmental Studies. In the framework of this program, clinical research in environmental studies is promoted in Japan and other parts of Asia in collaboration with research and educational establishments in various countries. The program maintains close cooperative ties with partner universities including Wageningen University and VU University Amsterdam in the Netherlands, and the University of California, Berkeley and the University of California, Santa Barbara in the United States, so that participants will develop into researchers and experts of international standing in basic and clinical environmental studies and become valuable human resources not only for universities and research institutes but also for international organizations, national and regional governments, and related private businesses.





## Elucidating the mechanistic role of plant hormones in the environmental adaptation and survival of plants

Research by Professor Motoyuki ASHIKARI, Bioscience and Biotechnology Center of Nagoya University, who was elected an American Association for the Advancement of Science (AAAS) Fellow in 2011 for his research achievements in the area of rice thremmatology

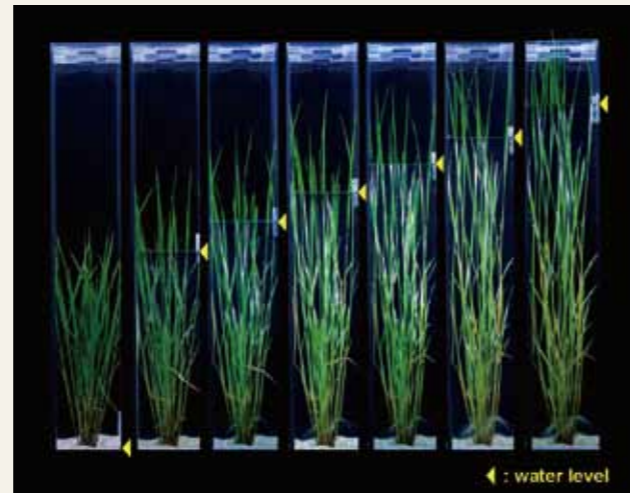


Habitat expansion is an important adaptational strategy of living organisms for survival in unfavorable environments. However, overcoming adverse environmental conditions is not easy for plants, due their sedentary nature. To overcome this constraint, plants evolve and gain new functions to fit with severely inhospitable environments and survive adverse conditions.

In understanding the different adaptational responses of plants to adverse environments, the production and analysis of loss-of-function mutants has been an essential tool. In the case of rice, for example, many mutants have been identified. However, insights into the possible multitude of traits present in many species of rice have been limited instead to the study of characters that are present in rice cultivars. In 10,000 years of crop domestication, cultivars have evolved through human selection of crops for important agronomic characters, including non-shattering (i.e. of grains), high production and non-dormancy. Due to such a focus of selection, many important characters, including stress tolerance and disease resistance, that are present in wild species have been lost. In rice, particularly, many wild species have important and unique

characters that cultivars do not possess. It is on this fact that Professor Ashikari founded his belief that rice cultivars are mutants and that the wild rice species are wild types.

The genus *Oryza* has 24 species (22 wild rice species + 2 cultivated species) distributed all over Asia, North Africa, South Africa and Australia. Each of the 22 wild rice species has its own adaptation to its native environment. The comparison of wild rice species and cultivars can provide us with insights into the unique characters present in wild rice but not in the cultivars. To date, several important characters that confer fitness for adverse conditions in wild rice have been identified. Some of these characters use plant hormone signaling for adaptation. Professor Ashikari's laboratory aims at elucidating the mechanistic role of plant hormones in the environmental adaptation and survival of plants.



The pictures are of deepwater rice.

Deepwater rice evolved and adapted to flooding by gaining the ability to significantly elongate its internodes, which act like a snorkel to allow gas exchange with the atmosphere and thus avoid drowning. Professor Ashikari identified the genes that trigger the deep-water response as Snorkel1 and Snorkel2, which encode ethylene response factors involved in the signaling of the gaseous phytohormone ethylene. Under deep water, ethylene accumulates in the node, triggering expression of the Snorkels, which causes remarkable internode elongation. (Hattori et al. Nature 2009).

## The signaling molecule semaphorin regulates mRNA translation and the actin cytoskeleton by altering the formation of two TOR complexes

Research by Associate Professor Shin TAKAGI, Graduate School of Science

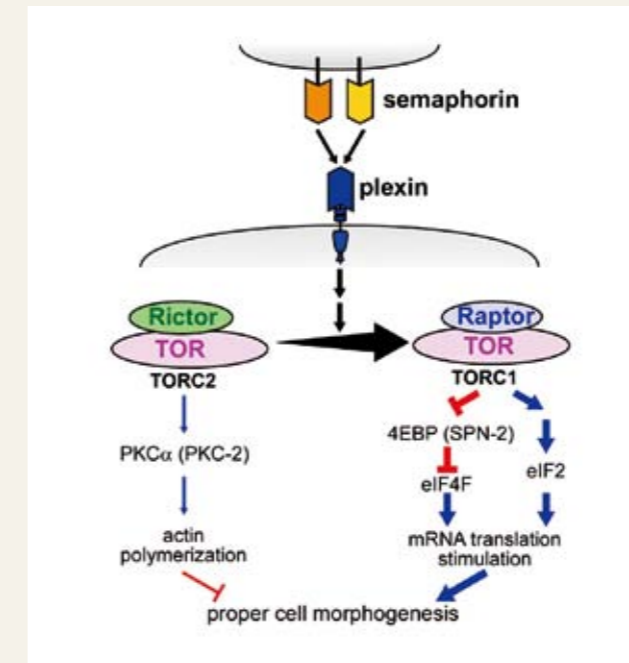


Fig. 1

Semaphorins are signaling molecules, which are proteins that transmit information between cells and regulate cellular activity that guides nerve fiber formation during development of the nervous system. Because of these important functions, semaphorins have received considerable attention from researchers studying nerve regeneration. In addition, semaphorins are also involved in suppressing cancer metastases and activating the immune system. In order to develop drugs that regenerate nerves and suppress cancer metastases, it is important to determine the detailed mechanisms by which semaphorins induce morphological changes.

TOR (Target Of Rapamycin) is a pivotal regulator of cell growth, morphogenesis and proliferation. Due to these central functions, TOR is widely studied in the cancer and immunology fields. When in a complex with other proteins, TOR performs many cellular functions, as highlighted above. However, the mechanisms that regulate the activity of these TOR complexes have not yet been fully elucidated.

A research team led by Associate Professor Shin Takagi, from the Graduate School of Science at Nagoya University, determined that semaphorins regulate mRNA translation and the actin cytoskeleton by altering the activation state of two TOR complexes.

To conduct these studies, this research team used the nematode *C. elegans*, which is an excellent multicellular animal model due to the efficiency of experimentation. They generated a genetically modified *C. elegans* that was deficient in semaphorins, and then identified secondary mutations that suppress the defects in semaphorin signaling. As a result, they identified a suppressor gene that was related to TORC2, which is a complex composed of TOR and the protein Rictor, and determined that there is a relationship between semaphorin signals and TORC2. In order to further examine the relationship between semaphorins and two TOR complexes, TORC2 and TORC1, which is composed of TOR and Raptor, they manipulated TORC1- and TORC2-related genes to regulate the activation of TORC1 and TORC2.

Consequently, they showed that semaphorins activate TORC1 but inhibit TORC2 by increasing the amount of the former while decreasing the latter. While activating TORC1 stimulates mRNA translation through two pathways involving eIF2 and eIF4F, inhibiting TORC2 leads to actin depolymerization (Fig. 1).

These studies were the first to identify the detailed mechanisms in which two TOR complexes relating to various cell activities are regulated by semaphorin signals. These findings then showed that single signal molecule semaphorins may contribute to various cell activities. This will guide further research on TOR and semaphorins.



## Doctoral student Ms. Kirika UEDA from the Graduate School of Science at Nagoya University receives the “L’Oreal-UNESCO Women in Science Award of Encouragement Japan”

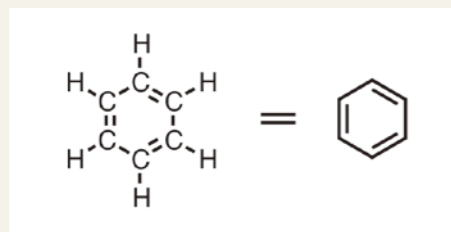


Fig. 1

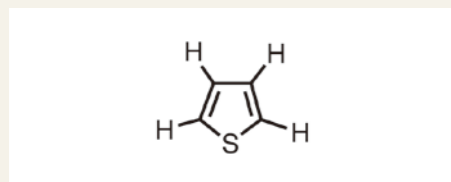


Fig. 2

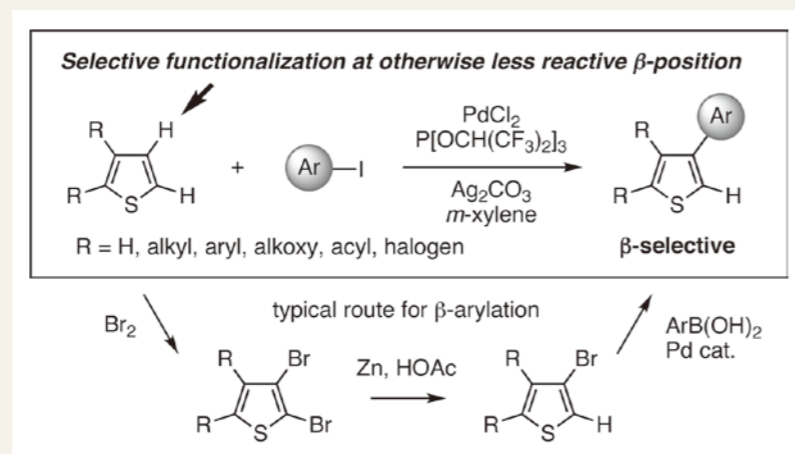


Fig. 3

Ms. Kirika Ueda, doctoral student at the Graduate School of Science, Nagoya University, has received the “L’Oreal-UNESCO Women in Science Award of Encouragement Japan”. This prize was designed to encourage excellent female doctoral students who have potential as future leaders. The prize is funded by Nihon L’Oreal with the cooperation of UNESCO. Nihon L’Oreal is the Japanese manufacturing arm of the L’Oreal group, which is the world’s largest cosmetic manufacturer. Only two researchers in the Life Sciences and Material Sciences are selected as prizewinners each year. Ms. Ueda received the prize in Material Sciences for her work in the “development of a new catalyst for making biaryls and heterobiaryls, and its application to pharmacologically-active and functional organic materials.” Biaryls and heterobiaryls are chemical compounds that include a planar carbon ring system, such as benzene (Fig. 1).

Many pharmaceuticals and electronic materials contain biaryls and heterobiaryls in their structures. Coupling reactions between aromatic rings are very important for the production of such materials. Aromatic coupling reactions, however, are not easy to achieve. The reactions are promoted by catalysts, which are chemical compounds that lower the barrier to the reaction and are not themselves consumed during the course of the reaction. In some cases, the production of a target material can require many catalytic reactions, which incur large production costs. To efficiently carry out a total synthesis, it is frequently desirable to reduce the number of catalytic reactions. Regioselective coupling reactions are also important for the synthesis of useful products, and the development of catalysts that can efficiently promote such reactions under mild conditions remains a goal among chemists.

Ms. Ueda has risen to the challenge posed by this difficult problem. Her research program is ideal chemical synthesis through C–H transformation. The direct C–H bond arylation reaction of arenes or heteroarenes has become an emerging methodology for making privileged biaryls and heterobiaryls. She has succeeded in developing a new catalyst for a coupling reaction of thiophenes (Fig. 2) with iodoarenes. This catalyst can directly and selectively functionalize the  $\beta$ -carbones of thiophene rings (Fig. 3). Previous synthetic approaches have relied on three consecutive catalyzed reactions. Ms. Ueda also shows that the catalytic system can be applied to synthesize the compound which is a potential drug candidate for treatment of Alzheimer’s disease, as well as tetraarylthiophene, which may be used as an organic material.



The Global 30 Project – Bringing Nagoya University to the World



Global Environmental Leaders Program



Nagoya University Summer Intensive Program (NUSIP)



Significant International Programs



NUPACE: Nagoya University’s Academic Student Exchange Program



Nagoya University has been selected for the government Project for Promoting Universities’ Activity with abroad



# The Global 30 Project – Bringing Nagoya University to the World

In July 2009, the selection results of the 2009 Project for Establishing Core Universities for Internationalization (Global 30) were announced, with Nagoya University standing out as one of the Global 30 leaders.



<http://admissions.g30.nagoya-u.ac.jp/en/>

The objectives of Global 30 are to strengthen the international competitiveness of Japanese higher education and to offer an education with standards that appeal to foreign students while, through creating an environment where Japanese students work together with international students, fostering highly educated individuals who can be active internationally. The project comprehensively supports a plan to create universities that act as bases for internationalization by providing both the high level of education expected from universities and environments that make studying in Japan more accessible for overseas students.



## ✓ New All-English Courses

1. Creating undergraduate degrees from which students can graduate entirely in English in the sciences (Physics, Engineering, Agriculture) and in the humanities (Law, Economics).
2. Establishing international courses for master's and doctoral degrees in the sciences and the humanities.
3. Accepting a greater number of international students to the graduate courses already available in English (Law, Engineering, International Development, and Environmental Studies).

	Name of the Courses	Name of the Schools / Graduate Schools	Degrees Offered		
			Bachelor	Master	Doctor
1	Automotive Engineering Program	• School of Engineering	●		
2	Fundamental and Applied Physics Program	• School of Engineering • School of Science	●		
3	Chemistry Program	• School of Science • School of Engineering	●		
4	Biological Science Program	• School of Science • School of Agricultural Sciences	●		
5	Program in Social Sciences	• School of Law • School of Economics	●		
6	Physics and Mathematics Graduate Program	• Graduate School of Science • Graduate School of Mathematics		●	●
7	Chemistry Graduate Program	• Graduate School of Science • Graduate School of Engineering		●	●
8	Biological and Bioagricultural Sciences Graduate Program	• Graduate School of Science • Graduate School of Bioagricultural Sciences • Graduate School of Medicine		●	
9	Biological and Bioagricultural Sciences Graduate Program	• Graduate School of Science • Graduate School of Bioagricultural Sciences			●
10	Medical Science Graduate Program	• Graduate School of Medicine			●
11	Graduate Program in Economics and Business Administration	• Graduate School of Economics		●	
12	Graduate Program in Comparative Studies of Language and Culture	• Graduate School of Languages and Cultures		●	
13	International Development and Cooperation Course	• Graduate School of International Development		●	●
14	Department of the Combined Graduate Program in Law and Political Science LL.M (Comparative Law) Program in Law and Political Science LL.D (Comparative Law) Program in Law and Political Science	• Graduate School of Law		●	●
15	Young Leaders' Program (YLP) (Healthcare Administration Course of Master's Degree Program)	• Graduate School of Medicine		●	
16	The Forefront Studies Program for Civil Engineering	• Graduate School of Engineering			●
17	Nagoya University Global Environmental Leaders Program	• Graduate School of Environmental Studies		●	
18	Special Doctoral Graduate Program of Sciences of Atmosphere and Hydrosphere for International Students	• Graduate School of Environmental Studies			●



## ✓ Short Term Student Exchange and Japanese Language Education

1. Broadening the Nagoya University Program for Academic Exchange (NUPACE), a short term student exchange program, to admit a greater diversity of international students.
2. Requiring international students enrolled in an English course to take Japanese for their foreign language credits, thus improving their chances for interaction with Japanese students.
3. Continuing to hire more international faculty and to send young researchers abroad for education and study.

## ✓ International Student Recruitment through Overseas Offices and Partner Institutions

### ✓ Multiple Screening Methods for Selecting Outstanding International Students

1. Implementing an entrance examination process that can be completed overseas at the undergraduate level.
2. At the graduate level, exploring a variety of screening methods such as applicant document screening, interviews in students' home countries, and videoconferencing.

### ✓ Attractive Scholarships and Fee Exemptions

### ✓ Increased Convenience for International Students

1. Creating a system to facilitate payment of entrance examination fees and other fees from abroad, including credit card transactions and overseas bank accounts.
2. Implementing overseas orientations and other measures to provide a smoother transition for international students who have been accepted to the University.

## ✓ Proactive Employment of Tutors, Teaching Assistants and Research Assistants

### ✓ International Zone and English-speaking Office Staff

1. Creating an International Zone (one-stop office) where international students go for counseling and procedures.
2. Setting up an English-language admission office to deal with recruitment and entrance examinations.
3. Increasing the number of staff with English ability, and creating bilingual intra-university documents and bulletin boards.

### ✓ International Library Resources

### ✓ Adapted Living Environments

1. Opening a new housing facility that can receive as many as 100 international students.
2. Offering diverse menus in University cafeterias for vegetarians and students who are not comfortable with Japanese food.

### ✓ Career Support and Internships

1. Providing orientation and career path guidance to international students who want to work in a Japanese company.
2. Offering a variety of internship programs, such as the Summer Intensive Program on automobile engineering.

### ✓ Sharing NU's internationalization experience with other universities in Japan

1. Opening up the systems developed in the G30 project to other universities
2. Building a network with other G30 leaders



## Student Columns



**Rina Hisamatsu**  
Department of Biological Sciences, School of Science

I never expected to find myself at Nagoya University, but I can't deny that it's a choice I definitely do not regret making. I can't help but feel the tingle of excitement whenever I think about the fact that this year's batch for the G30 program is one of the very first to be launched in Japan. I am one of the lucky few who were given the chance to experience a life-changing opportunity to study a field of interest in English while being surrounded by the beautiful Japanese culture and lifestyle. I guess what really attracted me to the G30 program was that it looked like an inspirational, fresh new challenge to me. Having lived abroad my whole life, the idea of coming back to Japan to study had been pushed into the deepest corner of my mind until the discovery of G30. It was then that I made the decision to take the leap and obtain a top-notch

education in the country I was born in but knew very little of. From the very first day of our arrival, the entire G30 staff and organizers have been nothing but caring and considerate. The Biological Sciences department, the school with which I am affiliated, has been constantly attentive and trying their best to suit our needs and make our four years in Nagoya the smoothest and most enjoyable possible. Lastly, what really makes G30 special is the close bonds that we are fortunate enough to create with our professors and students. As it is a close-knit program, G30 is filled with knowledgeable teachers and kind-hearted people who will gladly share their own cultures from back home. It is definitely a challenging yet amazing start to college life!



**Tan Zhi Liang**  
Department of Mechanical & Aerospace Engineering, School of Engineering

I was thrilled when I first found out that Nagoya University was offering the G30 Automotive Engineering course. Nagoya University is a leading research university renowned for its Engineering courses. Nagoya University, situated in Nagoya, is also strategically located, as the city is an automotive hub with Toyota headquartered here. Since I was young, I have always been interested in automobiles. Therefore, Nagoya University seems the best fit for me. Furthermore, the course offered in English is also very attractive, as I am not required to have any pre-existing knowledge of the Japanese language. By choosing to study at Nagoya University, I am well-placed to learn from experts in the automotive field.

When I first arrived in Japan I felt lost, as I was alone without knowing anyone in this foreign country I had never set foot in before. Besides, I do not speak Japanese well. However, the friendly Nagoya University staffs made me feel welcome, and they are willing to help me whenever I am faced with difficulties. The G30 lecturers are also very committed to providing us with a good education. As our classes are small, the lecturers are able to pay more attention to us. This makes our learning process more effective and enjoyable. The best part of studying in the G30 program is that I will be able to meet people from all over the world. I also get to interact with local Japanese people. Studying in Japan also allows me to experience the local Japanese culture and learn the Japanese language. This experience will surely enrich me and make my study in Japan much more meaningful!

## Global Environmental Leaders Program

### Promoting Active Leaders in Solving Global Environmental Problems

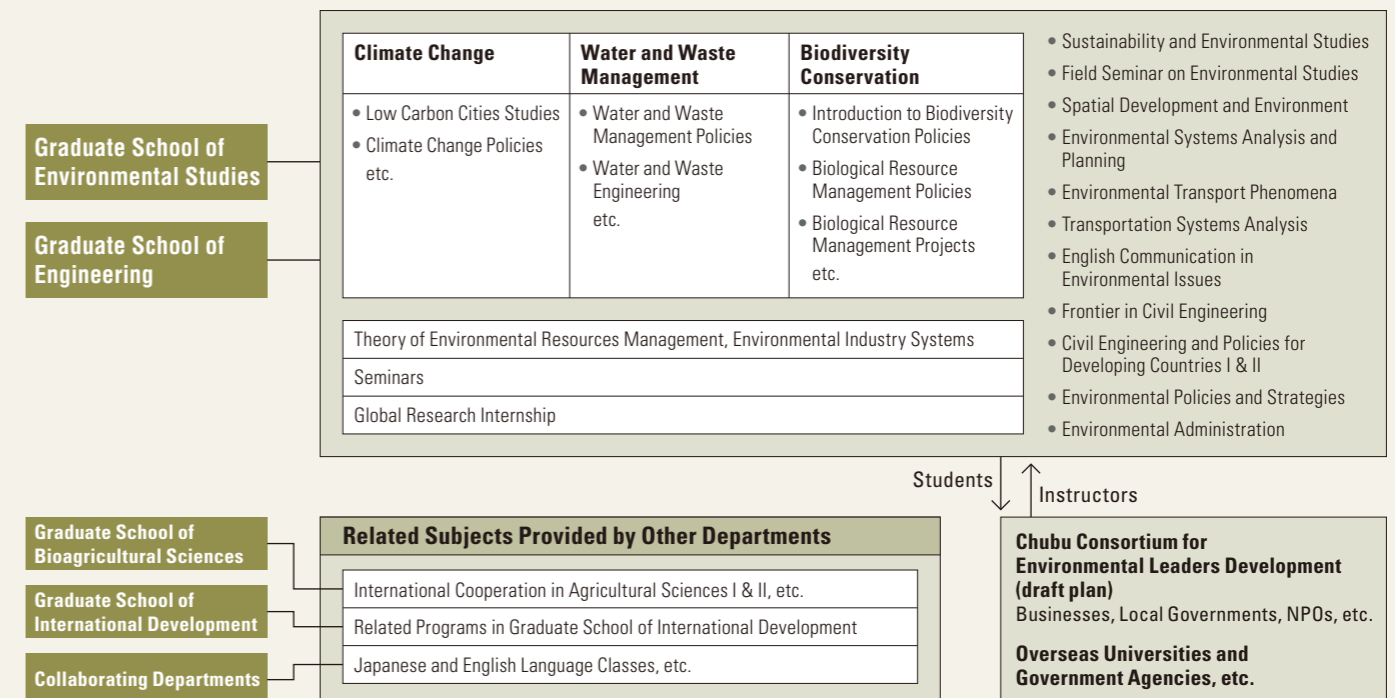
Due to rapid economic growth and social changes, developing countries worldwide, including in Asia and Africa, face serious environmental problems such as air and water pollution, waste management, biodiversity conservation, and global warming and climate change. Finding solutions to these problems is hard because of interrelated factors such as health education, infrastructure development, energy resources security, integration of environmental and economic concerns, and globalization. Sustainable development cannot be achieved unless these difficulties are overcome on both national and global scales.

Environmental specialists with the expertise and abilities to implement relevant solutions are the key to solving these problems. There is an urgent need to educate professionals with competitive skills and then translate these skills into concrete actions.

In 2008, Nagoya University established the master's course "Nagoya University Global Environmental Leaders Program (NUGELP)" to foster people able to understand and analyze environmental problems from a global perspective, and propose concrete ways of solving problems. Through various efforts such as distinctive curricula and student services, our goal is to become a global center of learning where motivated students from Asia, Africa, and elsewhere in the world, including Japan, can achieve their aims.



### Curriculum Model





## Nagoya University Summer Intensive Program (NUSIP)



With support and cooperation from the Japanese automotive industry and related enterprises, the Graduate School of Engineering offered a 6-week summer program entitled "Latest Advanced Technology & Tasks in Automobile Engineering," from June 15 – July 21, 2011. Conducted entirely in English, the program was aimed at overseas students and Nagoya University students in engineering-related fields. The program's greatest feature was its exciting lectures from various viewpoints regarding state-of-the-art technologies in areas such as hybrid automobiles, fuel cells, environmental strategies, accident prevention, and expressway traffic. The lectures were

conducted with support from some of the industry's leading technologists and researchers, as well as faculty members of Nagoya University. Although of short duration, the program's objectives enabled overseas students to study some of the various fields that are particularly advanced in Japan, as well as increase their interest in this country and its culture. The program also enabled Nagoya University students to improve their English and communication skills and broaden their international horizons in conjunction with studies in their specialty fields.



## Significant International Programs

### Global Human Resource Development Program

In April 2009, the Nagoya University's School of Economics launched its Global Human Resource Development Program in partnership with twelve globally developed representative Japanese corporations including Toyota Motor Corporation, Mitsui & Co., Ltd., and Sumitomo Mitsui Banking Corporation.

This Program, a collaboration between the industrial and academic sectors, takes advantage of Nagoya University's location in the Chubu region, which has a high concentration of internationally known industrial sites. The Program aims at training future leaders with a strong sense of responsibility and a business mindset indispensable to globally developed corporations, with each sector providing specialized educational materials. In academic year 2009, three courses are being held: Global Manufacturing Management, Global Financial Management, and Global Logistics Management. The Program's students attend lectures featuring concrete topics and the pragmatic mindset of instructors dispatched from participating corporations. Students also have the opportunity to observe actual manufacturing and distribution sites to identify required skills and abilities. Two-way interactive classes enable students to develop their presentation, communication and thinking skills.

### Program in Law and Political Science

The Graduate School of Law at Nagoya University has been committed to English-taught programs in Law and Politics since 1999. In that year, as a natural extension of ties with universities in Asia and Central Asia, the faculty undertook to establish a two-year Masters course in Law and Politics. Open at the outset to students from partner institutions in Vietnam, Laos, Cambodia and Mongolia, the first students under this initiative were admitted in 1999. In the following year the program was extended to universities in Uzbekistan, and admission to study toward an English-based doctoral degree was approved in 2004.

The program is complemented by social activities, student mentorship arrangements, private and public sector internships, language instruction through the Education Center for International Students, annual participation in the Japan Inter-Collegiate Negotiation Competition, and a set of student-driven cross-national seminars (the Peer Support Initiative). These features of our environment reinforce and supplement the opportunities of the traditional academic curriculum in law and politics. Classroom instruction is enriched through course offerings taught by legal staff of major local corporations, by practicing Japanese lawyers, and by reporters with front-line experience in covering both domestic and foreign news for Japanese media organizations.

We are proud to count among our graduates the staff of core ministries, counsel in major corporations, active lawyers and progressive academics of the jurisdictions that have enriched our environment through participation in our programs.



## The Forefront Studies Program for Civil Engineering

The Graduate School of Engineering at Nagoya University is accepting applications from foreign students who wish to pursue a Doctor of Engineering degree in the field of Civil Engineering, with the financial aid of the Japanese Government Scholarship Program. The “Forefront Studies Program for Civil Engineering” began in 2007, replacing the former “Civil Engineering Special Program”, implemented from 1987 to 2006. This new scholarship program provides a course specially designed for foreign students, in which coursework and research supervision are carried out in English. Around seven students will be accepted for this program, and those who will pass the selection process will be allowed to enter the doctoral program in October every year. Accepted applicants are granted financial support from the Japanese Government, which is sufficient to maintain a decent lifestyle in Japan.

The research fields of the professors in this program cover Structural Engineering; Hydraulics, Hydrology, Coastal and Ocean Engineering; Geotechnical Engineering; Transportation, Infrastructure and Environmental Planning; and Environmental Engineering.

## International Development and Cooperation Course

The Department of International Development and the Department of International Cooperation Studies of the Graduate School of International Development (GSID) at Nagoya University jointly offer a graduate program in international development and cooperation. The program aims to equip graduate students with knowledge of a wide range of development issues pertaining to developing countries and the practices of international development cooperation, and capabilities and skills to contribute to solving such development issues. The program has the following key features:

1. The goal of the program is to train future development professionals by imparting knowledge and understanding of the realities of the development world, and by providing them with skills and competence so as to work not only in the international development and cooperation field, but also in a variety of related professional fields.
2. Drawing on Japanese development experience, it provides alternative perspectives which differ from conventional development theories which draw largely on the Western model of development.
3. The program places strong emphasis on 1) fieldwork in developing countries, 2) exchange with scholars, development professionals and students from developing countries, 3) reflective education directly linked with development practices, and 4) overseas training and internships.
4. With respect to the course's “professional minimum” component, 6 programs are offered after completion of the development literacy component. These six programs are: Economic Development Policy and Management, Rural and Regional Development Management, Education and Human Resource Development, Governance and Law, Peace building, and Social Development and Culture.

## Special Doctoral Graduate Program of Sciences of Atmosphere and Hydrosphere for International Students

The “Special Doctoral Graduate Program of Sciences of Atmosphere and Hydrosphere for International Students”, set up in 2006, is a course supported by “The International Priority Graduate Programs (PGP)” at the Department of Earth and Environmental Sciences, Graduate School of Environmental Studies (DES). This course accepts five students a year and is specially designed for international students who are enthusiastic about researching environments in the Asian region from the aspect of Atmospheric and Hydrospheric Sciences.

This program provides two schemes: professional research training for the next generation of researchers, and cross-disciplinary education for acquiring knowledge of various environment fields. The professional research training is given by international-level professors in the fields of Atmospheric and Hydrospheric Sciences that encompass fundamental discrepancies in the fields of environmental variation, climate science, biogeochemistry, radiation and life sciences, and global water cycles. The professors in the field of Earth and Planetary Sciences in DES cooperate in the professional education, which is necessary for advancing Atmospheric and Hydrospheric Sciences. The professors in the Department of Environmental Engineering and Architecture and the Department of Social and Human Environment in DES also take part. This inter-disciplinary education aims to promote the ability to systematically understand the structure of environmental problems in the Asia region, in order to make the best use of specialist study for the solution of these problems.

## Young Leaders’ Program (Healthcare Administration)

The Young Leaders’ Program (YLP) at Nagoya University is a one-year Master’s degree course in Healthcare Administration. The YLP, which aims to foster the development of future national leaders in Asian and other countries, is one of the Japanese Government Scholarship Student systems, intended to help form a network among national leaders, contributing to the establishment of friendly relationships and improved policy planning among Asian and other countries, including Japan. Four universities are designated as host universities for the YLP, including Nagoya University, which offers a healthcare administration course. Applicants for the YLP at Nagoya University must be a national of one of the aforementioned 13 participating countries and a college degree holder, or higher, in the field of medicine or science.

The curriculum is suitable for rearing future national leaders in the field of healthcare administration. It seeks to learn from Japan’s unique and important role in bridging the gap between Western and Asian countries and their willingness to maintain the lasting friendship with Japan and other participating countries through various activities. The curriculum is also designed to demonstrate the actual mechanism of Healthcare Administration, and how modern Japan improved national living standards at a comparatively low cost within half a century by introducing the concept of Western methodology and adjusting it to Japanese culture and social system. Using this knowledge, the courses pursue the question of “what is the most desirable method of resolving the respective problems concerning Healthcare Administration for the country concerned?”.



## NUPACE: Nagoya University's Academic Student Exchange Program



### Fresh Insights, Intellectual Stimulation, and a Global Perspective

Established in February 1996, the Nagoya University Program for Academic Exchange (NUPACE) is an academic student exchange program through which international students enrolled at Nagoya University's partner institutions can study in Japan for four to twelve months. The program aims to foster friendships that extend beyond borders, internationalize through education, and motivate overseas students to pursue more extensive studies about Japan. The NUPACE academic year runs on a semester basis, and students can choose one of two admission periods: late September or early April.

NUPACE offers a unique and flexible curriculum comprising Japanese language instruction, Japan area studies, and a wide range of courses in the student's major field of study, with most courses taught in English. Provided that they take at least fifteen credits per semester, students can design their own

curriculum, balancing their interest in Japanese language and area studies with the desire to pursue their major or independent research. Guided research for graduate students is also available. Moreover, students proficient in Japanese are eligible to register for any course offered to degree-seeking students at Nagoya University.

NUPACE, which celebrated its 15th anniversary in October 2011, has hosted 1,000 international students from over 100 institutions in twenty-seven countries. It is renowned, in both domestic and international arenas, for its quality and leadership in exchange student education.



## Nagoya University has been selected for the government Project for Promoting Universities' Activity with abroad



The Project for Promoting Universities' Activity with abroad, which is sponsored by the government of Japan, has been launched. Aiming at supporting leading Japanese universities which launch new collaborative projects for the mutual exchange of students with overseas universities, this project is also expected to enhance quality assurance of higher education in an international framework.

Nagoya University is one of the institutions selected for this scheme. There are three projects proposed by Nagoya University which have been adopted by the government. One project, proposed by the Graduate School of Law, aims to foster human resources who can take the lead in establishing "Jus Commune" in East Asia. Another project will be jointly run by the Graduate School of Science and Graduate School of Engineering at Nagoya University, and various departments at

Tohoku University, and will set out to establish a core center for collaborative education in the field of chemistry and material research which can contribute to creating sustainable society. These two programs are student exchange programs with universities in China and Korea, which are playing leading roles in their respective areas of research in their countries, with the goal of building a "Campus Asia" through each program. Meanwhile, a project by the Graduate School of Engineering and EcoTopia Science Institute will collaborate with universities in the United States. Its ultimate goal is to create an "international joint graduate school" in the area of engineering, through exchanges of Master course students.

With the creation of these brand-new projects, the diversity of the classrooms and laboratories at Nagoya University is expected to increase even further.







Center for Asian Legal Exchange (CALE)  
- Fostering Legal Assistance in Asia as a Leader in Judiciary Globalization



International Cooperation Center for Agricultural Education (ICCAE)  
- A leading center for international cooperation in agricultural education



Project for the Promotion and Enhancement of the Afghan Capacity for Effective Development (PEACE project)

## Center for Asian Legal Exchange (CALE) - Fostering Legal Assistance in Asia as a Leader in Judiciary Globalization



Established in 2002 as a research base for Asian Law and a coordinating center for legal assistance in Asia, the Center for Asian Legal Exchange (CALE) has been expanding activities, remaining the only center within a Japanese University to be professionally involved with legal assistance research and

projects. The center is committed to play a major role in carrying out legal assistance projects centering on Asia, disclosing research outcomes related to those projects and disseminating research and legal information on countries in Asia, and expanding the network of specialists within this field.

### What is "Legal Assistance"?

Legal Assistance refers to the cooperating with developing countries and socialist regimes making the transition to a market economy to reform their legal systems enabling them to achieve a fair market economy, the rule of law, human rights, and democracy. Legal assistance activities include the following:

- Cooperating in the drafting of laws and judiciary system reform
- Cooperating in the consolidation of legal infrastructure such as the improving of maintenance and access to legal and judicial information.
- Cooperating in the human resource development of judicial officers

### Research and Education Centers for Japanese Law

Nagoya University has five centers in Asia and Central Asia regions in order to educate specialists who are able to understand Japanese society, language and law in a systematic and continuous way.



Research and Education Center for Japanese Law (Ulaanbaatar, Mongolia)



Research and Education Center for Japanese Law (Tashkent, Uzbekistan)



Research and Education Center for Japanese Law (Ho Chi Minh, Vietnam)



Research and Education Center for Japanese Law (Hanoi, Vietnam)



Research and Education Center for Japanese Law (Phnom Penh, Cambodia)



## International Cooperation Center for Agricultural Education (ICCAE) -A leading center for international cooperation in agricultural education



The International Cooperation Center for Agricultural Education (ICCAE) is a research institute mandated to function as a leading center for international cooperation in agricultural education. It was established in April 1999, at Nagoya University, under the initiative of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan.

In developing countries, many problems related to agriculture (for example, food shortages, downturns in agricultural production, poverty, environmental devastation, and animal-borne infectious diseases) have yet to be solved by the international community. To solve these global-scale issues, it is important to develop appropriate agricultural technologies while paying careful

attention to socioeconomic impact, effective use of natural resources, and respect for the environment. In both developing countries and Japan, the development of human resources is a pressing issue. In recent years, the need for international cooperation to overcome these problems and to facilitate human resources development has increased. Japan has been expected to work actively to resolve these issues.

To respond to such expectations, ICCAE was established by the MEXT of Japan at Nagoya University. ICCAE's goal is to become a leading center for international cooperation to help solve problems in agricultural and rural development in developing countries.



## Project for the Promotion and Enhancement of the Afghan Capacity for Effective Development (PEACE project)

PEACE Project Opening Ceremony at Embassy of Afghanistan in Tokyo



In association with the Japan International Cooperation Agency (JICA), Nagoya University has been involved with international cooperation projects for years: dispatching university experts in fields of development, infrastructure, and education to developing countries, and accepting trainees from developing countries to give them lectures and practical training.

At Kabul International Conference, held on July 20, 2010 in Kabul, Afghanistan, the Minister for Foreign Affairs of Japan outlined the support plan for Afghanistan's reconstruction, which entails the training of up to 500 Afghan government officials in the engineering and agricultural sectors. Based on this concept, the "Project for the Promotion and Enhancement of the Afghan Capacity for Effective Development" (PEACE project) began in 2011. In the PEACE project, candidates are recommended by Afghan government ministries; they also

need to pass several examinations and interviews. After these selection processes, Afghan trainees visit Japan in five batches, from 2011 to 2015, and gain training in the fields of infrastructure development, agriculture, and rural development at master's level, at graduate schools in Japan. In October 2011, 20 national and private universities accepted 47 Afghan government officials as the first PEACE project trainees. The Graduate School of Bioagricultural Sciences and the Graduate School of International Development at Nagoya University also accepted two of these trainees as part of the University's international cooperation projects.

After returning to their own country, it is expected that PEACE project trainees will have the ability to solve development challenges, and contribute to enhancing bilateral relationships between Japan and Afghanistan in the future.

PEACE Project Opening Ceremony at Embassy of Afghanistan in Tokyo







Nagoya University around the Globe: International Liaison Offices and Bases



Academic Consortium AC21



Our Partner Institutions

## Nagoya University around the Globe: International Liaison Offices and Bases

In order to establish a world presence to develop true research excellence, Nagoya University has international liaison offices, research and education bases and a technology transfer office around the world. These stations are strategically positioned to recruit top-level students and teaching staff, organize academic exchanges, host workshops, interact with world-level researchers, learn about different countries' education systems, and promote Nagoya University around the globe.



### ■ Shanghai Liaison Office (Shanghai, China)

The Shanghai Liaison Office was inaugurated in November 2005, with the goal of promoting academic exchange with Chinese institutions of higher education and research, advertising Nagoya University in China, and acting as a contact point for Alumni Association members overseas. The Shanghai Office was Nagoya University's first base abroad, and it continues to play an important role in expanding academic exchange with institutions in China.



### ■ Uzbekistan Office (Tashkent, Uzbekistan)

The Uzbekistan Office opened in March 2010 as an "Overseas Office for Shared Utilization by Universities," an element of the Global 30 Project for Establishing Core Universities for Internationalization. The Office strives to recruit students within Uzbekistan as well as all of Central Asia, and it collaborates with universities across Japan on international student activities.



### ■ European Center (Freiburg, Germany)

In April 2010, Nagoya University opened its European Center in Freiburg University with the aim of heightening its presence in Europe. The main objectives of the Center are recruiting outstanding international students for short-term and long-term programs at both undergraduate and graduate levels; developing a European-Japanese research and education network with universities, research institutes and companies; informing European high school and university students about the advantages of studying at Nagoya University; collecting information on research and education; and consolidating an alumni network in Europe.



### ■ Technology Partnership of Nagoya University Inc. (North Carolina, USA)

Headquartered close to the Research Triangle Park (RTP) in North Carolina as a registered nonprofit organization, its mission is to promote and support technology transfers between Japan and the US.

### ■ Research and Education Centers for Japanese Law

These Centers cooperate with local universities in transitional countries in Asia to provide education in Japanese language and Japanese law. Currently, five centers have been established as bases for information exchange and joint research between Japan and the respective host country:

- Uzbekistan: Tashkent State Institute of Law (Center founded Sep. 2005)
- Mongolia: National University of Mongolia, School of Law (Center founded Sep. 2006)
- Vietnam: Hanoi Law University (Center founded Sep. 2007)
- Vietnam: Ho Chi Minh City University of law (Center founded Jan.2012)
- Cambodia: Royal University of Law and Economics (Center founded Sep. 2008)

<http://cjl.law.nagoya-u.ac.jp/content/en/>

### ■ Field Research Center (Ulaanbaatar, Mongolia)

The Nagoya University Field Research Center was established in September, 2009 within the Mongolian University of Science and Technology. The Center is expected to further encourage our active collaborations and exchanges by promoting more effective research.



# Academic Consortium AC21

## The Global University — Architect of the New Century



The Academic Consortium for the 21st Century (AC21) was established on June 24, 2002 at the International Forum 2002 hosted by Nagoya University, Japan, as an international network comprised of educational, research and industrial organizations throughout the world. The Forum brought together the presidents and high-ranking delegations from twenty-five of the world's leading education and research institutions, and resulted in the founding of a new and vigorous global partnership in higher education, "Academic Consortium AC21."

### AC21 Member Institutions

As of March 2011

<b>Australia</b> <ul style="list-style-type: none"> <li>• University of Adelaide</li> <li>• University of Sydney</li> </ul>	<b>France</b> <ul style="list-style-type: none"> <li>• University of Strasbourg</li> </ul>	<b>Japan</b> <ul style="list-style-type: none"> <li>• Nagoya University</li> </ul>	<b>Thailand</b> <ul style="list-style-type: none"> <li>• Chulalongkorn University</li> <li>• Kasetsart University</li> </ul>
<b>China</b> <ul style="list-style-type: none"> <li>• Huazhong University of Science and Technology</li> <li>• Jilin University</li> <li>• Nanjing University</li> <li>• Northeastern University</li> <li>• Peking University</li> <li>• Shanghai Jiao Tong University</li> <li>• Tongji University</li> </ul>	<b>Germany</b> <ul style="list-style-type: none"> <li>• Chemnitz University of Technology</li> <li>• University of Freiburg</li> </ul>	<b>Laos</b> <ul style="list-style-type: none"> <li>• National University of Laos</li> </ul>	<b>USA</b> <ul style="list-style-type: none"> <li>• North Carolina State University</li> <li>• University of Minnesota</li> </ul>
	<b>Indonesia</b> <ul style="list-style-type: none"> <li>• Gadjah Mada University</li> </ul>	<b>South Africa</b> <ul style="list-style-type: none"> <li>• Stellenbosch University</li> </ul>	

### AC21 Activities

AC21 considers itself a dynamic consortium. It supports its mission and fosters collaboration amongst members through the following forums, activities and projects.



#### ✓ Collaboration in Research & Education

##### —International Forums

Held every two years, international forums provide members with the opportunity to reassess the role of higher education in society through keynote addresses by prominent public figures, presentations and panel discussions.

##### —Research Projects

Support for research networking among AC21 members is offered through the provision of funding and resources, which aim at developing and sustaining collaborative projects. The AC21 Special Project Fund (ACSPF), launched in 2009, endeavors to promote research and educational exchanges between member institutions.

##### —Workshops

#### ✓ Initiatives for Students

##### —Student World Forums

Biennial conferences at which students from member institutions are invited to exchange ideas on issues of international concern. The conferences facilitate international friendship, encourage students to develop a global mindset, and strengthen the AC21 network.

#### ✓ Industry-Academia-Government Collaboration

AC21, taking advantage of its international network, seeks to facilitate collaboration between academia, industry and government at the global level.

### 4th AC21 Student World Forum

The 4th AC21 Student World Forum (SWF) was held between May 15th and 21st, 2011, and hosted by Chulalongkorn University (Thailand), with the theme "Sustainable Rural Development". This biennial forum is one of the core activities of AC21. A total of 63 students attended the forum, from 16 AC21 member institutions in 9 countries.

At the official Opening Ceremony of the SWF, students were able to hear opening comments from Professor Pirom Kamolratanakul, President of Chulalongkorn University, and Professor Yoshihito Watanabe, Vice-President of Nagoya University and the Director of AC21 General Secretariat, whose comments focused on the value of participating in student-focused international events and the contribution this can make to a well-rounded and comprehensive education. A lecture entitled "The Role of Universities and Their Networks for Sustainable Development" by Associate Professor Akiyoshi Yonezawa from Nagoya University was also delivered during the ceremony.

After the ceremony, students departed for the lush countryside of Petchaburi Province, three hours south of bustling Bangkok, to study at the Huay Sai Royal Development Study Center. Students heard lectures and participated in hands-on agricultural fieldwork in the areas of "Soil Rehabilitation", "Water Distribution", "Reforestation" and "Sufficiency Economy". A highlight of the fieldwork for many students was the chance to meet local farmers and learn the successes of a "diversified farm" and direct benefits of a sufficiency economy from a firsthand source.

Returning to Bangkok, three keynote speeches were delivered to students at Chulalongkorn Campus. The speeches focused on various themes, and were given by Ms. Kamolinee Suksriwong from the Office of the Royal Development Projects Board, Associate Professor Thavivonse Sriburi from Chulalongkorn University, and Associate Professor Jun Murase from Nagoya University. After the speeches, students were treated to a luxurious buffet dinner cruise down the Chopraya River. Students were able to relax, sing and dance as they sailed past famous historical sites, beautifully illuminated along the river's edge, sharing in the success of their presentations and the weeklong activities.

The final day was spent touring the exquisitely preserved Grand Palace grounds and the Royal Monastery of the Emerald Buddha (a national treasure), as well as a tour through the National Discovery Museum Institute's "Museum of Siam", for a comprehensive look at Thai history and culture through the ages. It seemed very difficult for the students to say goodbye after their week together, and it is certain that they will nurture their special bonds of friendship for many years to come.





# Our Partner Institutions

As of Nov. 1, 2011

## Academic Exchange Agreements

- = Inter-University Agreement
- = Inter-School Agreement

### Asia

#### BANGLADESH

- Bangladesh Agricultural University
- Bangladesh University of Engineering and Technology
- University of Dhaka
- SAARC Meteorological Research Centre

#### BHUTAN

- The Centre for Bhutan Studies

#### CAMBODIA

- Royal University of Law and Economics
- The Royal University of Agriculture
- Royal University of Phnom Penh

#### CHINA

- Nanjing University
- Central South University
- Jilin University
- Huazhong University of Science and Technology
- Beijing University of Technology
- Chinese Academy of Sciences, Purple Mountain Observatory
- Chengdu Institute of Geology and Mineral Resources
- Chengdu University of Technology
- Tsinghua University
- Chinese Academy of Sciences, National Astronomical Observatories
- China University of Political Science and Law
- East China Normal University
- Peking University
- Fudan University
- Xi'an Jiaotong University
- Chinese Academy of Social Sciences, Institute of Literature and Institute of Literature of National Minorities
- Zhejiang University
- China National School of Administration
- East China University of Political Science and Law

- Chinese Academy of Sciences, Institute of High Energy Physics
- Shanghai Jiao Tong University
- Tongji University
- Northeastern University
- Harbin Institute of Technology
- Beijing International Studies University
- Nanjing University of Aeronautics and Astronautics
- University of Science and Technology of China
- Jiangsu Provincial Academy of Social Sciences (JSASS)
- Chinese Academy of Sciences, Shanghai Institute of Organic Chemistry
- Chinese Academy of Sciences, Institute of Process Engineering
- Polar Research Institute of China
- Southwest Jiaotong University
- Beijing Institute of Technology
- Chinese Academy of Sciences, Research Center for Eco-Environmental Sciences
- Tianjin University
- Chinese Academy of Social Sciences, Institute of Population and Labor Economics
- University of International Business and Economics
- Chinese Academy of Sciences, Xinjiang Institute of Ecology and Geography
- Chinese Academy of Sciences, Shanghai Institute of Ceramics
- Hainan University
- The Chinese University of Hong Kong
- The University of Hong Kong
- The Hong Kong University of Science and Technology
- Renmin University of China
- Shenyang University of Technology
- Sun Yat-sen University, Lingnan College
- Ministry of Health, P.R.China, China-Japan Friendship Hospital

#### INDIA

- University of Pune
- Tata Institute of Fundamental Research
- Indian Institute of Technology, Madras
- Indian Institute of Science, Bangalore
- Indian Institute of Technology, Delhi

#### INDONESIA

- Indonesian National Institute of Aeronautics and Space

- Gadjah Mada University
- The State University of Surabaya
- Universitas Padjadjaran
- Syiah Kuala University
- Diponegoro University
- Agency for the Assessment and Application of Technology (BPPT)
- Institut Teknologi Bandung
- University of Indonesia

#### REPUBLIC OF KOREA

- Korean Research Institute of Standards and Science, Astronomy Observatory
- Korea University
- Chungnam National University
- Mokpo National University
- Gyeongsang National University
- Korea Maritime University
- Ewha Womans University
- Korea Institute for Advanced Study
- Hanyang University
- Seoul National University
- Kyungnam University
- Sungkyunkwan University
- Korea Legislation Research Institute
- Pukyong National University
- Pusan National University
- Hankuk University of Foreign Studies
- Kyung Hee University
- Chonnam National University
- University of Seoul
- Yonsei University
- Chonbuk National University
- Korea Institute of Geoscience and Mineral Resources
- Kyungpook National University
- Institute of Sunchang Fermented Soybean Products
- Pohang University of Science and Technology

#### LAOS

- National University of Laos
- National Agriculture and Forestry Research Institute, Lao P.D.R.

#### MALAYSIA

- MARA University of Technology

#### MONGOLIA

- Health Sciences University of Mongolia
- National University of Mongolia
- Mineral Resources and Petroleum Authority of Mongolia
- National Legal Center of Mongolia
- Mongolian University of Sciences and Technology
- Mongolian Academy of Sciences, Institute of Geography
- Mongolian Academy of Sciences, Institute of Philosophy, Sociology and Law

#### NEPAL

- Kathmandu University

#### PHILIPPINES

- University of the Philippines, Los Baños
- University of the Philippines, Diliman

#### THAILAND

- Kasetsart University
- Chulalongkorn University
- Chulabhorn Research Institute/ Chulabhorn Graduate Institute
- King Mongkut's University of Technology North Bangkok

#### VIETNAM

- Vietnam Institute of State and Law
- Hanoi Law University
- Ho Chi Minh City University of Law
- Hanoi University of Technology
- Vietnamese Academy of Science and Technology, Ho Chi Minh City Institute of Resources Geography
- Vietnam National University, Ho Chi Minh City
- Foreign Trade University

#### TAIWAN

- National Chengchi University
- National Taiwan Normal University
- Soochow University
- National Chung Cheng University
- National Taiwan University
- National Tsing Hua University

### Pacific

#### AUSTRALIA

- The University of Sydney
- Flinders University
- University of South Australia
- The University of Adelaide
- Monash University
- The University of Melbourne
- The Australian National University
- Commonwealth Scientific and Industrial Research Organisation

#### NEW ZEALAND

- National Institute of Water and Atmospheric Research
- University of Auckland
- University of Canterbury

### Europe

#### ARMENIA

- Yerevan Physics Institute

#### AUSTRIA

- Johannes Kepler University Linz
- The Medical University of Vienna

#### BELGIUM

- Institut Supérieur de Traducteurs et Interprètes

#### BULGARIA

- Sofia University
- Bulgarian Academy of Sciences, Space Research Institute, Space Astronomy Division
- Bulgarian Academy of Sciences, Institute of Electronics
- Bulgarian Academy of Sciences, Institute of Mathematics

#### DENMARK

- University of Copenhagen

#### FINLAND

- Finnish Meteorological Institute

### FRANCE

- Université Stendhal (Université de Grenoble 3)
- Université de Paris-Sorbonne, Paris 4
- Ecole Nationale des Ponts et Chaussées (ENPC)
- Université Jean Moulin-Lyon 3
- Ecole Normale Supérieure, Lettres et Sciences Humaines
- Université Paris Diderot - Paris 7
- Université Joseph Fourier (Université de Grenoble 1)
- Université Pierre-Mendès-France (Université de Grenoble 2)
- Grenoble Institute of Technology (Université de Grenoble 4)
- Université de Strasbourg
- Université Panthéon Assas, Paris 2
- Université Paul Cézanne, Aix-Marseille 3
- Université Paris-Est
- Ecole Normale Supérieure de Lyon
- Université de Provence, Aix-Marseille 1
- Ecole Nationale Supérieure d'Architecture Paris Val-de-Seine

### GERMANY

- Albert-Ludwigs-Universität Freiburg
- Technische Universität Carolo-Wilhelmina zu Braunschweig
- Universität zu Köln
- Technische Universität München
- Johannes Gutenberg-Universität Mainz
- Deutsches Zentrum für Luft- und Raumfahrt
- Universität Ulm
- Technische Universität Chemnitz
- RWTH Aachen
- Universität Regensburg
- WWU Münster
- Ruhr-Universität Bochum
- Technische Universität Kaiserslautern
- Freie Universität Berlin
- Wissenschaftszentrum Ost- und Südosteuropa Regensburg
- Technische Universität Darmstadt
- Ruhr-Universität Bochum
- Universität Duisburg-Essen



### HUNGARY

- o Hungarian Academy of Sciences, Institute for Legal Studies

### ITALY

- National Institute of Nuclear Physics (INFN)
- University of Catania
- University of Bologna

### KAZAKHSTAN

- o Kazakh Humanitarian Law University
- o Legislation Research Institute, Republic of Kazakhstan

### LATVIA

- o Latvian State University

### NETHERLANDS

- o Wageningen University
- o Free University of Amsterdam

### NORWAY

- o University of Oslo
- o University of Tromso

### POLAND

- o Medical University of Gdańsk
- o Warsaw University of Technology
- University of Warsaw
- o Polish Academy of Sciences, Institute of Geological Sciences, Krakow Research Centre

### RUSSIA

- o Institute of Theoretical and Experimental Physics
- o Ministry of Health of Russia, Institute of Biomedical Problems
- o Lomonosov Moscow State University
- o Russian Academy of Sciences, Siberian Division, Institute of Cytology and Genetics
- o Moscow State Engineering and Physics Institute (Technical University-MEPH)
- o Russian Academy of Sciences, Institute of Computer Aided Design
- o Russian Academy of Sciences, Far Eastern Branch, Institute of Cosmophysical Research and Radiowave Propagation (IKIR)
- o Russian Academy of Sciences, Siberian Division, Institute of Solar-Terrestrial Physics (ISTP)

### SPAIN

- o University of Barcelona

### SWEDEN

- o Swedish Institute of Space Physics
- o University of Lund
- Uppsala University
- Royal Institute of Technology

### SWITZERLAND

- o University of Bern
- University of Geneva

### U.K.

- The University of Sheffield
- The University of Warwick
- o The University of Nottingham
- o University of East Anglia
- o The University of Manchester
- University of Bristol
- o University of Leicester
- o The University of Oxford
- University of London, School of Oriental and African Studies (SOAS)

### UKRAINE

- o Ukrainian SSR Academy of Sciences, Institute of Theoretical Physics

### UZBEKISTAN

- o Samarkand State University
- University of World Economy and Diplomacy
- Tashkent State Institute of Law

### North America

#### CANADA

- o Carleton University
- The University of Toronto
- o University of Victoria
- York University
- o University of Ottawa

#### USA

- Oberlin College

- o University of Michigan
- University of California, Los Angeles
- o University of Houston
- North Carolina State University
- Harvard-Yenching Institute
- University of Cincinnati
- o University of California, Berkeley
- The University of North Carolina at Chapel Hill
- o University of Alaska Fairbanks
- o National Oceanic and Atmospheric Administration
- o Massachusetts Institute of Technology, Haystack Observatory
- o Harvard Medical School
- o Tulane University
- o University of Pennsylvania
- o University of California, San Diego
- o Colorado School of Mines
- St. Olaf College
- Southern Illinois University, Carbondale
- University of Illinois at Urbana-Champaign
- University of Kentucky
- New York University
- o Duke University
- o Johns Hopkins University
- o University of Wisconsin Law School
- o University of Maryland
- o University of Washington
- o Northwestern University
- o The University of Texas
- The University of Chicago
- o Green Mountain College
- o Michigan State University
- o UC Santa Barbara
- University of Minnesota
- o University of Pittsburgh

### Latin America and the Caribbean

#### ARGENTINE

- o National University of Rosario
- o Luis F. Leloir, Campomar Foundation, The Research Institute of Biochemistry

### BOLIVIA

- o Universidad Mayor de San Andres, La Paz

### BRAZIL

- o Ministry of Science and Technology, National Institute for Space Research
- o Fundacao Joaquim Nabuco
- Universidade de Brasilia - UnB
- Universidade de São Paulo

### GUATEMALA

- o Del Valle de Guatemala University

### MEXICO

- o Universidad de Sonora

### Middle East

#### TURKEY

- o Bilkent University

### Africa

#### EGYPT

- o Tanta University
- o Cairo University

#### GHANA

- o University of Ghana

#### KENYA

- o University of Nairobi

- o African Institute for Capacity Development (AICAD)

### SOUTH AFRICA

- o South African Astronomical Observatory

### Others (International Organization)

- Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)
- European Organization for Nuclear Research (CERN)

### Agreements for Industry-University Collaboration

#### Europe

##### U.K.

- o The University of Warwick

#### North America

##### USA

- o North Carolina State University

### Agreements for International Joint Research

#### Asia

##### REPUBLIC OF KOREA

- o Sungkyunkwan University

#### Pacific

##### AUSTRALIA

- o The University of New South Wales

#### Europe

##### GERMANY

- o Ruhr-Universität Bochum

#### North America

##### USA

- o The University of Texas at Dallas

### Others (International Organization)

- o The Ministry of Science and Technology of Brazil
- o The National Institute of Space Research (INPE)
- o The Japan Aerospace Exploration Agency (JAXA), Institute of Space and Astronautical Science (ISAS)

### International Networks

- Academic Consortium 21 (AC21)
- International Forum of Public Universities (IFPU)
- Collège doctoral franco-japonais
- University Mobility in Asia and the Pacific (UMAP)
- OpenCourseWare Consortium
- The G8 University Summit
- Canada-Japan Strategic Student Exchange Program



## Academic Charter of Nagoya University

Appreciating the intrinsic role and historical and social mission of universities, Nagoya University, as a seat of learning, hereby defines its fundamental principles of scholarly activity.

Nagoya University maintains a free and vibrant academic culture with the mission of contributing to the well-being and happiness of humankind through research and education in all aspects of human beings, society, and nature. In particular, it aspires to foster the harmonious development of human nature and science, and to conduct highly advanced research and education that overlook the broad sweep of humanities, social and natural sciences. Towards this goal, Nagoya University endeavours to implement a variety of measures based on the fundamental objectives and policies outlined below, and to unremittingly carry out its responsibilities as a pivotal university.



### 1 | Fundamental Objectives: Research and Education

- 1** Nagoya University, through creative research activity, shall pursue the truth and produce results of scholastic distinction on the international stage.
- 2** Nagoya University, through an education that values initiative, shall cultivate courageous intellectuals endowed with powers of rational thought and creativity.

### 2 | Fundamental Objectives: Contribution to Society

- 1** Nagoya University, in spearheading scientific research, and through the cultivation of human resources capable of exercising leadership both in the domestic and international arenas, shall contribute to the welfare of humanity and the development of culture, as well as to global industry.
- 2** Nagoya University shall put to good use the special characteristics of the local community and, through multi-faceted research activities, contribute to the development of the region.
- 3** Nagoya University shall promote international academic co-operation and the education of foreign students, and contribute to international exchange, especially with Asian nations.

### 3 | Fundamental Policies: Research and Education System

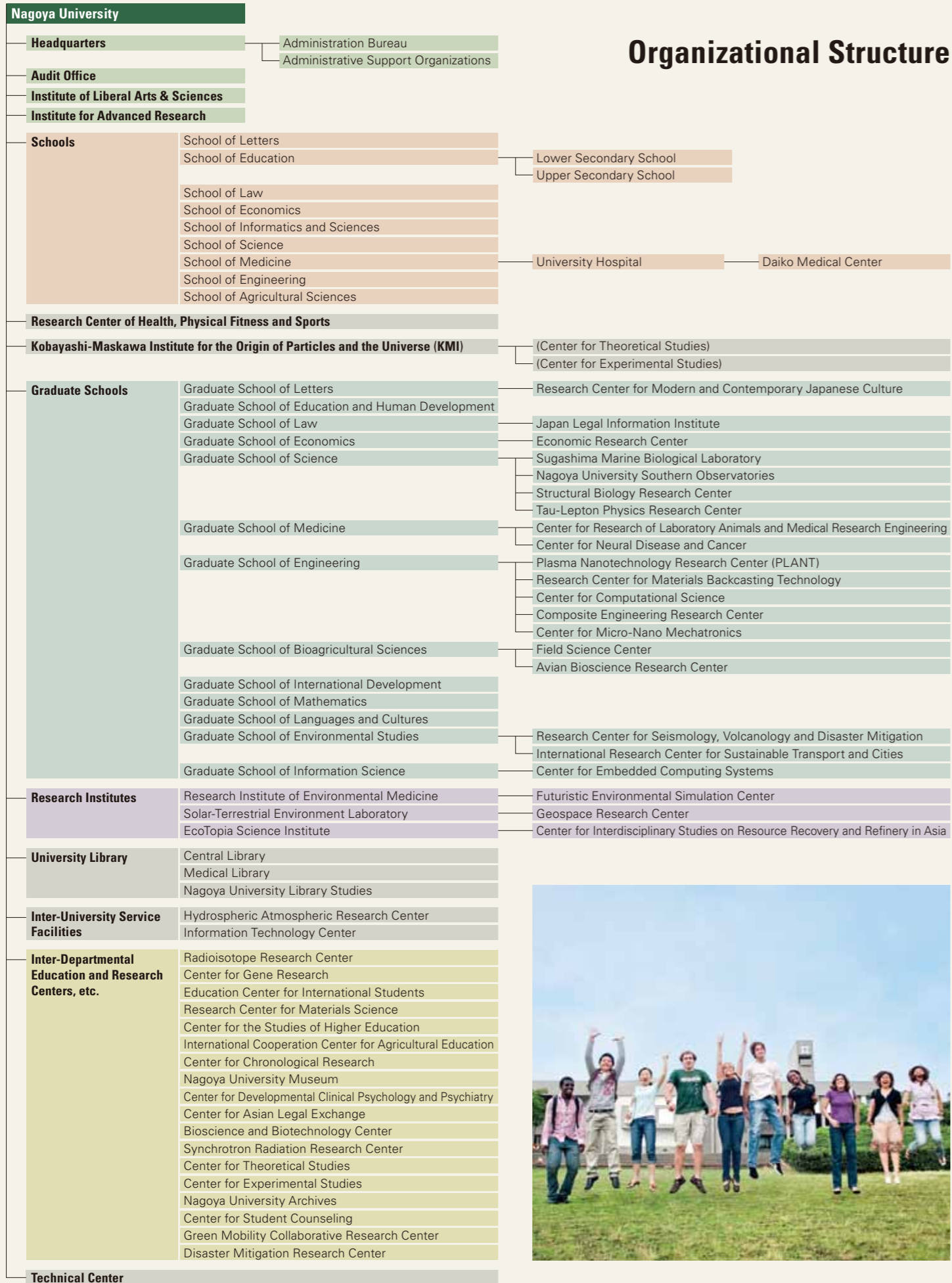
- 1** Nagoya University shall study the various phenomena of the humanities, society and nature from an all-inclusive viewpoint, respond to contemporary issues, and adjust and enrich its education system to generate a new sense of values and body of knowledge founded on humanity.
- 2** Nagoya University shall provide for an education system that rightly inherits and develops intellectual resources cultivated in the world's intellectual traditions, and promote educational activity that is both advanced and innovative.
- 3** Nagoya University, through the active dispatch of information and exchange of personnel, and interinstitutional co-operation in Japan and abroad, shall shape the international foundation of academic culture.

### 4 | Fundamental Policies: University Administration

- 1** Nagoya University shall at all times support scientific enquiry based on the autonomy and initiative of its members, and guarantee freedom of academic research.
- 2** Nagoya University shall require its members to participate in the drafting and implementation of both ideals and objectives related to research and education, as well as administrative principles.
- 3** Nagoya University, in addition to promoting autonomous assessment and evaluation from its members with regard to research, education and administrative activity, shall actively seek critical appraisal from external authorities, and aspire to be an accessible university.

\*This is a provisional translation and subject to change.





## Staff

As of November 1, 2011

Members of the Board of Trustees		
President		1
Trustees		7
Auditors		2
Staff (Full-time)		
Faculty	Professors	667 ( 32)*1
	Associate Professors	515 ( 57)
	Associate Professors / Lecturers	112 ( 60)
	Assistant Professors	436 ( 226)
	Research Associates	9
	Researchers	0 ( 152)
	School Teachers at Affiliated Schools	38
	Administrative / Technical Staff*2	1,456 ( 560)
<b>Total</b>		<b>3,243 (1,087)</b>

\*1 Data in parenthesis show the number of staff under limited-time contracts.  
\*2 Data include medical staff of the University Hospital.

## International Students by School

As of November 1, 2011

School / Graduate School	Number of Students
Letters	149
Education	82
Law	154
Economics	137
Informatics and Sciences	17
Science	74
Medicine	104
Engineering	412
Agricultural Sciences	63
International Development	182
Mathematics	9
Languages and Cultures	137
Environmental Studies	126
Information Science	74
Education Center for International Students	28
Others	1
<b>Total</b>	<b>1,749</b>

## Student Enrollment

As of November 1, 2011

Name of Schools / Graduate Schools	Undergraduate Courses		Graduate Courses		Total
	Degree seeking	Non-degree seeking	Degree seeking	Non-degree seeking	
Letters	598	70	283	14	965
Education	325	47	230	18	620
Law	694	21	358	72	1,145
Economics	939	27	160	10	1,136
Informatics and Sciences	342	13	-	-	355
Science	1,211	16	578	9	1,814
Medicine	1,523	66	888	33	2,510
Engineering	3,394	65	1,635	27	5,121
Agricultural Sciences	748	14	451	12	1,225
International Development	-	-	292	34	326
Mathematics	-	-	179	4	183
Languages and Cultures	-	-	209	52	261
Environmental Studies	-	-	530	21	551
Information Science	-	-	377	15	392
Human Informatics	-	-	1	-	1
Others	-	34	-	-	34
<b>Total</b>	<b>9,774</b>	<b>373</b>	<b>6,171</b>	<b>321</b>	<b>16,639</b>





# Campus Map

## Higashiyama Campus



### Open Facilities

- B3 2 NU Library (Central Library)
- B5 2 NU Museum Botanical Garden
- C4 6 Information
- D4 1 NU Museum (Furukawa Hall)
- D4 2 Information Plaza
- C2 4 Nobel Laureates Gallery (E & S Building)
- B2 6 Akasaki Institute
- D2 10 Chemistry Gallery (Noyori Materials Science Laboratory)

### International Conference Venues

- D3 6 Toyoda Auditorium / Symposion
- E3 1 Noyori Conference Hall
- B4 6 Integrated Research Bldg. for Humanities & Social Sciences
- C4 6 Conference Hall (Law & Economics Shared Facilities Bldg.)
- D2 7 Sakata & Hirata Hall (Science South Building)
- C2 4 E & S Hall (E & S Building)
- C3 1 Lecture Hall (IB Building)

### University Headquarters: Administrative Services

- B3 7 University Headquarters Building 1
- D4 4 University Headquarters Building 2
- E4 1 University Headquarters Building 3
- D4 3 University Headquarters Building 4
- D1 2 University Headquarters Annex
- C4 1 Graduate School of International Development Building
- C5 1 Education Center for International Students (ECIS)

### Schools / Graduate Schools: Administrative Services

- B4 6 Administrative Office, Humanities & Social Sciences
- B4 1 Administrative Office, Informatics & Sciences / Information Science
- D2 11 Administrative Office, Science / Mathematics
- C2 4 Administrative Office (General Affairs & Accounting), Engineering
- C3 1 Administrative Office (Educational Affairs), Engineering
- E2 1 Admin. Office, Agricultural Sciences / Bioagricultural Sciences
- D2 2 Admin. Office, Environmental Studies / Hydrospheric Atmospheric Research Ctr.
- F3 3 Administrative Office, Research Institutes
- B3 2 Administrative Office, NU Library

### Institute of Liberal Arts & Sciences

- B4 1 Liberal Arts & Sciences Main Building
- A4 1 Liberal Arts & Sciences Building A

### Institute for Advanced Research

- F3 2 Institute for Advanced Research Hall

### School of Letters / Graduate School of Letters

- B4 6 School of Letters / Graduate School of Letters Building

### School of Education / Graduate School of Education & Human Development

- School of Education / Graduate School of Education & Human Development Bldg.
- B4 6
- A2 1 Affiliated Upper & Lower Secondary Schools

### School of Law / Graduate School of Law

- C4 6 School of Law / Graduate School of Law (Law & Economics Shared Facilities Bldg.)
- B5 6 Law School

### School of Economics / Graduate School of Economics

- School of Economics / Graduate School of Economics (Law & Economics Shared Facilities Bldg.)
- C4 2

### School of Informatics & Sciences

- A4 6 Graduate School of Information Science Building
- B4 1 Liberal Arts & Sciences Main Building

### School of Science / Graduate School of Science

- D3 2 Building A
- D3 3 Building B
- D2 11 Building C
- D2 9 Building D
- D2 6 Building E
- D2 4 Building F
- D2 9 Building G
- C3 4 Shared Facilities Building
- D2 1 Ultra High Pressure Laboratory
- D2 6 Science & Agricultural Building
- D2 7 Science South Building
- D2 6 Science Hall
- D3 1 Facilities for Low Temperature Research

### School of Engineering / Graduate School of Engineering

- C2 4 Central Bldg. of Graduate School of Engineering (E & S Bldg.)
- C3 1 IB Building (Integrated Building)
- B2 6 Building 1
- B3 3 Building 2
- B3 1 Building 3
- C2 6 Building 5
- F2 1 Building 6
- C2 1 Building 7, A Wing
- C2 2 Building 7, B Wing
- C1 3 Building 8, North Wing
- C1 4 Building 8, South Wing
- C1 2 Building 9
- B2 2 Mechanical & Aerospace Engineering Laboratory
- B2 7 Mechanical Engineering Laboratory
- C3 1 Creation Plaza (IB Building)

### School of Agricultural Sciences / Graduate School of Bioagricultural Sciences

- E1 1 Building A
- E2 6 Building B
- E2 4 Lecture Building
- E2 1 Administration Building
- D2 6 Science & Agricultural Building

### Graduate School of International Development

- C4 1 Graduate School of International Development Building

### Graduate School of Mathematics

- D3 4 Graduate School of Mathematics Building

### Graduate School of Languages & Cultures

- A4 2 Graduate School of Languages & Cultures Building
- B4 1 Liberal Arts & Sciences Main Building
- B4 6 Integrated Research Bldg. for Humanities & Social Sciences

### Graduate School of Environmental Studies

- D2 2 Environmental Studies Hall
- B4 1 Liberal Arts & Sciences Main Building
- C2 4 Graduate School of Environmental Studies (E & S Bldg.)
- D2 6 School of Science / Graduate School of Science, Building E
- F3 1 Hydrospheric Atmospheric Research Center

### Graduate School of Information Science

- A4 6 Graduate School of Information Science Building
- B4 1 Liberal Arts & Sciences Main Building
- C3 1 IB Building (Integrated Building)

### Research Center of Health, Physical Fitness & Sports

- E5 1 Research Center of Health, Physical Fitness & Sports
- C3 6 Health Administration Office

### Kobayashi-Maskawa Institute for the Origin of Particles & the Universe (KMI)

- C2 4 Center for Theoretical Studies (E & S Building)
- C2 4 Center for Experimental Studies (E & S Building)

### Research Institutes / Inter-University Service Facilities

- E3 2 Research Institute of Environmental Medicine
- E4 3 Cosmic Ray Observatory (STEL)
- F3 3 Solar-Terrestrial Environment Laboratory (STEL)
- F3 3 EcoTopia Science Institute
- F3 1 Hydrospheric Atmospheric Research Center
- C3 2 Information Technology Center

### Inter-Departmental Education & Research Centers / Other Facilities

- D1 2 NU Archives (University Headquarters Annex)
- D1 2 Office for Gender Equality
- D4 1 Center for Chronological Research
- B4 6 Center for Developmental Clinical Psychology & Psychiatry
- B4 4 Center for the Studies of Higher Education
- D2 2 Disaster Management Office
- D2 4 Center for Gene Research
- C1 1 Synchrotron Radiation Research Center
- C2 2 Center for Student Counseling
- C2 2 Information Media Center Laboratory
- C3 1 ECIS Advising & Counseling Services (IB Building)
- B2 1 Research Facility for Advanced Energy Conversion, West Building
- B2 6 Akasaki Research Center
- C1 1 Research Facility for Advanced Science & Technology
- C5 1 Education Center for International Students (ECIS)
- C5 1 Center for Asian Legal Exchange
- D1 1 High Voltage Electron Microscope Laboratory
- D2 10 Research Center for Materials Science
- E2 2 Bioscience & Biotechnology Center
- E2 6 Radioisotope Research Center
- F3 6 International Cooperation Center for Agricultural Education
- F3 6 Research Laboratory Building

### Industry-Academia-Government Cooperation Facilities

- B2 3 Incubation Facility
- B2 4 Venture Business Laboratory
- B2 6 Headquarters for Industry, Academia & Government Cooperation (Akasaki Institute)
- F3 4 Materials Research Laboratory for Green Vehicle

### Sports Facilities

- B5 1 Gymnasium / Indoor Swimming Pool
- E4 4 Tennis Courts
- E5 2 New Gymnasium
- F4 1 Extra Curricular Athletic Activity Shared Facilities
- F4 2 Training Camp Facility
- F4 3 Athletic Field
- F4 4 Softball Tennis Courts
- F5 1 Student Activities Complex Administration Building
- F5 2 Baseball Field

### Cafeterias / Shops

- B3 2 STARBUCKS COFFEE
- D3 6 Restaurant UNIVERSAL CLUB
- B4 1 PRANZO
- B4 1 PHONON CAFE ROOM
- D2 5 Craig's Cafe SEATTLE ESPRESSO
- C2 2 Cafeteria NANAMI-TEI
- C2 4 Restaurant Chez Jiroud
- C3 1 IB Café
- F3 3 NU CO-OP Shop (Inter-Departmental Education & Research Facilities, Bldg. 1)
- B2 6 NU CO-OP North - Cafeterias & Shops
- B4 2 Family Mart
- B5 3 South Cafeteria
- B5 4 NU CO-OP South - Cafeterias & Shops
- B5 5 Amenity House
- D1 6 FOREST Books & Café
- D1 4 Green Salon Higashiyama
- D3 6 Staff Hall

### Other

- B1 1 Student Hall
- C3 3 Health Administration Office
- C5 2 NU Yakumo Hall
- E4 2 International Residence Higashiyama
- F2 2 Researchers Village Higashiyama
- Cafeterias and Shops
- Post Office
- Subway
- Bus Stop
- Automated External Defibrillator
- Car Entrance



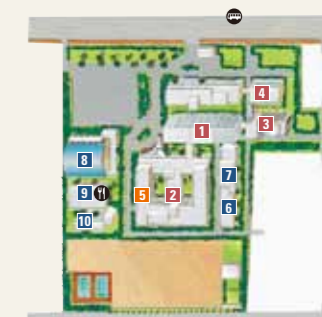
## Tsurumai Campus



- 1 Medical Science Research Building 1
- 2 Medical Science Research Building 2
- 3 Medical Library
- 4 Center for Promotion of Medical Research and Education
- 5 Basic Medical Research Building
- 6 Basic Medical Research Building Annex
- 7 Human Anatomy Laboratory
- 8 Ward Building
- 9 Central Consultation Building
- 10 Outpatient Building
- 11 Radioisotope Research Center
- 12 Energy Center
- 13 Kakuyu Kaikan (Alumni Hall)
- 14 Student Facility

- 11 Cafeteria
- Post Office
- Bus Stop

## Daiko Campus



- 1 School of Health Science - Main Building
- 2 School of Health Science - South Building
- 3 School of Health Science - East Building
- 4 Annex to School of Health Science
- 5 Daiko Medical Center
- 6 Annex to Radioisotope Laboratory
- 7 Gymnasium
- 8 Student Hall
- 9 Researchers Village Daiko

- 11 Cafeteria
- Bus Stop



# Access



**To Higashiyama Campus** From Nagoya Station: Take the Subway Higashiyama Line to Motoyama Sta. (15 minutes), then transfer to the Subway Meijo Line to Nagoya Daigaku Sta. Higashiyama Campus is just off the subway exit.

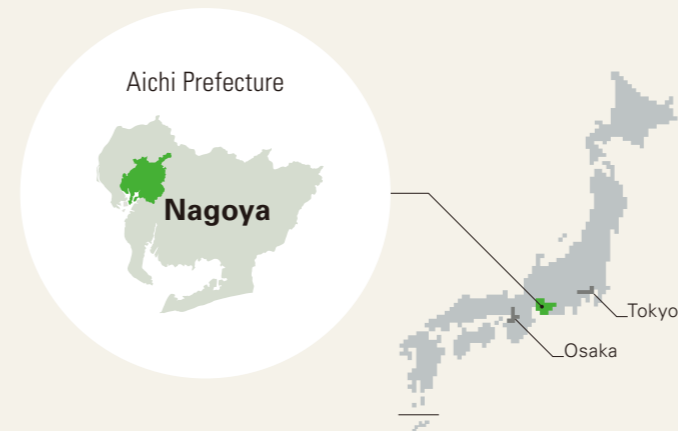
From Centrair (Central Japan International Airport): Take the Meitetsu Line to Kanayama Sta. (30 min.), then transfer to the Subway Meijo Line to Nagoya Daigaku Sta. (21 min.).

**To Tsurumai Campus** From Nagoya Station: Take the JR Chuo Line (bound for Tajimi) to Tsurumai Sta. (6 min.), then walk 5 min.

**To Daiko Campus** From Nagoya Station: Take the Subway Higashiyama Line to Sakae Sta. (5 min.), transfer to the Subway Meijo Line to Nagoya Dome-mae Yada Sta. (12 min.), then walk 5 min.

**To Nagoya Station** From Centrair (Central Japan International Airport): Take the Meitetsu Line (30 min.) or the airport bus (60 min.).  
 From Tokyo Station: Take the Shinkansen (103 min.).  
 From Shin-Osaka Station: Take the Shinkansen (52 min.).

# The City of Nagoya



Located in the heart of Japan, the Chubu region has played a central role in Japan's history and has long enjoyed a flourishing culture and economy. The area is well known as the home of Oda Nobunaga, Toyotomi Hideyoshi and Tokugawa Ieyasu, the three leaders who unified Japan over 400 years ago, bringing an end to the "Period of Warring States." Nagoya Castle, originally built by Tokugawa Ieyasu and famous for the pair of golden dolphins on top of its donjon, serves as the region's landmark.

Today, this vibrant metropolis occupies an important place in Japan's political and economic spheres. With a population of 2.2 million, Nagoya is the nerve center of the Chubu Industrial Zone, a merger of both traditional and modern industries, most notably the automotive industry. Nagoya offers a variety of urban conveniences, with shops, restaurants and leisure activities that cater to any taste, making it an exciting place to live, work and study.



JR Central Towers



Nagoya Castle



Nagoya Noh Theater



Arimatsu Shibori Matsuri (festival)



Nagoya City Archives



The Golden Dolphin



Nagoya Congress Center



Nagoya Port Triton



Nagoya City Art Museum



OASIS 21