

# NTU



## NEWSLETTER

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### NTU Scholars Nominated AS Academicians

Sizable Donation to Cosmology Center

Outstanding Research on Typhoon, Climate  
Change

Student Ambassadors to Chile

**Special Report**  
Int'l Academic Exchanges





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## NTU AT A GLANCE

Exhibition Portrays Lives of Past Graduating Students

## From the President's Office

Cooperation between institutions of higher education in Taiwan and China has been on the rise in recent years. NTU, however, took its first steps in this direction nearly two decades ago when former NTU President Wei-jao Chen and former Peking University President Shuqing Wu signed a letter of intent around 1994. Then, in 1996, we initiated a long-term collaboration with the Nanjing University College of Science that has included annual cooperation projects and mutual official visits. Since the normalization of such exchanges, NTU has cooperated most closely with Peking University and Tsinghua University, signing strategic collaboration agreements and establishing mechanisms for the development of joint research projects.

Besides academic cooperation, we have witnessed a significant growth in the number of short-term exchange students travelling between Taiwan and China. We have also pursued the joint establishment of courses with Peking University and trilateral long-distance universities in Southern California. Moreover, NTU has designed dual degree programs with Chinese universities, such as a dual Executive Master of Business Administration degree with Fudan University.

During recent summer vacations, NTU and a number of Chinese universities have offered community service courses that have allowed Taiwanese students to travel to China and Chinese students to visit Taiwan in order to help remote communities.

Some new projects are going on, which include the new Chinese Medicine Joint Research Center established by NTU together with Peking University, the University of Hong Kong, and the University of Macao. NTU looks forward to such cooperation elevating the quality of higher education in Taiwan.

李嗣涔

President  
Dr. Si-chen Lee

# PRESIDENT LEE URGES GRADUATES TO BETTER SOCIETY AT GRADUATION CEREMONY

The graduation ceremony for the 2011 academic year was held on NTU's main campus on Saturday June 9, 2012. At 8:00 a.m., graduation activities kicked off as President Si-chen Lee and the university's vice presidents, top administrative officials, and college deans led the graduating students on a ceremonial procession through the campus-- allowing them to reminisce on their days at NTU while viewing the beauty of the campus. Ceremony speakers and activities highlighted the themes of the limitless possibilities the world offers and the boundless potential of the new graduates in order to stir the graduates to strive to apply their hard-gained knowledge to contribute to the betterment of society.

In his address, President Lee urged the new graduates to devote themselves to becoming world-class professionals. He cited a speech delivered by Taiwan Semiconductor Manufacturing Co. CEO Morris Chang at NTU in which the eminent business magnate extolled the virtues of learning to cooperate with a team to get a job done well and how communicate clearly with others and clear up misunderstandings.

President Lee declared that establishing a systematic, strategic, dedicated lifelong learning attitude as well as a command of logic would allow the graduates to foster innovation, realize their potential, and create value, which in turn would permit them to make positive contributions to the well-being of society and effectively solve the problems facing human society. In conclusion, President Lee called on the graduates to march forward with courage to achieve personal success, bring honor to their parents, their alma mater, and their nation, and thereby lead a complete and fulfilled life.



NTU alumnus Dr. Chao-shiuan Liu, president of the General Association of Chinese Culture, addressed the graduates on the five forms of knowledge: knowledge, common sense, experience, insight, and appreciation. He then encouraged the graduates to hold their heads up and take giant steps in the most difficult directions in order to face great real challenges and realize their potential. Finally, he called on the graduates to make high demands of themselves to become elite professionals who care for society and strive to create greater opportunities and well-being for more people.

John Barthelette of the Department and Graduate Institute of Chinese Literature spoke on behalf of NTU's international degree students. He said that he hoped the graduating students would never forget the love and kindness they experienced on the NTU campus, and that they would continue to carry this passion as they enter society so as to make the world a better place.

On the night of the ceremony, a homecoming was held for alumni that graduated 30 years ago. A graduation dance called "HugWaltz" was held the following day.







LeCosPA Director Pisin Chen unfurls his hand-drawn national flag at the South Pole.

On June 21, the Gallery of NTU History hosted two ceremonies highlighting the major step NTU has taken into the vastness of the universe with its establishment of the Leung Center for Cosmology and Particle Astrophysics (LeCosPA). The first was a signing ceremony for a NT\$570 million donation by Quanta Computer Vice Chairman C.C. Leung, part of which will finance an endowment LeCosPA's continued operation.

The donation ceremony was followed by an unveiling ceremony of the ROC national flag that LeCosPA Director Pisin Chen unfurled last December at the South Pole while working on the installation of the ARA Observatory, an immense radio antenna array designed to detect neutrinos. The historic flag, which Director Chen made himself, is called the Antarctic Double Centennial National Flag because it was unfurled on the occasion of two grand centennials—those of the founding of Taiwan's government and the first human to reach the South Pole.

Addressing the ceremonies, President Si-chen Lee noted that while donations to the university usually go to fields with practical applications, such as electrical engineering and business management, Vice Chairman

## Endowment Created for Cosmology Center's Perpetual Operation



Quanta Computer Vice Chairman C.C. Leung, who provided the donation for LeCosPA's endowment, was a classmate of LeCosPA Director Chen when they studied at NTU.

told the attendees that while he is a businessperson, physics remains his greatest love. Revealing an early source of this love, he recalled constructing a telescope with his classmates at NTU. Adding that the vastness of the universe provides limitless inspiration to humanity and that cosmology deserves investment and research, Leung proclaimed that his modest donation was only a beginning and



Vice Chairman Leung's NT\$250-million donation for LeCosPA's establishment in 1997 allowed NTU to step onto the world stage in the field of cosmology.

Leung's donation was motivated purely by his love of knowledge. President Lee said the endowment would allow LeCosPA to play a leading role in cosmology.

Notably, Vice Chairman Leung's donation follows up a NT\$250 million donation he provided for the establishment of LeCosPA's in 1997. Since then, the center has allowed NTU to become a global power in the fields of cosmology and astrophysics. Leung's latest donation allocates NT\$350 million for the construction of a research building and NT\$200 million for the endowment fund. This donation of about US\$19 million is the largest single donation ever made in the field of cosmology.

Vice Chairman Leung, a graduate of NTU's Department of Physics,

that he looks forward to seeing this investment lead to world-class breakthroughs.

LeCosPA Director Pisin Chen spoke about the center's participation in ARA Observatory programs. LeCosPA is presently working with an international team on the construction of two new antennae stations for the array that will be buried beneath the Antarctic ice this winter. Additionally, the center is cooperating with scientists from nine nations, including the United States and Russia, on the Ultra Fast Flash Observatory (UFFO), a satellite that will detect early photons from gamma-ray bursts. The launch is scheduled for next April.

# Presidents of Three Elite US Partner Universities Lead Delegations to NTU



University of Iowa President Sally Mason and her delegation join their NTU counterparts for a group photo.

**N**NTU is delighted to have welcomed official delegations from three elite partner universities in the United States this summer. The delegations, headed by their university presidents and top academic and administrative officials, represented the University of Maryland, Johns Hopkins University, and the University of Iowa. Such high-level visits demonstrate the importance these prestigious institutions place on their relationships with NTU.

University of Maryland President Wallace Loh led an eight-person delegation to meet with NTU officials on June 11. During the meeting, President Loh, who was born in China before immigrating to Peru as a child, pointed out that three of the professors in his delegation were NTU graduates, which he noted was a sign of the great success that NTU graduates are capable of achieving.

For its part, NTU currently has 24 full-time professors who graduated from the University of Maryland; the College of Engineering and the College of Electrical Engineering and Computer Science account for a large number of these professors, with five each. NTU and the University of Maryland began cooperating in 1995; mostly in agriculture, as well as training, instruction and research in theater.

On June 8, Johns Hopkins University President Ronald Daniels visited NTU as part of a five-person delegation. The main purpose of the visit was to discuss research cooperation. The two universities officially established their partner relationship in 2009. This partnership has focused primarily on cooperation between the NTU College of Public Health and Johns Hopkins' Bloomberg School of Public Health.

Established in 1876, Johns Hopkins boasts a total of 36 professors or alumni that have claimed Nobel Prizes. NTU has 21 full-time professors who are Johns Hopkins alumni; seven of these professors work at the College of Medicine and six at the College of Public Health. Johns Hopkins is also the home of the control center for the Hubble Space Telescope.

University of Iowa President Sally Mason headed a six-person delegation that visited NTU on July 4. NTU and the University of Iowa established their formal partnership



NTU President Si-chen Lee and Johns Hopkins University President Ronald Daniels exchange gifts.

in 2003, and most cooperation thus far has been in hydraulics. NTU employs 21 full-time professors who are graduates of the University of Iowa. The College of Engineering has largest number of these professors, eight in total.

Established in 1847, the University of Iowa enjoys a world-class reputation in genetics and hydraulics. Moreover, its world-renowned Iowa Writers' Workshop, founded 75 years ago, has helped nurture some of Taiwan's greatest writers, including Kenneth Pai, Kwang-chung Yu, and Chen-ho Wang, who are also NTU alumni.



NTU Vice President for Academic Affairs Ching-hua Lo and University of Maryland President Wallace Loh exchange gifts.



## Szu-liang Chien Memorial Scholarship



Former NTU President Szu-liang Chien dedicated his life to education, and his visionary leadership earned him the respect and admiration of his students and faculty alike. Serving from 1951 to 1970, Former President Chien was the fifth president to lead NTU following the arrival of the Chinese Nationalist Government in Taiwan. After his nearly two-decade term at NTU, Chien continued his outstanding administrative and academic work for 13 years as the president of Academia Sinica.

As president of NTU, Chien introduced numerous administrative policies to support balanced growth and lay the university's foundation as a comprehensive university. In 1954, he established a unified university entrance examination system that ultimately evolved into the nation's Joint University and College Entrance Examination.

After the great educator passed away, his sons Robert, Shu, and Fred combined the government compensation they received on

Chien's death with funds collected through the American Bureau for Medical Aid to China to set up the Szu-liang Chien Memorial Scholarship for academically excellent underprivileged students. From 2005, when the first scholarships were awarded, through 2009, the scholarship program helped 98 students. In 2012, Chien's sons donated



additional funds to establish a perpetual endowment for the scholarship. Annual interest earned by the endowment ensures that the scholarship will help outstanding students for the years to come.

## Law School Hosts International Comparative Law Congress

The College of Law hosted the "2012 Congress of the International Academy of Comparative Law" during May 24-26. Taiwan joined the academy in 2007 to become its 43rd national committee. The academy currently has 67 national committees. Prof. Wen-yeu Wang serves as the chairperson of Taiwan's national committee. The honor of hosting this major international event was particularly special for Taiwan, as this was the first such congress to be held in Asia since the academy's founding in 1924.

The main theme of the congress was codification, which is a major focus of research internationally,



especially in Europe. The sub-theme was "Codification and Legal Transplant: the East Asia Experience," spotlighting Taiwan, Japan, Korea, and China.

The congress drew nearly 150 international legal scholars from 40 countries. The legal luminaries in attendance included European civil law authority Reinhard

Zimmermann, *American Journal of Comparative Law* Editor-in-Chief Mathias Reimann, and Yale University legal historian John Langbein. The event provided an outstanding opportunity for many of the nation's leading law experts to meet face-to-face with experts from around the globe. Taiwan's attendees represented NTU and other top Taiwanese institutions, including National Chengchi University, National Taipei University, and Academia Sinica's Institutum Iurisprudentiae. China was represented by legal experts from Peking University and Renmin University. In all, over 200 scholars attended the congress.

## NTU Accounts for Over Half of New Academia Sinica Academicians

**N**TU professors and alumni make up over half of Academia Sinica's latest group of academicians. That 13 of the 20 new academicians are associated with NTU is a further demonstration of our academic preeminence in Taiwan.

### Mathematics and Physical Sciences



#### Po-ming Chiang

Department of Geosciences distinguished professor, Department of Geosciences graduate (1963)

**Focus:** Geosciences



#### Frank Mau-chung Chang

Department of Physics graduate (1972)

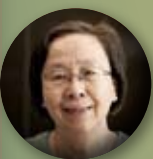
**Focus:** Heterojunction transistors and high-frequency and mixed-signal integrated circuits for telecommunications applications



#### Shaw-chen Liu

Visiting Professor (1992-1993), Department of Atmospheric Sciences adjunct professor (2000-present) and joint professor (2006-present)

**Focus:** Environmental sciences, atmospheric sciences



#### Alice Sun-yung Chang

Department of Mathematics graduate (1970)

**Focus:** Differential geometry, partial differential equations



#### Ker-chau Li

Department of Mathematics joint professor, Department of Mathematics graduate (1970)

**Focus:** Mathematical statistics, high-dimensional data, bioinformatics



#### Tso-ping Ma

Department of Electrical Engineering graduate (1968)

**Focus:** Semiconductor physics and technology

#### Jing Yu

Department of Mathematics professor

**Focus:** Number theory, arithmetic geometry

### Life Sciences

#### Fu-tong Liu

College of Medicine professor (2011-present), Department of Chemistry graduate (1970)

**Focus:** Galectins, allergic inflammation, atopic dermatitis

#### Soo-chen Cheng

Department of Chemistry graduate (1977)

**Focus:** Biochemistry, molecular biology

#### Tao-hih Hsieh

Department of Chemistry graduate (1970)

**Focus:** Biochemistry

#### Ming-daw Tsai

Institute of Biochemical Sciences joint professor, Department of Chemistry graduate (1972)

**Focus:** Biophosphates, enzymology, signal transduction, chemical and structural biology

### Social Sciences and Humanities

#### Shou-chien Shih

Graduate Institute of Art History professor (1990-2000), director (1991-1997), joint professor (2000-present), Department of History graduate (1973), Graduate Institute of History graduate (1977)

**Focus:** Art history

#### Yun-han Chu

Department of Political Science professor, Department of Political Science graduate (1977)

**Focus:** Political science



## Materials Scientists Named ASM International Fellows

**T**wo professors from the Department of Materials Science and Engineering, Distinguished Professor and Chairman C. Robert Kao and Distinguished Professor Chun-hway Hsueh, received the honor of being named a fellow of ASM International. ASM International is one of the leading professional organizations of the international materials science and engineering academic community.

Chairman Kao's research interests include 3D integrated circuit integration, microelectronic and nanoelectronic packaging, and optoelectronic packaging. He is the editor of two prestigious international journals and has an impressive h-index of 29.

Prof. Hsueh's research is focused primarily on analytical modeling. He is a fellow of the American Ceramic Society and World Innovation Foundation as well as an ISI Highly Cited Researcher in Materials Science.





## World-Renowned NTU Electrical Engineers Honored With Awards

The Pan Wen-yuan Foundation has conferred its 2012 Outstanding Research Award on two NTU professors and one NTU alumna; Dr. Li-chen Fu and Dr. Homer H. Chen are both distinguished professors of the Department of Electrical Engineering while Dr. Teresa H. Meng is the Reid Weaver Dennis Professor of Electrical Engineering at Stanford University.

The Pan Wen-yuan Foundation was established in 1996 to honor its namesake, who is known as the father of Taiwan's semiconductor industry. The foundation awards its Outstanding Research Award to outstanding ethnic-Chinese researchers who make significant discoveries and innovations in electronics, information technology, and/or telecommunications.

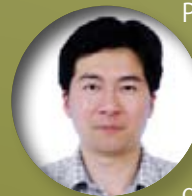
Dr. Fu, a former NTU secretary-general, is highly regarded both at home and abroad. A technology renaissance man, Dr. Fu's research interests span a wide spectrum, including nonlinear systems control, adaptive control, visual tracking and servoing, magnetic levitation, mechatronics, robotics, production automation and scheduling, home automation, and e-commerce.

Dr. Homer H. Chen holds the Irving T. Ho Chair Professor of the College of Electrical Engineering and Computer Science. The IEEE fellow's interests lie in multimedia signal processing and communications, including music emotion recognition, perceptual video processing, light field cameras, and cloud computing. He has developed many new interactive multimedia technologies for MPEG-4 and JPEG-2000.

Dr. Teresa H. Meng graduated from the Department of Electrical Engineering in 1983. The Academia Sinica Academician worked at Stanford for a decade before ceasing to establish the highly successful Atheros Communications Inc. in 1999. She returned to Stanford in 2000. Her current interests are the cutting-edge fields of bio-implant technologies and neural signal processing.

## Three Young Professors Earn Research Publication Awards

Academia Sinica honored the research achievements of three NTU professors with Outstanding Young Scholar Research Publication Awards on June 5. The award was established in 1996 to encourage young scholars to publish probing academic papers.



Prof. Nei-li Chan of the Institute of Biochemistry and Molecular Biology specializes in analyzing the structural biology of proteins. By investigating the three-dimensional structures of proteins, he has unveiled new perspectives and created valuable applications for the biological functions of protein molecules. He has published two papers that not only further clarify the functional mechanisms of anticancer medicines but more importantly explain the factors influencing drug resistance in cancer cells.



Dr. Tsung-Lin Yang is an assistant professor at the College of Medicine's Department of Otolaryngology. Besides being a head and neck surgeon, Dr. Yang is a physician scientist, as well. He has been recognized for his research into the use of biomedical materials for tissue engineering and regenerative medicine. Yang also developed a new methodology for salivary tissue structure formation.

Prof. Wen-chen Chang of the College of Law has published prolifically in public law, constitutional law, and international human rights. Prof. Chang's research approach reflects her interdisciplinary integration of law, politics, and international comparative studies. She conducts research into the development of constitutional government by the United States Supreme Court and the constitutional courts of other nations to gain insight into the courts' functions and limitations. Chang's research is recognized for its current relevance as well as its foresighted, macroscopic outlook.





## International Affairs Dean Attends Pacific Rim University Meeting in Oregon



Dean of International Affairs Hsiao-wei Yuan represented NTU at the "16th Annual Presidents Meeting of the Association of Pacific Rim Universities (APRU)," which was hosted by the University of Oregon during June 26-30. Organized under the theme "Shaping Asia-Pacific Higher Education in the 21st Century," the conference was attended by 23 presidents and 66 officials from 32 member universities.

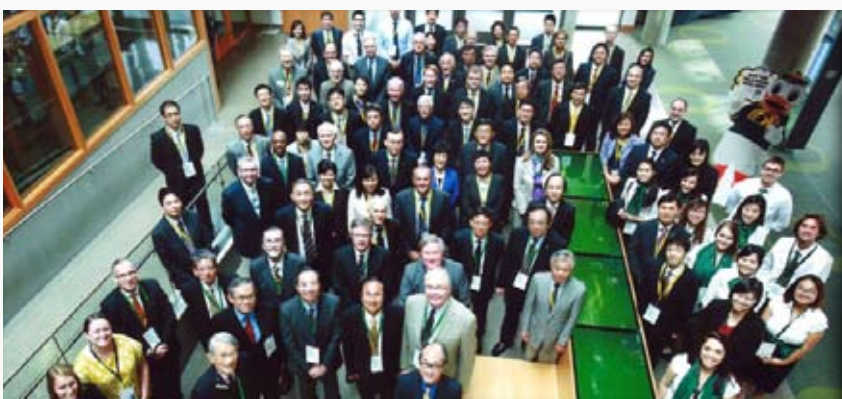
The Presidents Meeting followed up on topics discussed at the APRU's 9th Senior Staff Meeting, which was hosted by Korea University on May 14-16. In the plenary meetings as well as working groups, Meeting participants addressed three priority themes under the APRU Strategic Framework: "Shaping Asia-Pacific Higher Education and Research," "Partnering on Solutions to Asia-Pacific Challenges," and "Creating Asia-Pacific Global Leaders."



The APRU's 9th Senior Staff Meeting was hosted by Korea University in May.

The APRU was established in 1997 for the purpose of promoting academic, research, and industry cooperation that would foster economic, scientific, and cultural improvements and exchanges in the Asia Pacific region. The association is comprised of 42 member universities, including such elite Asia Pacific institutions as Stanford University, the University of California, Berkeley, California Institute of Technology, the University of Melbourne, the University of Tokyo, and Seoul National University. The APRU's secretariat is presently based in Singapore. Its current chair is Chancellor Henry T. Yang of the University of California, Santa Barbara.

NTU is the only university in Taiwan to have been invited to join the APRU. Of all the international educational organizations in which NTU participates, NTU gives highest priority to the APRU.



## American Graduate Shares Love of NTU at Graduation Ceremony



John Barthelette, who earned a Master's degree from the Graduate Institute of Chinese Literature this year, was granted the honor of speaking on behalf of NTU's graduating international students during the graduation ceremony for the 2011 academic year on June 9, 2012. Addressing the audience in fluent Mandarin, the Californian declared his enduring love of NTU



and called on his fellow graduates to embrace the kindness and compassion they experienced at NTU as they enter society.

Mr. Barthelette shared anecdotes to describe the unforgettable experiences he had since arriving at NTU five years ago. With real emotion, he said that his time at NTU will be his most special life memory, adding, "Whether I was studying hard for a final exam or participating in campus activities, I was always happy."



## NTU Delegation Has Busy Schedule in Texas



Associate Dean of International Affairs Hsin-yu Lee and two colleagues had a full platter in Houston, Texas in late May. While in that city to represent NTU at the “NAFSA: Association of International Educators 2012 Annual Conference and Expo,” the NTU delegation also took time to attend the “Taiwan—USA (Texas) Roundtable” and visit the MD Anderson Cancer Center.

Associate Dean Lee’s team represented Taiwan at the NAFSA

conference as part of a larger Ministry of Education delegation of 48 people who represented 21 Taiwanese universities and the Foundation for International Cooperation in Higher Education of Taiwan. During the conference, the NTU team introduced NTU’s summer programs at a poster fair and addressed the Taiwan Session. Associate Dean Lee also took this opportunity to meet with officials from almost 40 NTU partner universities.

Before the conference, Lee attended the Taiwan—USA (Texas) Roundtable, which allowed the NTU team to meet with major NTU Texan partner universities Rice University, University of Texas, and University of Houston. Lee also scheduled a stop at Houston’s International Television Channel, where he promoted NTU on an interview program. A Youtube video (<http://youtu.be/jBE53H2XIKI>) of the program shows him speaking about higher education in Taiwan and touting NTU’s summer programs and NTU as an ideal destination for overseas studies.

During this trip to Texas, Lee’s team also visited the United States’ largest cancer center, the MD Anderson Cancer Center, which is currently in the process of opening a major cancer research center here at NTU.

## Student Ambassadors Share Taiwanese Culture in Chile

Six students, traveling under the auspices of the Ministry of Foreign Affairs’ International Youth Ambassadors program, spent two weeks communicating and interacting with students at two universities in Chile in June. Despite the extremely long flight and the frigid Southern Hemisphere winter, the students relished their experience of sharing their local Taiwanese culture and learning about life in Chile. Indeed, they all felt they came away with the experiences and memories of a lifetime.

This year, the youth ambassadors program sponsored 43 groups from 25 universities. Offered a choice of 38 countries, these NTU students knew that Chile was their preferred destination. Representing six



different majors, each participant had studied Spanish for at least three years.

Prof. Luisa Shu-ying Chang, who is the deputy dean of the College of Liberal Arts and a Spanish professor of the Foreign Languages and Literatures Department, led the students on their 40-hour flight to Santiago on June 17. The Taipei Economic and Cultural Office in Chile arranged their schedule in Chile, highlighted by visits to the Pontifical Catholic University of Chile, which is

a partner university of NTU, as well as San Sebastián University.

The students spotlighted Taiwan’s diversity by games and hands-on activities to teach the Chilean students about life in Taiwan, including an aboriginal dance, calligraphy, hand puppets, Mandarin pop songs, cooking, film, and NTU. The Chilean friends expressed their deep interest in Taiwanese culture and cuisine, and were especially enthusiastic about the dancing and singing.

Throughout their Chilean adventure, the student ambassadors were moved by the warmth and hospitality of their hosts. They not only improved their Spanish and broadened their international perspective, they made many new friends.



# 350-YEAR RECORD OF SOUTH PACIFIC SEA TEMPERATURES RECONSTRUCTED



⌚ The research team led by Prof. Chuan-chou Shen of the Department of Geosciences and Prof. Kristine DeLong of Louisiana State University pose for a group photo.

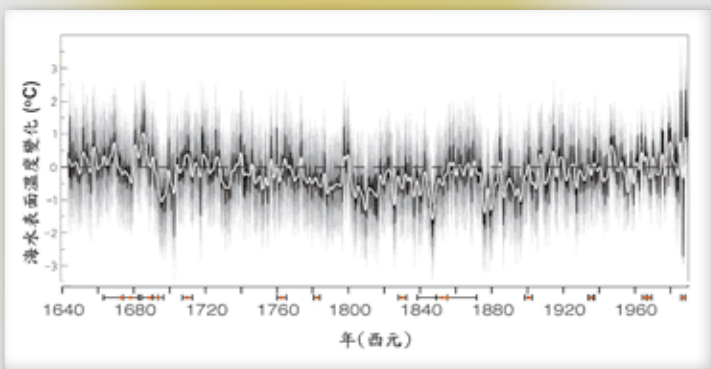
A research team led by Prof. Chuan-chou Shen of NTU's Department of Geosciences and Prof. Kristine DeLong of Louisiana State University published its latest findings regarding climate change in the South Pacific Ocean over the last 350 years in the June 24 issue of journal *Nature Climate Change*. Utilizing a unique, cutting-edge "natural thermometer" developed in Prof. Shen's lab, the investigators for the first time accurately reconstructed a record of sea surface temperatures in the Southern Hemisphere from 1649 to 1999. The team further discovered a striking correlation between rainfall in Taiwan and sea temperatures in the South Pacific Ocean.

To look back in time, the team extracted five core samples from coral reefs off the coast of Amédée Island, New Caledonia. They then spent seven years applying a uranium-thorium dating method and analyzing strontium and calcium ratios in the coral samples. Strontium/calcium ratios in coral can be used to serve as a natural thermometer because for every one-degree Celsius rise in seawater temperature there will be a corresponding 0.8%

decrease in the strontium/calcium ratio of living coral.

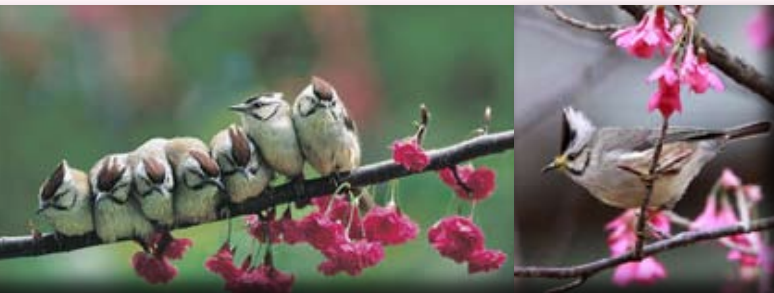
Looking at the team's three-and-a-half century reconstruction, we can see a steady rise in sea surface temperatures beginning in 1890 that is a reflection of global warming. Their record reveals that the sea surface temperature has already climbed one-degree Celsius since 1890.

📍 Divers from the joint NTU-Louisiana State University team extract five core samples from coral reefs off the coast of Amédée Island, New Caledonia, in the South Pacific.



The big news for Taiwan is that both the coral and modern data show a close relationship between summer rainfall volumes in Taiwan and South Pacific Sea surface temperatures. If the team's climate model is accurate, we are entering a decade of higher temperatures in the South Pacific. Coupled with the effects of global warming, this rise in temperature is highly likely to lead to an increase in both the intensity and frequency of summer rainstorms in Taiwan and coastal East Asia.

# Unique Study Shows Ecological Degradation Boosts Cooperation



▲ The Taiwan yuhinas is an endemic species of passerine that lives only at mid to high altitudes in the mountains of Taiwan.

Climate change leads to a deteriorating environment and threats to the survival of biological organisms. How do these organisms respond? Do they work together, or do they compete among themselves for dwindling resources?

A research team led by Prof. Hsiao-wei Yuan of NTU's School of Forestry and Resource Conservation and Dr. Sheng-feng Shen, an assistant research fellow at Academia Sinica's Biodiversity Research Center, conducted a long-term study of the Taiwan yuhinas (*Yuhina brunneiceps*), a species of bird unique to Taiwan, to seek answers to these questions. They discovered that under unfavorable environmental conditions there was less conflict between individuals and that the individuals adopted cooperative reproductive strategies that, surprisingly, resulted in more offspring surviving than would have in ideal conditions.



This study is the first of its kind to show that a harsher environment lowers social conflict and results in improved fitness outcomes in social vertebrates. The results were published under the title "Unfavourable Environment Limits Social Conflict in *Yuhina brunneiceps*" in the prestigious journal *Nature Communications* on June 6.

Prof. Yuan, who has studied the Taiwan yuhinas for 20 years, states that this passerine species lives only at mid to high altitudes in the mountains of Taiwan. The species exhibits the rare social behavior of joint nesting, in which unrelated females compete to lay

eggs in the same nest, yet cooperate on nest building, incubation, and the raising of offspring. Of the nearly 10,000 bird species, less than 20 demonstrate this type of behavior.

The researchers observed 37 nests, filming 85 days of incubation competition and analyzing 288 hours of feeding behavior. They discovered that in severe



conditions there was less competition between individuals within the group, including less conflict over egg laying. Also, fewer eggs were laid and there was an increase in incubation cooperation. These cooperative responses resulted in the survival of more offspring.

Conducted from 2004 to 2007, the study utilized such traditional methods as observation with binoculars, as well as advanced RFID identification and digital videography for monitoring. Moreover, the researchers applied an evolutionary game theory model to overturn the common view that competition intensifies as resources decline, demonstrating conversely that a degraded environment calls for greater cooperation to achieve the best outcome.

In this era of climate change, scientists from every discipline are striving to understand the influence of climatic shifts on the environment and humans. For their part, ecologists aim primarily to study the effects of climate change on the distribution and survival of species. Still, few have addressed the impact of climate change on cooperation and conflict between individuals within a species. It is this focus that earned Prof. Yuan's study publication in *Nature Communications*.



## CENTER PROMOTES TECHNOLOGY ETHICS DOMESTICALLY, REGIONALLY, AND GLOBALLY

Established in April 2007, the Center for Ethics, Law, and Society in Biomedicine and Technology (CELS) plays an active role in examining and reflecting on the impact of emerging technologies on ethics, law, and society, as well as in promoting interdisciplinary understanding of and cooperation in bioethics.

The CELS represents Taiwan as a member of the International Network of the UNESCO Chair in Bioethics and has attended the network's annual conference since 2007. CELS Director Daniel Fu-chang Tsai will attend the network's 2012 International Conference on Bioethics Education: Contents, Methods, Trends in September.

The CELS and the Department of Social Medicine invited two internationally-renowned scholars in bioethics and clinical ethics, Prof. George J. Agich from Bowling Green State University and Prof. James Dwyer from SUNY Upstate Medical University, to be visiting professors



at the College of Medicine in 2011 and 2012.

Since 2010, the CELS has collaborated with the NTU Center for Systems Biology and Bioinformatics. To raise awareness of research ethics, the CELS offered the course "Research Ethics and Integrity—The Ethics, Law, and Social Issues in Life Science Research" at the College of Life Science last March. Director Tsai also taught the summer course "Translational Research Ethics" in July.

The CELS organized a number of significant events in 2011 and 2012. It hosted the International Association of Bioethics Conference on Clinical Ethics and Research Ethics and co-hosted the 12th Asian Bioethics Conference, September 28-October 1, 2011. The CELS also held a Roundtable on Ethics Committees and Clinical Ethics and a Winter Course on Withholding/Withdrawing Life-Sustaining Treatments in December 2011.

At the Expert Meeting on the ELSI of Neuroscience on March 18, 2011, local scholars in philosophy, law, sociology, neuroscience, medicine,

and psychology addressed the following crucial topics "Bioethical Issues of Neuroscience," "Legal Issues of Neuroscience," "Citizen Deliberation on Brain Science and Society," and "Psychological Approaches to Neuroscience." The meeting reflected the CELS's mission to promote interdisciplinary dialogue and integration in bioethics and neuroscience.

The CELS held the 2012 International Conference on Biomedical Ethics and East Asian Confucian Tradition on March 28-29. Scholars from Korea, Germany, the United States, New Zealand, Hong Kong, and China met with local scholars to engage in spirited dialogues from the perspectives of philosophy, ethics, law, sociology, education, and medicine.

In 2013, the CELS will cooperate with the ELSI Group of the National Research Program for Biopharmaceuticals (NRPB) to promote ELSI research and development. The CELS and ELSI Group will join hands to investigate the current ethical, legal, and social issues arising from the NRPB's research.





# Course Teaches Knowledge and Philosophy of Coffee and Life

If you were to ask NTU students to name the most unique and popular course on campus, many would reply, "The Department of Agronomy's course on Coffee Culture."

Prof. Yue-wen Wang, a researcher in grassland science at the Plant Breeding Laboratory, created the course in 2004. Prof. Wang recalls that he noticed that a coffee craze was emerging in Taiwan back then but that at the same time coffee farmers and coffee tasters still lacked a comprehensive understanding of coffee. He therefore set out to design a course that would bring education in step with this trend by training professional coffee tasters. The course was a big hit, and with over 100 students competing to get a seat each semester, Prof. Wang decided to rely on interviews to select students who were truly interested and enthusiastic.

Wang's "Coffee Culture" is not simply a laidback affair that allows students to hang out and indulge in fine coffees. As its purpose is to cultivate professional coffee tasters, students are required to learn a range of knowledge and skills. Topics include coffee breeding, coffee roasting, the appraisal of bean quality, the coffee tasting process, the recognition of coffee flavors and aromas, and the operation of all types of coffee makers. To round out the course content, Prof. Wang even arranges a trip to a coffee farm so the students

will roll up their sleeves to pick coffee beans themselves.



Shu-yang Lin, a graduate student in Computer Science and Information Engineering, chose the course out of her love of coffee. Lin says she most enjoyed manipulating the controls of the siphon coffee maker because this machine requires meticulous attention to several factors. For example, she learned to pay attention to type of bean, water temperature, flame size, coarseness of the ground coffee, brewing time, and stirring speed to achieve a more flavorful brew.



She says the siphon offers greater flexibility and is more fun than relying on an automatic coffee maker.

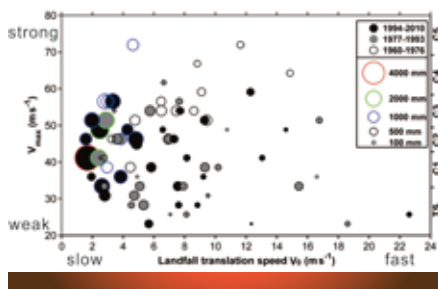
Besides brewing coffee, the budding coffee experts get a taste of the philosophy of coffee as well. Ms. Lin remains deeply impressed by the words of Prof.

Wang: "When appreciating a cup of coffee, don't say it lacks aroma just because you don't taste the flavor you want. You might end up missing the best acidic flavor in the world or the best bitter flavor. Life is the same sometimes. Don't feel a sense of loss or that what you already have is inadequate simply because you don't get what you want. Try to accept it and taste all of the flavors life offers. Perhaps this is the thing we must all learn in our lives." Prof. Wang teaches his students not only how to savor coffee but how to appreciate life as well.





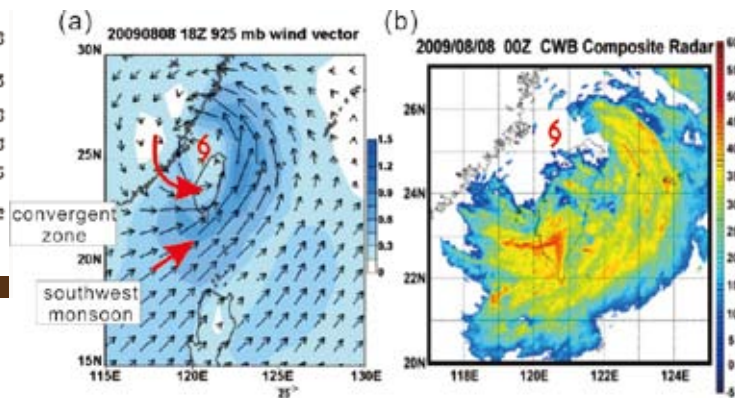
# Journal Articles Provide Insight into Extreme Typhoon Rainfall in Taiwan



Ⓐ This chart shows total 95th percentile extreme rainfall (mm) as a function of typhoon intensity (maximum wind speed) and translation speed from 1960 to 2010. Rainfall is proportional to the circle size; the three decadal periods are shaded differently.

With seven of the top ten rain-producing typhoons to hit Taiwan in the last half century occurring in the last decade, Prof. Hung-chi Kuo of the Department of Atmospheric Sciences has been busy producing world-class research into extreme typhoon rainfall. Prof. Kuo, working with his PhD. students Li-huan Hsu and Yi-ting Yang and collaborators Dr. Chih-pei Chang, Dr. Fang-ching Chien, Dr. Robert G. Fovell, Dr. Chung-chieh Wang, and Dr. Shih-hao Su, has authored five articles on extreme typhoon rainfall over the last two years.

The first paper, "On the Extreme Rainfall of Typhoon Morakot (2009)," appeared in the *Journal of Geophysical Research* in 2011; the second paper, "Temporal and Spatial Characteristics of Typhoon Extreme Rainfall in Taiwan," came out in the *Journal of Meteorology Society of Japan* in 2012; and the third paper, "Effects of Asymmetric Latent Heating on Typhoon Movement Crossing Taiwan: The Case of Morakot (2009) with Extreme Rainfall," was published in the *Journal of Atmospheric Sciences* in 2012. The papers "On the Geographic Asymmetry of Typhoon Translation Speed Across the Mountainous Island of Taiwan" and "Terrain Effects and Large Increasing



Ⓐ The special features of Typhoon Morakot (2009): (a) 925mb wind vectors and water vapor flux ( $m\ s^{-1}\ kg\ kg^{-1}$ ) at 18Z, Aug. 8, 2009; (b) CWB composite radar reflectivity at 00Z, Aug. 8, 2009.

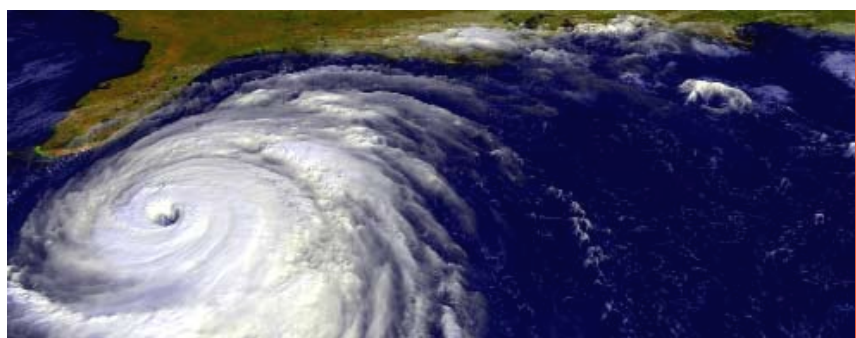
Tropical Cyclone Rainfall Trend in Taiwan During the Past 52 Years" were submitted for publication this year.

Taiwan lies in the middle of the highly active western North Pacific tropical cyclone (TC) zone. For the period of 1960 to 2011, seven of the top ten rain-producing typhoons have struck Taiwan since 2001. The top ten gushers were: Nari 2001, Morakot 2009, Sinlaku 2008, Haitang 2005, Herb 1996, Sarah 1989, Shirley 1960, Krosa 2007, Mindulle 2004, and Kalmaegi 2008. It has been suggested that the recent increase in extreme typhoon rainfall is reflects the impact of global climate change on TCs because the TCs get stronger in a warmer world with warmer sea surface temperatures.

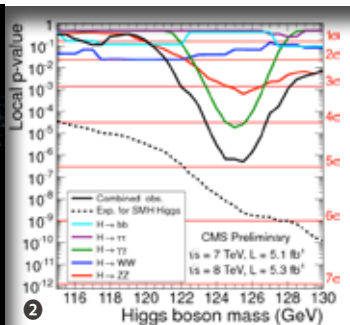
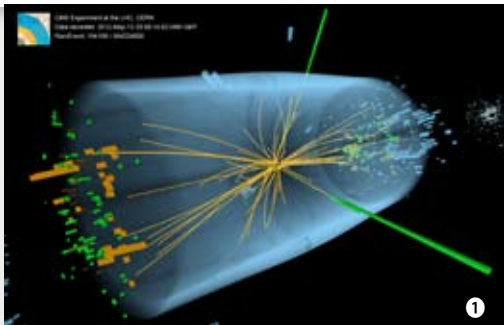
With Taiwan's TC rainfall significantly influenced by the Central Mountain Range (CMR), a complex terrain consisting of steep mountains exceeding 3,000 meters, the island serves as a

natural laboratory for studying the influence of terrain on TC rainfall. Prof. Kuo suggests that the strong TC-CMR interaction allows heavy rainfall to occur in fixed locations and that latent heat release caused by rainfall may influence typhoon motion. Most of the slowest storms have made landfall on Taiwan's northeast coast. Thus, the TC-CMR interaction severely constrains the potential climate change effects of TC rainfall. Prof. Kuo concludes that most of the recent increase in typhoon rainfall volumes is the result of slowly moving TCs and their paths relative to the CMR.

Another factor contributing to Taiwan's increased TC extreme rainfall is the interaction between typhoon circulation and southwest monsoon wind surges. This factor, which is operative only after the typhoon center exits Taiwan and has become apparent only during the last decade, may suggest potential decadal or longer-term changes in monsoon-TC interactions.



# NTU Scientists Play Important Role in Historic Search for Higgs Boson



⊞

- ① The results of a proton-proton collision at the CMS in 2012 show what is consistent with the decay of a Higgs boson particle into two photons.
- ② A distribution graph for the mass of photon pairs (left) and a distribution graph for the combined mass of four leptons (right); the black dots are actual CMS data.

On July 4, several teams conducting Compact Muon Solenoid (CMS) and ATLAS experiments at the Large Hadron Collider at the European Organization for Nuclear Research (CERN) independently reported data collected from early 2011 to June 2012 that demonstrates the existence of a previously unknown particle whose behavior is consistent with the hypothesized Standard Model Higgs boson. The discovery of this elementary particle, and its associated Higgs field, would constitute final confirmation of the Standard Model of particle physics. It turned out that a team of NTU scientists working on the CMS's Preshower detector played an important role in this historic search for the Higgs boson.

The NTU team started to participate in the construction and operation of the Preshower detector in 2000. The goal was to make preparations for the decay of the Higgs boson to  $\gamma \gamma$  photon pairs. The Preshower detector is located at the fore of the Electromagnetic Calorimeter (ECAL), and works like a pair of glasses by boosting the ECAL's photon

resolution. The NTU team— including graduate students Yeng-ming Tzeng, Yeong-ji Lei, Kai-yi Kao, and Yu-wei Chang led by Assistant Research Fellow Rong-shyang Lu—undertook most of the Preshower detector's maintenance and operation responsibilities.

Although the sole function of the Preshower is to prepare for the decay of the Higgs boson to  $\gamma \gamma$  photon pairs, competition in the Higgs boson analysis unit is extremely intense due to the unit's massive size and the fact that it is made up of the leading scientists from the world's most elite institutions. For this reason, the NTU team initially opted not to participate in analyzing the Higgs boson data due to its limited resources and manpower. However, at the end of 2010, CMS Higgs boson analysis coordinator Dr. Vivek Sharma called on the NTU team to formally take part in analyzing the decay of the Higgs boson to photon pair channels. This invitation was mainly owing to the rising importance of the photon pair channels and the demand for the NTU team's hands on expertise with the Preshower detector.

## Thespians Claim First Runner-up in Hong Kong Shakespeare Festival

Following its performance of *The Tempest* at the 8th Chinese Universities Shakespeare Festival in Hong Kong in May, a troupe of NTU undergraduate Shakespearians of the Department of Foreign Languages and Literatures and the Department of Drama and Theatre took home a bagful of awards. Besides placing as first runner-up, the NTU thespians brought home awards for Best Director, Audience



Choice of Best Performance, and Most Original Production.

Though the troupe faced the stiff competition of 44 other talented teams from Taiwan, Hong Kong, and around China, its exceptional performance should come as no surprise. Not only is NTU ranked among the world's 100 leading universities, the DFLL placed 37th in the English Language and Literature section of the QS World University Rankings in 2011.



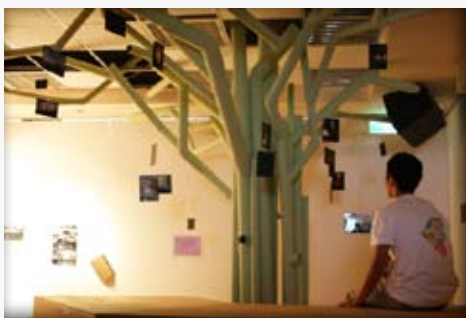
## Lively Arts Fest Fosters Bond with Communities Surrounding Campus

For three weeks in May, the 18th NTU Arts Festival enlivened the campus and surrounding neighborhoods with an bountiful array of creative and community-minded activities, injecting a fun and raucous energy in to an institution known mostly for its intense academic atmosphere. The festival kicked off on May 4 with a press conference and performance by the student band Crispy.

The theme of this year's festival was "NTU—Wen-Luo-Ding." Wen-Luo-Ding refers to three thoroughfares near the NTU campus—Wen Zhou Street, Roosevelt Road, and Dingzhou Road—that are central to the lives of our students and faculty. The neighborhoods along these roads offer a rich variety of student- and youth-oriented establishments, such as independent bookstores, quirky coffee shops, live music venues, inexpensive clothes boutiques, and countless eateries. Along with the campus itself, these neighborhoods are the canvas on which NTU's students paint their lives. They represent a shared memory for every member of the NTU family, and it would be hard to imagine life at NTU without them.

Putting the theme of community involvement into practice, the Arts Fest highlighted the plight of an old Japanese-style dorm located on Wen Zhou Street's Lane 52 that was constructed during the Japanese period and is now slated for sacrifice to urban renewal. The Arts Fest thus expressed its love of the surrounding community as well as its desire to foster a "university village" in which everyone lives and develops together.

Other community-oriented Arts Fest events included a theater and dance performance produced by residents of the surrounding communities and a tour of the Wen-Luo-Ding area led by several of Taipei's famous authors and film personalities.



This year's Arts Festival not only promoted the creation and appreciation of arts and culture but worked to build a stronger bond between the NTU family and the surrounding community and instill a sense of identity with the neighborhood.



## Freshmen Orientation Camp Extended to Five-Days/Four-Nights



Participants in Freshmen Orientation Camp show their teamwork skills in a group photo.

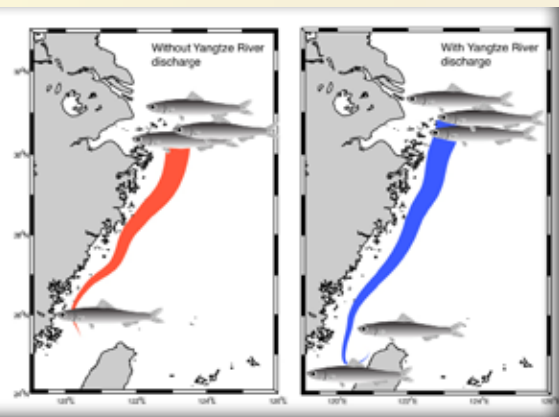
Organized by the Office of Student Affairs each summer, Freshmen Orientation Camp is an important event for NTU's entering freshmen. Upperclassmen lead orientation groups that help their new schoolmates adapt to life on campus quickly. The camp helps the freshmen learn about the university's core values and develop an identity with NTU just as they are beginning their golden years at NTU.

This year, the camp has been extended to five-days/four nights for the first time in order to realize the orientation's spirit of "living and learning together." Moreover, more courses have been added to help the new students become familiar with NTU's abundant learning resources.

Nighttime activities have also been arranged in order to create more opportunities for the new students to meet each other. With the students preparing to enter their respective departments for the next four years, it is nice for them to broaden their circles of friends by meeting students from other departments.



## “DAMNED” YANGTZE RIVER MAY REDUCE ANCHOVY MIGRATION TO TAIWAN



issue of *Fisheries Oceanography*. Discharge reduction caused by the Three Gorge Dam would have a significant detrimental impact on Japanese anchovy fisheries around Taiwan, which could lead to adverse ecological and economic consequences.

Typically, a population of adult Japanese anchovies migrates from the East China Sea to the coastal region of Taiwan to spawn in late winter and early spring, later their larvae constitute an important fishery and source of income for fishermen in Taiwan.

Tu and Hsieh used a coupled fish behavior-hydrodynamic model. They simulated the physical field using the Pacific Ocean adaptation of the Taiwan Multi-scale Community Ocean Model (TIMCOM) developed by Prof. Yu-

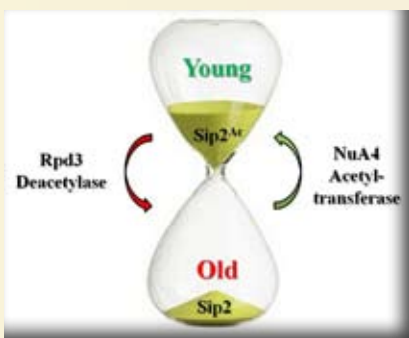
heng Tseng of the Department of Atmospheric Sciences. The fish migration was simulated by Lagrangian tracer tracking with the aid of the approximation of fish swimming behavior. The team ran the model with and without Yangtze River discharge to compare the impacts of discharge reduction.

Their study demonstrates that the migration of Japanese anchovy from the East China Sea to Taiwan is aided by the China Coastal Current, and that the adult anchovy would be unlikely to reach Taiwan without the boost of the Yangtze River discharge. The reason for this failure is that the reduced river runoff inevitably would diminish the strength of the China Coastal Current, on which the anchovy depend to proceed on their spawning migration toward Taiwan.

Ⓐ These diagrams show the influence of Yangtze River discharge on the spawning migration of Japanese Anchovy. The probability of anchovy arrival at Taiwan is significantly lower (left) under the modeling experiment without Yangtze River discharge.

Graduate student Chen-yi Tu and Prof. Chih-hao Hsieh of the Institute of Oceanography published a study demonstrating that the damming of the Yangtze River could negatively impact the spawning migration of Japanese anchovy in the East China Sea in the July

## NTU PHYSICIAN SCIENTISTS FIND ANTI-AGING REMEDY IN YEAST



“What we found is an anti-aging remedy for yeast. Our next mission is to apply this novel finding to mammals, or even to humans.”

Those are the words of Dr. Jin-ying Lu. Dr. Lu is the lead author of an article describing the identification of a novel pathway regulating an age-related protein modification in the single-

celled eukaryote *Saccharomyces cerevisiae*, or bakers’ yeast. The article, which appeared in the September 16, 2011 issue of *Cell*, was written by Dr. Lu together with her physician scientist colleagues at the College of Medicine and researchers at the Johns Hopkins Medical Institute.

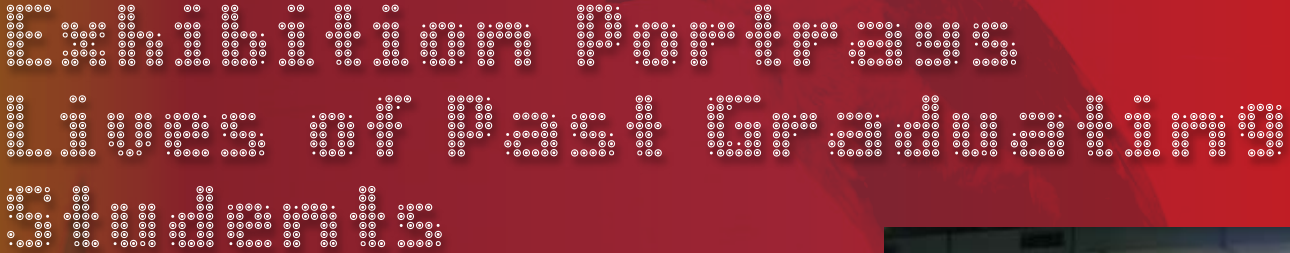
This protein modification is acetylation, and this is the first time protein acetylation has been directly shown to be implicated in the aging pathway. Even more intriguingly, the investigators showed that this type of longevity regulation is independent of those related to diet or calorie restriction. Hence, it represents an entirely new potential therapeutic

target for aging and aging-related diseases.

Specifically, the team showed that acetylation of the protein Sip2 influenced yeast longevity, which is defined as the number of daughter cells a yeast mother cell can produce throughout its lifetime, or the replicative life span. The replicative life span in normal yeast cells is around 25. In the yeast cells genetically modified by the scientists to mimic the removal of Sip2 acetylation, the replicative life span shortened to 18, a decrease of about 30 percent. When they were modified to mimic the restoration of Sip2 acetylation, the life span extended to 38, an increase of about 50 percent.



# NTU at a Glance



**The Office of General Affairs organized the exhibition “About the Graduation Story,” adding to the exciting events arranged for graduation season this year. Held from June 4 until July 14 at the Museum of Archives, the exhibition displayed historic documents and photographs telling the stories of the university’s graduating students from 1945 to 1961.**



**The visitors learned about the pre-graduation celebration activities of the old days and witnessed the evolution of NTU student uniforms over the years. Surrounded by the old archival materials, one could imagine seeing oneself among the graduating students of old.**



**Informative guided tours that provided insight into the lives of the graduating students were offered June 4 - 8. The student guides said that many of the visitors in their groups fell into deep thought as they viewed the displays. Current students who hadn’t yet graduated felt**

**sympathy for the figures in the pictures, as they could see similarities between themselves and the students of decades past. Those who had already graduated were teleported back in time by the aging documents and photographs.**



# NTU Joins Top 300 Organizations Granted US Patents in 2011

Only eleven universities made the list of the Top 300 Organizations Granted U.S. Patents in 2011, three fewer than in 2010. But, there was one newcomer to the ranking: National Taiwan University, which ranked 271st with 91 patents. The only other non-American university on the list, which is compiled annually by the Intellectual Property Owners Association, was China's Tsinghua University at the 243rd spot with 104 patents.

As in 2010, the 10-campus University of California system was the academic institution receiving the most patents (323), followed by the Massachusetts Institute of Technology (160), Stanford University (153), and the Wisconsin Alumni Research Foundation (144), the patenting arm for the University of Wisconsin at Madison. The IBM Corporation continues to be the world leader in number of US patents awarded.



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