

# Tohoku University

Annual Review 2007



Tohoku University  
1-1 Katahira 2-chome, Aoba-ku,  
Sendai 980-8577 Japan  
URL: <http://www.tohoku.ac.jp/>

Public Relations Division,  
Public Relations Department  
Tel: +81-22-217-4977

International Exchange Division,  
International Affairs Department  
Tel: +81-22-217-5019





# MISSION STATEMENT

Since its foundation, Tohoku University has been committed to a "Research First" principle and an "Open-Door" policy, and the University is internationally recognized for its outstanding standards in education and research. The university contributes to world peace and equality by devoting itself to research useful in the solutions of social problems and by developing leadership qualities in students.

# HISTORY

Tohoku University was founded in 1907 as the third Imperial University of Japan, following Tokyo Imperial University and Kyoto Imperial University. From the start, it displayed to the world an unswerving commitment to an "Open-Door" admissions policy. In contrast to the other Imperial Universities, it accepted graduates from Higher Technical Schools and Normal Schools and, despite opposition from the government at that time, it became Japan's first National 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. Partly as a result of this, a "Research First" principle came to develop, which calls upon our scholars not only to 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 their results of cutting-edge research are being put to use for the good of society and the improvement of ways of living. Evidence of our pioneering practice (before the World War II period) includes the establishment of local venture businesses which foster regional industry as well as our status as the national center for research into family law - the domestic branch of law which is closely associated with our daily lives.

This spirit, which continued strongly through World War II and the rapid economic growth of the postwar period, still remains vibrant and can be seen in today's new era of advanced globalization.

# CONTENTS

01	• Mission Statement • History
03	• Aiming to Be a World-Leading University • News and Events in FY 2006 • The Inoue Plan
05	• Our Products are the Most Widely Used Drugs in the World
06	• Discovering the Mechanism for Reducing Obesity and Diabetes
07	• Nano-Machines Help Restore Functions to Partial Areas of the Eyes and Brain
08	• Elucidating Moments of Insight into Ideas Through Science
09	• An UltraHigh-Speed Optical Network is the Key to the Future of Information Communication
10	• Elucidating the Mysteries of the Earth's Interior Under a Microscope
11	• A New Creation in Education with "Self-Cultivation Seminars"
12	• Creating a New Direction in the Future of Robotics at the Advanced Level of Human Haptic Sensation
13	• Award Winners for 2006
15	• Substantial Education Continues in Development
17	• A Bright and Active Campus Life with Many Talented Friends
19	• Providing Intellectual Resources Through University-Industry Cooperation
21	• International Exchange Programs
23	• Contributing to Society and Promoting a Gender-Equal Society
25	• Tohoku University Celebrates Its 100th Anniversary
26	• New Campus Plan
27	• Divisional Major Achievements
29	• Contacts • Location of Tohoku University
30	• Data and Overview of Tohoku University

[Pictures]  
Front cover  
The University's Main Administrative Building (Katahira Campus)  
Contents  
The Zelkova street that runs through the Graduate School/School of Engineering (Aobayama Campus)

The Annual Review 2007 covers activities conducted from April 2006 to March 2007.

# Aiming to Be a World-Leading University

President of Tohoku University  
**Akihisa INOUE**

Since its founding in 1907, Tohoku University has been engaged in research and education at the highest international level, while displaying commitments to the philosophies of "Research-First," "Open-Door" and "Practice-Oriented" research and education. In Tohoku University's Annual Review 2007, we describe the remarkable achievements and highlights of the previous year at the University.

In 2007, our university celebrates its 100th anniversary, in the midst of many serious and complex social and global issues which we are forced to face and to conquer. Through persistent efforts to promote research and education and with the accumulation of knowledge which the University has built up during its 100-year history, we are determined to be a front-runner in tackling these issues.

In March 2007, Tohoku University announced the "Inoue Plan (Tohoku University Action Plan)." And based upon a firm commitment towards contributing to human society, the Inoue Plan establishes the specific implementation of a strategic five pillar plan. This includes education, research, our social contribution, the campus environment and the organization and management necessary for a "World-Leading University." Presently, we are initiating various new targets. These include the establishment of an "International Advanced Research and Education Organization" which intends to foster research leaders in science and academia for the 21st century and the introduction of an "Overseas Internship" to foster an international awareness in students. In addition, we are also establishing strategic research centers at a level of global excellence, taking a lead in the creation of new businesses through collaboration with industry, academia and the government, and creating an international standard campus open to the world, without compromising what makes our institution unique.

Our aim to be a "World-Leading University" is not a short-term goal. Therefore, we must make sure that our university's policy has a clear direction to follow, obtain a good understanding concerning our missions and activities, and through mutual cooperation, make definite progress towards our goal. Our intentions as a university are to contribute to the improvement of mankind and to be trusted, respected and loved by society.



## The Inoue Plan

The Tohoku University Action Plan was set up following Akihisa INOUE's accession to the presidency of Tohoku University and was formulated in 2007 with the Office of the President at its center. The plan, based upon a firm commitment towards contributing to humanity and society, provides a specific and strategic implementation plan which aims to achieve our goal of becoming a "World-Leading University."



## Tohoku University News and Events in FY 2006

### 2006

4.1	The Institute for International Advanced Research and Education Established
4.6	Tohoku University Entrance Ceremony
5.24	The Tohoku University US Office (Los Altos, California) Opened
6.22	Tohoku University Pre-Centenary Event - One Year Prior to the 100th Anniversary -
7.27	Organizational Partnership Agreement with Seiko Epson Corporation
7.27,28	Tohoku University Open Campus
8.2	Tohoku University's 6th, 100th Anniversary Seminar (Tokyo) "Crisis of Civilization and the Rebirth of Global Community"
9.25	Tohoku University Commencement Ceremony
11.6	Prof. Akihisa INOUE's Accession to the Presidency of Tohoku University
12.3	Tohoku University's 100th Anniversary Seminar, Sendai "Challenge of Advanced Science - To Achieve 'Long Life in Good Health' "
12.4	Presentation Ceremony for Tohoku University's Professor Fujino Incentive Award
12.16	First General Assembly of Tohoku University China Alumni Association (Beihang University, Beijing, China)
12.26	Basic Agreement upon Partnership and Cooperation with Kahoku Shimpō Publishing Co.

### 2007

1.13	Tohoku University's 7th, 100th Anniversary Seminars (Tokyo) "Children Who Show Agoraphobia, Lack of Motivation, and Sense of Failure - What Their Parents, Teachers, and Society Can Do for Them"
1.31	Organizational Partnership Agreement with The 77 Bank, Ltd.
2.8,9	International Forum for Joint Anniversary "Lyon-Tohoku, Teaming for the Future" - We Pioneer the 2020 Horizon with Science and Technology - (Lyon, France)
2.25,26	2007 Tohoku University Entrance Examination: First Examination for General Admission
3.3	Tohoku University Centenary Education Summit: "New Knowledge Society" (Tokyo)
3.6	Organizational Partnership Agreement: DOWA Holdings Co., Ltd.
3.12	2007 Tohoku University Entrance Examination: Second Examination for General Admission
3.27	Tohoku University Commencement Ceremony

1	Education	The Inoue Plan is designed to reform the university educational system. As a "Transmitter of Knowledge," the university will provide and disseminate the knowledge which it has accumulated through its history as a "Creator of Knowledge," nurturing students to become our future leaders. Those who will play key leadership roles must be provided with strong cultural backgrounds, specialized knowledge and an international outlook.
2	Research	Tohoku University, as a "Creator of Knowledge," has established a research system based upon originality, oriented towards strategies with a long-term perspective. And in order to create the upmost in advanced, top-level achievements in world research, the University carries out research which is driven by fundamental needs and questions.
3	Social contribution	"As a University Open to the World and Community," Tohoku University shares its leadership and its intellectual knowledge with society while contributing to the welfare of all mankind.
4	Campus environment	The university, as a "Creator of Knowledge" and "Transmitter of Knowledge," provides a global-standard campus environment. It maintains a high standard of support for various educational and research activities.
5	Organization and Management	The "Enterprise of Knowledge" scheme is a process of reform in the managerial foundations of the university which includes the financial response to changes in our environmental surroundings and to contemporary challenges.



## Our Products are the Most Widely Used Drugs in the World

Specially Appointed Prof. **Akira Endo**

Born in 1933, he graduated from the Faculty of Agriculture, Tohoku University and in 1966-1968 studied in the United States, at the Albert Einstein College of Medicine.

The drugs generically called Statins, administered to more than 30 million people daily, are the most widely sold drugs in the world. Dr. Akira Endo, the Representative Director for Biopharm of Japan Corporation, is from the Faculty of Agriculture, Tohoku University and discovered ML-236B (Compactin) the main ingredient of statin.

Specialized in applied microbiology, Doctor Endo studied as many as 6,000 varieties of fungus in the early 1970's; then in 1973, he discovered a substance in a blue-green mold variety called ML-236B (this report was published in 1976) and also showed how ML-236B dramatically reduces cholesterol in the blood. Doctor Endo's research project was initially triggered by his study experience in the United States at the Albert Einstein College of Medicine. It was here that the increasing number of heart attacks was to top cancer among lifestyle diseases as a cause of death. However, at that time, there was no effective medicine for its treatment. While chemical medicines were thriving at that time, Doctor Endo had the inspiration that an "effective treatment by medicines might be discovered in microorganisms similar to the story of the discovery of penicillin from a blue-green mold by Doctor Fleming."

Doctor Endo has been honored with many awards including the 2006 Massry Prize in the United States and the 2006 (22nd) Japan Prize, presented for his enormous contribution to the advancement of medicine.



Dr. Endo's fundamental work in microbiological study is in sampling soil. A hole 15 cm in diameter and 15 cm deep is dug in the ground for sampling the soil, then microorganisms in the soil are examined carefully.



"Statin," a new drug, effectively reduces cholesterol in blood

## Discovering the Mechanism for Reducing Obesity and Diabetes



Japan Society for the Promotion of Science Prize plaque

[Division of Molecular Metabolism and Diabetes]

Professor **Yoshitomo Oka**

Born in 1949, he graduated from the Faculty of Medicine, University of Tokyo. He worked at the University of Tokyo Hospital, University of Massachusetts Medical School, and then the Faculty of Medicine, Yamaguchi University. In 2001, he joined Tohoku University, as a professor at the Graduate School of Medicine. Since 2004 he has been the Associate Dean of the Graduate School of Medicine. (Left in the picture)

[Division of Advanced Therapeutics for Metabolic Diseases]

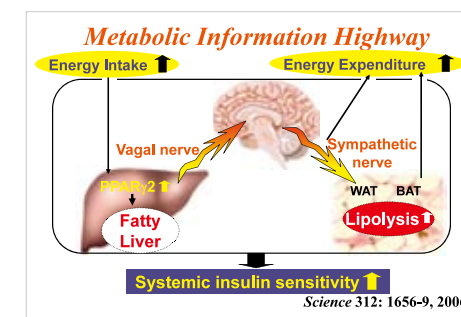
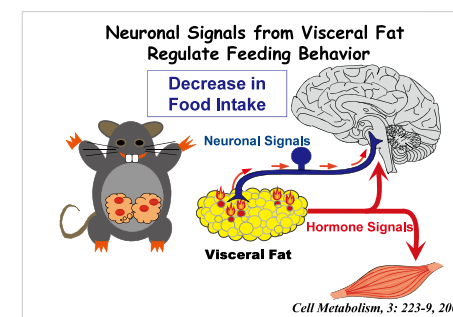
Professor **Hideki Katagiri**

Born in 1962, he graduated from the Faculty of Medicine, University of Tokyo. He worked at the University of Tokyo Hospital, and then became a professor at the Graduate School of Medicine, Tohoku University in 2003. (Right in the picture)

A research team composed of Professor Hideki Katagiri (Center for Translational and Advanced Animal Research) and Professor Yoshitomo Oka (Department of Internal Medicine) was the first in the world to discover the existence of "an inter-organ neural network for metabolic information." When fatty liver was induced in mice, the basal metabolism responded actively to reduce fat accumulation in fat tissue. This inter-organ neuronal system functions as a protective machinery against obesity.

Professor Oka states that: "The brain cells receive neural signals sent from the liver and instruct the fat tissue to decompose fats by becoming more actively metabolic. The brain plays the role of conductor for the entire body, the orchestra." This discovery anticipates great research advances, especially in the fields of biology and medicine. Its clinical application, of course, will be in the prevention of obesity and establishment of new means of treating it. "This discovery opens up a new field for research," said Professor Katagiri.

Professor Oka has been honored with many awards, including the Japan Diabetes Society Award in 1990. Professor Katagiri was awarded the Japan Society for the Promotion of Science Prize (FY2006), which is given to young researchers who have produced notable research and achievements. Their research results were published in the US journal *Science* (Vol. 312, June 16, 2006).



## Nano-Machines Help Restore Functions to Partial Areas of the Eyes and Brain

The Koyanagi and Tanaka Laboratory makes full use of the latest semiconductor technologies to carry out research in the areas of biotechnology and robotics.

A retinal prosthesis chip and a brain-type computer represent the research achievements of this laboratory. A 3D stacked microchip for retinal prosthesis has a structure almost identical to that of a human retina. It receives image information which is then processed in a fast and sophisticated manner using the image information processing system.

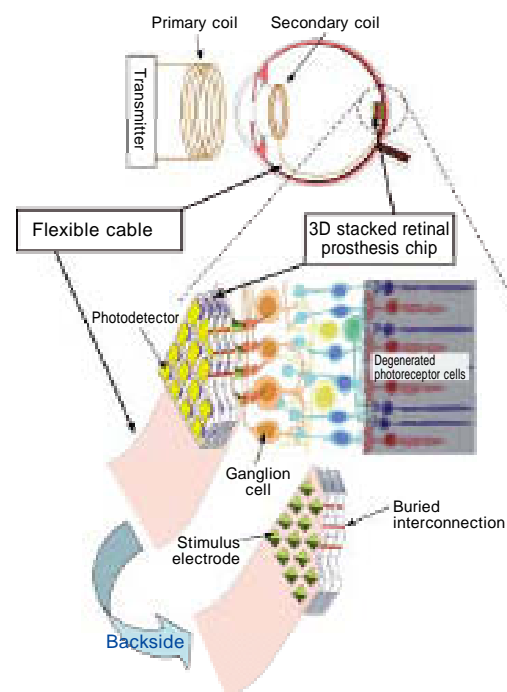
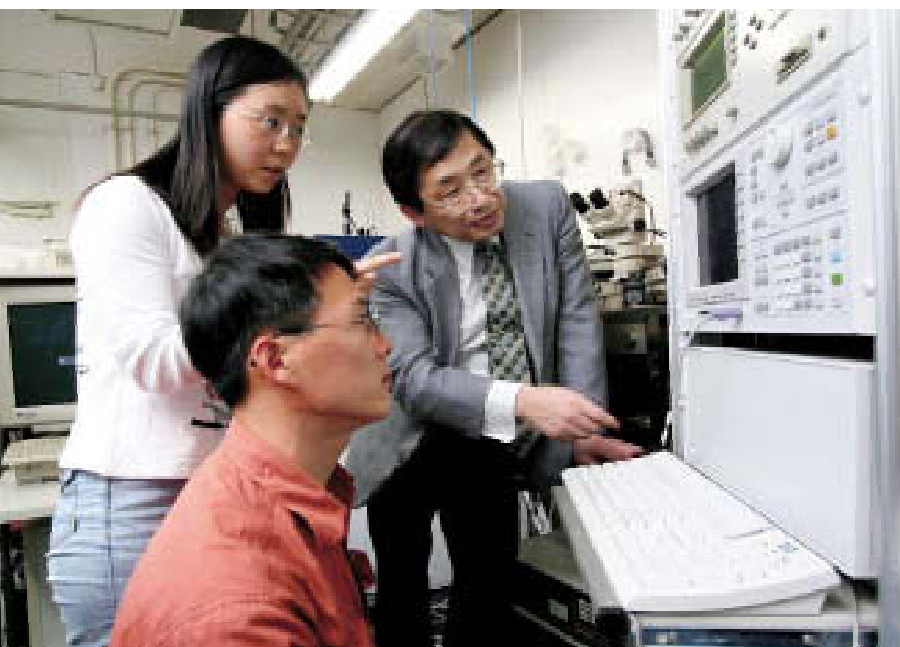
Professor Koyanagi refers to his future research by saying, "It will become possible to have a blind person recover his or her vision by implanting a retinal prosthesis chip into the eyes and applying an electric stimulus to the retinal cells. In the same way, it will also become possible to recover brain functions lost due to an accident or a disease with a brain computer."

In 2006, Professor Koyanagi was awarded the IEEE Jun-ichi Nishizawa Medal by the Institute of Electrical and Electronics Engineers (IEEE), USA.

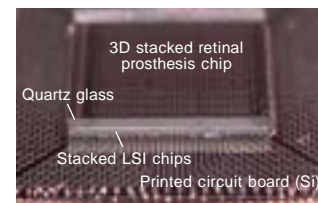
### 【Advanced Bio-Nano Devices】

#### Professor Mitsumasa Koyanagi

Born in 1947, he completed his Doctoral Course at the Graduate School of Engineering, Tohoku University. He then worked for Hitachi Ltd., and U.S. Xerox Corp. In 1994, he assumed a position as a professor at the Faculty of Engineering, Tohoku University. (picture on the right and in the back)



A brain computer aims to substitute some of the brain functions, such as cognition, by means of integrated-circuit technology. The retinal prosthesis chip will simulate the functions and structure of the retina, making it possible to construct a complex parallel processing system, similar to a human brain mechanism.



IEEE Jun-ichi Nishizawa Medal

Professor Mitsumasa Koyanagi, Graduate School of Engineering <http://www.sd.mech.tohoku.ac.jp/>

## Elucidating Moments of Insight into Ideas Through Science

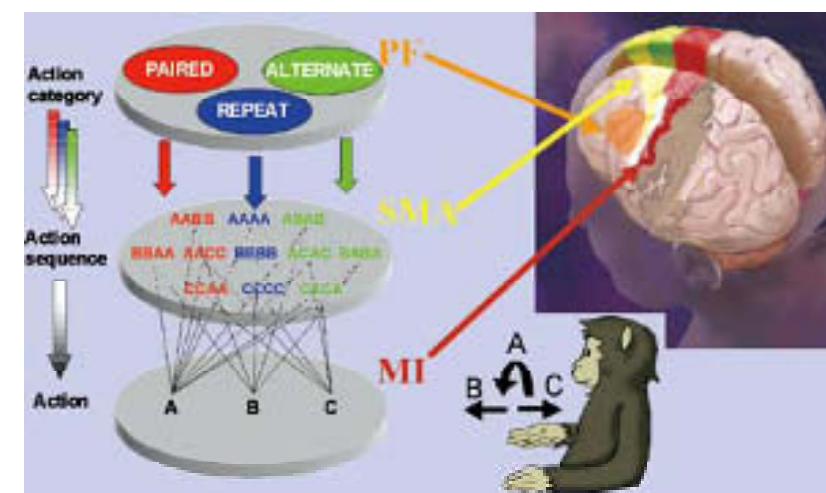
The research team lead by Professor Hajime Mushiaki carries out studies on the neural mechanism of voluntary actions, exploring the mechanisms of higher cognitive functions in the prefrontal cortical areas, and has elucidated the role which this mechanism performs in problem-solving behavior. The brain cells in the prefrontal area set goals in problem-solving and generate a process to reach the goal swiftly. These cells not only integrate information received by the brain, but also lead to the emergence of the information which the brain deems necessary. The research team has elucidated the higher functions of the brain, called "insightful" behavior and the "Aha! Experience" in problem-solving.

Their research was conducted using an experiment in which monkeys were shown a map of a maze on a display device. The monkey moved a cursor to the goal by means of a controller and was then able to move around obstacles along the way. The monkey anticipated what

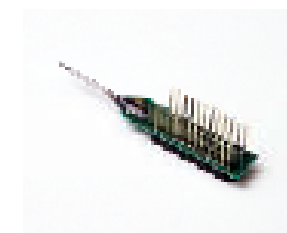
would happen and decided upon the required action.

"The recent advances in neuroscience owe much to developments in engineering," said Professor Mushiaki. His research team, in cooperation with the Laboratory for Mechanical Engineering and the Laboratory for Information Sciences in the university, assisted in the development of precise silicon electrodes which monitor the activity of the brain. This cooperation across the graduate schools has helped new technologies to evolve and deepened its research.

In 1998, Professor Mushiaki was awarded the 30th Naito Foundation Research Prize for his research conducted in cooperation with Dr. Jun Tanji and Dr. Keisetsu Shima. His paper, written in collaboration with them, was entitled "Brain: Categorization of Behavioral Sequences in the Prefrontal Cortex" and was published in Nature (Vol.445 No. 7125, 18 January 2007).



The cells of the lateral prefrontal area act in specific ways for particular categories of behavioral sequences, and the cells of the prefrontal area express the categories of behavioral sequences in plan behavior.



A prototype silicon electrode was developed by the Koyanagi & Tanaka Laboratory, the Graduate School of Engineering, and the Laboratory for Information Sciences in collaboration with Yamagata Electronic Corporation.

### 【Medical Physiology】

#### Professor Hajime Mushiaki

Born in 1958, he graduated from the Graduate School of Medicine, Tohoku University and worked as a researcher in the Faculty of Medicine at the New York State University. He then became a researcher at Sakigake 21, the Japan Science and Technology Foundation. He assumed the position of professor at the Graduate School of Medicine, Tohoku University in 2005.



Professor Hajime Mushiaki, Graduate School of Medicine <http://www.med.tohoku.ac.jp/~2sei/index.html>



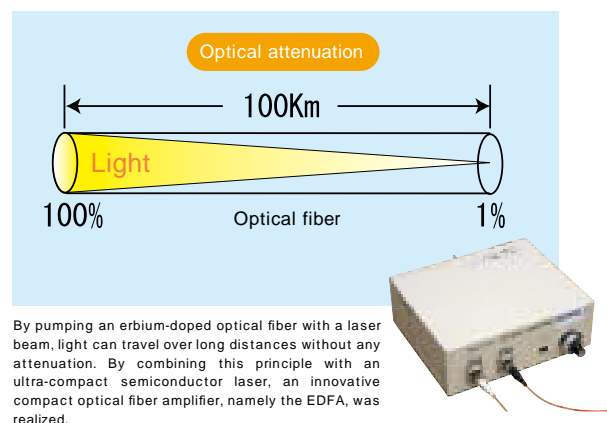
# An UltraHigh-Speed Optical Network is the Key to the Future of Information Communication

Professor Nakazawa's laboratory is well known for its research and development related to ultra-short optical pulse generation and transmission technologies, high-speed mode-locked lasers, and optical signal processing, which are the fundamental technologies for ultrahigh-speed optical communication. The laboratory aims to achieve a global ultrahigh-speed optical network for the 21st century.

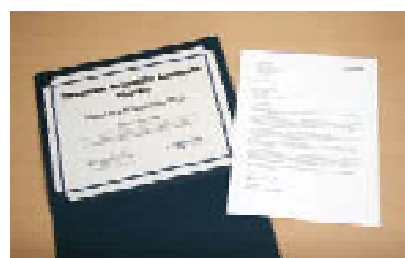
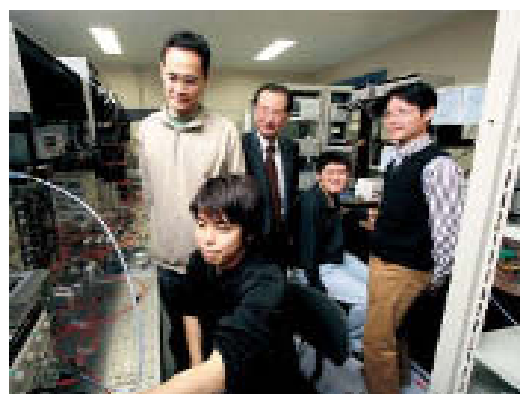
The Ministry of Education, Culture, Sports, Science and Technology adopted the idea of "Establishing a new transmission technique that employs optical Fourier

transformation" as an area of specially promoted research in 2004. The goal is to reduce the cost and enhance the performance of an ultrahigh speed optical communication system.

Professor Nakazawa received the Wood Prize from the Optical Society of America in 2005, and has been honored with many other awards. In 2006, he was named as a Thomson Scientific Laureate, which indicates that he was considered a leading candidate for the 2006 Nobel Prize in Physics.



By pumping an erbium-doped optical fiber with a laser beam, light can travel over long distances without any attenuation. By combining this principle with an ultra-compact semiconductor laser, an innovative compact optical fiber amplifier, namely the EDFA, was realized.



His development of the erbium-doped fiber amplifier (EDFA) was the reason for Professor Nakazawa being selected as a leading candidate for the Nobel Prize in Physics.

## 【Ultrahigh-speed Optical Communication】

### Professor Masataka Nakazawa

Born in 1952, he was awarded his Ph. D by the Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology. He then joined the Nippon Telegraph and Telephone Corporation (currently known as NTT). Since 2001, he has been a professor at the Research Institute of Electrical Communication, Tohoku University.

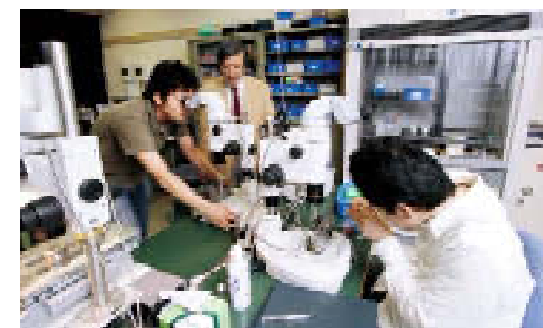


Professor Masataka Nakazawa, Research Institute of Electrical Communication <http://www.nakazawa.riec.tohoku.ac.jp/>

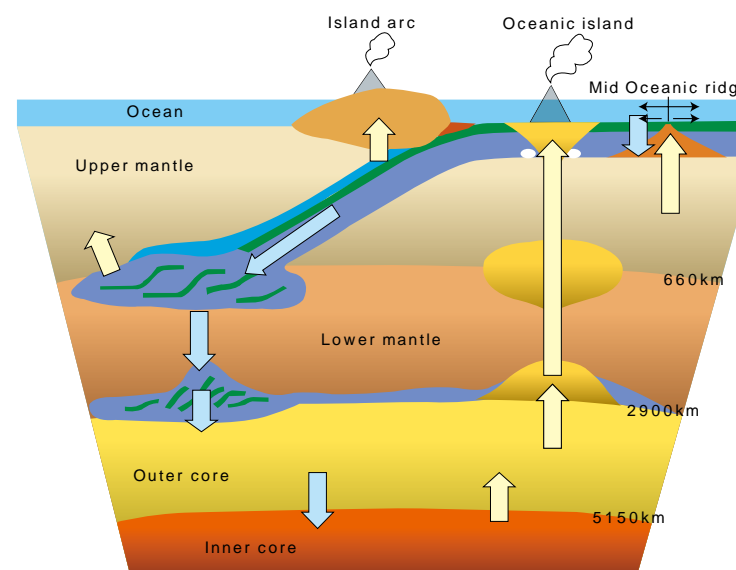
# Elucidating the Mysteries of the Earth's Interior Under a Microscope

Professor Eiji Ohtani's Laboratory studies the internal structure of the Earth, and the structures and properties of the substances that compose our planet. In the laboratory they have generated a high-temperature and high-pressure environment similar to that of the Earth's interior, and they have conducted experiments to study how substances change in such an environment, in order to elucidate the billions of years of the evolutionary history of planet Earth.

The laboratory succeeded in measuring the density of hydrous magma at high temperatures and pressures. It has then proved that hydrous magma stays at the bottom of the upper mantle. It was known that water on the surface, on the ocean floor, is carried deep into the mantle due to its sinking plates, which in turn causes earthquakes and volcanic activity inside plates. This study was the first of its kind and highly praised by researchers in many countries around the world. His achievement and research result were published in the scientific journal Nature in 2005.



In a high-pressure diamond anvil cell, the reaction of the core with the mantle is reproduced.



The Earth's internal environment can be reproduced by using this high-pressure generation device, which is capable of applying ultra-high pressures and temperatures equivalent to those inside the core by heating up to the temperatures of several thousands degrees centigrade by focusing a laser beam.

## 【Earth and Planetary Material Physical Research】

### Professor Eiji Ohtani

Born in 1950, he graduated from the Faculty of Science, Tohoku University, and finished his doctoral course in the Graduate School of Science, Nagoya University. He worked as a researcher in the Research School of Earth Sciences at The Australian National University, and then, became an associate professor in the Faculty of Science at Ehime University. In 1994, he assumed his current position as a professor in the Faculty of Science at Tohoku University.



Professor Eiji Ohtani, Graduate School of Science <http://www.ganko.tohoku.ac.jp/bussei/>

## A New Creation in Education with "Self-Cultivation Seminars"



The students are to submit their comments, the hidden treasures of their thoughts, which lead, as great hints and keys, to successful class planning. Students write down many comments about their thoughts and impressions.

It is not Professor Mizuhara who stands at the podium, but some graduate school students; they are TA's (teaching assistants), who start the "pedagogy" class. TA's discuss with their professor how they should deliver their class lectures, usually a day before the class, and then make a detailed scenario by which they will proceed with their lessons. They develop the contents of their next lecture based upon comments submitted at the end of the classes by the undergraduate students. This system is based upon Professor Mizuhara's idea that "nowhere in education can exist on one-way communication just from the teaching side. It is important to create a situation for communication, where teacher and students can carry on active discussions with one another, face to face." His theories are implemented in the "Self-Cultivation Seminars."

The university's own liberal education curriculum is presently a priority on the reform list in the "Tohoku University Action Plan 2007," with the results of Professor Mizuhara's studies being applied to it.

【Sciences of Teaching and Learning】

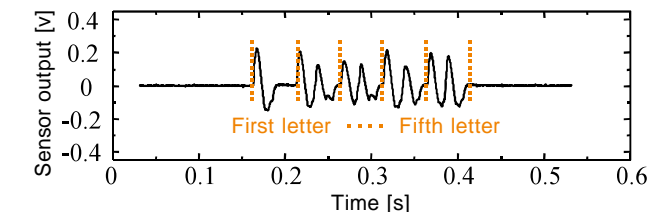
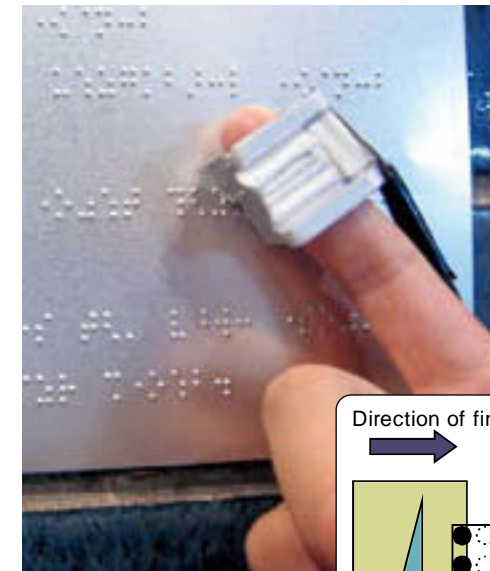
### Professor Katsutoshi Mizuhara

Born in 1949, he completed his master's course in the Graduate School of Education at Tohoku University then studied in China at the Beijing Normal University. He acquired his Ph.D in 1989 and assumed the position of professor at the Faculty of Education at Tohoku University in 1994.

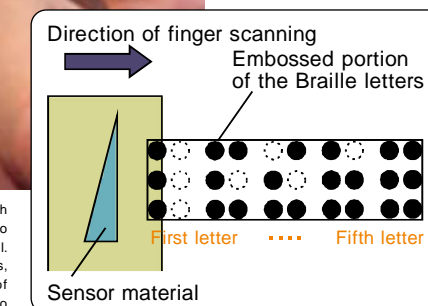


Professor Katsutoshi Mizuhara, Graduate School of Education <http://www1.sed.tohoku.ac.jp/~mizuhara/>

## Creating a New Direction in the Future of Robotics at the Advanced Level of Human Haptic Sensation



The aim is to develop a sensor system for reading Braille which is made up from a simple sensor material. The system should be of a wearable finger-attachment type, allowing it to be used like a human finger.



Aims are to develop a haptic sensor which attaches to the finger tips and is able to read, by a simple stroking, lines of Braille. The basic material contains sensor cells, each made with different lengths of contact time. Therefore, it is possible to obtain different output waveforms, producing patterns for differentiating and recognizing Braille letters.



We, as humans, have the ability to reason and to understand the fuzzy areas of things. As an example, when they hear the phrase "smooth touch," people think of the same sensation, with a subtle difference in understanding from person to person. Associate Professor Mami Tanaka, as a researcher, has been approaching these abstracts and the fuzzy areas by means of mechatronics. In an attempt to develop new types of sensors and actuators which will allow further advancements of human-robot synergetic activities, she conducts studies in micro-macro mechatronics with measurements and automatic controls.

One accomplishment is rating and evaluation of human haptic sensation to elucidate the "touch sensation" through engineering and by applying the functions of the Pacinian corpuscles, which are mechanoreceptors in the human skin.

A robot finger system for the hand is now under development, which will collect and handle information on various types of touch-sensations. These developments in biorobotics can also be applied in medical palpation or in the various areas of industrial robots.

【Biorobotics】

### Associate Professor Mami Tanaka

Associate Professor Tanaka completed her master's degree in the Graduate School of Engineering then assumed the position as an associate professor in 2001, at the Tohoku University in the Graduate School of Engineering.



Associate Professor Mami Tanaka, Graduate School of Engineering <http://rose.mech.tohoku.ac.jp/index.htm>



## Award Winners for 2006

## Japan Academy Prize

Awarded on July 3, 2006

## Research of Anti-neutrino Science

Emeritus Professor Atsuto Suzuki, Graduate School of Science

The "neutrino" is one of the elementary particles composing matter in the universe. Emeritus Professor Atsuto Suzuki has been conducting his studies at the experimental facility "KamLAND," established in January 2000, a Research Center for Neutrino Science at the Graduate School of Science. His research accomplishments are greatly valued both in Japan and abroad with the establishment of neutrino geophysics, a new academic field in science.

He leads the KamLAND international collaboration, and was the first to succeed in detecting neutrinos generated from the radiogenic decay of U/Th inside the earth. The Japan Academy recognized his studies of geologically produced neutrinos, the so-called geoneutrinos, and decided to award him this prize in March of 2006 during his professorship at Tohoku University.



## Person of Cultural Merits Elected on November 3, 2006

## Establishment of the Law of Resistance for Flow in Curved Pipes and in Rotating Pipes

Emeritus Professor Hidesato Itô, Institute of Fluid Science



Prof. Hidesato Itô at the Institute of Fluid Science, formerly the Institute of High Speed Mechanics, was elected Person of Cultural Merits for establishing the "law of resistance" for flow in curved pipes and in rotating pipes. This discovery was based upon his experiments and development of hydrodynamic theory. The results of his research are widely used for the design of cooling channels in rocket engines, heat exchangers for nuclear power plants and cooling passages in gas turbine blades.

## Award by the American Heart Association Awarded on April 29, 2006

## Research on Atherosclerosis and Ischemic Heart Disease

Professor Hiroaki Shimokawa, Graduate School of Medicine



Prof. Hiroaki Shimokawa, who has a long career in research into atherosclerosis and ischemic heart disease, received the 2006 Je rey M. Hoeg Award from the Council of Arteriosclerosis, Thrombosis, and Vascular Biology of the American Heart Association (AHA). AHA is the world's leading society in the field of cardiovascular medicine. The Award is presented to one outstanding researcher every year and Prof. Shimokawa is the first recipient from outside North America.

## Medal of Honor with Purple Ribbon Awarded on April 29, 2006

## Micro Electro Mechanical Systems

Professor Masayoshi Esashi, Graduate School of Engineering



Prof. Masayoshi Esashi conducts the applied research into semiconductor microfabrication technology, and is a world authority on Micro Electro Mechanical Systems (MEMS). His research accomplishments have been put to wide and varied uses such as in the sensor devices for triggering air bags, video camera stabilization and cell phones. The Medal of Honor with Purple Ribbon was presented to him for his long and faithful contributions to the industry.

## Medal of Honor with Purple Ribbon Awarded on April 29, 2006

## Organic Chemistry Research

Professor Yoshinori Yamamoto, Graduate School of Science



Prof. Yoshinori Yamamoto developed a method to easily produce organic compounds using catalysis. There are two catalytic methods: the metallic molecular catalyst and the Lewis acid catalyst. Prof. Yamamoto has long been engaged in research with the Lewis acid catalyst. The Medal of Honor with Purple Ribbon was presented to him for his great contribution to the development of organic chemistry research.

## Commander's Cross of the Order of Merit of the Federal Republic of Germany Awarded on May 31, 2006

## Outstanding Contribution to the Federal Republic of Germany

Emeritus Professor Tokiyasu Fujita, Graduate School of Law

Emeritus Prof. Tokiyasu Fujita (Justice of the Supreme Court since September 30th 2002) was presented with the "Commander's Cross of the Order of Merit of the Federal Republic of Germany" for his outstanding contributions in the academic field. The Ambassador of Germany honored him for "promoting the exchange of lawyers between Japan and Germany."

(Source: Kahoku Shimpo, June 1, 2006)



Photo: provided by Kahoku Shimpo Publishing Co.

2006 April 1	Nobuhiro Satou	Professor, Graduate School of Arts and Letters	Japan Poets' Club Prize
April 20	Akira Endo	Specially Appointed Professor, Graduate School of Agricultural Science	Japan Prize awarded by the Science and Technology Foundation of Japan
June 2	Akihisa Inoue	Professor, Institute for Materials Research	The Prime Minister Prize for development of Industry-Academia-Government collaboration
July 4	Mitsumasa Koyanagi	Professor, Graduate School of Engineering	2006 IEEE Jun-ichi Nishizawa Medal
Sept 5	Masataka Nakazawa	Professor, Research Institute of Electrical Communication	Thomson Scientific Laureate
2007 March 2	Hideki Katagiri	Professor, Graduate School of Medicine	JSPS Prize (Japan Society for the Promotion of Science Prize)
March 2	Masashi Kawasaki	Professor, Institute for Materials Research	JSPS Prize (Japan Society for the Promotion of Science Prize)

April 2006 - March 2007

## Topics

Selected as the "No. 1 University," from Overall Ranking, by Japanese High School Teachers.

In the "University Ranking 2007," published by the Asahi Shimbun Company, Tohoku University was ranked top from an overall rating of responses to questionnaires. The newspaper conducted a questionnaire survey of high school teachers in charge of educational guidance from across Japan and compiled the results. Specifically, Tohoku University was third favorite both for "Which university do you recommend to your students?" and "In which university did the students show improvements in performance after entering?"

- No.1 | Tohoku University
- No.2 | Kyoto University
- No.3 | Ritsumeikan University
- No.4 | Keio University
- No.5 | The University of Tokyo

## Topics

"Materials Science" Ranked Third in the ESI's List of Most Cited Papers in the World.

As of January 2007, the Institution Rankings based upon ESI (Essential Science Indicators) which provides data of citation frequencies, published by Thomson Scientific, USA, Tohoku University's publications "Materials Science" ranked 3rd (1st as a university), while its "Physics" publications were ranked 9th.

- 3rd in the world (1st in Japan) | Materials Science
- 9th in the world (2nd in Japan) | Physics
- 21st in the world (5th in Japan) | Chemistry
- 41st in the world (2nd in Japan) | Engineering



# Substantial Education Continues in Development



President Takashi Yoshimoto (left) and Vice President Akihisa Inoue (right) who has since succeeded to the presidency, in November 2006.

## Fostering World-Renowned Researchers in New Disciplinary Areas

In April 2006, Tohoku University established the "Institute for International Advanced Research and Education" with the objective of training and supporting talented young researchers as global academic front-runners. The institute assists them to acquire outstanding knowledge, be creative and develop "comprehensive intelligence" in new disciplinary areas which are beyond the existing frameworks of graduate schools and faculties.

## Winners of the Presidential Prize for Educational Excellence

(The award celebrates university staff members who have achieved prominent results based upon Tohoku University's educational philosophy.)

【Graduate School of Information Sciences】Associate Professor **Hideo Imai**

Awarded for his outstanding instructional talents in mathematics in topics which are required at a high level of technical sophistication, in subjects common across disciplines. He teaches in a lucid and accessible way and significantly contributes to the process of education across disciplinary boundaries.

【Graduate School of Science】Research Associate **Nobuki Sasaki**

Awarded for his efforts and improvements in the contents of experiments and in modernizing the equipment for "Chemistry - General Experiments," a major course subject in the Faculty of Science. He has succeeded in assembling the nation's finest collection of top-level equipment.

【Graduate School of Life Sciences】Network for the Joint Lecture of Ecology in Graduate Schools (Representative: Professor Kiwamu Minamisawa)

Professor Minamisawa was recognized with his award for implementing outstanding teaching in the joint lecture on ecology, broadening the students' interdisciplinary vision, based upon the key concepts of Ecology and the Environment. The joint lecture has a 36-year history based upon the university's interdisciplinary network and collaborations with the Graduate School of Agricultural Science, the Graduate School of Science, the Graduate School of Medicine and the Graduate School of Life Sciences.

## University House Sanjo Completed

University House Sanjo, which was completed in February of 2007, is a private room dormitory complex with capacity for 416 persons. The dormitory houses both the Japanese and international students, and aims to develop a better understanding of foreign cultures and to promote a collaborative spirit in everyday exchanges.



Student Hall

## Adoption of a "Support Program for University Education" Sponsored by the Ministry of Education, Culture, Sports, Science and Technology

The notation in the parentheses refers to the department implementing the program. \* refers to a program adopted in 2006

### Support Program for Distinctive University Education

- Educational Program for the Development of Human Resources with International Competence (Faculty of Engineering)
- Nurturing Natural Understanding and Logical Thinking Through Interdisciplinary Scientific Experiments (Center for the Advancement of Higher Education)
- Small-sized Classes in University Research: Aiming for "Transformation of Learning" (Center for the Advancement of Higher Education)\*

### Initiative for Attractive Education in Graduate Schools

- Program for Fostering Researchers and Educators in Language (Graduate School of Arts and Letters)
- Program for the Development of Young Internationally-Minded Researchers (Graduate School of Science)
- Exploring Aerospace Frontiers Through Flight Testing (Graduate School of Engineering)
- An International Educational Initiative Program for Bio-Nano Electronics (Graduate School of Engineering)

### Support Program for Professional Graduate School Formation

- Raising the Curriculum Quality of Accounting School to International Levels (Graduate School of Economics and Management)
- Multilateral Implementation of Experience-Based Education and Infrastructure Development of Public Policy Education (Graduate School of Law)\*
- Accounting Education at the Post-Qualification Stage (Graduate School of Economics and Management)\*

## Achievement in the "Support Program for Distinctive University Education"

The "Basic Seminar", a Small-Sized, Cross-Faculty Educational Activity

The "basic seminar" covers subjects campus-wide and encompasses the whole university. It was started in 2002, on a regular basis, and has developed to the stage at which there are now more than 150 themes covered. The seminar does not focus on one-way instruction from teachers, but emphasizes participation and fieldwork experience, which nurtures the students' independent initiative in a small-sized, cross-faculty class education.



A class for the practical application of "Lactic acid bacteria and functional yogurt," first established in 2006  
Small-sized Classes in Research Universities: Aiming for "Transformation of Learning"

### Program to Support Medical Education Corresponding to Community Health Care Needs and Other Social Needs

- General Perinatal Practitioner Training Plan (University Hospital)\*

### Long term Internship Program for Graduate Students

- Education Program for the Development of "Green Steel" (Graduate School of Engineering)

### University Education Internationalization Promotion Program

- Strategic International Cooperation Support Project
- Japan-Euro/Japan-China Joint Educational Programs for the Next Generation Leaders (International Affairs Department)
- Support Project For The Practical Application of Overseas Advanced Research
- Education Program for Enhancing Advanced ICT Literacy (Graduate School of Information Sciences)\*
- Supporting Projects for Creating New Interdisciplinary Research Areas (Whole University)\*
- Long Term Study-Abroad Support Project
- Long Term Study Abroad Program (International Affairs Department)

## Achievement Results on the "Initiative for Attractive Education in Graduate Schools"

ARLISS 2006

The top two positions (1. & 2.) in the Come-Back Competition

The ARLISS (A Rocket Launch for International Students Satellites) Come-Back Competition is a competition in which a small robotic payload is sent to an altitude of 4,000 m by a solid rocket, and required to autonomously reach a given goal on the ground. Two teams from the Graduate School of Engineering won the first and second prizes using wheeled rovers which traveled over the desert after landing by parachute from the sky.



The Tohoku University team at the Come-Back Competition in the Nevada Desert, USA  
"Project-based learning at the frontier of aerospace engineering"



# A Bright and Active Campus Life with Many Talented Friends



Photo by the Tohoku University Team "Windnauts"

## Victory at the 30th Japan International Birdman Rally

(in the "distance" category with man-powered propeller aircrafts)

### The Tohoku University Birdman Team "Windnauts"

Tohoku University's Birdman Team "Windnauts" won the First Prize at the 30th Japan International Birdman Rally. The competition, organized by Yomiuri Telecasting Corporation, was held on July 22, 2006 at Lake Biwa. The "Windnauts" won the contest, in the "distance" category, with a continuous flight of 28,628.43 m. The members of

the Windnaut team focused upon wind countermeasures which included the devising of a suitable shape for the aircraft's body, its horizontal tail wing and vertical tail fins, as well as improving the aircraft's operational techniques. Windnauts was the only team successful in returning back to the course over Lake Biwa.

## Achieving Substantial Results in Numerous Competitions

### Orienteering Club



## Visits and Performances at Elementary Schools in Miyagi Prefecture

### Mixed Chorus Club



## Japan Student Services Organization (JASSO) for the First Time, the JASSO's Student of the Year Award was Presented to Three Students from the Same University in the Same Year

JASSO recognizes, encourages and supports students with outstanding achievements in the fields of academic study, culture and art, sports activities, and social contribution activities. This is the first time that three students from the same national university have received this prestigious award in a same year.



Student of the Year: Academic Study  
"Roles of the Brain in the Reflex Pathways of Internal Sensation" was published in an academic journal and was awarded by the Academic Society.  
Hideaki Suzuki,  
School of Medicine (6th year student)

Student of the Year: Culture and Art  
Conferred the Grand Prize at the Yahoo! Japan Literary Award.  
Kaori Takahashi,  
School of Law (3rd year student)

Student of the Year: Culture and Art  
Awarded, for the second consecutive time, the First Place Prize in the Mainichi Newspapers Japan New Year Card Contest  
Kenji Ohtsu,  
School of Engineering (3rd year student)



## Completion of a Long-awaited Sumo Ring Sumo Club

Since Makiko Uchidate, a screenwriter and member of the Yokozuna Promotion Council, became Tohoku University Sumo Club's manager they have been making remarkable progress. This includes taking third place at the National University Sumo Competition. At first, the club members had no place to practice Sumo. They decided to make a sumo ring with their own hands, under the guidance of the Sendai-born Yobidashi (professional caller and keeper for Sumo) Kiriya Sumo-Beya. It was completed at the Kawauchi Campus on August 22nd, 2006.

## First Prize Received, for the Third Time in a Row, at the Amateur Radio International Contest

### Amateur Radio Club



## Instructions, for the Junior and High School Students, on How to Tell "Rakugo" Stories

### Rakugo Study Group



## Topics

### "Komorebi Cafe"

The "Komorebi Cafe" opened in December 2006 as a dining area on the Aobayama Campus. The design is based upon natural wood which provides a fresh and relaxing space. The university also opened its first campus convenience store next door as well.





## Providing Intellectual Resources Through University-Industry Cooperation



A computer display in picture synthesized image.

### "Combinatorial Computational Chemistry" for Industrial Innovation

(Far left, front row) Prof. Miyamoto

The laboratory of Prof. Akira Miyamoto at the New Industry Creation Hatchery Center of Tohoku University is developing a variety of combinatorial computational chemistry software for solving industrial problems in collaboration with world leading companies. Many products and technologies, in a variety of fields such as plasma display panels and lubricants for automobiles, have already been developed through university-industry

collaborations.

The Ministry of Education, Culture, Sports, Science and Technology initiated the "Industrial Innovation by Combinatorial Computational Chemistry" project with Prof. Miyamoto as its project leader. The goal of the project is to foster top world-level researchers who will bring about innovations in Japanese industries utilizing the Combinatorial Computation Chemistry approach.

### Organizational Cooperation with Private Companies/Institutes

(Development of active collaboration between universities and industries through partnership agreements.)

Agreement concluded	Private company/institute	Objective
July 27th, 2006	Seiko Epson Corporation	For the promotion of activities in collaborative research, mutual exchange of researchers, the education and development of human resources, and subsidiary assistance for international students, international exchanges to contribute to the development of academic studies and of industrial technologies.
December 26th, 2006	Kahoku Shimpo Publishing Co.	To incorporate the educational and research functions of Tohoku University with the news coverage and information service functions of Kahoku Shimpo Publishing Co. To include major cooperation in areas of joint research and investigation, event co-sponsorship and collaboration, development of human resources, etc.
January 31st, 2007	The 77 Bank, Ltd.	To support and perform information exchange with a Tohoku University-based Start-up program, matching coordinates between Tohoku University's seeds and regional companies, technical advice, and human exchange.
March 6th, 2007	DOWA Holdings Co., Ltd.	For the promotion of joint research, mutual exchange of researchers and students, fostering of young researchers, and mutual use of research facilities, and provision of equipment to promote international competitive research and the application of research results to society.



Signing ceremony on agreement with DOWA Holdings

### "Delivering" the Knowledge of the Academy to Industries

Since 2005, Tohoku University has been promoting the "Academic Guidance and Consultation System" aimed at supporting industries. Under this system, researchers and technical staff of Tohoku University give guidance/advice to industries, charging fees at hourly rates. Companies can utilize this system in a fashion which does not require a joint research contract with the university.

In addition, Tohoku University implements an on-site consultation program, collaborating with Sendai City. Under this program researchers and technical staff visit local companies as technical consultants. This program has attracted much public attention, and is a new style of partnership between university, industry and local government.



(Right) Prof. Kazuo Hokkirigawa, Graduate School of Engineering, visits a company to give assistance and technical advice.

### The 3rd International Industrial-Academic Collaboration Meeting Japan-France Workshop

In November 2006, researchers from Tohoku University, INSA-Lyon and Ecole Centrale, as well as business people and local government from the Tohoku region, Miyagi Prefecture and Sendai City in Japan and Rhone-Alpes region in France attended a workshop to launch an International Academic-Industrial Alliance.



Tohoku University "Sakura Hall"

### The Smallest Microgeared Motor in the World Developed, with a diameter of 1.5 mm



The microgeared motor uses metallic glass microgears, which enable both its ultraminiaturization and extended durability compared to conventional stainless steel microgears. It exhibits superiority of over 10 times in wear resistivity. This microgeared motor is intended for practical use in medical devices such as endoscopes, catheters, etc.

### Topics

#### A Notable Example of a Partnership between University and Industry: Prof. Ryuta Kawashima

Prof. Ryuta Kawashima of the Institute of Development, Aging and Cancer has been involved with research to improve and recover brain functions with "Learning Therapy." He actively returns the results of his research to society by advising and evaluating businesses on product development. One of his achievements is a series of software goods for a mobile gaming machine, called "Brain Training." In January of 2007 at the 9th Japan PR Awards, he received "The PR Person of the Year" for his contribution to both public and industry.



Prof. Ryuta Kawashima appears in the software game "Brain Age: Train Your Brain in Minutes a Day" CG©Nintendo



# International Exchange Programs



Joint Forum "Lyon-Tohoku, Teaming for the Future" - We Pioneer the 2020 Horizon with Science and Technology

In February 2007, a Joint Forum was held in Lyon, France which celebrated the 100th, 150th and 50th Anniversaries of Tohoku University, Ecole Centrale de Lyon, and of INSA-Lyon respectively. Academic exchange agreements were implemented including the Double Degree Program with the two notable French institutions. With more than 300 participants in

total, including the Honorable Jacque Barrot, the Vice President of EU Commission, French and Japanese researchers as well as government and business leaders from both our countries spoke on the future of science and technology. They discussed the themes of transport, energy and materials, forecasting developments in each area over the upcoming ten years.

## Nine New Institutions Join the Program for Academic Exchange

Sweden	Chalmers University of Technology	Apr. 19, 2006
Germany	Dresden University of Technology	Jun. 26, 2006
China	Xi'an Jiaotong University	Aug. 31, 2006
France	Ecole des Mines d'Albi-Carmaux	Sep. 12, 2006
China	East China Normal University	Sep. 20, 2006
Canada	University of Waterloo	Oct. 30, 2006
Indonesia	Gadjah Mada University	Dec. 16, 2006
China	Beihang University	Dec. 16, 2006
Korea	Sogang University	Feb. 2, 2007

As of March 31st 2007, there are 118 institutions from 25 countries and regions under the Academic Exchange Agreement.

## Promoting the Overseas Internship Program

The Short-term Overseas Internship Program sends students to outstanding overseas institutions, and aims to foster future managers with international awareness. The students take an active part in international projects and participate directly in research projects at these institutions.



## The Education Summit: "New Knowledge Society"

On March 3rd 2007, Tohoku University held an Education Summit, the "New Knowledge Society," at the Palace Hotel Tokyo. The summit was co-sponsored by the Yomiuri Shimbun, a major Japanese newspaper publisher, to mark the 100th anniversary of the university.

Global leaders from the sectors of academia, industry and government joined in for this auspicious occasion. The presidents of five outstanding universities from overseas and the 2002 Nobel Laureate in Chemistry Koichi Tanaka, a graduate of the School of Engineering, were invited to speak and exchange their views on the roles and functions of the universities and the paradigms of society.



(From left, front row) Finance Minister Omi, Tohoku University President Inoue, and the National Institute of Advanced Industrial Science and Technology (AIST) President Yoshikawa (Extract: March 2007)

## Established the Tohoku University China Alumni Association December 16, 2006

The Alumni Association aims to contribute to and promote cooperation and development in association with China and Tohoku University, increasing its contacts with the university. It also provides support to those wishing to study at Tohoku University and supports Tohoku University's PR activities in China.



## Tohoku University US Office Opened May 24, 2006



The US Office aims to strengthen the presence of Tohoku University in the US by promoting its developments in research and educational achievements and also supports the university's contribution to society on an international basis through its research.

## Topics

### "Spotlight on Sendai" - An Advertising Feature in "Nature"

In August 2006, Tohoku University placed an advertisement in the English science journal Nature, in cooperation with the City of Sendai. The article was entitled "Spotlight on Sendai." It shows Sendai as a "City of Trees" and also as an "Academic City" featured in a blend of natural beauty, convenience and advanced science.

Tohoku University introduces its research commitment to benefit the global scientific community as well as its research achievements, etc.

Nature Vol.442 no.7103, 10 August 2006





# Contributing to Society and Promoting a Gender-Equal Society

## Tohoku Women's Hurdling Project The "White Paper on Science" Symposium in Sendai



The Science Angel Program is one of Tohoku University's next-generation support programs. The female graduate students of the natural science division play the main role as Science Angels, participating in activities to encourage future female researchers.

In December 2006, Tohoku University co-sponsored the "White Paper on Science" Symposium in Sendai with Mainichi Newspapers Co., Ltd. The symposium was held at the Kawauchi Campus. Many female high school students attended the Science Angel symposium where they exchanged opinions and had discussions with active female scientists.

## The Science Café Provides an Opportunity for Chats Between Researchers and Citizens

Tohoku University started the Science Café in August 2005, providing citizens with an opportunity to chat with researchers about scientific matters over a cup of coffee. These discussions take place in the evenings, once a month, and also on a weekday at Sendai Mediatheque.

Although the Science Café is broadcast on cable TV, on a Miyagi Prefecture network, everyone is welcome to attend the Science Café Program.



## The University Hospital Introduces a Sophisticated and Highly-Functional Medical Innovation The Advanced Medical Emergency Center, New Ward and Health Information Corner Have Opened

The Hospital's new building (East Ward and West Ward) was opened on the Seiryō Campus. It has a 2 story basement and stands 18 stories high and has the capacity for 1,308 inpatients. The Advanced Medical Emergency Center was established in the East Ward with the support of Miyagi Prefecture and Sendai City. There is a heliport on the center's roof, which facilitates accepting emergency patients. "The Health Information Corner" was opened in the Clinics for Outpatients in order to help people to learn more about diseases. With these advanced facilities, Tohoku University Hospital assumes a more significant role in supporting the health and medical care needs of the community.



## An Open Lecture - "Challenge to Mitigate Disasters within the Community"

The Disaster Control Research Center of the Graduate School of Engineering, regularly holds a seminar on "Mitigating Disasters in the Community," which started as an academic seminar in 2002. The seminar was renewed in 2006 by taking on the style of an open lecture for local citizens, which was entitled the "Challenge to Mitigate Disasters within the Community." The lecture, held at L-Park Sendai, gave people an opportunity to discuss, with the specialists, how to secure and enhance safety within the community through collaboration between the "community" and its "schools."

## Topics

### The 100th Anniversary Seminar of Tohoku University (Sendai)

As one of its 100th anniversary campaign events, Tohoku University held the "Sendai Seminar" in December 2006 at the Sendai International Center. It was co-sponsored by Kahoku Shimpō Publishing Co. and around 1,000 people attended the seminar, entitled the "Challenge of Advanced Science - To Achieve 'Long Life in Good Health'."





# Tohoku University Celebrates Its 100th Anniversary

## The Countdown towards the 100th Foundation Day Celebrations Started with the "Pre-Centenary Event"

On June 22nd 2006, Tohoku University held a "Pre-Centenary Event" for its 99th Foundation Day Anniversary. The event included ceremonies to announce Tohoku University's official logo motif and also initiated anniversary advertisements on Sendai City Buses. The decorated 100th Anniversary Bus, with the aim of promoting our centenary projects, was launched to mark this auspicious occasion with the following major projects: the establishment of the Tohoku University Foundation, the publication of a Centenary History Book, the restoration of the Memorial Auditorium and a range of commemorative events (the 100th anniversary campaign).



The Pre-Centenary Event - The University's Logo Tapestry Unveiling Ceremony

## A Restoration Project, Creating a New Symbol of Sendai "Tohoku University Ninomaru Hall (its provisional name)"

The "Tohoku University Ninomaru Hall" (its provisional name) will join the symbols of the Academic City of Sendai. The existing "Memorial Auditorium" and the "Matsushita Memorial Hall" at the Kawauchi Campus will be subject to restoration and will be converted into new facilities. They shall be provided with advanced technologies which include a concert hall, conference rooms, an exhibits gallery, a faculty club, etc.



The Academic Hall to be established. (CG image)

## Tohoku University Campaigns in Newspapers and on TV

In collaboration with reporting organizations and the media, various projects are being carried out to celebrate Tohoku University's 100th Anniversary.

"Tohoku University's 100-year History," released and produced by Sendai Television Inc. (can be accessed through the Sendai Television Inc. website)



## Main Projects of the 100th Anniversary Events

### Celebrating the University's 100th Anniversary in Various Forms of Events

- **Tohoku University Centenary Anniversary Festival**  
Aug. 25 (Sat) - 26 (Sun), 2007  
Areas set aside as Special Exhibition Zones, an International Zone and a Main Festival Stage Zone: introducing the University's Activities and Field of Excellence to the public.
- **Centenary Anniversary Garden Party**  
Aug. 26 (Sun), 2007  
Katahira Campus
- **Centenary Anniversary Ceremony and Reception**  
Aug. 27 (Mon), 2007  
Sendai International Center
- **Centenary Anniversary Exhibition "Tohoku University Treasures: The Legacy of a Century"**  
Sep. 1 (Sat) - Oct. 14 (Sun), 2007  
Edo-Tokyo Museum  
Nov. 2 (Fri) - Dec. 9 (Sun), 2007  
Sendai City Museum
- **Special Exhibition "A Great Novelist: Natsume Soseki: His Life and Works"**  
Sep. 26 (Wed) - Nov. 18 (Sun), 2007  
Edo-Tokyo Museum  
Exhibits the "Soseki Collection" of Tohoku University Library

# New Campus Plan

## Challenge for Progress with Big Leaps as a University of Global Excellence

On the occasion of its 100th Anniversary, Tohoku University launched a New Campus Plan. It is a challenge, making progress in large bounds, to become a world-competitive university with global excellence in the next 100 years. The New Campus Plan aims to create a distinguished education and research

environment, which will bring about the emergence of new academic and industries areas. It will make the best natural environment for Aobayama and also represent Sendai as the "City of Trees," establishing an "environmentally-friendly campus."

## Four Campus Policies:

### Policy 1

A campus created using city links and development.

### Policy 2

A campus that maintains harmony with nature and the environment.

### Policy 3

A campus which is open and encourages interaction and exchange with the local community.

### Policy 4

A campus that is unified and integrated on a systematic basis.





# Divisional Major Achievements

Divisions	Achievements
Graduate School / Faculty of Arts and Letters	Results from the JSPS project "Medicine and Morality" were offered to hospitals as the "Clinical Medicine Examination System." The Yubikan Lectures were continued and "Cultures Considered in Terms of Food," a collection of the lectures, was published. Publication began of the half-yearly magazine, Thoughts and Ideas, intended for the students and general public.
Graduate School / Faculty of Education	"High School Educators in Comparative Perspective: Japan and USA" in the International Symposium for the Centenary Anniversary of Tohoku University. The 42nd "Institute for Educational Leadership" for Primary and Secondary School Teachers in the Tohoku District including the Niigata Prefecture.
Graduate School / School of Law	International Seminar held on "Citizenship, Diversity and Gender: Japan, Canada, and France in Comparative Perspective." Symposium on "The Academic Frontier of Olympe de Gouges" held (Organized by Tohoku University COE program). Symposium on "Dwindling Birthrate, Aging Society, and Gender Equality" organized by the Science Council of Japan (supported by COE).
Graduate School of Economics and Management / Faculty of Economics	Tohoku University's first endowed professorship ( Small & Medium Enterprises Policy) in a faculty of humanities or social science was established. The International Graduate Student Forum "Economic Development, Governance and Regional Cooperation in East Asia" was held. Professor Omura coordinated Tohoku University's participation in the clean development mechanism (CDM) project in the coke industry in Shanxi (China).
Graduate School / Faculty of Science	Evolution of the pseudogap from Fermi arcs to the nodal liquid in High Tc superconductors. A.C.Cope Scholar Award for Prof. Yoshinori Yamamoto. Two expository lectures were presented at Kawai Hall for those high school students and teachers who are interested in mathematics. Prof. Takashi Shioya was awarded the Mathematical Society of Japan Geometry Prize 2006 for "the sequence of research achievements related to Alexandrov space."
Graduate School / School of Medicine	Establishment of Cancer Medical Science. Prof. Hideki Katagiri received the 3rd JSPS Prize. Prefrontal Cortex Involved in Future Planning and Its Execution Process at the Cell Level. Discovery of novel neuronal signals from the liver which improve obesity and diabetes. We found that green tea consumption was associated with reduced mortality due to all causes and due to cardiovascular disease.
Graduate School / School of Dentistry	The 2nd International Symposium for Interface Oral Health Science. The Regional Oral Health Promotion Office cooperated with Miyagi Prefecture and Sendai City. The Regional New Consortium Project: Development of a 3-D Visualization System of Dental Occlusion. The establishment of Edo man in the central Tohoku region by measurement science of tooth crown.
Graduate School of Pharmaceutical Sciences / Faculty of Pharmacy and Pharmaceutical Sciences	The 50th Anniversary Ceremony of the Founding. Prof. Yoshiharu Iwabuchi received "The Japanese Society for Process Chemistry 2006 Award for Excellence." Associate Prof. Takayoshi Ohkubo received "Young Investigator Award of the Japan Epidemiological Association in 2006."
Graduate School / School of Engineering	Prof. Koji Kato selected as Japan Academy Laureate. Technological achievement of enhanced light extraction from light emitting diode using subwavelength grating (Prof. Kazuhiro Hane G). Divisions: Graduate School of Engineering / School of Engineering Main achievements or topics: Prof. Tatsuo Uchida and Research Associate Takahiro Ishinabe succeeded to develop an ultra-low power, high performance, reflective liquid crystal display. World's first direct synthesis of p-nitrophenyl glycosides (Prof. Shin-ichiro Shoda G). 0.5GHz precision coherent THz wave revealed molecular defects in organic Materials (Prof. Yutaka Oyama G). Criteria of human loss with inundation depths obtained by analysis at Banda Aceh by the 2004 Indian ocean tsunami (Prof. Fumihiko Imamura G). Promotion of lifespan extension of traditional and modern houses by improvement of thermal insulation and airtightness (Prof. Hiroshi Yoshino G).
Graduate School of Agricultural Science / Faculty of Agriculture	Role of phosphoSer-Pro Isomerase Pin1 on Cancer & Alzheimer's Disease, & Drug Discovery. Associate Prof. Yuichi Ogawa succeeded in discrimination of pigments by means of the terahertz spectroscopy technique. An international symposium entitled "Advances in Bioscience and Biotechnology for Future Bioindustry" was held. An international symposium entitled "Frontiers in Rice Science - From Gene to Field" was held.

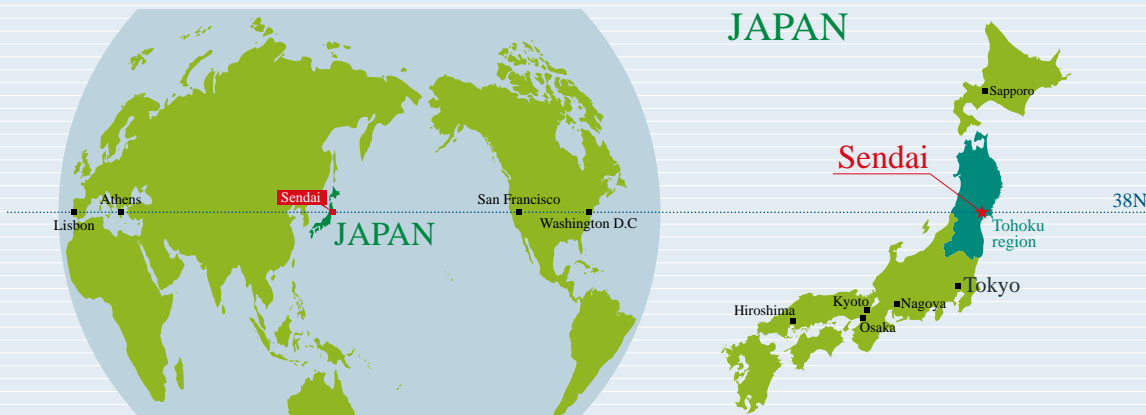
Divisions	Achievements
Graduate School of International Cultural Studies	Japan-China-Korea Academic Exchange Forum: "Japanology in East Asia-Language, Literature, and Ideology." Lecture Meeting on European Culture: "Language Education in the European Union."
Graduate School of Information Sciences	Advanced ICT Educational Program supported by MEXT was adopted, and ICT International Workshop was held. The robotics groups finished second in 4-leg robot and rescue leagues at RoboCup Japan contest. Four members received prizes from Minister of MEXT as outstanding and young science researchers.
Graduate School of Life Sciences	Identification of a gene essential for hydrotropism in roots. Identification of invasion pathways for trematode parasites and their exotic snail hosts. New enzyme discovery to inhibit melanin transport in melanocytes.
Graduate School of Environmental Studies	4th Environmental Technical Symposium: "Think again the basics on Manufacturing. " 12th Environment Forum: "Soil Pollution and Geosphere Informatics 2007."
Institute for Materials Research	Prof. Inoue was awarded The Prime Minister Prize for development of Industry-academia-government collaboration. Development of a new technique for growing a high-quality polycrystalline Si ingot for solar cells. Quantum Hall-effect in polar oxide heterostructures. Success in Fundamental Understanding of Materials Formation from Atoms by Accurate Numerical Calculation.
Institute of Development, Aging and Cancer	Development of daily intervention methods for prevention of cognitive decline. Discovery of the novel protein regulating intracellular membrane trafficking.
Institute of Fluid Science	Emeritus Professor Hidesato Ito was elected Person of Cultural Merits in 2006. The 1st Japan Korea Student Workshop was held (Prof. Tokuyama).
Research Institute of Electrical Communication	Prof. Masataka Nakazawa received Thomson Scientific Laureate in 2006. Prototype 2Mbit non-volatile RAM chip employing spin-transfer torque writing. Mobile broadband wireless access demonstration using latest technology.
Institute of Multidisciplinary Research for Advanced Materials	Establishment of Alliance between RIEC-Hokudai, CRL-TIT, and Sanken-Osaka Univ. and IMRAM-Tohoku Univ. Cooperation Laboratories between NIMS and IMRAM-Tohoku Univ. Stricter Selection of Focus on Nitrides as a Novel Material.
Center for Northeast Asian Studies	Development of land mine detection sensor ALIS and its test in mine affected countries. The center started joint volcanic research among Japan-China-Korea. New Efforts for Japan-Russia Technology Transfers.
New Industry Creation Hatchery Center (NICHe)	The Tokyo Electron Ltd. (TEL) decided to open a new plant in the suburbs of Sendai, and that will enhance closer business-cooperation with Prof. Ohmi's research group. The NICHe was selected as one of the four cooperative universities in Japan by the National Institute of Information and Communications Technology (NICT), and its responsibility includes taking charge of Tohoku, Kanto and Koshinetsu areas. The construction of the Tohoku University Business Incubator (T-Biz) sponsored by Small & Medium Enterprises and Regional Innovation - JAPAN (SMRJ) started.
Center for the Advancement of Higher Education	The "Introductory Seminar" project of Liberal Arts program were selected as MEXT "Support Program for Distinctive University Education." Established a practical English learning program, which realized the improvement of English language proficiency among excellent students.
Tohoku University Library	The Library published "Tutorial of Information Search for Tohoku University Students: Arts & Humanities/Social science." The Library published "Guide to Academic Information Search - for Students of Tohoku University." "TOUR: Tohoku University Repository" opened to the public.
Tohoku University Hospital	Completion of east ward and a move to east ward. Establishment of Emergency Center. Establishment of Cancer Center. Establishment of Medical Cooperation meeting.
Biomedical Engineering Research Organization (TUBERO)	A venture company originating from TUBERO "G-Angstrom" was established.



Contacts

Graduate School/Faculty of Arts and Letters General A airs Section Tel. +81-22-795-6002 http://www.sal.tohoku.ac.jp/index.html	Graduate School of Environmental Studies General A airs Section Tel. +81-22-795-7414 http://www.kankyo.tohoku.ac.jp/en/
Graduate School/Faculty of Education General A airs Section Tel. +81-22-795-6103 http://www.sed.tohoku.ac.jp/index-e.html	Graduate School of Educational Informatics Research Division, Education Division Education A airs Division Tel. +81-22-795-6105 http://www.ei.tohoku.ac.jp/en/index.html
Graduate School/School of Law General A airs Section Tel. +81-22-795-6173 http://www.law.tohoku.ac.jp/english/	Institute for Materials Research General A airs Section Tel. +81-22-215-2181 http://www.imr.tohoku.ac.jp/eng/index.html
Graduate School of Economics and Management/Faculty of Economics General A airs Section Tel. +81-22-795-6263 http://www.econ.tohoku.ac.jp/econ/english/	Institute of Development, Aging and Cancer General A airs Section Tel. +81-22-717-8443 http://www.idac.tohoku.ac.jp/index.en.php
Graduate School/Faculty of Science General A airs Section Tel. +81-22-795-6346 http://web.sci.tohoku.ac.jp/english/index.html	Institute of Fluid Science General A airs Section Tel. +81-22-217-5302 http://www.ifs.tohoku.ac.jp/eng/index.html
Graduate School/School of Medicine General A airs Section Tel. +81-22-717-8005 http://www.med.tohoku.ac.jp/index-e.html	Research Institute of Electrical Communication General A airs Section, General A airs Group, Administration Office Tel. +81-22-217-5420 http://www.riec.tohoku.ac.jp/index-e.html
Graduate School/School of Dentistry General A airs Section Tel. +81-22-717-8244 http://www.ddhtohoku.jp/index_e.html	Institute of Multidisciplinary Research for Advanced Materials Administrative Section Tel. +81-22-217-5204 http://www.tagen.tohoku.ac.jp/index2.html
Graduate School of Pharmaceutical Sciences/Faculty of Pharmacy and Pharmaceutical Sciences General A airs Section Tel. +81-22-795-6801 http://www.pharm.tohoku.ac.jp/index-e.html	Center for Northeast Asian Studies General A airs Section Tel. +81-22-795-6009 http://www.cneas.tohoku.ac.jp/index_e.html
Graduate School/School of Engineering General A airs Section Tel. +81-22-795-5805 http://www.eng.tohoku.ac.jp/english/index-e.php	New Industry Creation Hatchery Center (NICHe) General A airs Section Tel. +81-22-795-7527 http://www.niche.tohoku.ac.jp/en/
Graduate School of Agricultural Science/Faculty of Agriculture General A airs Section Tel. +81-22-717-8604 http://www.agri.tohoku.ac.jp/index.html	Center for the Advancement of Higher Education Student A airs Division, Education and Student Support Department Tel. +81-22-795-7537 http://www.he.tohoku.ac.jp/
Graduate School of International Cultural Studies General A airs Section Tel. +81-22-795-7541 http://www.intcul.tohoku.ac.jp/?lang=en	Tohoku University Library General A airs Section Tel. +81-22-795-5911 http://www.library.tohoku.ac.jp/top/index-e.html
Graduate School of Information Sciences General A airs Section Tel. +81-22-795-5813 http://www.is.tohoku.ac.jp/index-e.html	Tohoku University Hospital General A airs Section Tel. +81-22-717-7007 http://www.hosp.tohoku.ac.jp/
Graduate School of Life Sciences General A airs Section Tel. +81-22-217-5702 http://www.lifesci.tohoku.ac.jp/english/index.html	Biomedical Engineering Research Organization (TUBERO) Public Relations Room Tel. +81-22-717-8595 http://www.tubero.tohoku.ac.jp/
Information about the entrance examination Admission Division, Education and Student Support Department Phone: +81-22-795-4802 http://www.tohoku.ac.jp/english/index.html	Information for international students Student Exchange Division, International A airs Department Phone: +81-22-795-7776 http://www.bureau.tohoku.ac.jp/ryugaku/index.html
	For general inquiries International Exchange Division, International A airs Department Phone: +81-22-217-5019 Fax: +81-22-217-4846 E-mail: kokusai@bureau.tohoku.ac.jp http://www.tohoku.ac.jp/

Location of Tohoku University

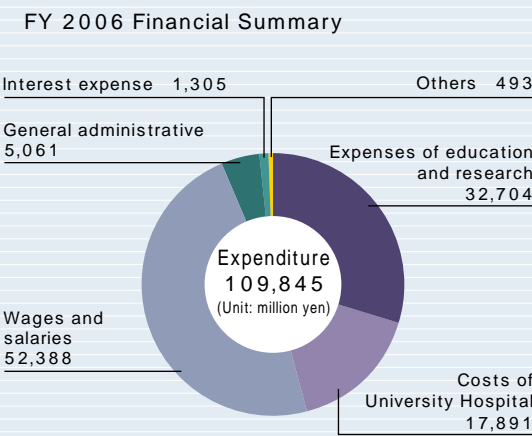


Data and Overview of Tohoku University

The 21st Century Centers of Excellence Program (COE Program) (FY 2006)			
Future Medical Engineering based on Bio-nanotechnology	Masaaki Sato	Advanced Science and Technology Center for the Dynamic Earth	Eiji Ohtani
Unexplored Chemistry: Giant Molecules and Complex Systems	Yoshinori Yamamoto	Exploration of the Frontiers of Mechanical Science Based on Nanotechnology	Tetsuo Shoji
International Center of Research & Education for Materials	Akihisa Inoue	International COE of Flow Dynamics	Shigenao Maruyama
System Construction of Global-Network Oriented Information Electronics	Tatsuo Uchida	Center for the Study of Social Stratification and Inequality	Yoshimichi Sato
Strategic and Education Center for an Integrated Approach to Language and Cognition	Kaoru Horie	Gender Law and Policy in the Gender Equal Society	Miyoko Tsujimura
Center for Innovative Therapeutic Development for Common Diseases	Kazuo Sugamura	Comprehensive Research and Education Center for Planning of Drug Development and Clinical Evaluation	Yutaka Imai
Exploring New Science by Bridging Particle-Matter Hierarchy	Osamu Hashimoto		

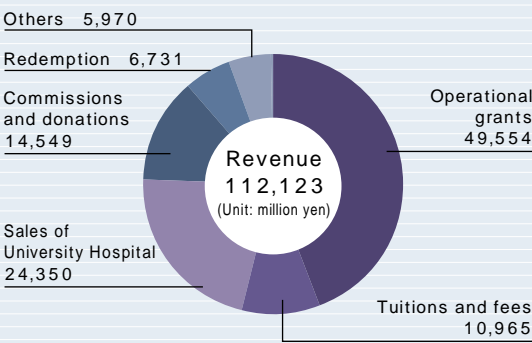
Number of Students (as of May 1, 2007)		
	School enrollment	Number of international students included
Undergraduate students	10,913	124
Graduate students (Master course, Master's Program, Profession Degree Program)	4,155	302
Graduate students (Doctoral Program)	2,740	447
Attached school	41	0
Research students, etc.	592	306
Total	18,441	1,179

Number of Personnel (as of May 1, 2007)	
President	1
Executive Vice Presidents	7
Auditors	2
Teaching sta	2,675
Professors	821
Associate professors	638
Senior assistant professors	153
Assistant professors	994
Research associates	69
Administrative/Technical sta	2,691
Total	5,376



Agreements on Academic Exchange (as of March 31, 2007)		
Agreements on the University Level	25 countries & regions	118 institutions
Agreements on the Department Level	39 countries & regions	261 institutions

Overseas Offices (as of March 31, 2007)		
Liaison offices	8 countries	11 centers
Overseas office	1 country	1 office



Number of International Students (as of May 1, 2007)		
	86 countries & regions	1,179

Number of Exchange Students Based on Academic Exchange Agreements (FY 2006)		
To overseas	7 countries	26
From overseas	17 countries & regions	100