MISSION STATEMENT

Tohoku University has been committed to the “Research First” principle and “Open Door” policy since its foundation, and is internationally recognized for its outstanding standards in education and research. The university contributes to world peace and equity by using the research results in solving societal problems, and educating human resources in leadership skills.

HISTORY

Tohoku University, formerly known as the Tohoku Imperial University, was founded in 1907. From its start, it displayed to the world an unswerving commitment to an “Open Door” policy. Departing from the norms of other imperial universities, it accepted graduates from technical schools and higher normal schools, and despite opposition from the government at that time, became Japan’s First University to admit female students in 1913 (admitting three in that year).

At the time of its founding, Tohoku University was able to attract a group of young and brilliant researchers who had trained around the world to serve on its faculty. For this reason, a “Research First” principle was established, calling upon scholars to not only pursue highly productive research but to also put their findings to work in the teaching of their students. In addition to this, Tohoku University has nurtured a tradition of “Practice Oriented Research and Education,” in which the results of cutting edge research are being put to use for the good of society and the improvement of living standards. Evidence of our pioneering practice includes the establishment of local venture businesses which have contributed to regional industry, and our status as the nation’s center for research on family law; the domestic branch of law which is closely associated with our daily lives.

Although Tohoku University was severely damaged in the wake of the Great East Japan Earthquake on March 11, 2011, great efforts have been made to restore the basic educational and research functions of our university, and with the traditions, the spirit of Tohoku University as its foundation, we will work toward the reconstruction of the Tohoku region and the regeneration of Japan.
Ever since Tohoku University was established in 1907, our philosophy has always been to put “Research-First,” to maintain an “Open-Door” Policy, and to emphasize “Practice-Oriented Research and Education.” With these principles, the University has historically served its charter role as a premier research-oriented educational institution of higher learning. Tohoku University’s Annual Review lists and describes the major achievements of the 2012 academic year.

Two years have passed already since the catastrophe of the March 11, 2011 Great East Japan Earthquake. Tohoku University, which was in the epicenter of the disaster-stricken area, must be a force not only for the reconstruction of the Tohoku Region but for the whole nation, which had been in a stagnant state for years even prior to the disaster.

We would like to steadily continue toward our two goals of “Leaping Ahead” and “Achieving World-Class Status and Leading the Restoration of Tohoku and Japan” that were set upon my inauguration as President of the university last April.

First, we will set a clear agenda in education and research towards our goal of “Achieving World-Class Status and Leaping Ahead.” In education, we will reconsider which liberal arts are necessary for future leaders in a turbulent society, and create an environment in which they can be reliably acquired. We will continue to produce human resources that will be able to communicate and interact with people around the world, along with future leaders that can play an active role in the international community. In research, we will analyze the current situation and challenges faced by each institute and graduate school to clearly define the direction of change that will lead to improvement in their functions. In April of this year, the Frontier Research Institute for Interdisciplinary Sciences was created, enabling the University as a whole to identify issues facing humanity and resolutely solve these issues from a comprehensive and interdisciplinary standpoint.

Second, we will continue to play an important role as “Leaping the Restoration of Tohoku and Japan.” Even though the reconstruction efforts in the disaster affected areas have finally begun, a comprehensive vision for these efforts has yet to be outlined. Tohoku University, as a university at the epicenter of the disaster, has a duty to lead the reconstruction efforts through the development of new technologies and industries. Tohoku University has promoted a variety of projects aimed at reconstruction and rebirth through the “Institute for Disaster Reconstruction and Regeneration Research,” created immediately after the disaster, and its various programs such as the “International Research Institute of Disaster Science” and the “Tohoku Medical Megabank Organization.” In addition, we have established organizations for the reeducation of medical personnel and development of human resources for local health care organizations. We also launched the “Resilient ICT Research Center.” Looking toward the future, we are determined to overcome this crisis by building a worldwide cooperative framework to serve, not only Japan, but the entire world using the knowledge obtained from this disaster.

To fulfill its mission and to continue its contribution to the sustainable development of human society, Tohoku University will establish and act upon its vision to achieve the two above goals. Through analyzing both domestic and foreign trends and assessing the weaknesses, strengths, and the potential of this University, this vision will define our policies and timetable, serving as a foundation for achieving an ideal form for the University in five years time. As we celebrate the centennial anniversary of the admission of the first female students in Japan by Tohoku University, we sincerely ask for your understanding of our goals and duties, as well as our, and many others’, wish to contribute to the development of a peaceful and just human society.

Susumu Satomi
President, Tohoku University

“Achieving World-Class Status and Leaping Ahead” and “Leading the Restoration of Tohoku and Japan”

Tohoku University News and Events (April 2012 - July 2013)

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2012</td>
<td>Apr.1 Susumu Satomi became the 21st President of Tohoku University</td>
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<td>Apr.1 International Research Institute of Disaster Science established</td>
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<td>Apr.5 2012 Tohoku University entrance ceremony</td>
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<td>Jul.30-31 Tohoku University open campus</td>
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<td>Sep.25 Tohoku University graduation ceremony</td>
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<td>Oct.6 Tohoku University Homecoming Day</td>
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<td>Oct.20 10th anniversary of the Graduate School of Educational Informatics Research Division/Education Division</td>
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<td>Oct.2-4 Tohoku University Festival 2012</td>
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<td>Nov.22 10th anniversary of the Graduate School of Environmental Studies</td>
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<td>Nov.30 20th anniversary of the Graduate School of Information Sciences</td>
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<td>Dec.10 Tohoku Medical Megabank Organization Community Support Centers opened</td>
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<td>2013</td>
<td>Feb.25-26 2013 Tohoku University entrance examination: first examination for general admission</td>
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<td></td>
<td>Mar.12 2013 Tohoku University entrance examination: second examination for general admission</td>
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<tr>
<td></td>
<td>Mar.27 Tohoku University graduation ceremony</td>
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<td></td>
<td>Apr.1 Frontier Research Institute for Interdisciplinary Sciences inaugurated</td>
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<td></td>
<td>Apr.1 Ceremony for Student Certification for Leading Graduate School Programs</td>
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<td></td>
<td>Apr.4 2013 Tohoku University entrance ceremony</td>
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Tohoku University Disaster Reconstruction Projects

We are in the third year since the Great East Japan Earthquake, which occurred on March 11, 2011. Tohoku University established the Institute for Disaster Reconstruction and Regeneration Research on April 2011 and promoted the following eight projects.

1. **International Research Project on Disaster Science**
   - The Institute for Disaster Science (IDSci) has been established and is already undertaking a project that will create a comprehensive database of earthquake and tsunami-related data, including information on shaking intensity, tsunami wave height, and other factors. This project aims to contribute to the development of rapid disaster response and mitigation strategies.

2. **Project for the Reconstruction of Community Health Care**
   - The goal of the Comprehensive Training Center for Community Medicine is to train advanced medical personnel, achieve medical recovery, and develop human resources to cultivate regional medicine in disaster-stricken areas. This project focuses on developing human resources to support medical care in affected areas.

3. **Project for Environmental Energy**
   - Develops and studies next-generation energy and energy management systems tailored to the local climate and geographical features of disaster-stricken areas, and solutions for the energy problems facing Japan.

4. **ICT Reconstruction Project**
   - Established the Research Organization of Electrical Communication (ROEC) to address solutions to problems in information and communication technology exposed in the wake of the earthquake, such as the disruption of communication lines.

5. **Tohoku Marine Science Project**
   - Aims to create a whole genome reference panel for Japanese so that genomic information can be integrated into genetic information. The facility will modify medical information and medical support activities in an effort to construct a system of medical care for the future.

6. **Radioactive Decontamination Project**
   - The Research Center for Remediation Engineering of Living Environment Contaminated with Radioisotopes strives for technological developments for remediation and restoration of contaminated living environments, such as technology for contamination inspection and decontamination of soil.

7. **Regional Industries Restoration Support Project**
   - The Regional Innovation Producer school trains managerial talent from local communities and supports innovative businesses in local communities.

8. **Industry-University Collaboration Development Project for Reconstruction**
   - Aims to create stronger cooperation with industries and municipalities in Miyagi Prefecture, and to have the technological innovations of the University utilized and commercialized in local businesses.

In addition, “Reconstruction Action 100” has expanded with a diverse pool of more than 100 voluntary projects by faculty members.

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**Tohoku Medical Megabank Organization**

Spearheading the effort for construction of a cutting-edge medical care system set in motion with the recovery efforts from the Great East Japan Earthquake

Now, two years after the Great East Japan Earthquake that occurred on March 11, 2011, there are many earthquake victims who still have to live in temporary houses. Not a few of them are suffering from health problems caused by stress since the occurrence of the earthquake. Tohoku University has engaged in various medical support activities for recovery from the earthquake since its occurrence. It established the Tohoku Medical Megabank Organization (TMMb) in February 2012 with the motto of “Determined Reconstruction” to actively support the recovery of the disaster-stricken areas.

In order to use genome analysis techniques that have rapidly evolved since the Human Genome Project was started in the 1990s, it should be accelerated to construct a whole genome reference panel for Japan so that the development of new medical technologies based on medical information that has been integrated into genetic information. While it engages in a health study on people in the disaster-stricken areas, TMMb will store genetic information on people, and provide long-term preventive health care and medical support activities in an effort to construct a system of medical care for the future.

“At present, TMMb has a staff of 350 people including Genomic Medical Research Coordination (GMRC). GMRCs are certified by TMMb to recruit those who agree to provide their genetic information to the TMMb for the project (joining a genomic cohort). GMRCs are trained and nurtured in an internal training school. A genomic counseling course was newly established at the Tohoku University School of Medicine, because communication with genetic information providers gives them information on possible risks for diseases obtained from genomic information will become increasingly important,” says Professor Yamamoto, Executive Director, TMMb. He emphasizes that it is an important mission of Tohoku University to develop human resources that are able to work in the future medical care system so that they can provide outstanding medical services.

Construction on the central facility for the project will be completed in spring of 2014, and TMMb should be ready to start full-scale operations by summer. It will be equipped with a super computer and other cutting-edge equipment necessary for human genome analysis, and a mega-database for genomic information. The facility will modify medical information and medical histories so that they can be handled by ICT. In fact, joint data from being lost in disaster, TMMb also aims to attract related medical industries so that they are able to utilize these resources as well. In this way, this facility will become a major center for advanced medicine.
In 2000 at Jean Mayer Human Nutrition Research Center of Aging, Tufts University and at Massachusetts General Hospital in Boston, Professor Miyazawa performed high precision analysis of phospholipids, which are brain phospholipids associated with Alzheimer’s disease, and revealed their relationship with dementia. His achievements were highly regarded as a breakthrough in dementia treatment. There are many kinds of fish oils. In particular, fish-derived lipids (fish lipids) contain many high polyunsaturated fatty acids (EPA and DHA) that when consumed are expected of significantly maintaining healthy brain functions in addition to reducing cholesterol levels and blood pressure. However, fish oils are easily oxidized, have a strong smell and are liquid, which makes them difficult to process into powder.

Professor Miyazawa has become the first in the world to develop a fish oil powder called “sustained-release fish oil powder.” This fish oil is clathrate in a cross-linked gelatin containing the enzyme transglutaminase. Because of this structure, the fish oil readily oxidizes and can be released little by little in the human body. Depending on the size of the mesh of the cross-linked gelatin, the amount of fish oil released is controlled. When this fish oil powder is consumed, the fish oil is released slowly and efficiently absorbed into the body. Large companies are paying attention to this ingredient. This fish oil powder has been made into a product in a joint development with a local enterprise and its basic particles have been applied for.

Professor Miyazawa had been working on high precision analysis of phospholipids in Alzheimer’s disease at the department of neurology at Tohoku University. In 2000, he moved to the Food Biotechnology Project at Tohoku University’s New Industry Creation Hatchery Center (NIcHe) and became the director of the TOYOHA research center for research on food development.

Professor Toruo Miyazawa received his Ph.D. in Agricultural Chemistry from Tohoku University in 1982. He has been in his present position as Professor of Tohoku University since 1998. Professor Miyazawa has been leading the research on the development of fish oil powder technology since 2001.

In 2012, the Higgs boson, as predicted by the standard model of particle physics, was discovered at the European Organization for Nuclear Research in Geneva, Switzerland. This was hailed worldwide as the discovery of the century, which will lead to great progress in the field of particle physics, although there remain more than a few questions yet to be solved.

To promote this research, the Linear Collider Collaboration was formally inaugurated in February 2013, and commenced its activities in June. The main goal of the project is to construct the International Linear Collider — a particle physics research facility to be constructed only one in the world. Professor Yamamoto is a director heading the section for physics and detectors, and is playing an important role in the research of the silicon tracker system and the design of the LC detector. He is also extensively involved in developing new analysis techniques using physical detectors. The ILC project is moving ahead with Japan as its primary candidate host and the Kitakami mountain range in Tohoku was chosen as its candidate site. The shape of the planned ILC accelerator is straight and long, extending over a length of 30-50 km. It will require excavation of a tunnel through the stable bedrock.

Professor Yamamoto’s laboratory is presently developing a new sensor “silicon-oxide-insulator (SOI) image sensor.” Their challenge is to develop a sophisticated sensor with ultra-high resolution that can withstand radiation in a high-energy environment.

“Industry of the achievements derived from elementary particle research is to be based on pure scientific findings, we can understand the origin of the universe. That gives us a glimpse of the miracle of our human beings as well as a better understanding of nature. Another is that new technologies and detectors developed during research have useful applications in society. For example, miniaturization of heavy ion radiotherapy medical equipment and the image sensor mounted in the digital camera that we use in everyday life are products that have been realized during research on high-performance accelerators. The economic benefits of such products to society are difficult to predict. And there is the feature of elementary particle research that challenges the unknown environment.”

Professor Yamamoto. Through Science Café for junior and senior high school students and the general public, he is continuously working to arouse interest in particle physics and educate about it.
In humans, primary teeth are replaced by permanent teeth. Once permanent teeth are lost, they do not regenerate. Using mouse iPSC cells, Professor Fukumoto succeeded, for the first time in the world, in producing the cells involved in the formation of enamel, which is the hardest substance of the teeth. This achievement may reveal the possibility for the regeneration of teeth that do not develop again since they have been lost.

Dental enamel is the hardest tissue in a human’s body. Ameloblasts differentiate from dental epithelial cells that exist in the oral mucosa acutely around the surface of the dentin of a developing tooth and ameloblasts are formed. In humans, once the adult teeth have been formed, the ameloblasts disappear and teeth cannot be formed anymore.

Professor Fukumoto pondered the discovery that human lamellae originally contain quantities of tissue of bone, hair, and teeth, and he began to conduct regeneration research of teeth. In 2006, Professor Yamamura’s research group at Kyoto University succeeded in producing iPSC cells. Immediately, we were provided with their iPSC cells and tried to culture them in the cell line of dental epithelium. We found that ameloblasts was expressed in the cultured iPSC cells. The ameloblasts is one of the dental matrix protein secreted by ameloblasts. Our research he progressed to this stage by 2006, however, we lost every sample when the Great East Japan Earthquake occurred in 2011. We had to start from the beginning again,” says Professor Fukumoto.

Professor Fukumoto is at present promoting gene-level research on how the kind and size of teeth are determined, which is an important point in regenerating human teeth. When this mechanism has been revealed, it will give great impetus to the research of regenerating lost teeth.

Besides actively doing research, Professor Fukumoto frequently holds visiting lectures for dentists, public health nurses, school teachers and elementary school students. “There is a long way to go before regenerative technology of human teeth is established. That’s why we should take good care of our teeth,” appeals Professor Fukumoto. Such words from a top researcher in the field of state-of-the-art technology are very persuasive.

In the laboratory, a tooth is formed again.

Improve the efficiency of energy utilization

Optimized spectral control of thermal radiation to attain high efficiency energy utilization

Professor Yugami’s laboratory is working on research involved with efficient utilization of renewable energy such as solar energy and hydrogen. One of their main research is the spectral control of thermal radiation, which relates to a technology to alter specific wavelengths of light to be absorbed or reflected on microstructures fabricated on the surface of the material. In conventional technology, only a 1 x 1 square or so square area of the microstructure could be fabricated on the surface of materials. For practical application, a much larger area of a microstructure is required, and the material used for the product needs to be located at temperatures above 600 degrees Centigrade. By optimally controlling the metal microstructures, Professor Yugami has successfully developed a technology to fabricate surface microstructures over a large area.

Today, solar-thermal-photovoltaic power generation as well as photovoltaic power generation has become popular throughout the world, and the application of research achievements are expected in these fields. In addition, research on thermo-photovoltaic power generation is progressing, in photovoltaic power generation, electrical power is generated by solar radiation acting on solar cells. The conversion efficiency of the widely-used silicon solar cell panels is only about 15-16%. This low efficiency is due to poor matching between the silicon and the wavelength of the solar radiation. On the other hand, a thermo-photovoltaic system has an emitter that receives thermal energy and emits thermal radiation, which is converted into electricity with photovoltaic cells. Because of selective emission of radiation-wavelengths, spectral control of thermal radiation is possible, and this leads to the possibility of achieving a high generating efficiency. In addition to solar energy, thermo-photovoltaic systems are capable of using a variety of heat sources, including industrial waste heat. The current generating efficiency is about 55% at maximum, but Professor Yugami predicts this can be greatly improved.

In 2012, Tohoku University launched a five-year Program for Leading Graduate Schools, which combines Master’s Course and Doctoral Course. The Inter-Graduate School Doctoral Degree Program on Science for Global Safety is the first program that has been implemented in the Leading Program. The program is implemented in collaboration between researchers in science and technology and researchers in human and social sciences, and covers a multidisciplinary field of safety and security. Global safety and security has become a prime issue after the 2011 Great East Japan Earthquake. Based on the three perspectives of “ensuring safety and security,” “creating safety and security,” and “living in safety and security,” Professor Yugami, serving as program coordinator, is devoted to fostering students to become excellent global leaders capable of playing noticeable roles involved in the science for global safety and security in the world.
Economics of aging is a field of study and a profession that involves understanding issues such as population aging from a perspective of economics. Professor Hiroshi Yoshida specializes in economics of aging and he is analyzing the influence of the aging society combined with a low fertility on economics and the effect of our current society and economics on human lifestyle. Professor Yoshida says, “The countermeasure to an aging society is to reverse the falling birthrate, and the countermeasure to the falling birthrate is the women’s issue.” Today’s women are playing an important role that is indispensable in maintaining society, specifically, they bear and raise children and take care of elderly family members, even while many of them work outside of their homes. However, when comparing the men’s and women’s social activities in Japan, women’s social activities are at a very low level compared to other developed countries. Professor Yoshida hopes that his research efforts will be able to support and encourage those who are promoting the equal participation of men and women in society.

In Japan’s current declining birth rate very serious? Professor Yoshida’s laboratory is releasing a website called “World Clock of Child Population in Japan” where the “estimated number of children at the current time” is updated every second. Based on the current birth rate, the population of Japanese children up to age 14 will be “zero” in 1,800 years. Indicating using numeric numbers allows us to have a concrete image of future Japan. “As an example, one of my duties is to act like a speedometer of a car. The speedometer essentially drives to control their speed based on the amount of gasoline left in their tank and the remaining distance to the destination,” says Professor Yoshida. He encourages students to actively attend meetings of debate and discussion with students of other seminar classes who are studying different economic policies as well as to exchange opinions at meetings with people of practical experience in society. Students are required to study both theory and practical knowledge in order to become such human resources that can manage society with warm hearts and cool heads.

It is often difficult to obtain understanding and sympathy from people when we refer to welfare and the number of children from the viewpoint of economics that is considered to be in line with favorable economic growth. However, it will be impossible to provide medical service and education to more and more people without such an approach in economics. Professor Yoshida’s unique approach to economics attracts students.

Professor Hiroshi Yoshida

Economics of Aging and Public Finance, Graduate School of Economics and Management
Professor
Hiroshi Yoshida

Economics of Aging and Public Finance, Graduate School of Economics and Management
Professor
Hiroshi Yoshida

When humans get infectious diseases caused by pathogens such as virus and bacteria, they produce immunity in their bodies, and consequently subsequent infections will not be as serious or may not even cause diseases. This defense mechanism is called acquired immunity and is obtained by the development of antibodies resulting from an attack of infectious disease. Only vertebrate animals, which constitute only 4% of all animal species, have this mechanism of acquired immunity. However, all multicellular animals have an infection prevention mechanism in their bodies. Here then do these animals recognize pathogens entering their bodies and remove them? This infection prevention mechanism has not been well known before. Professor Kurata is the first person who has identified the pathogen recognition protein (PGRP-LE) which is the pathogen recognition sensor of the Drosophila melanogaster (fruit fly). Furthermore, based on the results he obtained, he elucidated the mechanism of PGRP-LE that produces antimicrobial peptides, induces autophagy and removes the bacteria that entered the cells.

There are 13 types of PGRP in the Drosophila melanogaster and 4 types in humans. The PGRP-LE molecule interacts with gram-negative bacteria, activating the IMS pathway to the gram-negative bacteria and releasing antimicrobial peptides. Professor Kurata published his results in an article in 2002, but almost at the same time a group in France discovered the PGRP-SA interacts with gram-positive bacteria. This was a discovery of two separate pathways. The finding of the protein that recognizes the pathogen using the Drosophila melanogaster has led to elucidation of the immune system. This protein exists not only in the fruit fly but also in humans, and will be a target of pharmaceutical development. Using this achievement, diseases caused by viruses will be mediated by inducing autophagy, Professor Kurata says. Tohoku University is implementing the “Science Angels” aimed at attracting female senior high school and university students to develop an interest in science and research. Science Angels are women PhD students, and Professor Kurata is responsible for the program. The “Science Angels Program” is steadily working to foster the next generation of motivated researchers.

Professor Shoichiro Kurata

Molecular Genetics Laboratory, Department of Molecular Biopharmacy and Genetics, Graduate School of Pharmaceutical Sciences
Professor
Shoichiro Kurata

A questionnaire survey was conducted to understand the health of the elderly people who live in the disaster area. The survey indicates that women are more stressed than men in the disaster area.

Official website that shows the number of children in Japan as of 2014

Research Activities

World’s First Identification of Drosophila melanogaster’s Pathogen Recognition Sensor PGRP-LE

Elucidation of the immune system in the fruit fly through PGRP-LE

Fertility with Economics

Population Aging and Low Fertility with Economics

Considering the issues of population aging and low fertility with economics

Forefront of Economics of Aging

Research Activities

Research Activities

Forefront of Economics of Aging

Considering the issues of population aging and low fertility with Economics

Elucidation of the immune system

World’s First Identification of Drosophila melanogaster’s Pathogen Recognition Sensor PGRP-LE

Fertility with Economics

Population Aging and Low Fertility with Economics

Considering the issues of population aging and low fertility with economics

Forefront of Economics of Aging
Providing Spiritual Care in Disaster-stricken Areas

Proposing the Necessity of Training “Rinsho Shukyo-shi” That Is Recognized in the Activities of Spiritual Support after the Great East Japan Earthquake

At the “Endowed Department of Practical Religious Studies,” a program to train “Rinsho Shukyo-shi” (a Marshal Chaplain) is being carried out. The “Rinsho Shukyo-shi” are people who are capable of providing spiritual religious care to victims of various religious backgrounds. The program is being managed by Professor Iwayumi Suzuki as head, and Associate Professor of Hans. After the Great East Japan Earthquake, attention was paid to religious leaders who were providing “religious support” using their religious characteristics of extra ordination and spiritual comforting. Before then, many local Japanese religious leaders reported most of their efforts giving interpretations of the teachings of their own denominations to the limited number of their believers. After the earthquake, however, when religious leaders were conducting relief efforts in disaster-stricken areas, they had to provide support to people having various religious backgrounds. This has led to the development of a program in which people are trained as special religious professionals who can provide spiritual care regardless of their religious viewpoints. Professor Suzuki says, “Because our university is a national university that is neutral in terms of religion, we could open an endowed department. Other reasons Tohoku University was chosen were that it has a Department of Religious Studies with a 90 year history and a School of Medicine that allows us to extend our activities into the mental health area with the cooperation of medical professionals.

The program expects that participants will improve their capabilities of “relating attentively,” “spiritual care,” “inter-religious shukyo-shi” and “cooperation between religions” by attending lectures, group sessions, meaning pilgrimage, and practical training. In addition to providing suitable religious care, participants will be trained about approaches for collaboration with other organizations other than their religious bodies. Program operating expenses are funded by donations. In March 2013, the Japan Buddhist Federation and, in the following June, the Japan Association of Religious Organizations decided to recommend and support the Department of Practical Religious Studies. The department started as a three-year duration program. People involved in this activity hope that donations will increase and allow the department to continue operating beyond the duration limit that comes the year after next.

Professor Suzuki thinks, “Japan is entering a time of hyper-aging society with a high death rate. I hope that, in our future society, Rinsho Shukyo-shi will be permanently established at all medical and care facilities where people may seek salvation before the end of life.”

Center for International Exchange at Tohoku University is mainly involved with educational support for its international students and assistance for domestic students who are to be delegated to its partner universities. Before serving as head of the center, Professor Suematsu created various educational opportunities at the Division of International Education and Exchange in the Graduate School of Economics and Management. One of the activities, in which she currently gives high priority, is the improvement and expansion of the exchange program for liberal arts students. As the leader, Professor Suematsu has continued to negotiate with each of the liberal arts faculties to develop the program further and explore the advantages of accepting international students.

With her own experience of studying abroad, Professor Suematsu is able to provide superspecialized care to international students. Her activities start from making arrangements with domestic students and support groups to pick up international students at Sendai Station on their first visit in Japan, taking them to their dormitories, and helping them find jobs, while collaborating with domestic students and support groups for international students. Using external funds, she also provides support for childbirth and child-rearing to international students and their families.

There is also an organization of domestic students to support international students. It is the “PLAUNET” that was launched by students who support the exchange students in the International Program in Liberal Arts (IPA). PLAUNET aims to give exchange international students the opportunity to have the same experiences that domestic students have during their 1-year stay in Japan. A variety of support activities and events are held to expand the network of international exchange at the university.

Inter-cultural education programs are also extensive. Professor Suematsu is specializing in intercultural education. She is implementing a Project-Based Learning (PBL) in a co-existing environment class, which is still rare at Japanese universities. In this class, groups of 10 domestic and international students conduct discussions from various perspectives and carry out projects together. The range of the projects is broad and includes planning of a cultural event to mediate between clubs and international students, making a restaurant map for international students, and introducing Japan through metaphors. Professor Suematsu encourages students to improve themselves during the process of project development. “Joint study between international and Japanese students will be important for international education and for finding global human resources. It is necessary to complete this cycle of researching the educational effects and putting them into practice. Students are saying that they are going to change what they think ‘they can’t do’ into what they use,” says Professor Suematsu.
**Awards and Honors**

### Faculty Awards and Honors (July 2012-August 2013)

**2012 Order of Culture**

**Professor Emeritus Shigeru Oda**

Dr. Oda served as a lecturer at Tohoku University in 1949 immediately after he went to the United States by a grant from the Rockefeller Foundation as one of the first exchange students after World War II. In 1955, he became Assistant Professor (presently Associate Professor) and in 1959 Professor at Tohoku University School of Law. In 1958 Professor Oda was inaugurated as an attorney for the German Government, and in 1973 as a judge of the Permanent International Court of Justice (previously the International Court of Justice). He worked as the judge for 27 years, and currently holds the longest tenure on record.

In 1997 he was appointed Professor Emeritus of Tohoku University. In 1991 he was inaugurated as the Vice President of the International Court of Justice. In 2003 awarded the Grand Cross of the Order of Sacred Treasures, and in 2007 selected as a Person of Cultural Merits.

**2012 IEEE GRSS Education Award**

**Professor Motoyuki Sato, Center for Northeast Asian Studies**

At the international conference IGARSS 2012 held in Munich, Germany, Professor Sato received the Education Award from the Institute of Electrical and Electronic Engineers Geoscience and Remote Sensing Society (IEEE GRSS). This Award is granted to members who have made significant educational contributions to the field of remote sensing research. GRSS recognized that he has essentially lectured at graduate schools, for interleaved courses, etc., including activities in foreign countries such as China and Russia in the field of Ground Penetrating Radar and microwave remote-sensing, and contributed to researcher cultivation.

**Medal with Purple Ribbon Autumn 2013**

**Professor Emeritus Tokujii Miyashita**

Recognizing for his great contributions to polymer chemistry. In 1977, Dr. Miyashita received the Award from the Society of Polymer Science, Japan, and in 2012 the award for Outstanding Achievement in Polymer Science for his research on polymer nanosheet assemblies, in 2003 the BESC Award from the Chemical Society of Japan for his research on an innovative polymer sensor and polymer imaging system, in 2004 the Award of the Society of Pure and Applied Coordination Chemistry for the development of photovoltaic conversion and photodiode systems, and in 2011 the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology (Prizes for Science and Technology) for his research on polymer nanosheet assemblies for film electronics. He has also contributed to the development of new hybrid polymer films with thermal stability and high transparency.

**Medal with Purple Ribbon Spring 2013**

**Professor Tetsuya Torasaki, Graduate School of Pharmaceutical Sciences**

Taking “research to start the mechanism of the drug distribution in the brain.” Professor Torasaki has developed methods to investigate mechanisms in which the drug and/or endogenous compounds are pumped out from the brain to the blood across the capillary endothelial cells. These methods involve a novel technology for the simultaneous quantification of functional proteins by Shint-Guy LC-MS/MS method combined with silica peptide selection criteria. This selection criteria is covered by a patent issued for Tohoku University in Japan, the United States, and EU. He is currently a Distinguished Professor who also works for the Tohoku Medical Megabank Organization and the Graduate School of Medicine.

**Japan Academy Prize**

**Professor Masataka Nakazawa, Director of the Research Institute of Electrical Communication**

Succeeded in achieving a compact and a highly reliable erbium-doped fiber amplifier (EDFA) for the first time in the world. EDFA uses erbium-doped optical fibers and amplifies optical signals at a 1.55μm telecommunication window. EDFA has about 1000 times larger channel capacity than an electric amplifier. Since it is compact, uses little electric power, and has long service life, it has become to be extensively used in the world as optical repeaters for optical fiber communications systems. Thus, our highly informative society has been realized, where people around the world can exchange information instantly.

**Professor Emeritus Elimeel Sato**

Professor Sato elucidated the mechanism of selective production of outstanding sex within the oyster, which is indispensable for improving the propagation efficiency of mammal. Namely, he discovered the mechanism of the factors such as female stimulating hormones, factors for promoting oestrogen growth, an angiogenic growth factor, and ovum maturity suppression factors involved in ovum selection and maturazation. Based on these findings, not only has he contributed to the development of efficient production technology for large livestock such as cattle and hens but also for clinical application for human ovariain infertility.

**The 2012 IEEE GRSS Education Award**

**Professor Motoyuki Sato, Center for Northeast Asian Studies**

At the international conference IGARSS 2012 held in Munich, Germany, Professor Sato received the Education Award from the Institute of Electrical and Electronic Engineers Geoscience and Remote Sensing Society (IEEE GRSS). This Award is granted to members who have made significant educational contributions to the field of remote sensing research. GRSS recognized that he has essentially lectured at graduate schools, for interleaved courses, etc., including activities in foreign countries such as China and Russia in the field of Ground Penetrating Radar and microwave remote-sensing, and contributed to researcher cultivation.

**Medical Award of The Japan Medical Association**

**Professor Hiroshi Shimomura, Graduate School of Medicine**

Professor Shimomura is the authority in the world in the research of coronary artery spasms, which is important because it plays an important role in the pathogenesis of ischemic heart disease. He was awarded this time, because his achievements on “Experimental and clinical research on ischemic heart disease in the Japanese” were highly regarded. His broad fundamental and clinical research clarified the molecular mechanism and resulted in the development of new drugs. In addition, he contributed considerably to the world in research on vascular endothelium. He played an active part also in Japan as Chairman of Tohoku University Medical Association and Chairman of the Miyagi Prefecture Medical Association.

**The French ‘Officier dans l’Ordre des Palmes Academiques’**

**Professor Emeritus Tadashi Nomura**

This award is one of the traditional awards of culture established by Napoleon I in 1804. He was praised for promoting France-Japan exchange over the years and having had significant results. Through the activities in the field of marine science and technology and participating in the activities of the International Court of Justice, he worked as the judge for 27 years, and currently holds the longest tenure on record.

**The IUPAC 2013 Distinguished Women in Chemistry or Chemical Engineering Award**

**Professor Kazue Kunihara, Advanced Institute for Material Research/Institute of Multidisciplinary Research for Advanced Materials**

The International Union of Pure and Applied Chemistry (IUPAC) established the award as one of the projects for the International Year of Chemistry 2011. She was the second award winner from Japan. In 1997 Professor at Tohoku University Research Institute for Frontier Chemistry, 2001 Professor at Tohoku University Institute of Multidisciplinary Research for Advanced Materials due to recognition, 2010 Professor at Tohoku University Advanced Institute for Material Research. Also, she acts as the Director of the Chemical Society of Japan and the Chairperson of the Committee for Chemistry of the Chemical Committee of Science Council of Japan.
Effective organization and management that can forge a splendid future

Innovations that lead the way to a New Society

Center for Innovative Integrated Electronic Systems completed

In April 2013, the “Center for Innovative Integrated Electronic Systems” (established in October 2012) was completed at the Aobayama New Campus, which was funded wholly by the private sector.

This center has already started industry-university joint research projects in a wide variety of integrated electronics fields such as for next-generation semiconductor memory, high-performance printed-circuit board technology, packaging technology, and image processing technology. In the field of next-generation semiconductor memory, the center has a program for R&D of spin-transfer torque magnetic random access memory (STT-RAM) where Tohoku University leads the world. The center was the first among Japanese universities to develop a trial 300 mm wafer process line and is working on R&D together with domestic and overseas semiconductor device development companies, universities, and research institutes.

It is expected that the center will become a worldwide R&D base for integrated electronic technologies, and play a leading role in the “Reconstruction of Tohoku and Regeneration of Japan” through various industry-university joint research projects and cultivation of highly talented human resources in such an environment. Consequently, the center will contribute to enhancing the international competitive power of Japan in this field and create new industries which will lead to the realization of an ever-growing society in the future.

The center has received official support from Miyagi Prefecture through utilization of the system of special zones for the promotion of private investment in Information Service related industries that was applied for jointly by the Miyagi prefectural government and municipal governments in the prefecture. The center has also received official support from Sendai City through an amount corresponding to the fixed property tax, etc., according to an agreement made by Tohoku University and Sendai City.

Institute for Materials Research established a logo for its 100th anniversary

Institute for Materials Research (IMR) was established in 1916 by Dr. Kyoto Hatake as the 2nd Division of the Provisional Institute of Physical and Chemical Research and well celebrated its 100th anniversary in 2016. To date, IMR has been conducting both basic and applied research on a variety of materials such as semiconductors, ceramics, compounds, organic materials, and composite materials including metals. It has also been working to create new materials as semiconductors, ceramics, compounds, organic materials, and composite materials. IMR plans to hold anniversary events such as a commemoration ceremony and open house on May 21, 2016, for these projects, IMR has accepted entries for a commemorative logo from the general public, and the logo was selected from 765 candidates. The design represents the “tradition” of IMR in the form of the building as the line of its foundation and the “future” for realizing a fulfilling life by a continuous straight line. The logo conveys the message that past tradition and history can create the future. Mr. Koichi Oide, who is a teacher at the International Department of the Miyagi Technical High School, created the logo.

20th anniversary of the Graduate School of Information Sciences

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Offering diverse support to meet the needs of the times
Educational programs designed to stimulate the intellect for the next generation

Program for Leading Graduate Schools: Inter-Graduate School Doctoral Degree Program on Science for Global Safety

The Inter-Graduate School Doctoral Degree Program on Science for Global Safety develops human resources through integrated education in the 5-year doctoral program across departments at the University for students in the humanities, sciences and technologies. It develops top leaders in the area of global safety who have a substantial knowledge of liberal arts, international adaptability, high sense of morals, and a clear vision, and are able to think and act appropriately on this basis. They are expected to make contributions to the protection of human lives, societies and industries from global disasters such as the Great East Japan Earthquake.

In this program, interdisciplinary cutting-edge education and research are conducted on the basis of “practical disaster prevention studies” in the International Research Institute of Disaster Science (IRIDeS), with participation by the Graduate Schools of Science, Engineering, Environmental Studies, and Letters, etc., so that this integrated program can combine knowledge from the natural sciences, social sciences and liberal arts. This program aims to develop excellent human resources with core specialties, an ability to apply them in various areas, and other required abilities for leaders, through activities at recovery sites from the Great East Japan Earthquake and conducting world-class researches.

Preparing Future Faculty Program for graduate students

The Tohoku University Preparing Future Faculty Program (Tohoku U. PFFP) cultivates the skills required of university faculty in graduate students who aspire to become faculty, professors, leaders, and researchers. New faculty can feel confusion and stress because of the broad range of their duties, which encompass teaching, research, management, and social contribution. To ensure that faculty can develop their early careers smoothly, the program fosters the acquisition of the necessary skills and knowledge.

Fukkou University Alliance / Training and Education for Future Fukkou Leaders

“Fukkou University Alliance” was established by member institutions of the Academic Consortium of Sendai to support in the FUKKOU (meaning “reconstruction”) from the unprecedented Great East Japan Earthquake of 2011. Tohoku University offers six courses in the Training and Education for Future Fukkou Leaders Program: “Politics for FUKKOU,” “Economics for FUKKOU,” “Sociology for FUKKOU,” “Thoughts for FUKKOU,” “Science of Living for FUKKOU” and “Science and Technology for FUKKOU” for students of the member universities. This program aims to develop human resources that are able to deal with problems even in such cases as in the case of natural disasters, in a swift and flexible manner, on site. They are expected to take the leadership in FUKKOU from disaster anywhere in Japan or in the world. This program offered a public lecture to the general public on February 2013, with an audience of 447 in total (including multiple counts).

Open Campus

Tohoku University holds an “Open Campus” for two days around the end of July every year. Each faculty and graduate school of the University provides model classes, simulated experiments, facility tours, and other events. A lot of individuals or groups of students from high schools who are interested in attending the University, or their parents, visit the Open Campus. In 2012, 57,445 people (including multiple counts) visited the Open Campus during the two days. This number was the third largest among all the universities in Japan, and first among the national universities (according to “University Ranking 2014,” Asahi Shimbun Newspaper Publishing). In 2013, a total of 61,600 (including multiple counts), exceeding the number for last year, came to the Open Campus.
Offering diverse support to meet the needs of the times

Educational programs designed to stimulate the intellect for the next generation

University Contribution Award in Education

The University Contribution Award in Education recognizes those who have shown excellence in the liberal arts curriculum at Tohoku University through improvements in classroom teaching, educational methods and instructional skills. This award honors faculty members who have attained exceptional success in their classrooms or with their educational methods as well as those who have achieved positive results with their original and innovative methods of teaching. The awards ceremony was held on January 7, 2013.

In charge of the Future Global Leadership Program, Professor Haga promotes one of the finest intercultural and linguistic environments for students enrolled in the program. In addition to educational activities, he encourages various exchanges in research programs and teaching practice to advance the quality of all fields of study.

Professor
Mitsuru Haga
Center for the Advancement of Higher Education

These two educators are in charge of the Current Topics course “Introduction to Sign Language.” Through the study of sign language, students are able to understand and empathize with persons who are hearing impaired. This long-standing course has gained great social significance and students who have taken this course all have high praise for the class.

Associate Professor
Masatoshi Koizumi
Graduate School of Arts and Letters

Associate Professor
Jo Matsuzaki
Meiji University of Education

In the Future Global Leadership Program, Professor Haga has applied his remarkable language skills to promote understanding between Japanese and international students in a learning environment with cultural and linguistic diversity. His classes involve acquiring a multifaceted approach to thinking and have received high praise from students.

Presidential Prize for Educational Excellence

The Presidential Prize for Educational Excellence is given to faculty members who have shown excellence in teaching that has been carried out with sincerity and passion in accordance with the educational principles of Tohoku University. On March 27, 2013, an awards ceremony was held at the Sendai Grand Hall.

School of Dentistry
Toshihiko Suzuki, Assistant Professor

In addition to giving lectures and practical training in anatomy to students, Professor Suzuki has successfully created a new network achievement system for students to view their ability to resolve problems proactively. He has also worked to identify victims of the Great East Japan Earthquake of 2011 and has shared his experiences with his students. He has made an immense contribution to education in dental medicine and has an excellent reputation with his students.

Center for the Advancement of Higher Education

Mitsuru Haga

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Associate Professor
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“The ‘Q’ School” Graduate School of Engineering

Graduate School of Information Science

Information Literacy Education Program

This project supports programs at the elementary and secondary school levels and actively sponsors public lectures for the general public so that they will be able to use information and Communication Technology (ICT). While making a contribution to society, this program allows graduate students interested in a career in information education to gain practical experience.

Steering Committee “Exploring-Germination-and-Growth Program for Young Scientists” (EGGS)

This educational program for high school students nurtures them to become scientists for the next generation. This program has received wide acclaim for its innovative programs and has become a model for successful collaboration between high schools and universities. Also, many of the students who have completed this course decide to enroll at Tohoku University.

Activities that have been designated “Joint Usage/Education Center”

In the program, the University and other universities jointly work at the “Joint Usage/Education Center,” to offer a high quality of education to respond to the needs of society and universities using human and physical resources of the University. This program was created in 2009 by the Ministry of Education, Culture, Sports and Science (MEXT) to make it possible for one university to share its best human resources in various fields with other universities. In addition to the Center for the Advancement of Higher Education, Tohoku University has two other centers that have received certification by MEXT.

Research Center for Marine Biology, Graduate School of Life Sciences

The Research Center for Marine Biology located in Aomori City was established in 1984 and since then, has been a place where undergraduate and graduate students in marine biology from various universities throughout the Tohoku region come to gain practical experience. The center also cooperates with universities to carry out marine training. It has been carrying out world-class research on the abundant marine life in Mutsu Bay. It also hosts various educational programs in marine life for undergraduates and graduate level students so that they can observe marine life in its natural environment and carry out experiments in its original state. In addition, the center sponsors activities for the general public and children to educate them about marine life.

Kawatabi Field Center, Graduate School of Agriculture

The Kawatabi Field Center, Located in the city of Osaki in Miyagi Prefecture is the largest farm in Japan that is affiliated with a university. This farm covers an area of 2,200 ha consists of a variety of natural features that include mountains as well as farming regions. The landscape is a unique mixture of forests, grassland, and farmland. Cultivated farmland, grassland, and forests do not exist in independent ecosystems but instead share water and nutrients in a circulating system with a variety of flora and fauna living in concert in a complex arrangement, making this farm an ideal place for conducting a variety of educational agricultural research. As a “Joint Usage/Education Center,” Kawatabi Field Center offers students a place to learn hands-on about “food,” one of the basic needs of human beings, and about “farmland” and “the environment,” which food is produced. In addition, it carries out educational activities for the general public and children.

Advanced information technology in education

The Information and Computer Literacy (ICL) classroom and Computer-Assisted Language Learning (CALL) classroom are located in the Multimedia Education and Research Complex at the Katsura Kita Campus where many first and second year undergraduate students study. Over 600 computers are available for use and a variety of services are provided for students and liberal arts curriculum.

The “Basic Information Science” course in liberal arts curriculum is taken by all students and is used to improve academic and social skills. The course is designed to fit all students regardless of their major. In order to acquire foreign language skills, various kinds of learning jobs are provided and students can access those materials not just from the CALL classroom but from home as well, thus creating an excellent learning environment.
Our students demonstrate individuality in various fields
Pursuing their potential and improving themselves through friendly rivalry

JASSO Students of the Year for 2012
To help nurture students, the Japan Student Services Organization (JASSO) runs the Students of the Year program, which recognizes those who make outstanding achievements in academic studies, the arts and culture, sports, and social contributions, and awards them prize money and scholarships.

Human-Powered Aircraft Club wins the Birdman Rally
In the 35th Japan International Birdman Rally held at Lake Biwa on July 26-29, 2012, the Human-Powered Aircraft Club, "Windnauts" won its fourth victory in the HPA-Distance section following its victory the previous year. The team recorded a great flight of 14,129.34 m and won the championship for two years running for the first time.

Brass Band Club wins the Gold Prize in the All Japan Ensemble Contest
In the 36th All Japan Ensemble Contest held on March 29, 2013 at the Tohoku Prefectural Civic Center, the Brass Band Club brilliantly won the Gold Prize in the University Category with a saxophone quartet. In the previous year, the club won the Silver Prize with a clarinet quartet.

Intramural commendation
Award Club/Club member awarded
Sports Club Four Awards

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<td>Triathlon Club</td>
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<td>Shimura Cup</td>
<td>American Football Club</td>
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<td>Suzuki Award</td>
<td>Kazuki Itoh, School of Law, Japanese Anthrology Club</td>
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<tr>
<td>[Suzuki Award]</td>
<td>Shunsuke Sugimura, Faculty of Science, Orienteering Club</td>
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<td>[Otanai Award]</td>
<td>Aiko Takahashi, Faculty of Agriculture, Skiing Club</td>
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<td>[Shimura Cup]</td>
<td>Kazuya Kariyama, School of Engineering, Triathlon Club</td>
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<td>[Suzuki Award]</td>
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<td>Shogo Terajima, Faculty of Science, Golf Racing Club</td>
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<td>[Otanai Award]</td>
<td>Keita Sakurita, Faculty of Arts and Letters, Baseball Club</td>
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<td>[Shimura Cup]</td>
<td>Tohoku University Fund Encouragement Award</td>
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Sports Club Four Awards/Chairman’s Award
Award Club/Club member awarded

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Promoting local industries with the world's top level research and technology

**University-industry collaboration to tackle new challenges**

The beginning of large-scale, university-industry-government collaboration projects for recovery from the earthquake and tsunami damage

**Tohoku innovative materials technology initiatives for reconstruction**

Tohoku University, which is a world leader in materials science, serves as a center of a broad range of cooperative activities between universities and businesses in the Tohoku region. With this cooperation, the University will aim to bridge the creation of innovative technologies and commercialization in these areas: ultra-low friction technology, ultra-high magnetic core materials, and high-efficiency rare earth elements extraction.

**Next-generation automobiles in Miyagi prefecture area**

Expectations are spreading that next-generation automobiles will be a key factor for recovery and revitalization from damage caused by the Great East Japan Earthquake. In this project we are aiming to establish a center for research and development of next-generation automobiles, taking advantage of world-class cutting-edge innovation and technology that Tohoku University and other research institutions in this area have, whereas we are, while enhancing the technical abilities of local automobile-related businesses, to rigorously promote recovery from the earthquake and tsunami damage, with the help of Miyagi prefecture and other parts of the Tohoku region could sustain the development as a great automobile industrial cluster area.

**Knowledge-based medical device cluster in Miyagi prefecture area**

The Council for Founding the Center for Knowledge-based Medical Device Cluster Miyagi Prefecture Area was established by two institutions: Miyagi Prefecture, Tohoku University, Tohoku Economic Federation, The 77 Bank, and the Intelligent Cosmos Research Institute. The council aims to create new medical devices by introducing intellectual property, human resources, and funding into advanced electronics, precision machinery, IT, industries, etc., in the region. It also works towards an establishment of a global industrial area as part of the Miyagi Prefecture Disaster Recovery Plan.

**Opening of satellite schools for Regional Innovation Producer School**

Satellite schools for Regional Innovation Producer School will be opened at Hanamaki City, Iwate Prefecture, and Aizuwakamatsu City, Fukushima Prefecture. The School was established at the Katsurahori Campus of Tohoku University as the principal school for developing human resources for business management, business leaders who can create and manage innovative businesses that promote and accelerate industrial development, and create new job opportunities. The School is currently in operation, and is expected to have a comprehensive understanding of Hanamaki City on April 12, 2013, and Aizuwakamatsu City on April 26, 2013. It is expected that a lot of human resources will make a contribution to the development of the satellite school so that the regional industry/economy will grow and opportunities will be created.

**University-industry collaboration events**

**“Tohoku University Innovation Fair 2013”**

Tohoku University Innovation Fair 2013 was held at the Sendai International Center on January 17, 2013 to promote cutting-edge innovative research at the University and the commercial needs of society. At this event, the University presented its approaches to the recovery from the earthquake disaster in a special exhibition, and set up more than 70 booths for exhibitions, including demonstrations of “Next-generation Mobile System” and “Robotics for Extreme and Uncertain Environments.” About 1,000 people visited the fair.

**“Tohoku University Lab Tour”**

On February 19 and 22, 2013, Tohoku University and the The 77 Bank held a Tohoku University Lab Tour as a joint project. In the event, local business people visited laboratories at the University in order to increase the technical abilities of local businesses and help develop young employees. Institutions from the University presented state-of-the-art technology and unique research related to the automobile industry to visitors from manufacturing industries, while the visitors made a tour around research facilities and equipment. This tour was the first university-industry collaboration project that Tohoku University conducted with a financial institution.

**TOPICS**

Professor Kuriyagawa, School of Engineering, Tohoku University, was honored with Minister of State Award for Science and Technology Policy.

Professor Takamasa Kuriyagawa, School of Engineering, was honored with the 10th Minister of State Academic Partnership Award for Science and Technology Policy as a part of a Commendation for Contributions to University-Industry-Government Collaboration for remarkable individuals or groups recognized to have made great contributions to university-industry-government collaborative efforts that have produced significant results. The title of research on which the professor was honored with the Award is “Development of Nano-Pressure Machining and Metrology Method for Aspherical Glass Lens,” which was based on the results of the consortium headed by Professor Kuriyagawa, and reflected current industrial needs.

Picture of Innovation Fair

Picture of Lab Tour

Picture of Award presentation ceremony (courtesy of Cabinet Office, Government of Japan)
Creating the future from a worldwide perspective

International exchange to transmit our ideas aiming at great achievements

**APRU Multi-Hazards Program**

From September 20 through 22, 2012, Tohoku University (headed by the International Research Institute of Disaster Science) organized the 8th APRU Research Symposium on Multi-Hazards around the Pacific Rim, based on the subject of “Towards Disaster-Resilient Societies: The Role of Universities in Reducing Risks of Catastrophic Natural Disasters.”

Triggered by this symposium, revitalizing the Pacific Rim network in the field of disaster science has even grown in importance, and Tohoku University has been assigned the task of functioning as the hub of the APRU Multi-Hazards Program for three years from April 1, 2012. Tohoku University has taken a leading role in this field globally, providing researchers and students of the member universities of APRU with various programs, such as training programs, summer schools, and workshops, to make further international contributions through the APRU network. The first Summer School was held from July 23 through 25, 2013 as part of the program.

**Association of Pacific Rim Universities (APRU)**

APRU was established in 1997 by major universities in the Pacific Rim area with the aim of increasing exchange among the universities to cooperate in the fields of education and research and contribute to solving important issues. Consisting of 45 universities from 16 countries and areas in the Pacific Rim, APRU confirmed that the second Japan-Russia Medical Forum will be held in Sendai in 2014.

**The 32nd AEARU Board of Directors Meeting**

Tohoku University has been serving as a member of the AEARU Board of Directors since January 2012, and hosted the 32nd AEARU Board of Directors Meeting on May 10 and 11, 2013 in Sendai. Participating national Tohoku University, Keio University, Hong Kong University of Science and Technology, Osaka University, Peking University, Seoul National University, and Tohoku University. The members actively discussed the shaping of further collaboration, showing originality and regionality, in the fields of research and education and discussed specific efforts to promote exchange and other activities within the AEARU framework. The next meeting will be held at National Tsing Hua University (Taiwan) in December 2013.

**Association of East Asian Research Universities (AEARU)**

AEARU was established in 1998 with the aim of having close relationships among member universities by providing a platform for exchange among the heads of major research universities in East Asia as well as among faculty members and students. Consisting of 17 universities in four countries and areas (Japan, China, Korea, and Taiwan), AEARU was established in 1996 with the aim of creating close relationships among member universities by providing a platform for exchange among the heads of major research universities in East Asia as well as among faculty members and students. Consisting of 17 universities in four countries and areas (Japan, China, Korea, and Taiwan), AEARU has been promoting exchange and other activities within the AEARU framework. The next meeting will be held at National Tsing Hua University (Taiwan) in December 2013.

**International symposium and workshop**

The Advanced Institute for Materials Research (AIMR) of Tohoku University held an international symposium at the Sendai International Center from February 19 through 21, 2013. The lectures from around the world included 32 researchers, among Professor Eiji Negishi, a Nobel prize winner, other invited lecturers, and researchers from AIMR. The 240 participants from 14 countries, including the United States, China, and the United Kingdom, who attended the symposium, exchanged opinions actively. The theme of this symposium was “Challenge for green materials innovation through the fusion of materials science and mathematics.” With many mathematicians attending the symposium, the fusion of mathematics with materials science that AIMR has been working on was actively discussed.

On January 15 and 16, 2013, the Research Institute for Electronic Communication (RIEC) of Tohoku University held a Tohoku-Harvard Joint Workshop “New Directions in Materials for Nanoelectronics, Spintronics and Photonics Together with Harvard University” to share the latest research results of materials science. The workshop was organized by Tohoku University in conjunction with Harvard University.

**Seminars/Forums abroad**

On September 3, 2012 Susumu Satomi, President of Tohoku University, was invited and gave a keynote speech at the 2012 Taiwan-Japan Science and Technology Forum. This forum was held on the subject of “Reconstruction of Japan following the Great East Japan Earthquake, and Cooperation between Taiwan and Japan,” so that top leaders in Taiwan and Japan in areas of science and technology are able to share their expertise, and experiences in policies and public administration, in order to help develop strategic plans for leading research, science, and technology. There were more than 400 participants. President Satomi gave a speech on “Tohoku University and the Great East Japan Earthquake: Our Role, Responsibility and Mission,” which was well received. During the forum, he participated in a panel discussion titled “Japan Industrial Restoration Plan: Futures of Energy Policies, and Taiwan-Japan Cooperation.”

On December 10, 2012, the First Japan-Russia Medical Forum was held jointly in Moscow by Tohoku University and Moscow State University. At this Forum, Victor Sudopp, Rector of Moscow State University, and President Satomi signed a joint statement with the aim of promoting further joint research and confirming that the second Japan-Russia Medical Forum will be held in Sendai in 2014.

**Promotion of international education: the Project for Promotion of Global Human Resource Development**

Tohoku University was selected for the Project for Promotion of Global Human Resource Development by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in FY2012. Within that framework, the Global Learning Center launched the Tohoku University Global Leader Program (TGL) to develop top leaders in the field of management and public administration, in order to help develop strategic plans for leading research, science, and technology. There were more than 400 participants. President Satomi gave a speech on “Tohoku University and the Great East Japan Earthquake: Our Role, Responsibility and Mission,” which was well received. During the forum, he participated in a panel discussion titled “Japan Industrial Restoration Plan: Futures of Energy Policies, and Taiwan-Japan Cooperation.”

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In the spirit of our “open-door policy,” we look to the future hand in hand with our community

Preserving tradition, contributing to a changing society and promoting gender equality

Project commemorating 100th anniversary of first women students at Tohoku University

In 1913, Tohoku University welcomed its first female students. At the time, it was considered unthinkable to accept a woman as a legitimate student and in spite of the fact that the Ministry of Education did not grant permission, 10 female students eventually entered the university. In 1915, 10 female students entered the university and in 1919, Tohoku University welcomed its first female students. Today, more than 10,000 female students are enrolled at Tohoku University.

Various activities to promote gender equality have been carried out throughout 2013 to commemorate the 100th anniversary of the first women students to study at Tohoku University. On August 8, 2013, as part of our commemorative activities, a symposium was held on the theme “100 Years since the First Women Scientists Studied at Tohoku University and Fostering Future Female Leaders” with the participation of top female scientists from throughout Japan and the world. In addition, a 10-year “Action Plan” was announced to promote gender equality by fostering female leaders and scientists for the next generation and supporting faculty and staff members who want to work while raising a family.

Fostering a sense of community among Shuyukai members

Shuyukai holds events such as Homecoming Day and regional exchange meetings for its members to promote friendship and communication. Class reunions are held every 15 years from the year of graduation, and secretaries selected from among alumni by year of graduation organize a reunion of that class. By the end of the 2012 academic year, secretaries of the alumni association have been chosen from among graduates of classes of 2006 through 2012.

Maintaining tradition, contributing to a changing society and promoting gender equality

The Tohoku University Alumni Association Shuyukai was created in 2007 to commemorate the 100th anniversary of the establishment of the University and to set a course for its next 100 years. In addition to the 140,000 alumni members of the organization, there are 18,000 current students and their families, and 6,000 members of the faculty and staff. Shuyukai is working to deepen the bonds among its members and to contribute to its development by strengthening communication between the University and members, thus creating a high awareness and closer ties as members of the “Tohoku University Community.”

Tohoku University Alumni Association Shuyukai

3rd Shuyukai premium alumni meeting

On May 24, 2013, a performance of the musical “Cats” performed by the Gekidan Shiki theater troupe was held exclusively for Shuyukai members at the Tohoku Electric Hotel Musashino as part of the 3rd Shuyukai premium alumni meeting.

On this day, over 300 Shuyukai “Premium Members,” including alumni, faculty and staff, current students and their families, attended this performance. The two and a half hour musical passed by swiftly as the audience watched mesmerized, clapping to the beat of the music and laughing out loud with joy. Although the members of the audience came from different walks of life, on this day, everyone was united as they shared the thrill and excitement of this special time.
Achieving world-class status
Tohoku University Campus Report for the Future

Aobayama North Campus

Start of construction of the “Science Complex C”
Construction has begun on the “Science Complex C” at an area to become the entrance of the Aobayama North Campus towards the new saury-e Fixed Line station. This design is made to blend in with existing structures. The lower level consists of a large auditorium, lobby, coffee shop, etc., and with an open space that welcomes visitors. Built with a seismically isolated structure, this facility has special features that will allow research projects to continue in the event of a disaster and will also function as a disaster prevention center.

New Aobayama Campus

Start of construction of building for “International Research Institute of Disaster Science”
In April 2012, construction was begun along the Campus Mall for the “International Research Institute of Disaster Science.” This five-story building, with an area of 10,000 square meters, will enable visitors to observe and experience the effects of disasters and, in accordance with the design of the new campus, “scratch films” will be used to emphasize the vertical design of the facade. On the first floor, there will be a large auditorium and exhibition spaces, and various kinds of presentations can be made and will also function as a center for information on disaster prevention. Also, plans for moving the Graduate School of Agricultural Sciences to this campus are under way.

Aobayama East Campus

Renovation of Experimental Laboratories
Experimental laboratories in the departments of “Electrical Engineering and Applied Physics,” “Materials Science and Engineering,” and “Civil Engineering and Architecture” are undergoing renovations after sustaining major damage from the earthquake of March 11, 2011. Rebuilding and repair work is expected to be completed in the first half of 2014. In addition to constructing a seismically isolated structure and installing emergency generators as part of safety measures, the married in 2011 and the preserved open space around the North Gate. The 6th to 8th floors contain rooms for researchers, either as single-person units or as family units. The 3rd to 5th floors serve as a student dormitory. On the 2nd floor, the Kitamon Lounge is open to alumni of the Shiyakusho Association. "Espace," a 72-seat seminar room and "Cerisier," a combination lounge and reception room for honored guests, are also located on this floor. In spring, visitors can enjoy a magnificent view of cherry blossoms in full bloom.

The WPI-AIMR Main Building received the Nikkei New Office Award and the Tohoku Architecture Award
Originally built in 1924 to house the Tohoku Imperial University Metallurgical Engineering Department, this 78-seat seminar room and "Cerisier," a combination lounge and reception room for honored guests, are also located on this floor. In spring, visitors can enjoy a magnificent view of cherry blossoms in full bloom.

Kawahachi South Campus

Renovation of Beautiful Outdoor Greenery
At the Kawachi South Campus, where graduate schools in the humanities are located, the former parking area for bikes and motorcycles is undergoing a revamp to become a pedestrian mall where people can take leisurely strolls in a comfortable environment. Located adjacent to the Sendai Castle East Area and the Botanical Gardens of Tohoku University, this area will provide a place of abundant greenery where people can relax in good weather, have lively exchanges with each other.

Seiryo Campus

Center for Cutting-Edge Medical Research
At the Seiryo Campus, various construction projects are underway to make the campus a center for cutting-edge medical research. The “Center for Tohoku Medical Multiple Bank Organization” situated in the “Academic Mall” is planned open space in front of the Medical School’s main gate. This organization is working to create an advanced medical system in the Tohoku region to help in its recovery from the devastating earthquake and tsunami and to develop world-class cutting-edge treatment in medical genetics. As visitors enter the entrance to the building, they will see a soaring five-layered atrium with areas for intellectual discussions among researchers. Expectations are high for the development of new medical treatments through collaboration with the business world and local communities.

Katahira Campus

Opening of Katahira Kitamon Commons
The recent opening of the Katahira Commons has given the Katahira Campus a new look with a renovated open space around the North Gate. With the classrooms which opened in 2011 and the preserved open space around the North Gate. The 6th to 8th floors contain rooms for researchers, either as single-person units or as family units. The 3rd to 5th floors serve as a student dormitory. On the 2nd floor, the Kitamon Lounge is open to alumni of the Shiyakusho Association. "Espace," a 72-seat seminar room and "Cerisier," a combination lounge and reception room for honored guests, are also located on this floor. In spring, visitors can enjoy a magnificent view of cherry blossoms in full bloom.

The WPI-AIMR Main Building received the Nikkei New Office Award and the Tohoku Architecture Award
Originally built in 1924 to house the Tohoku Imperial University Metallurgical Engineering Department, the WPI-AIMR Main Building was reconstructed to improve its facilities. This building received the 25th Nikkei New Office Award sponsored by the Nihon Keizai Shimbun Inc. and the New Office Promotion Association, and the 33rd Tohoku Architecture Award sponsored by the Architectural Institute of Japan.

Completion of “University House Sanjo” II
The "University House Sanjo II," an addition to the student housing facility located in the Sanjo district, has been completed. With the completion of this new building, a further 216 persons will be able to live in this housing complex, and when combined with the existing "University House Sanjo I," it will be able to accommodate up to a total of 652 residents. As in the "Sanjo I," "Sanjo II" has opened living spaces that can be shared by clusters of 8 rooms each, and Japanese and international students live together to develop more global human resources. This inner garden, located between the existing structure and the new building is a quiet space that serves as an ideal spot for international gatherings and exchanges among abundant greenery.
## Data and Overview of Tohoku University

### Number of Students (as of May 1, 2013)

| Undergraduate students | 17,033 | 156 |
| Graduate students (Affiliated Courses) | 2,677 | 537 |
| Students at Affiliated Schools | 38 | 0 |
| Research students/Others | 493 | 277 |
| Total | 18,240 | 1,436 |

### FY2012 Financial Summary

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<thead>
<tr>
<th>Item</th>
<th>Value (million yen)</th>
</tr>
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<tbody>
<tr>
<td>Revenues from Management Grants</td>
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<td>Revenues from Governmental Grants</td>
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<td>Revenues from Contract Research</td>
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<tr>
<td>Revenues from Affiliation Project</td>
<td>1,206</td>
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<td>Total Revenues from University Management</td>
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<tr>
<td>Expenses for Reconstitution</td>
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<tr>
<td>Expenses for Contract Research</td>
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<tr>
<td>Expenses for Contract Research</td>
<td>0</td>
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<tr>
<td>Expenses for Facility Improvement</td>
<td>3,683</td>
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<tr>
<td>Expenses for Debt Repayment</td>
<td>3,680</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>176,391</td>
</tr>
</tbody>
</table>

### Number of Faculty and Staff Members (as of May 1, 2013)

- **President**: 1
- **Board of Directors**: 7
- **Academics**: 2
- **Faculty Members**: 3,316
  - Professors: 859
  - Associate Professors: 729
  - Senior Assist Professors: 170
  - Assistant Professors: 1,169
  - Research Assistant: 183
- **Administrative/Technical staff/Others**: 3,065

Total: 6,211

### Agreements on Academic Exchange (as of May 1, 2013)

- **Agreements on the University Level**: 179 Institutions
  - **Agreements on the Department Level**: 43 countries/regions 322 institutions

### Number of International Students (as of May 2013)

- **Total**: 78 countries/regions 1,416
- **Overseas Office**: 9 countries 13 centers
- **Overseas offices**: 3 countries 4 offices

### Number of Exchange Students Based on Academic Agreements (as of May 2013)

- **To overseas**: 34 countries/regions 59
- **From overseas**: 60 countries/regions 146

### Endowed Chairs and Research Divisions (as of May 1, 2013)

- **Endowed Chairs**: 30
- **Endowed Research Divisions**: 10

## Location of Tohoku University

![Location Map of Tohoku University](https://example.com/map)

## Contacts

### Graduate School/Faculty of Arts and Letters

- **General Affairs Section**: Tel. +81-22-795-6022
  - http://www.shushi.tohoku.ac.jp/index.html

### Graduate School/Faculty of Education

- **General Affairs Section**: Tel. +81-22-795-6112
  - http://www.kie.tohoku.ac.jp/eng/index.html

### Graduate School/School of Law

- **General Affairs Section**: Tel. +81-22-795-6011

### Graduate School of Economics and Management/Faculty of Economics

- **General Affairs Section**: Tel. +81-22-795-6283

### Graduate School/Faculty of Science

- **General Affairs Section**: Tel. +81-22-795-6112
  - http://www.sc.tohoku.ac.jp/index.html

### Graduate School/School of Medicine

- **General Affairs Section**: Tel. +81-22-795-6132

### Graduate School/School of Dentistry

- **General Affairs Section**: Tel. +81-22-795-6132

### Graduate School of Pharmaceutical Sciences/Faculty of Pharmacy and Pharmaceutical Sciences

- **General Affairs Section**: Tel. +81-22-795-6581
  - http://www.pharm.tohoku.ac.jp/index.html

### Graduate School/School of Engineering

- **General Affairs Section**: Tel. +81-22-795-6082

### Graduate School of Agricultural Science/Faculty of Agriculture

- **General Affairs Section**: Tel. +81-22-795-6082
  - http://www.agr.tohoku.ac.jp/index.html

### Graduate School of International Cultural Studies

- **General Affairs Section**: Tel. +81-22-795-6240
  - http://www.sci.tohoku.ac.jp/index.html

### Graduate School of Information Sciences

- **General Affairs Section**: Tel. +81-22-795-6240

### Graduate School of Life Sciences

- **General Affairs Section**: Tel. +81-22-795-7078

### Graduate School of Environmental Studies

- **General Affairs Section**: Tel. +81-22-795-7143

### Graduate School of Biomedical Engineering

- **General Affairs Section**: Tel. +81-22-795-7143
  - http://www.bme.tohoku.ac.jp/index.html

### Graduate School of Educational Informatics

- **Research Division/Education Division**
  - **General Affairs Division**: Tel. +81-22-795-6012

### Institute for Materia Medica

- **General Affairs Section**: Tel. +81-22-795-6132
  - http://www.imr.tohoku.ac.jp/index.html

### Institute of Multidisciplinary Research for Advanced Materials

- **General Affairs Section**: Tel. +81-22-795-6132
  - http://www.imr.tohoku.ac.jp/index.html

### Center for Northeast Asian Studies

- **General Affairs Section**: Tel. +81-22-795-6132
  - http://www.cnas.tohoku.ac.jp/index.html

### Research Center for Electron Photon Science

- **General Affairs Section**: Tel. +81-22-795-6132
  - http://www.cerep.tohoku.ac.jp/index.html

### Research Center for Nuclear Science (NCRS)

- **General Affairs Section**: Tel. +81-22-795-6132

### Center for Information Technology in Education

- **Student Affairs Division**: Tel. +81-22-795-6132

### Tohoku University Library

- **General Affairs Section**: Tel. +81-22-795-6132
  - http://www.library.tohoku.ac.jp/index.html

### Tohoku University Hospital

- **General Affairs Section**: Tel. +81-22-795-6132

### Tohoku University MEGABank Organization

- **General Affairs Section**: Tel. +81-22-795-6132

### WPI Advanced Institute for Materials Research (WPI-AMR)

- **General Affairs Section**: Tel. +81-22-795-6132

### Tohoku Medical Megabank Organization

- **General Affairs Section**: Tel. +81-22-795-6132

### Information about the entrance examination

- **Student Affairs Division**: Tel. +81-22-795-6132

### Information for international students

- **Student Affairs Division**: Tel. +81-22-795-6132

### Center for Information Technology in Education

- **Student Affairs Division**: Tel. +81-22-795-6132

### Tohoku University Annual Review 2013

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- **Authors**: Masahiko Fujimoto, Takashi Sekiuchi, Atsushi Muramatsu, Yositaka Taniguchi, Hiroo Sato, Tsunemoto Kuriyagawa
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