

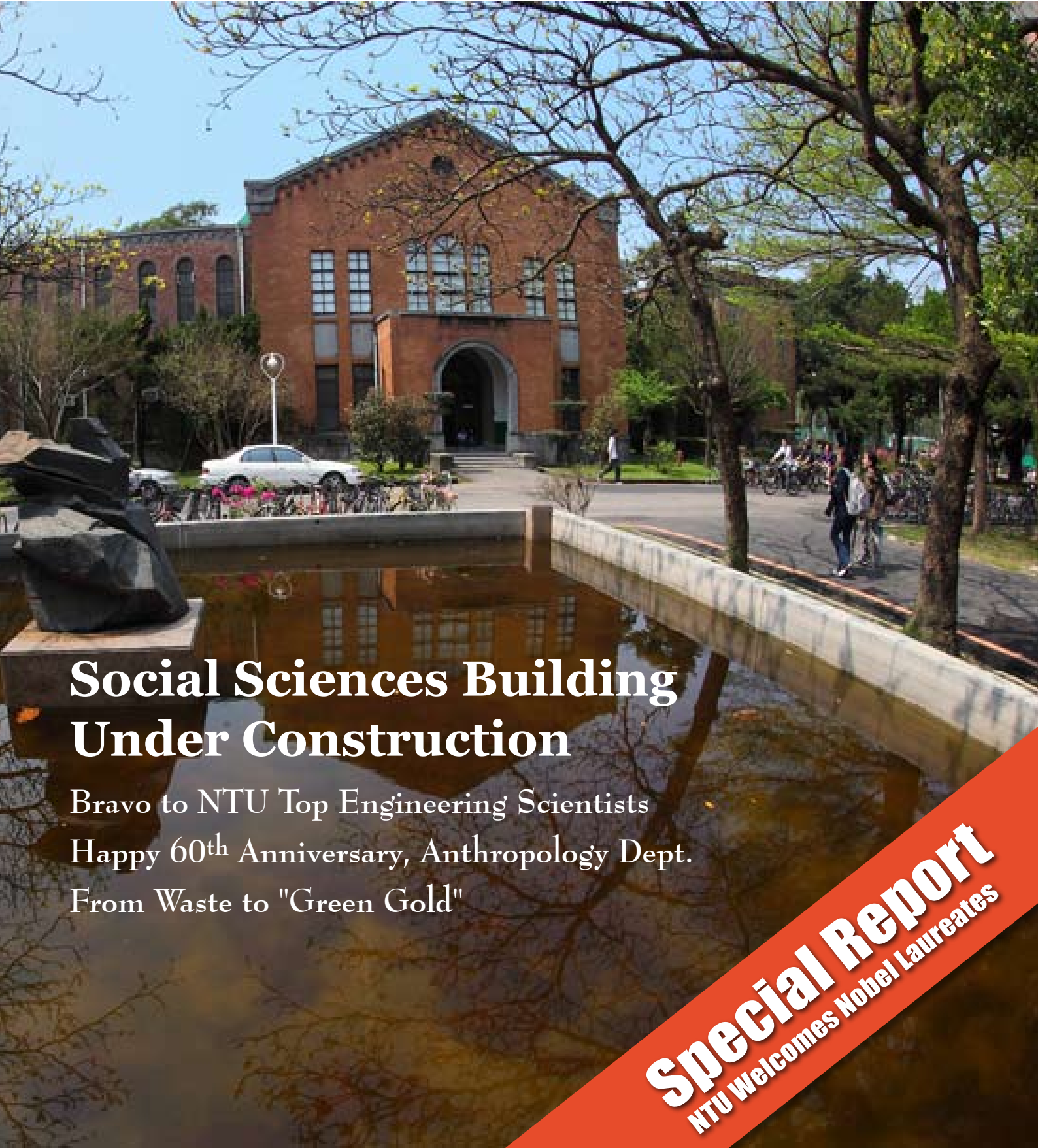
NTU



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Social Sciences Building Under Construction

Bravo to NTU Top Engineering Scientists
Happy 60th Anniversary, Anthropology Dept.
From Waste to "Green Gold"

Special Report
NTU Welcomes Nobel Laureates



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14th NTU Azalea Festival Sets Campus Abloom with Fun Activities in March

Just like the lovely flowers of the perennial shrub itself, NTU's annual Azalea Festival returned for the month of March, bringing with it a colorful array of exciting events and activities. While the Departmental Fair and Student Associations Fair are always the highlights of the festival, other happenings, such as guided campus tours, arts and cultural events, alumni homecoming activities and student performances, ensured

there was always plenty to do for members of the NTU family, guests and visitors alike during this 14th annual festival. Though the festival was open to the public, the university extended special invitations to the nation's high school students and their families as well as to NTU alumni.

On Saturday, March 13 in the NTU Sports Center plaza, NTU President Si-chen Lee presided over the opening ceremony of the Azalea Festival, which also marked the beginning of the Departmental Fair and Student Associations Fair. The ceremony was brightened by performances by the NTU Choir, the International Ballroom Dancing Society and children from the NTU Kindergarten.

The Departmental Fair and Student Associations Fair ran for the weekend of March 13-14. As NTU is Taiwan's premier university, these events always attract thousands upon thousands of high school students and their families, and this year was no exception. The fairs even drew students to Taipei from every high school in central and southern Taiwan.

At the Departmental Fair, faculty and students from the university's 54 departments manned colorful booths that filled the 1st and 3rd floors of the NTU Sports Center. In the booths, the departments showcased their curricula, faculty qualifications and development plans directly to enthusiastic high schoolers. The fair is one of the best opportunities for the departments and students interested in enrolling



at NTU to communicate in detail regarding their concerns, interests and desires.

The Student Associations Fair was held outside of the sports center and featured over 100 festive student association booths promoting their respective themes and interests. The student associations embody the diversity and vitality of extracurricular life here at NTU.

The NTU Center for the Arts also organized the Azalea Poetry Festival, which included a series of events promoting the works of NTU alumni who have received acclaim in the world of contemporary literature. This included an exhibition of manuscripts and published works of NTU poets and the "Dance with the Azaleas" party, which invited celebrated poets to recite their works to music, dance and multi-media performances.



Groundbreaking Ceremony for Long-Anticipated New College of Social Sciences Building in March



NTU President Si-chen Lee (center) leads the honorary guests in breaking ground for the new College of Social Sciences building in March.

Following over a decade of efforts to amass the enormous funds required for its design and construction, the groundbreaking ceremony for the new College of Social Sciences building finally took place on March 2.

With an elated NTU President Si-chen Lee presiding, the event was attended by university administrators, faculty members and students as well as alumni who generously provided donations to make this dream come true. Attendees included Dean of the College of Social Sciences Dr. Yung-mao Chao, former NTU President Chen Sun, Chairman of Tung-Ho Steel Mr. Jen-shyong Ho, Chairman of Taiwan Cement Corporation Mr. Cheng-yun Koo, Mrs. Cecilia Yen Koo and her family, Chairman of the International Cultural

and Educational Foundation Mr. Jie-zhou Liu, the building's Japanese architect Tayo Ito, and Chairman of Fu Tsu Construction Mr. Chih-sheng Lin.

The new building will allow the College's Department of Political Science and Department of Economics to relocate back to the university's main campus, and finally see all of the College's departments under one roof.

Requiring a total budget of NT\$1.6 billion, President Lee pointed out that the building is the largest construction project ever undertaken at NTU. With 40% of the budget covered by donations from NTU alumni, the university is greatly indebted to these alumni who gave donations, both large and small.

Chairman Ho of Tung-Ho Steel donated 8,100 tons of steel (with a market value of NT\$150 million) and NT\$90 million.

Mr. Cheng-Fu Koo, the deceased chairman of Taiwan Cement Corp., promised to donate NT\$100 million prior to his death. His son, current Taiwan Cement Chairman Koo, honored his father's promise and also donated NT\$90 million on behalf of his family. NT\$30 million of this will be used for the design and decoration of the College of Social Sciences' new Cheng-Fu Koo Memorial Library.

The Ministry of Education has also provided a subsidy of NT\$470 million for the building's construction.

2008 Nobel Physics Laureate Kobayashi Leads Symposium for High School and University Students in February

Nobel physics laureate Makoto Kobayashi (fourth from right) during his visit to NTU in February. NTU Academic Vice President George Chen is fifth from right.



While in Taiwan in early February, 2008 Nobel Physics laureate Makoto Kobayashi visited NTU to meet with NTU administrators and faculty and to hold a symposium for high school and university students on February 2. Kobayashi was awarded one fourth of the 2008 Nobel Prize in Physics "for the discovery of the origin of the broken symmetry which predicts the existence of at least three families of quarks in nature."

2008 Nobel Laureate in Chemistry Roger Y. Tsien Speaks at College of Life Science

2008 Nobel Chemistry laureate Roger Y. Tsien visits the Gallery of NTU History prior to speaking at NTU.



At the invitation of the College of Life Science, Dr. Roger Y. Tsien, who was awarded the Nobel Prize in Chemistry in 2008 "for the discovery and development of the green fluorescent protein, GFP," delivered a lecture titled "Building Molecules to Image and Help Treat Cancer and Inflammatory Disease" at NTU's Ji Si International Conference Center. Commenting on Dr. Tsien's achievements, Prof. Chien-yuan Pan of the Institute of Zoology stated that, due to Dr. Tsien's diligent research, the green fluorescent protein isolated from jellyfish has already become an invaluable tool for life science research, and that it was as a consequence of this that he was awarded the 2008 Nobel Prize in Chemistry.

Since tumor cells often show a high volume of matrix metalloproteinase, making an activatable cell-penetrating peptide carry a sequence that can be cleaved by this enzyme makes this active cell-penetrating peptide more readily absorbable by cancer cells and thus causes cancer cells to be marked with fluorescence. As a result, doctors performing surgical procedures can determine the scope of the area that needs to be removed based on the distribution of fluorescence.

During Kobayashi's visit, NTU officials introduced the university's internationalization efforts to him, while faculty from the Department of Physics took advantage of the opportunity to exchange ideas with a Nobel laureate. The symposium, called "Meet the Laureate," received an enthusiastic response from the audience of students, and Kobayashi commented that Taiwan's high school students compare well with those in Japan and show a deep love of science.

One of his achievements while working at Japan's Institute of Particle and Nuclear Studies (KEK) was the initiation of the Belle Experiment, a project in which NTU researchers have been involved.

Dean of Stanford School of Engineering Encourages NTU Students and Professors to Transcend Academic Elite

Dean James D. Plummer and Prof. Teresa H. Meng of the Stanford School of Engineering talked



freely about transcending the academic elite in a speech entitled "Come Meet Stanford: Achieving Academic Excellence and Beyond" that they delivered to 150 students and professors here at NTU.

Dean Plummer declared that the crucial element in transcending the elite is possessing the courage to apply one's specialization and pursue interdisciplinary cooperation.

Citing the Stanford School of Engineering as an example, Dean Plummer stated that the School of Engineering places a heavy emphasis on cooperating with other Stanford colleges in creating interdisciplinary courses. He also noted four interrelated core abilities: creativity and problem-solving skills, entrepreneurship, interdisciplinary teamwork and competitiveness.

Addressing the young people in the audience who wish to go to the United States for further study or work, Prof. Meng, who graduated from NTU's Department of Electrical Engineering in 1983, stressed that they should seize the opportunity and be brave in pursuing the things they desire while they are young.

The speech was made available to the public on NTU Speech, an on-line archive of speeches and lectures presented at NTU, at the end of March.

Fruitful 2009 Annual AOTULE Meeting Held at College of Engineering in December

The College of Engineering hosted the 2009 Asia-Oceania Top University League of Engineering (AOTULE) Deans Meeting and Postgraduate Student Conference from December 3-4. These events drew over 100 participants, including 31 deans and faculty members as well as 71 students from ten member universities.

AOTULE is a network of leading technology universities in the Asia-Oceania region. It was founded in 2007 to improve the quality of education and research at its 12 member universities. AOTULE's members include Bandung Institute of Technology, Chulalongkorn University, Indian Institute of Technology, Bombay, Korean Advanced Institute of Science and Technology, Monash University, Nanyang Technological University, University of Malaya, The Hong Kong University of Science and Technology, The University of Auckland, Tokyo Institute of Technology, Tsinghua University and NTU.

The main theme of the Postgraduate Student Conference was "R&D activities in water and environment, energy, sustainable development, bioengineering, and other engineering areas." The 71 students attending the conference included 13 graduate students from NTU's College of Engineering and College of Electrical Engineering and Computer Science. Prof. Huan-jang Keh, dean of the College of Engineering, presented the conference's opening speech, while Dean Ken Okazaki of the



Participants in the 2009 Annual AOTULE Meeting, which was held at College of Engineering in December, pose for a group photo.

Tokyo Institute of Technology was invited to give the keynote speech, entitled "Engineering Challenges to Suppress Global Warming Toward Sustainability." Prof. Falin Chen, a distinguished professor in the NTU Institute of Applied Mechanics, gave a speech called "Kuroshio Power Plant Project." Students gave 35 oral presentations and 28 poster presentations. The conference drew great responses from students and provided a wonderful opportunity for discussion and academic interaction.

"Student Mobility and Internationalization Strategies" was the main topic of the Deans Meeting. On the first day of the meeting, the deans made presentations highlighting their achievements in terms of student exchanges and internationalization and took 70-minute tours of the College of Engineering and the

College of Electrical Engineering and Computer Science labs.

Meetings on the second day were focused on developing a strategic plan for increased student mobility, internationalization and bilateral agreements among AOTULE partners as well as general business matters. The deans tentatively decided to hold the 2010 AOTULE meeting at Bandung Institute of Technology in Indonesia during the 3rd week of October and to hold the 2011 meeting at Tsinghua University in Beijing, China, in September 2011. Prof. Masahiro Susa of the Tokyo Institute of Technology was elected as chairperson of the league's steering committee for 2010-11, while NTU's Prof. Chia-pei Chou was chosen for the newly-created position of vice-chairperson, a position in which he will assist the chairperson in his duties and provide guidance for the organization of 2010 meeting at BIT.



NTU Team Takes Third Place in International Computer Programming Contest

A team from NTU placed an impressive third in the world finals of the 2010 Association of Computing Machinery International Collegiate Programming Contest in Harbin, China, in February. ACM ICPC is the world's most prestigious computer programming contest and draws tens of thousands of undergraduate competitors every year.

In the contest, teams of three are presented with eight to eleven complex programming problems and must devise programs using C, C++ or Java to solve them. The team that solves the most problems in the shortest time wins.

Three NTU teams won in the ACM ICPC Asian Regional Contest, and one was selected to go to the World Finals as the rules limit universities to just one team in the finals.

Shanghai Jiaotong University won the world title for the third time by solving seven out of the eleven problems. Moscow State University also solved seven problems, but took longer and claimed second place. NTU solved six problems to grab third place.

NTU Teams Take Three Top Spots in 4th Yuanta Cup EMBA Intercollegiate Case Analysis Competition

NTU teams posted the three top finishes in the 4th Yuanta Cup EMBA Intercollegiate Case Analysis Competition on February 7.

The case analyzed in this year's competition concerned the operation of the Joslin Diabetes Center, which is affiliated with Harvard Medical School. The teams were asked to analyze the financial troubles of the treatment center from a business management perspective so as to ensure patients receive the best care and that losses are reduced to a minimum.

Now in its fourth year, the Yuanta Cup is sponsored by the NTU College of Management with the financial backing of the Yuanta Foundation.

Prof. Houn-gee Chen, director of the college's EMBA program, says that in the future businesspeople will need even more a completely new kind of operational thinking, such as that reflected in the different values of corporate social responsibility. He says they will no longer be able to focus simply on reducing costs and increasing profits.

Environmental Engineering Professor Removes Heavy Metals from Waste Sludge and Ash Using Microwaves

Prof. Shang-lien Lo of the NTU Institute of Environmental Engineering has been presented with the First-Class Environmental Protection Professionalism Medal for 2010 by the Environmental Protection Administration. Prof. Lo developed an innovative method that uses microwaves to efficiently extract the heavy metals from waste sludge and ash generated by such facilities as steel plants and waste incinerators.

The traditional technique for removing heavy metals from waste sludge and ash requires 24 hours and achieves only a 70% extraction rate. Prof. Lo's microwave method takes only two to three hours and boasts a removal rate of up to 95%.

Distinguished Prof. Liang-gee Chen Receives Academy of Sciences for the Developing World's 2009 TWAS Prize for Engineering Science

The Academy of Sciences for the Developing World (TWAS) has recognized NTU Distinguished Professor Dr. Liang-gee Chen with its 2009 TWAS Prize for Engineering Science. Prof. Chen is deputy dean of the College of Electrical Engineering and Computer Science and a professor in the Department of Electrical Engineering.

TWAS awards annual TWAS Prizes to scientists in developing countries for outstanding contributions in eight fields of science: biology, chemistry, mathematics, physics, agricultural sciences, earth sciences, engineering sciences and medical sciences.

Prof. Chen has repeatedly broken world records. He and his research team developed the world's first H.264 high profile video encoder chip, an achievement for which they received a scientific article award from an international integrated circuit design association. At the time, the research division of South Korean multinational Samsung was seeking his services.



▲ Prof. Liang-gee Chen (second from right) appears with his research team.

Laboratory for Genetics and Development Plays Major Role in International Effort to Sequence Aphid Genome



▲ The NTU research team that works with the International Aphid Genomics Consortium takes time out to attend an art exhibition. Below them are the photos they provided for the cover of the journal *PLoS Biology*.

The cover photo for a feature article on aphid genomics in a recent issue of *PLoS Biology* was provided by NTU's Laboratory for Genetics and Development, which is led by Prof. Chun-che Chang of the Department and Graduate Institute of Entomology, NTU College of Bioresources and Agriculture. The article reports on the aphid genome project of the International Aphid Genomics Consortium, a group in which Prof. Chang's research team has participated for the last two years. *PLoS Biology* is the leading scientific journal in biology and has an influence rate of 14.662.

For the aphid genome project, the Human Genome Sequence Center at the Baylor College of Medicine in Houston, Texas, is identifying the genome sequence of the pea aphid (*Acyrtosiphon pium*), a rising model organism for genomics studies. While scientists from over ten countries are involved in the project, most of the work is undertaken at institutions in the United States, France and Japan.

Prof. Chang plays the important role of head of the project's reproductive genomics unit, which is tasked with performing annotation work on the pea aphid's reproductive genes. In addition to his cooperation with the consortium, Prof. Chang is also working with graduate student Shao-ling Lu on the analysis of the aphid's reproductive genes in order to research important molecular platforms for the agricultural pest's reproduction and early development.

The decoding of the aphid's genome is essential to gaining an understanding of this organism's particular life history, and will be a major contribution to the prevention of the agricultural damage it causes. The aphid transmits diseases when it stabs its proboscis into the flesh of plants to feed on their juices. The project aims to use functional genomics to identify the "switching sequence" for the alternation between the aphid's sexual and asexual generations.



NTU President Si-chen Lee speaks at the opening of the International Students Tea Party.

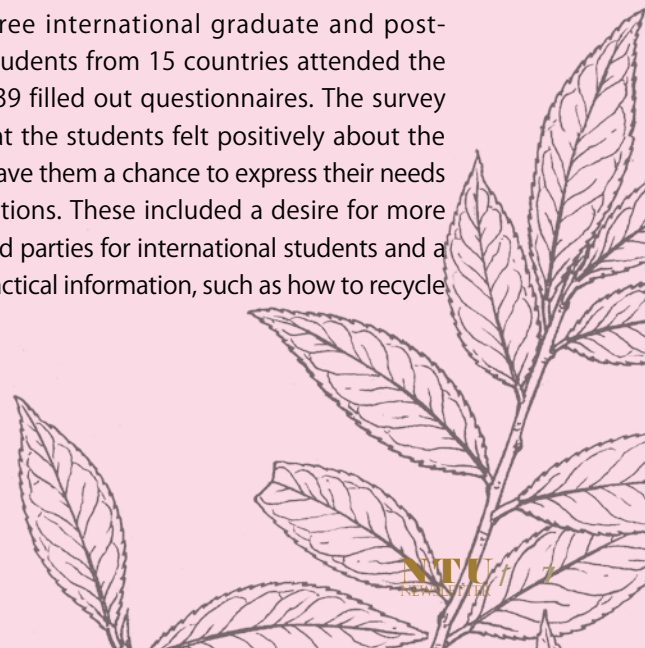
5TH ANNUAL TEA PARTY BRINGS INTERNATIONAL STUDENTS TOGETHER

The 5th Annual International Students Tea Party was held in the Global Lounge as part of NTU's continuing effort to promote interaction among the university's international students.

NTU President Si-chen Lee and Dean of International Affairs Tung Shen opened the tea party with rousing speeches, while Department of Foreign Languages and Literature lecturer Janette Custodio Yuvienco amused the audience with her MC talents. Following a brief break to pose for a group photo, four local students took turns giving exciting and practical introductions to the night markets around Taipei. Department of Drama and Theatre Visiting Professor Anne O. Cleveland spoke about the different living experiences of Kaohsiung and Taipei, and her interesting accounts struck a sympathetic chord with the audience.

The tea party came to an close following a question and answer session in which Ms. Yuvienco led the international students in speaking about their own experiences in Taiwan.

Forty-three international graduate and post-graduate students from 15 countries attended the party, and 39 filled out questionnaires. The survey showed that the students felt positively about the party and gave them a chance to express their needs and suggestions. These included a desire for more activities and parties for international students and a need for practical information, such as how to recycle garbage.



International Students Spend Lunar New Year with Taiwanese Host Families



Lunar New Year is a time when families in Taiwan come together to celebrate the arrival of the New Year. For international students, it is a time of year when their Taiwanese friends have all returned home and most shops and businesses are shuttered. Therefore, the Office of International Affairs has organized a host family program for international students during Lunar New Year for the last three years. This program allows international students to experience the festive atmosphere of this most important of all holidays in Taiwan and feel the warmth of Taiwanese families.

In the run up to Lunar New Year, the OIA held two events to let the students and families get to know each other. First, a party was held on January 16 in the NTU Global Lounge. Even before the event formally started, the room was abuzz with energy as the students and host family representatives mingled. Then, following a rousing speech and games designed to foster interaction between the students and families, it began to look as if the students and families had known each other all along. Over the short course of two hours, the partygoers learned about each others' families and cultures. The party left all in attendance looking forward with even greater anticipation to the Lunar New Year.

On January 30, the students and families took in the crowded, bustling energy of Dihua Street, the prime spot in Taipei to sample and purchase Lunar

New Year eats and goods. They first visited a 50 year old restaurant selling *ji chuan*, a spicy wrapped pork roll, whose name in Mandarin means chicken roll. The students were all curious as to why this dish is called chicken roll when it is clearly made with pork. One of the host mothers explained that the name actually comes from the Taiwanese language. In Taiwanese, or Hoklo, the character *gei* means to wrap many things together and is a homophone with the character for chicken, which in Mandarin is pronounced *ji*. On Dihua Street, the students and families became one with the flood of people sauntering down the narrow street and choosing their purchases from stalls practically overflowing all kinds of New Year's goodies.

During Lunar New Year, each student enjoyed a different experience, yet they all learned the importance of New Year's Dinner to Taiwanese families.

One Honduran student visited her host family's grandmother's house on Lunar New Year's Eve and was moved by the coming together of the family's three generations. She said that her host family made her feel as if she had returned to her own family. To return the favor, she even prepared a traditional Honduran treat of fried bananas. One Japanese student visited a temple with her host family and learned about the tradition of Taiwanese families going to temples during the Lunar New Year to ask for fortune and peace in the coming year.



International Chinese Language Program Celebrates Traditions of Lantern Festival



Students, instructors and staff of NTU's International Chinese Language Program (ICLP) celebrated *Yuanxiaojie*, or the Lantern Festival, with seasonal food and games on February 26. *Yuanxiaojie* marks the end of the two weeks of festivities ringing in Lunar New Year.

Besides the lighting of the paper lanterns that are its namesake, the Lantern Festival is celebrated by eating *tangyuan*, rice dumplings stuffed with sweet sesame or peanut paste, and cracking riddles.

Lantern riddles, or *dengmi*, challenge one to guess a Chinese character from a series of clues. The complexity of characters and ingenuity of riddle-makers make for endless new puzzles. For instance, what is green on one side and red on the other, hates rain on one side and loves it on the other? The answer, *chiou*, which means autumn, makes no sense to someone unfamiliar with Chinese characters. The

character *chiou* is composed of the two radicals *he* and *huo*, meaning grain and fire respectively.

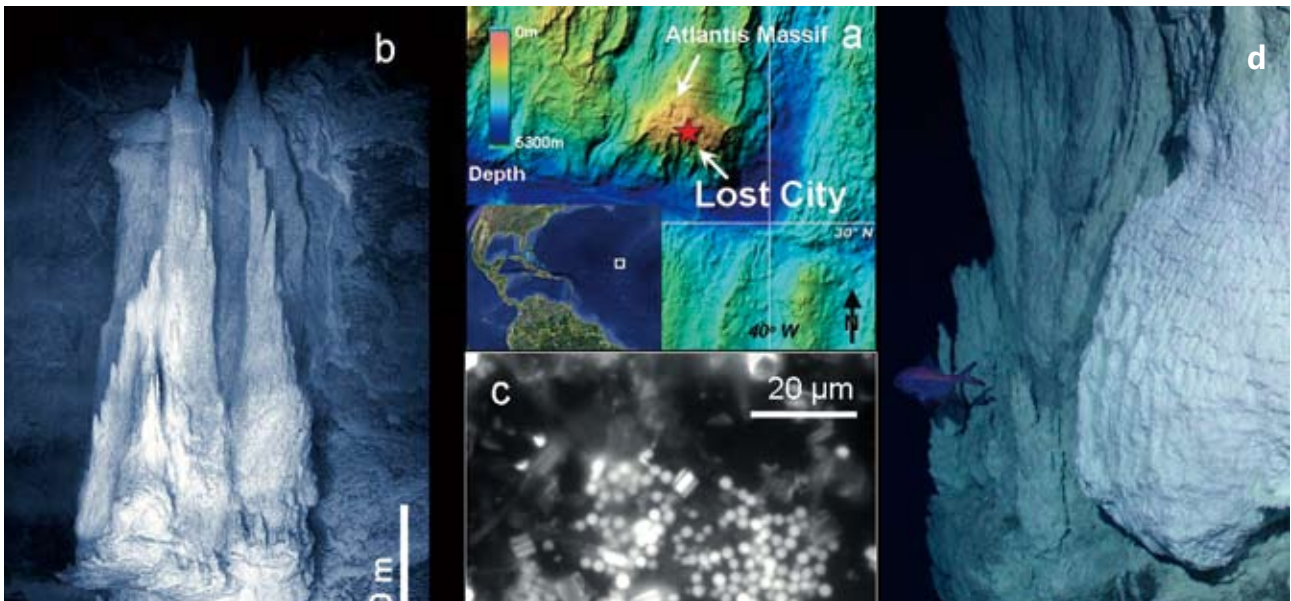
Thanks to the hard work of the activity's planners, instructors Xu Zhi-cheng, Wang Yi-quan and Lin Zi-jun and other ICLP instructors, students practiced characters while enjoying this New Year tradition.

Many instructors and staff recounted fond childhood memories of *Yuanxiaojie*. Instructor Li-yuan Chen recalled buying paper lanterns at a stationary store and decorating them as a child. Instructor Meei-yuan Fann remembered making lanterns out of tin cans and using them to cook vegetables.

Instructor Zhen-feng Xu, who is Hakka, pointed out a slight difference in his family's traditions. Hakka *tangyuan* is not filled. Rather, the emphasis is on a more flavorful broth.



NTU Geoscientist Helps Provide Evidence of Non-Darwinian Evolution at Lost City in North Atlantic



(a) The Lost City is located on the southern edge of the Atlantis Massif in the middle of the North Atlantic Ocean. (b) The area is covered with towering carbonate chimneys that grow to heights of tens of meters. (c) Methanosarcinales and other methanotrophic microbes grow on the surfaces of newly formed chimneys. In this anaerobic environment, these microbes survive by relying on the methane and hydrogen-rich hydrothermal fluids flowing from the carbonate columns. (d) An approximately one-meter long fish glides past carbonate chimneys at the Lost City. **(Photos provided by Prof. Debbie Kelly of Washington University's Institute of Oceanography.)**

NTU has made the pages of the esteemed *Proceedings of the National Academy of Sciences of the United States of America*. In the January 11th issue of the internationally recognized journal, Prof. Chuan-chou Shen of the NTU Department of Geosciences and Prof. Debbie Kelly of Washington University's Institute of Oceanography, together with fellow researchers, announced evidence suggesting a form of evolution in microorganisms that differs from Charles Darwin's theory of evolution.

In a scientific first, the research team used U-Th dating technology along with genomic analysis to reconstruct the micro-bioevolution of the last 1,200 years in the rare biosphere of the Lost City Hydrothermal Field at a depth of about 750 meters in the North Atlantic.

Lost City is an area of carbonate chimneys of varying ages located on the ocean floor about 30 degrees north latitude 15 kilometers west of the Mid-Atlantic Ridge. It has been hydrothermally active for at least 30,000 years. These giant columns are formed by the mixing of the inorganic minerals in expulsions of hot, alkaline hydrothermal fluid with the surrounding cold seawater, and can remain active for at least 300 years.

Lost City comprises an environment that possibly resembles that existing billions of years ago during the origin and early evolution of life on Earth, and that is thought to also exist on other planetary objects with aqueous fluids. The porous interior walls of the chimneys are inhabited by archaeal biofilm communities supported by a flow of methane and hydrogen-rich hydrothermal fluids and dominated by a single

phylogroup of archaea called Lost City *Methanosarcinales*.

For the study, the researchers conducted a genomic analysis of an extensive sampling of the carbonate-hosted archaeal and bacterial communities inhabiting a wide variety of chimneys and correlated the results with the ages of the chimneys using the U-Th dating method, over a 1,200-year period.

They found that rare genetic sequences in young chimneys were generally more abundant in older chimneys. This is a sign that members of the rare biosphere can gain dominance in the ecosystem when environmental conditions change. The researchers believe that the long history of selection, possibly tens or hundreds of thousands of years, during many cycles of chimney growth has resulted in micro-biodiversity,

meaning a large number of closely related species, and that each of these species is preadapted to a certain makeup of reoccurring environmental conditions.

The findings indicate these microorganisms developed diverse survival strategies. Though dominant species vary between the different environments, microbial diversity is not greatly altered. It appears these microorganisms can remain rare for over a millennium before gaining dominance once changes in environmental conditions occur.



Prof. Chuan-chou Shen of the Department of Geosciences

These results support the Rare Biosphere model, a fundamental prediction of which is, according to the journal article, "when environmental conditions change, some of these rare, preadapted taxa can rapidly exploit the new conditions, increase in abundance, and out-compete the once abundant organisms that were adapted to the past conditions."

The research team's evidence runs counter to such Darwinian ideas as species multiply from single species, complicated mechanisms develop from simple ones, and new species descend from and supplant old ones.

Genetic Epidemiological Research Helps Unravel Complex Genetics of Schizophrenia

A team led by Prof. Wei J. Chen of the Institute of Epidemiology and working with Prof. Hai-gwo Hwu and other psychiatrists of the Department of Psychiatry is searching for susceptibility genes of schizophrenia using an endophenotype-based approach in combination with genome-wide linkage scanning and high-density single nucleotide polymorphisms association fine-mapping.

Prof. Chen's team has focused on sustained attention deficit and executive dysfunction as potential endophenotypes of schizophrenia. It has established that sustained attention deficits as measured on the Continuous Performance Test (CPT) are present not only in schizophrenia patients, but also in subjects with schizotypal personality disorder

and in nonpsychotic relatives of schizophrenia patients. The team has found an elevated recurrence risk ratio for CPT deficits among parents or siblings and a positive association between the severity of the CPT deficits and the familial loading for schizophrenia. Meanwhile, executive functioning as measured by the Wisconsin Card Sorting Test (WCST) is impaired in schizophrenia patients and their first degree relatives.

The team applied these neurocognitive deficits in gene mapping for schizophrenia. Some genes were associated with schizophrenia in the subgroup with CPT deficit; some were associated with schizophrenia in the subgroup with neither CPT nor WCST deficit; and some were associated with different SNPs for different indexes.

Second, the team applied family-based clustering analysis on the performance score indexes of both CPT and WCST to derive different clusters of schizophrenia families, in which only a cluster with selective deficit on sustained attention exhibited association with *BMP6-TXNDC5* locus on 6p24.3.

Third, the team searched for empirically based subgroups of schizophrenia and its potential susceptibility gene loci by means of a combination of subset linkage analysis. They found that subsets of families of patients with schizophrenia characterized by early age onset or neurocognitive deficits exhibited increased linkage signals as compared with those obtained in the initial linkage analysis using all available families.

NTU Article Illuminating Molecular Mechanism of Maternal-Fetal Blood Type Relationship Published in *Blood*

An article detailing blood research conducted by Prof. Lung-chih Yu, of NTU's Institute of Biochemical Sciences, and a multi-institutional team of Taiwanese scientists was published recently in the journal *Blood* (*Blood*, 25 March 2010, Vol. 115, No. 12, pp. 2491-2499). The article presents the results of their research on the molecular mechanism of the formation of poly-LacNAc chains on the cell surface during red blood cell differentiation and development. Professor Yu's team is pursuing the molecular-genetic bases responsible for the polymorphisms of human red cell surface antigens, especially antigens with a carbohydrate structure. In particular, the team's long-term target has been the biomolecular and molecular-genetic mechanisms of poly-LacNAc branching in red cell differentiation. This article is the team's third on this subject to be published in *Blood*.

Gal-GlcNAc (LacNAc) units consisting of galactose and N-acetylglucosamine, called poly-LacNAc chains, are highly expressed glycans on the surface of various human cells. Many pathophysiologically significant antigens with carbohydrate structures, such as ABO blood antigen, and the antigens highly related with gastric and colorectal metastasis, namely sialyl Lweis a (sLea) and sialyl Lweis x (sLex), are attached to the back end of poly-LacNAc chains. On the adult's red cell surface, branched poly-LacNAc chains are often greatly expressed, while the poly-LacNAc chains expressed on the fetus or neonate's red cell surface are straight, not branched. During the first eighteen months, however, the straight structure branches off rapidly, greatly boosting the antigenic potency of ABO blood antigen and other carbohydrate antigens. Yet, it is just this low potency of the ABO blood antigen caused by the straight newborn poly-LacNAc chains that provides a defensive mechanism that protects fetuses and neonates from the hemolytic disease in the fetus and newborn (HDFN) that results from ABO incompatibility between the mother and fetus.

The significant structural as well as functional changes of the carbohydrate structure on red cell surface indicates the cell surface branched repeats of poly-LacNAc chains play a decisive role in the



expression and function of cell carbohydrate antigens. Prof. Yu's team has spent years seeking the molecular mechanism of this change so as to identify its triggering channel.

In this series of studies, the team first proved the IGnTC gene regulates the branching and provided its genetic structure and expression model (presented in *Blood*, 2003). Afterwards, the team discovered the transcription factor *C/EBP α* , which adjusts the genetic expression of IGnTC (presented in *Blood*, 2007). In their latest article published in *Blood*, they utilized the differentiation of the blood cell line and blood stem cell as the methodological model to prove the transcription factor *C/EBP α* is highly expressed in fetal blood stem cells and precursor cells and yet does not induce the branching of poly-LacNAc chains. Besides, during red cell differentiation, the formation of the branched poly-LacNAc is regulated by the post-translational modification's determining the phosphorylation of the Serine-21 residue on *C/EBP α* ; on the other side, during the differentiation of adult's blood stem cell, the phosphorylated *C/EBP α* -Serine21 are largely dephosphorylated, accelerating the genetic expression of IGnTC and the formation of the branching of poly-LacNAc chains. Moreover, it was also unveiled that poly-LacNAc branching (I antigen) formation in erythropoiesis and granulopoiesis share a common mechanism. This was the first proof ever obtained in hematology for a common mechanism of erythropoiesis and granulopoiesis.

New Animal MRI Lab Open for Neuroscience and Biomedical Research

The NTU Neurobiology and Cognitive Science Center established the 7T Animal MRI Core Lab for non-invasive, *in vivo* and longitudinal imaging of small animals for neuroscience and biomedical research on December 9, 2009 thanks to support from the NTU "Aim for Top University Project." The state-of-the-art lab is a critical step towards strengthening neuroscience research at NTU, and will serve as a major training site for young MR scholars in Taiwan.



Recently, magnetic resonance imaging (MRI) is being widely used in neuroscience research and has become recognized as the gold standard for imaging. Its major applications include dynamic functional MRI studies, oncology and metabolic disorders research as well as molecular biology and genome research.

Molecular imaging and rapid phenotyping of transgenic animals are two applications that have extended the role of MRI in pharmacology. Its unique ability to provide noninvasively a combination of functional/physiological and anatomical information sets MRI apart from other *in vivo* imaging modalities.

The specific advantage of MRI is that it does not depend on a single physical property but allows the user to play with a multitude of contrast parameters depending on the application. They reflect the physical and chemical states of cell-water and of metabolite molecules, and these states are highly sensitive to changes in the environment.

The lab can perform scans on over 50 animals per day on a single animal MR-scanner. However, animal MRI can significantly reduce the numbers of test animals in a study due to its high information content and the ability to carry out lifetime studies on the same animal. A rapidly growing number of transgenic animals and drug targetings has also increased the demand for rapid phenotyping.

Neurobiology and Cognitive Science Center's Human Cognition Core Lab Works with NTU Hospital Psychiatric Patients

The Neurobiology and Cognitive Science Center began setting up its Human Behavior Study and Data Bank Core Labs two years ago with a special grant from the university. These labs have the added benefit of being the first experimental labs in the psychiatric ward at NTU Hospital.



As part of this ward, the Human Cognition Core Lab allows Department of Psychology researchers to work directly with NTU Hospital physicians in studying patients' mental functions and building "indigenous" blueprints of cognition, emotion and behavior in patients with specific disease profiles. Importantly, as this is a hospital lab, cognition researchers can access cognition and emotion data of patients who would not ordinarily visit the Department of Psychology to undergo cognitive function examinations.

Recently, several Department of Psychology researchers in cognitive and clinical psychology began a cooperative study on the pathogenesis of schizophrenia using genetic, neurobiological and cognitive science approaches. They aim to explore mental function features and mechanisms in schizophrenia patients.

As NTU encourages interdisciplinary studies among scientists throughout the NTU system, the Human Cognition Core Lab accepts lab-use applications from any NTU researcher who wishes to carry out studies of patient mental functions.

Besides the Human Behavior Study and Data Bank Core Labs, five years ago the Neurobiology and Cognitive Science Center set up three important core laboratories for animal studies: the Animal MRI Core Lab, Animal PET Core Lab and Animal Behavior Core Lab.

Physics Department Holds Creative Experiment Design Contest for Undergrads



The NTU Department of Physics held its first General Physics Creative Experiment Design Contest in the fall of 2009. After two months of preparation, the 69 teams selected for the final round of competition presented their experiments to the judges and public on December 6. These fascinating experiments were displayed until December 11.

For the contest, teams of three to five undergraduate students devised general physics experiments to test physical phenomena in everyday life. They used simple materials to design displays or posters of their findings. This activity was aimed at promoting the students' understanding of physics as well as their appreciation of its beauty and creativity.

The First Place team was awarded a prize of NT\$10,000. The two Second Place teams each received NT\$6,000, while the three Third Place teams each claimed NT\$3,000.

Office of General Affairs Teams Up with NTU Farm to Produce "Green Gold"



The NTU Office of General Affairs has joined hands with the NTU Farm to produce "green gold". They are collecting natural waste from the campus to make organic compost for use as a natural fertilizer for the wide variety of greenery that graces the NTU campus.

NTU is not only famous for its bountiful, colorful azaleas; with over 80 years of history, the campus embraces a plethora of thriving trees and shrubs as well as ample grassy areas. These "green assets"

create a startling volume of fallen branches, leaves and clippings, so much so that if ordinary waste disposal methods were used, the costs and fuel consumption would be considerable.

Therefore, in 2005, with cost savings and environmental protection in mind, the university started to collect branches from trimming work and fallen leaves and mix them with dung from the NTU Farm's dairy herd to make organic compost. The composting process takes about six months and yields a rich, black compost that is loose and lacks a foul odor.

In 2009, this project saved the 120-hectare main campus about NT\$600,000 in waste disposal costs while generating 38 metric tons of "green gold."

NTU Highland Experimental Farm Welcomes Public to Peach Blossom Festival in March

As spring began to warm up Taiwan's high mountains in March, the NTU Highland Experimental Farm in central Nantou County invited the public to escape the confines of the city and attend its annual Peach Blossom Festival to check out some of the exciting things going on in and around the farm.

This year's festival featured video shows introducing the 1,092 hectare farm, tours of the Dried Flower Room, and strolls around the colorful temperate plant and flower garden, which is home to a breathtaking rainbow of wild mountain



flowers bred by the farm staff. The garden's highlights include the Taiwan Pleione, or one leaf orchid, which blooms after producing just one leaf.

The festival also featured a farmers' market with local highland produce, including peaches, apples, tea, beets and the medicinal herb asitaba.

Department of Anthropology Celebrates 60th Anniversary

The NTU Department of Anthropology celebrated its 60th anniversary with the conference “Migrations and Restructurings of Social Groups: Anthropological Perspectives” and the workshop “University Collections, Museums and Communities” on November 13-14, 2009. A department alumni reunion was also held, which was attended by the department’s first graduate, Prof. Yih-yuan Li, currently an academician of Academia Sinica and chairman of the Chiang Ching-kuo Foundation for International Scholarly Exchange. The conference and workshop each attracted 100 to 150 people, while over 150 alumni returned for the reunion festivities.

The conference included four panels with presentations by department faculty and guest scholars from the United States, China, Japan and the United Kingdom.

The first panel, “Mobility and Cultural Identity,” focused on popular indigenous music in Taiwan and its relation to world music, the reconstruction of culture and identity among She people in eastern Fujian Province in China from the perspective of the memory of ancestral migration, and how village people in southwest Taiwan challenge the spatial hegemony of migrant “entrepreneurs” through house-building.



“Ecological Archaeology and Ethnic Study,” the second panel, examined the spread of populations from the viewpoint of ecological adaptation based on archaeological finds in Taiwan. It concluded that Taiwan’s Austronesian people likely had little motivation to migrate, since they had a stable grain crop agriculture. The panel also discussed a new osteo-archaeological study of the social organization of Niao-Song Culture from Taiwan’s Iron Age as well as a study of the origin of cultivated beans on the Japanese islands that is based on seed imprints on pottery surfaces and proposes that soy beans and red beans were originally cultivated in Japan.

The third panel, “Movement of People,” reviewed earlier theories on the movement of people and discussed how archaeologists can better understand human movements in the past from

evidence of material remains, historical texts and oral histories. The panel reflected a sense that we cannot simply take the relocation of certain materials as evidence of people’s movement, suggesting the need for further research on why people move from place to new place and how they adapt to new environments. As DNA analysis improves, DNA evidence from human remains will be increasingly crucial for identifying real migration paths.

The fourth panel, “Constructing Culture and Cultural Industry,” focused on how culture, tradition and history are gradually standardized, objectified and reconstructed by the culture industry, and explored such issues as meaning in the cultural industry and how natives redefine culture when confronted by external demand and internal transformation processes.



NTU Center for the Arts Lends Atmosphere of Arts and Culture to NTU Campus



The NTU Center for the Arts has organized about 100 performances and events each year since it was upgraded in 2006. These have included exhibitions and performances by artists at NTU, a weekly series of Monday afternoon art performances, an art lecture series, performances for the Azalea Festival and NTU Anniversary, the Young Artists Art Festival, the NTU Literature Award and NTU Creativity Award, as well as a variety of special lectures and demonstrations. Well received by the community, these activities and performances enhance the atmosphere of arts and culture at NTU.

In 2009, the center hosted performances by such renowned groups as the Neo-Classic Dance Company, Taipei Philharmonic Orchestra, Performance Workshop and Wild Fire Music. It also arranged lectures and demonstrations by such luminaries as authors Sima Zhongyuan and Chang Tieh-chih, architect Yu-tung Liu, radio DJ Shih-fang Ma, and film directors Tung Wang and Gilles Ya-che Yang. And, the center is presenting the NTU

Creativity Award and 12th NTU Literature Award and hosting the Young Artists Art Festival. These frequent and diverse programs present arts and culture for not only NTU students and faculty but also the public.

The center has set several goals for the future. It aims to establish The Odeum performance hall as a new landmark in Taipei for arts performances. It will make full use of this newly-renovated hall and organize numerous art exhibitions in The Odeum's new plaza, which will be ready at the end of April. The center aims to promote the spirit of creating art as well as an understanding of the concept of the creative industries among NTU students. It will continue to be an exchange platform for artists in Taiwan by, for example, cooperating with national-level art performance groups. Such activities will enhance the atmosphere of arts and culture at NTU. Moreover, the center will increase its art exchanges with overseas universities and performance groups so as to establish NTU as an important hub

Time flies—The NTU Center for the Arts has hosted performances in The Odeum for a year now.



for international art exchanges, which in turn will stimulate and promote Taiwan's rich arts and culture resources.

NTU Press Publishes Broad Selection of Academic Book Series

In 2009, National Taiwan University Press began a twofold transformation. For one, it established a broad selection of book series in diverse academic fields. In addition, it created an academic review mechanism to ensure the high quality of its academic publications. This mechanism subjects all publications to peer review.

Some of these NTU Press book series are complete while others are under peer review. The Press is also holding talks with writers on yet other possibilities. The university press expects to publish 35 books in these series this year.



NTU Press Publishes First General Education Statistics Textbook in Chinese

On March 8, NTU Press published *Statistics and Life*, the first textbook for general education statistics courses in Chinese. Intended to stimulate student interest in general education statistics classes, it shows the practical importance of statistics and its uses in everyday life.

The book has a vivid design and its contents are student-friendly. Designed to stimulate class discussion, each unit includes practice questions along with discussion topics.

The textbook was designed and edited by the working group and professors at the NTU Statistics Education Center.



NTU to Launch First Summer+ Programs for International Students This Summer

NTU's new for-credit study abroad Summer+ (plus) Programs for international students will start on July 1.



All Summer+ students will select Exploring Taiwan @ NTU courses, which will be conducted in English by internationally renowned specialists. Courses will include Taiwan Literature, Cinema, Theater and Musical Heritage as well as the History, Prehistory, Aboriginal Culture, Religions and Tea Culture of Taiwan.

For Asian Studies majors, Chinese language students and cultural enthusiasts, the Exploring Taiwan classes are complemented with classes at the world-renowned International Chinese Language Program (ICLP) under the Summer Intensive Program for Chinese and Culture.

Researchers and technicians will deepen their Exploring Taiwan studies with laboratory projects at the university's leading laboratories under the Summer Program for Laboratory Research and Culture.

Applications and further information are available on the Office of International Affairs website at <http://www.oia.ntu.edu.tw/>.



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