

NTU



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Washington U Chancellor Visits NTU

Spotlight on NTU Scientists, Biologists, Engineers

Students Volunteer Overseas

NTU Museums Offer Summer Camp

Special Report
Int'l Academic Exchange



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NTU AT A GLANCE

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Correction:

In the article "Congratulations! 11 NTU Graduates Elected as Academia Sinica Academicians in 28th Academicians' Election" which appeared on Page 5 of the August 2010 issue of the NTU Newsletter, among the 11 NTU alumni named Academia Sinica academicians, Prof. Yu Wang is a professor of the NTU Department of Chemistry.

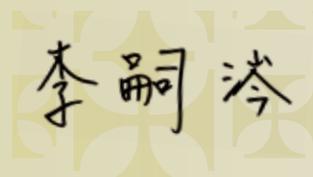


★ President's Statement

As a comprehensive research-oriented university, NTU endeavors to cultivate talented professionals for all industries and professions, and its graduates hold leadership positions in organizations and companies in many disciplines. The university's greatest contribution to Taiwanese society is therefore the education of talented young people, people who will have a major impact on society. Were NTU to fail in providing a good education, the nation's future would be affected.

I believe students must be diligent in their scholastic pursuits and develop their personal qualities if they are to rise above the rest and become leaders possessed of global vision, sociability and empathy. Our school motto "Integrity, Diligence, Patriotism and Philanthropy" reflects perfectly the spirit and reasoning behind the education provided at NTU. I further believe NTU's students should possess the qualities represented in the acronym TAIDA: Teamwork, Accountability, Integrity, Diligence, and Ambition.

I have great expectations for those of you who have yet to graduate. The 21st century is an era of a globalized knowledge economy, and universities are the foundation of the knowledge industry. As students, you must keep your fingers on the pulse of the planet, strengthen your scholarship, develop your cultural knowledge and foster the qualities necessary to take on the world. It is crucial you take the initiative in your studies if you are to be prepared to face the challenges of society after graduation.



President
Dr. Si-chen Lee

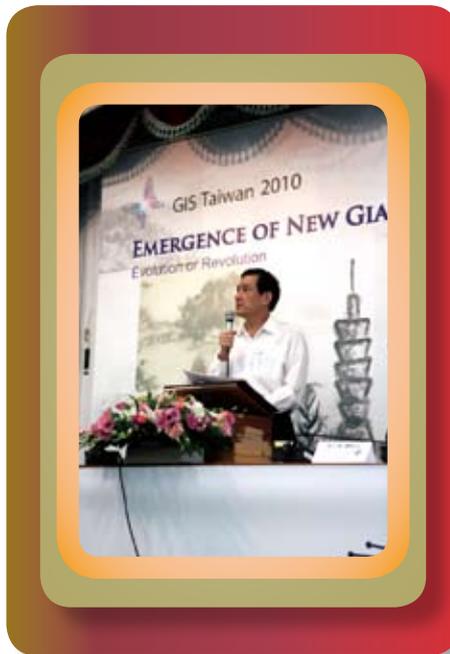
Students from 18 Countries Attend 2nd Global Initiatives Symposium

The Global Initiatives Symposium Taiwan 2010 was held at NTU from July 12-16. Organized by NTU students and the NTU Office of Student Affairs, the annual meeting brings together students from around the world to share their innovative ideas in addressing major challenges facing the international community.

Now in its second year, this year's GIS Taiwan drew 120 students from 18 countries. These students study at from some of the world's most prestigious universities, including Harvard, Yale, MIT, Cambridge, the University of Tokyo and Peking University.

GIS Taiwan is the first international student symposium organized by students in Taiwan. Among the goals of the symposium is the common desire to gather the opinions of young people from around the globe in exploring the world's pressing issues and developmental trends, and to encourage the students to show flexibility and insight in their thinking. Furthermore, GIS Taiwan aims to enhance Taiwan's prominence on the global stage.

Under the topic "Emergence of New Giants: Evolution or Revolution?," GIS Taiwan 2010 explored current trends in global economics, culture and technology as they relate to emerging economies. Conference sub-themes included, "Natural Resources: A Golden Apple for Emerging Countries?," "Emerging Countries at the Crossroads: Adoption of Green Technology" and "When East Meets West: New Perspectives Under Asian Culture Expansion."



At the symposium, NTU Vice President George Tai-jen Chen encouraged the students to apply what they learned at GIS Taiwan 2010 to their lives and put their knowledge into action. He urged them to have the courage to translate their ideas into practice to create change.

Symposium keynote speaker, Dr. Sirilaksana Khoman of Thailand's Thammasat University, delivered a fascinating speech entitled "Reshaping the World Order: From G8 to G 20," in which he addressed the difficulties confronting emerging states. Dr. Khoman noted that, while emerging economies must rely on developed

countries due to their lack of professional knowledge and skills, the protocols applied in international trade are often detrimental to emerging countries. He concluded that this can be solved only by working through international organizations.

The conference also witnessed a bit of star power in the form of President Ying-jeou Ma. Speaking on industrial development in Taiwan, President Ma said that, while he sees a good outlook for the green energy, information and communication technology industries, it is important not to underestimate the influence of culture. He added that a lot can be expected from the medical technology, high-quality tourism and cloud computing sectors, as well. President Ma declared his strong support for private enterprise and said that his government stands on the side of the business community. The president also proclaimed his desire that Taiwan use its soft power to promote its role as a peacemaker and supporter of humanitarianism, and said he looks forward to Taiwan moving on to an even brighter future.

1. Taiwan's President Ma interacts with the audience at GIS Taiwan 2010. 2. President Ma and NTU Vice President Tzong-ho Bau talk with students. 3. President Ma presides over the award presentation ceremony at GIS Taiwan 2010.



High-Level Taiwanese University Delegation Visits UK Universities

As president of the Taiwan Top Universities Alliance, NTU President Si-chen Lee led a delegation representing seven elite Taiwanese universities on a visit to leading British universities and national-level higher education management and research organizations from July 12-20. The delegation embarked on the tour at the invitation of Universities UK and received financial support from the Ministry of Education, National Science Council's Department of International Cooperation and the British Council Taipei.

The purpose of the trip was to promote cooperation between the two countries' universities and learn from Britain's experience in higher education. The delegation's itinerary included the University of Bath, King's College London, Imperial College London, University College London, University of Glasgow, University of Edinburgh and University of Southampton. The delegation also paid visits to Research Councils UK, Universities UK, the Royal Society and the Higher Education Funding Council for England.

The final day of the tour was dedicated to the UK-Taiwan Research Collaboration Forum, which allowed representatives from British and Taiwanese universities to discuss research resources and government funding. The event drew research and development deans from nearly 30 British universities, most of whom expressed willingness to share their experiences with NTU.

At the University of Bath, the two sides discussed the ongoing cooperation between the host university and Prof. Chu-fang Lo of NTU's College of Life Science. The NTU team learned that it shares common research interests with Imperial College London in metabolomics, bio-engineering, bio-chips and climate change, prompting President Lee to invite ICL scholars to visit NTU.

NTU was particularly interested in King's College London's research innovation agenda, especially its industry-academia cooperation model, which includes the establishment of on-campus research centers. NTU Dean of Research and Development Ji-wang Chern stated that he will send NTU faculty to visit KCL.

At University College London, Prof. Mike Wilson, the coordinator for bacteriology projects under the EU's Seventh Framework Programme (FP7), expressed interest in visiting Taiwan. President Lee expressed his desire to invite him to NTU.

At the University of Glasgow, the discussion topics included existing research cooperation in parasitology, hepatology and cardiovascular diseases between the host university and Prof. Chii-wann Lin of the NTU Institute of Biomedical Engineering.

Prof. Jeremy Bradshaw of the University of Edinburgh has been cooperating with the NTU Institute of Zoology. He expressed his willingness to send students to NTU for exchanges and to invite NTU faculty to join his FP7 projects.

At the University of Southampton, the delegation observed state-of-the-art clean rooms for nanotechnology and optoelectronics research. NTU is presently constructing similar facilities, and could learn from Southampton's experience. Prof. Harvey Rutt, head of Southampton's School of Electronics and Computer Science, has visited Taiwan and cooperated with Prof. Din-Ping Tsai at NTU's Department of Physics. Also, Mao-zu Lu, director of Southampton's Centre for Contemporary China, is a friend of Dean Yung-mau Chao of NTU's College of Social Sciences, and expressed his hope to cooperate with NTU.



President Lee Visits Universities in Guangdong



1. NTU President Lee speaks about NTU's current status and its Aim for Top University Project. 2. President Lee receives his father's academic transcript.

NTU President Si-chen Lee traveled to Guangdong, China, with NTU Dean of International Affairs Tung Shen to visit Sun Yat-sen University and South China University of Technology in late July. This trip was aimed at promoting exchanges between universities in Taiwan and China, and President Lee and Dean Shen were warmly welcomed by Sun Yat-sen University's President Daren Huang and South China University of Technology's President Yuanyuan Li. This trip followed on the heels of President Lee's participation in Hong Kong in the 6th Presidents Forum for the Internationalization of Higher Education, which was aimed at fostering exchanges and friendship between institutions of higher education in China, Hong Kong, Macao and Taiwan.

President Lee's purpose in traveling to Sun Yat-sen University was to deliver a speech about NTU's current status and its Aim for the Top University Plan at the 5th University Research Forum on July 30. Speaking to hundreds of students and faculty members, President Lee introduced NTU and explained the administrative, educational, research and internationalization strategies that NTU adopted in its drive to become an elite world university. His speech received an enthusiastic response. President Huang stated repeatedly that the education improvement measures and faculty guidance mechanisms touted by President Lee were not only specific and feasible but also highly foresighted, and added his hope that his university could follow Lee's example by instituting similar measures. The university's faculty were especially interested in the flexible salary plan currently being deliberated at NTU.

Later, President Lee was interviewed by reporters from five major Guangzhou media outlets, including the *Yang Cheng Evening News* and *Nan Fang Daily*. Much of the interview was devoted to the issue of permitting Chinese students to study at universities in Taiwan and strategies for cooperation between NTU and major Chinese universities. The Chinese journalists also asked President Lee his opinion about university "de-administrativization" and the concept of universities as academic communities, topics that are heatedly debated in China. Lee spoke about the history of universities, commenting that, while the role of universities evolved from education, research and social service to an emphasis on industry-academia cooperation, the foundation of universities remained the transmission of knowledge to students. The younger reporters were also interested in how Taiwan has preserved traditional Chinese culture and how NTU encourages research innovation and adopts textbooks written in English and other foreign languages.

Sun Yat-sen University was founded by Sun Yat-sen, the father of the Republic of China, and has influential historical, cultural and medical traditions. Former NTU President Si-nian Fu taught there after studying in Germany. On this visit, President Lee's speech was presented in the university's Swasey Hall, which is an important building in modern Chinese history: while delivering a speech in this hall in 1923, Sun Yat-sen uttered his famous words, "Be resolved to aim high in contributing to the nation, not just to strive for high officialdom!", a statement that has profoundly impacted Chinese students since then.

Washington University Chancellor Discusses Energy, Cooperation at NTU

Chancellor Mark S. Wrighton of Washington University in St. Louis visited NTU on September 10 to discuss cooperation plans with NTU and present a keynote lecture on the future of energy in the United States.

During a meeting between Chancellor Wrighton and such top-level NTU officials as President Si-chen Lee, Dean of International Affairs Tung Shen and Deputy Dean of International Affairs Patrick Shang-hsien Hsieh, the two sides held substantive discussions on future cooperation plans. These include a student exchange program, summer programs and cooperation in designated fields, including energy and Taiwan studies. Wrighton also noted that he was scheduled to host a forum aimed at strengthening ties between the two universities at Washington University in October.

Chancellor Wrighton's lecture, "America's Energy Future: The Options Before Us," drew an enthusiastic audience of over 200 students and faculty members. The organizers were pleasantly surprised at the larger than expected turnout and set up a live broadcast at another location to accommodate the overflow crowd. President Lee presided over the lecture while Director Li-fu Lin of the Atomic Energy Council's Institute of Nuclear Energy Research and Prof. Chung-yuan Mou of the NTU Department of Chemistry were discussants. Dr. Yuan-tse Lee, former president of Academia Sinica and 1986 Nobel Laureate in chemistry, was in attendance.



Washington University Chancellor Mark S. Wrighton receives a memorial ceramic plate from President Lee.

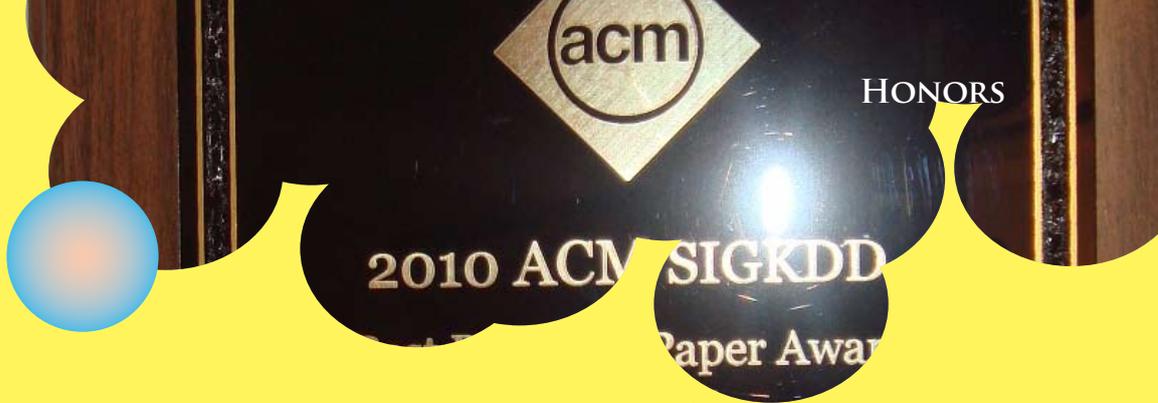
In his lecture, Wrighton, who is a professor of chemistry, talked about the heavy impact of energy on the environment, national security and economic competitiveness, as well as nuclear and solar energy. He also introduced important energy organizations, such as the International Center for Advanced Renewable Energy and Sustainability, which promotes multinational research cooperation, and the Consortium for Clean Coal Utilization, an industry-government-academia organization that facilitates international research on carbon dioxide.

Chancellor Wrighton has made significant research contributions in photochemistry and surface chemistry. He is a long-time participant in the development of energy technology strategies in the United States and has served as the vice chairman of a United States National Academy of

Sciences commission addressing America's energy future.

A report published by that commission indicated that more than 85% of the energy generated in the United States comes from fossil fuels and that the US produces one quarter of the world's total carbon dioxide emissions. The report also stated that boosting energy efficiency would be the most feasible energy strategy for the US for the next ten years. It singled out energy conservation for buildings as especially important because buildings consume 40% of America's energy resources and 73% of its electricity.

Established in 1853, Washington University in St. Louis employs 3,297 instructors and 12,000 staff members and has an enrollment of 12,000 students, half of whom are graduate students and over a third of whom are international students.



Breakthrough Liver Cancer Therapy Published in the *Proceedings of the National Academy of Sciences*

Researchers at the NTU College of Medicine who devised a gene therapy cocktail to first suppress angiogenesis and then boost the body's immunity to cancer in order to kill liver cancer cells in woodchucks published their breakthrough findings in the August 2 issue of the *Proceedings of the National Academy of Sciences*.

The researchers chose woodchucks as the guinea pigs for this project because they are one of the few animals that suffer from hepatitis B and develop liver cancer in the manner that human beings do. Moreover, these large rodents typically die soon after developing liver cancer.

The NTU researchers have been developing new methods of liver cancer treatment in recent years and have designed a number of possible gene therapy treatments. For this project, the team combined four different gene formulas in a cocktail as an anti-cancer gene combination that is more effective and has fewer side effects than other known treatments. They first used two angiogenesis suppressor genes (PEDF and endostatin) to inhibit the growth of new tumor blood vessels, thereby starving liver cancer cells of blood. They followed up with two cytokine genes (interleukin-12 and GM-CSF) that kill cancer cells by inducing the body to develop its own anti-cancer immunity.

This study confirms that the team's gene cocktail is more effective in treating multiple liver cancers than are known single ingredient treatments. When applied to woodchucks with chronic hepatitis B, this cocktail therapy successfully shrinks the size of tumors or even results in their total regression. Furthermore, the researchers found that the woodchucks' hepatitis is not activated in response to the treatment, nor was their liver function affected significantly.

The NTU team is currently applying for a global patent for this gene cocktail treatment.

NTU Teams Shine Again, Leading Annual Data Mining Competition

Prof. Chih-jen Lin and students Hsiang-fu Yu, Choji Hsieh and Kai-wei Wang of the NTU Department of Computer Science and Information Engineering won the Best Research Paper Award for a Technical Contribution at the Sixteenth ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD 2010), held in Washington, D.C. from July 25-28. Entitled "Large Linear Classification When Data Cannot Fit in Memory," their paper bested the 577 other entries, marking the first time a team from Taiwan claimed this award. This annual meeting is regarded as the world's most prestigious international conference on data mining.

Also at the conference, a research team led by Prof. Lin and his departmental colleagues Prof. Hsuan-tien Lin and Prof. Shou-de Lin competed in the KDD Cup 2010 and outperformed over 100 participating teams to win in both the student group and the general group.

The KDD Cup has been held annually since 1997 and is recognized as the world's most important data mining competition. Competitors are required to design data mining methods for intelligent decision making systems in order to analyze large volumes of real data presented by the organizers.

This year's cup requested participating teams to perform data analysis on an online math learning system. The challenge was to analyze over 30 million historical records of students learning math online to determine how much each student had learned and judge the probability of a certain student answering a particular math problem correctly.

The KDD Cup draws top-rate teams from academia and industry each year. NTU teams have fared well for the last three years. In 2008, the NTU team devised an intelligent breast cancer diagnosis system for which it placed first together with IBM Research. In 2009, NTU placed third for its analysis of mobile phone retail sales to determine consumer behavior.



Access IC Lab Team Wins 2010 VLSI-DAT Best Paper Award

A team from the Access IC Lab of the NTU Graduate Institute of Electronics Engineering earned the best paper award at the 2010 International Symposium on VLSI Design, Automation and Test (VLSI-DAT) in April.

In the paper, Prof. Andy An-yeu Wu, with post-doctoral researcher Kai-yuan Jheng and graduate students Chih-hao Chao and Hao-yu Wang, explain advances they made in developing an efficient thermal-traffic co-simulation platform for future three dimensional network-on-chip (NoC) systems. Their paper, "Traffic-Thermal Mutual-Coupling Co-Simulation Platform for Three Dimensional Network-on-Chip," was singled out from among the 72 technical papers presented at the symposium.

As system-on-chip (SoC) technology becomes increasingly complex, the interconnectivity and data exchange of chips will be major factors influencing their performance and power consumption. NoC and through-silicon-via (TSV) based 3D integrated circuit technologies have been proposed as solutions to the current on-chip communication and performance bottleneck. However, heat problems with 3D ICs pose a major challenge. Researchers need to take into consideration appropriate heat dispersal technology in the early stages of the design of the 3D NoC that is destined to be the communication platform for the high-performance chips of the future.



thermal simulation will facilitate future 3D NoC research.

Prof. Wu and his research team at the Access IC Lab developed their simulation platform in view of the lack of a function in existing design tools for NoC. Their technology

This year's VLSI-DAT was held in Hsinchu, Taiwan, from April 26 -29, and was sponsored by Taiwan's Industrial Technology Research Institute together with the Institute of Electrical and Electronics Engineers (IEEE). This annual event attracts international scholars and experts in the fields of semiconductor design, design automation and test to share their analyses of trends in the semiconductor industry, present their cutting edge research and discuss the industry outlook.

MOEA Presents Prof. Li-chen Fu with Industry Economic Contribution Award

Prof. Li-chen Fu of the NTU College of Electrical Engineering and Computer Science was named a recipient of the 2010 Ministry of Economic Affairs University-level Industry Economic Contribution Award (Individual Award) in September for his development of a vehicle warning system using computer vision technology. Along with eight other professors, Prof. Fu was presented with this award by Premier Den-yih Wu at an MOEA academia-industry technology research and development presentation ceremony on September 8.

In devising his vehicle warning system, Prof. Fu outfitted a car with digital image sensors and a computer. When the car is in motion, it will automatically detect road lanes, vehicles, pedestrians and road signs. When the system senses a hazard, it notifies the driver to make an appropriate response so as to avoid an accident. When the driver is momentarily distracted or unable to concentrate, this intelligent warning system can significantly decrease the chance of a having an accident, thus protecting the lives of the driver and others on board and outside.



Prof. Fu's research expertise lies in computer vision, artificial intelligence, robotics and systems control, and he is strong in both theory and applications. Owing to his dedication and enthusiasm, he has not taken a break from his research in the twenty plus years he has taught in the Department of Electrical Engineering and Department of Information Engineering. Prof. Fu has published over 400 academic articles and holds ten patents in the United States and Taiwan. Moreover, he has provided technological assistance to numerous manufacturers and institutions, while his scholastic achievements have earned him many honors from the National Science Council and private organizations. In recognition of his contributions to industry, Prof. Fu received the Ministry of Education's Industry-Academia Cooperation Award, the Chinese Institute of Engineering's Outstanding Engineering Professor Award, as well as the Teco Cultural and Educational Foundation's Teco Technology Award.

NTU STUDENTS PROMOTE COMMUNITY AND ENVIRONMENTAL SERVICE IN MALAYSIA

Twelve NTU students joined the NTU Overseas Service Learning Corps to promote community and environmental service in Malaysia for twenty days in August. Under the guidance of Mr. Hang-tong Chou, director of the Overseas Student Advising Division, the students worked with four charity organizations in Penang and Kuala Lumpur where they interacted with local college students, promoted mutual understanding and respect between Taiwanese and Malaysians and spread the spirit of service. The Overseas Service Learning Corps has seen amazing results in the years since it first began conducting service work in Malaysia in 2005.

This year the corps included four Malaysian overseas Chinese and eight Taiwanese NTU students. They arrived in Singapore on July 31 and traveled into Malaysia to set off on a 20-day journey. Starting in Kuala Lumpur on August 8, the students helped physically handicapped people at the Shuang Fu Double Blessing Disabled Independent Living Association and provided tutorial service to autistic children at the Kai-Chi Learning Disabilities Center. Then on August 13, while still in Kuala Lumpur, they provided warmth and companionship to elderly, disabled and disadvantaged people at the Rumah Charis and Eden Handicap Service Center.

Director Chou pointed out that, in the process of providing service, the students not only promoted social welfare by spreading compassion to those in need; their experiences led them to reflect on themselves and understand gratitude, and ultimately, to arrive at the satisfaction and happiness of self-affirmation.

In addition to providing social service, the service corps paid visits to Singapore's Nanyang Technological University and a number of independent high schools. Through academic counseling, the corps helped Malaysian overseas Chinese students establish a link to Taiwan and raised their awareness of Taiwan and NTU.

On August 4, the NTU students opened a two-day camp at Multimedia University in Malacca. They interacted with local students and shared the spirit of "letting service take root locally" in hopes of sowing the seeds of service among local youth so that more local people would take up social service work. The NTU corps led a series of interactive games and activities, such as "experiencing the blind," "green garbage collection iron man competition" and "Taiwan/Malaysia Culture and Gourmet Meet" to



Members of the corps play educational balloon games at a children's home.

promote the concept of service and build friendship between Taiwanese and Malaysians.

The corps expanded the scope of its service to include environmental service this year, as it considers the biosphere and natural environment as "new disadvantaged groups" in dire need of help. On this trip, the corps evaluated the level of environmental awareness in

Malaysia and called on Malaysians to organize beach cleanups. The students also showed environmental films and shared the concept of green living with local students to encourage local environmental efforts.

Though they stayed in Malaysia for only a brief 20 days, the service corps members made dedicated efforts to accomplish the goals of strengthening ties between Malaysia and Taiwan and spreading the ideal of social and environmental service.



The NTU Overseas Service Learning Corps visits Foon Yew High School in Malaysia.

Thoughts of an International Student on Studying at NTU



International students of the Department of Chinese Literature pose together.

Summer vacation is over in a flash, and then it's time to pack up and leave home again. Studying as an international student at NTU brings joy, pleasure and contentment and leaves one moved. Naturally, coupled with a reluctance to leave this new home is a lurking homesickness after having lived in a different place for so long.

NTU's beauty lies in its people, happenings and things. Its azalea blossoms burst onto the scene, awaiting the day they scatter on the ground. Their brief lives hint at a boundless hope. As the azaleas wither in May, plumes of bright crimson Royal Poinciana blossoms appear to cheer and congratulate the soon to be graduating NTU students.

During the "Dancing with the Azaleas" poetry and music recital, instructors Kwang-chung Yu and Mu-jung Hsi traversed the interflow of poetry to make that night's sky appear especially beautiful and moving.

The smiles of NTU's instructors and the compassion of its advisors for international students are like drip irrigation moistening the hearts of their students. The friendship and support between classmates fill the time international students study at NTU with warmth and make it our second home.

International Student Airport Pick-up Service Welcomes Record Number of Students



Now in its second year, the NTU Office of International Affairs' airport pick-up service for international students welcomed a new high of 222 arriving students at Taiwan Taoyuan International Airport on September 6-7. This semester, the categories of international students eligible for this service were expanded from incoming exchange students, visiting students and international degree students to include college- and department-level exchange students as well.

On the two days the service was provided this September, NTU student volunteers received arriving students at each of the airports' terminals between 8:00 a.m. and 11:30 p.m. Prior to boarding the shuttle buses, the volunteers made themselves available to the international students to provide information and help them exchange currency and apply for mobile phone service.

The buses delivered the students and their luggage to their dormitories on NTU's campuses up to seven times per day. During especially busy periods, extra buses were dispatched to deliver student luggage. After arriving at the international students' respective dorms, the volunteers provided additional services in order to help the students settle in to their dorms smoothly and comfortably.

During the 2009/2010 academic year, the OIA airport pick-up service welcomed 133 international students at the beginning of the fall semester and 62 students at the start of the spring semester.

NTU is proud and excited to see its international student enrollment expanding annually. While many of these students come from nearby Asian countries, those travelling from Europe and the Americas must endure long flights of over ten hours. This service is designed to provide a convenient way for all international students arriving from overseas to arrive at NTU safely.

This convenient airport pick-up service is but one of many examples of the proactive steps the OIA is taking to accommodate these new members of the NTU family.



Student volunteers happily await arriving NTU international students.

COLLEGE OF LIBERAL ARTS EXPANDING EXCHANGES WITH MONGOLIAN SCHOLARS



In recent years, NTU's College of Liberal Arts' Center for Buddhist Studies has steadily expanded its academic exchanges with the National University of Mongolia. The center first sent a group of scholars to attend a conference at NUM in the summer of 2007, and two years later it invited NUM professors to NTU to hold a joint conference on Buddhist studies.

This last summer, College of Liberal Arts Dean Yeh Kuo-liang led a delegation of NTU scholars to take part in another conference at NUM. NTU participants included Prof. Li-chen Lin and Prof. Sheng-hsin Hsu of the Department of Chinese Literature, Prof. Shu-ling Hong of the Graduate Institute of Taiwan Literature, and Prof. Yao-ming Tsai and Prof. Bau-ruei Duh of the Department of Philosophy.

On their first day in Mongolia, the NTU delegates met with NUM President Suren Davaa to share ideas about academic exchanges and took part in the opening day of the conference. President Davaa, the director of NUM's Buddhists Studies Center and Dean Yeh delivered the conference's opening speeches, and the academic discussions began. On the second day, the conference moved to a Buddhist monastery at Mongolia Buddhist University.

The theme of the conference was "The Culture, Philosophy and Religion Passed Down from the Yuan Dynasty." NUM invited scholars from each

of the universities in the Mongolian capital of Ulan Bator to participate in the conference. Thirty-four academic papers were presented on the history, politics, culture and religion of Mongolia from the Yuan Dynasty. Dean Yen and his colleagues from the College of Liberal Arts presented six papers. The conference expanded the NTU team's understanding of Mongolian culture and religion as well as their appreciation of the academic achievements of contemporary Mongolian scholars.

NUM published a beautiful color conference book with all of the conference papers as well as the participants' photos and introductions in Mongolian and English. The editors also included graphics and photographs related to the conference topics.

On the day following the two-day conference, NUM representatives escorted the NTU scholars to a Mongolian culture tourist center on the outskirts of Ulan Bator.

The final day of the trip, the NTU delegation returned to NUM for in-depth talks with NUM Vice President R. Rinchinbazar. The two sides discussed expanding the breadth of fields covered in the exchanges. It is hoped that in the future more humanities and social sciences scholars from NUM and other Mongolian universities will come to Taiwan for exchanges.

Researchers Collaborate to Make Spin Pumping Advances in the Field of Spintronics

The spin of electrons offers many degrees of freedom for use in signal-transfer and signal-storage devices. Many scientists are drawn to the investigation of this spin, named spintronics, because with pure spin currents (spin currents without any charge currents involved) processes of pure spin transfer can be non-dissipative. One way to generate pure spin currents is called spin pumping.

Prof. Ching-ray Chang and Prof. Son-hsien Chen of NTU's Center for Quantum Sciences and Engineering and Department of Physics and Prof. Branislav Nikolic of the University of Delaware's Department of Physics and Astronomy have been working together to devise pumping mechanisms from the rotation frame that precesses along with the precessing magnetization.

An effective "circuit" [See Fig. (b)] can be achieved by exploiting this rotation frame. Each of the adjacent normal metals can be viewed as two single-spin conductors; one allows only spin-down to transport, and the other allows only spin-up. The spin-down conductor is of a higher voltage than the spin-up conductor with the electrical potential difference being the microwave or precession frequency. Accordingly, for the right-attached conductor, down spins travel through the ferromagnet where they can get flipped to up, and then enter into either the right-attached or left-attached spin-up conductors. Two identical transportation paths occur for the left conductor. Eventually, these four symmetric paths yield pure spin currents being pumped into the normal metals.

On the other hand, in the asymmetric case where left- and right-attached conductors are made of different materials, charge current appears concurrently, reflecting

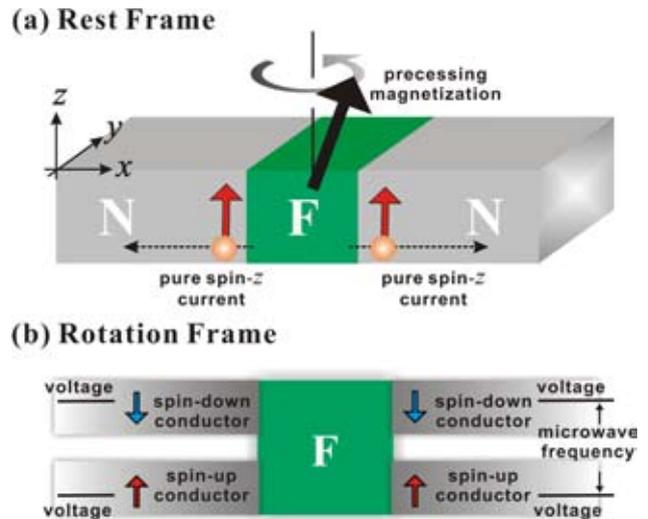


Fig. (a) Spin-pumping setup in the rest or laboratory frame and Fig. (b) effective circuit for the spin-pumping setup in the rotation frame. The letters, F and N, stand for ferromagnet and normal metal, respectively.

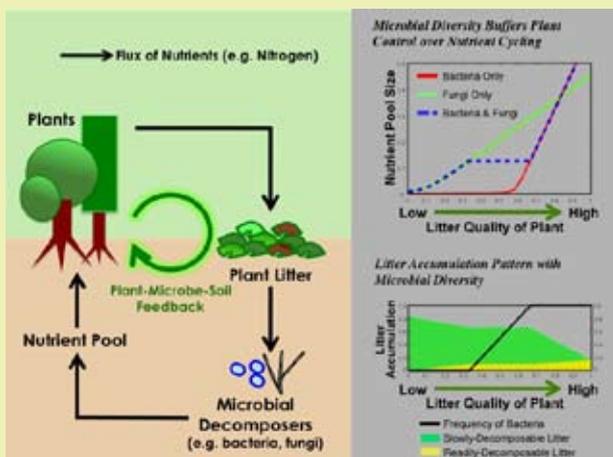
the asymmetries of these four paths. In this case, a voltage drop echoing the existence of the charge current can be detected experimentally. The effective circuit renders not only a simpler physical picture for the whole pumping device but yields a voltage drop in the experimentally-observed order of micro-volt, which has proved difficult to predict with other theories.

This team of researchers is applying this effective circuit to novel materials, such as topological insulators. Some exciting results, e.g., quantized conductance that can be used to identify the topological-insulator phase, have already been achieved.

Research on Ecosystem-level Impact of Microbial Diversity Published in PNAS

An NTU scientist, leading an international team, has proposed the novel hypothesis that microbial diversity buffers plant control over nutrient cycling and facilitates plant coexistence.

Assistant Professor Takeshi Miki, NTU Institute of Oceanography, leading an international research team with Japan's Ryukoku University and Kyoto University, has developed a new ecosystem model to explore the roles of microbial diversity in ecosystem structuring and functioning.



Plant-Microbe-Soil Feedback and the role of microbial diversity in buffering plant control over nutrient cycling.

The accepted view is that a plant controls the soil conditions (e.g., nitrogen concentration) via litter supply in terrestrial ecosystems. However, this study, published in the August 10 issue of the *Proceedings of the National Academy of Science of the United States of America*, indicates that biodiversity of microbial decomposers in soil can act as a buffer that weakens plant control over nutrient cycling, promoting negative feedback between community and ecosystem and facilitating plant coexistence. This is explained by the decoupling of plant litter quality and its decomposition rate arising from flexibility in microbial composition and functions in response to variations in plant litter quality.

These findings shed new light on the role of microbial diversity, a neglected component of biodiversity, in enhancing ecosystem resilience.

Microarray Core Provides New Generation Sequencing for Genomic Research

In its effort to provide cutting edge services to genomic researchers at NTU, the NTU Center of Genomic Medicine's Microarray Core has set up a new generation sequencing (NGS) system as a platform for genomic research. The core now hosts five sets of NGS (four AB SOLiDs and one Illumina GA), making it the largest such center in Taiwan and the fifth largest in Asia.

Applications of NGS include whole genome sequencing and resequencing, DNA methylation studies, DNA and protein interactions, whole transcriptome profiling, mRNA tag profiling, and small RNA discovery and analysis.

Current and potential NGS research in Taiwan in disease causes includes Kawasaki disease, multicentric lung adenocarcinoma, juvenile rheumatoid arthritis, identification of cancer driver mutations and some

mild disorders, and in pathogenic mechanisms it includes elucidation of different oncogenic mechanisms and epigenomic regulation.

Recent developments in biotechnology have propelled human disease gene studies from a few candidate genes to comprehensive cellular pathways, and have aided genome research in the collection of disease gene information.

The Microarray Core has worked to set up a series of gene expression, SNP, DNA methylation and copy number variation platforms over the years. These include home-made microarrays, genome-wide expression microarrays, SNP arrays, methylation chips and aCGH chips as well as data analysis tools.

This core facility provides gene expression array services to support



researchers. It has helped in the identification of the sets of genes and of microRNAs involved in cancer progression, and applied them in the prediction of clinical outcomes of cancers, including lung, liver, colon and brain cancer as well as leukemia.

In Taiwan, there are presently five sets of Roche 454, eight sets of Illumina GA and ten sets of AB SOLiD.

Metabolomics Coming of Age in Field of Systems Biology



Fig. 1: The Metabolomics Core provides a quadrupole-time of flight Mass Spectrometer (MaXis from Bruker) coupled with a UPLC system from Dionex.

Metabolomics is an area of systems biology along with genomics, transcriptomics and proteomics. Omics involve the development and application of techniques for the comprehensive collection of molecules, biological processes and physiological functions of a system. Systems biology emphasizes the dynamic interactions between the numerous components,

such as genes, transcripts, proteins, metabolites and cells, of a biological system to achieve a global view of the systems under study.

However, unlike genomics and transcriptomics, metabolomics has to deal with a diverse set of metabolites much more varied than DNA, RNA and proteins.

Mass spectrometry (MS) and nuclear magnetic resonance (NMR) are major instruments that provided abundant information on which the foundation of metabolomics was built. The MS instruments used in metabolomics experiments differ in ionization technology and type of mass analyzer (Figure 1). Samples can be either directly analyzed by MS or separated by different chromatographic techniques followed by MS detection. A routine practice of metabolomics measurement involves rapid extraction of metabolites from a biological sample, derivatization of metabolites if necessary, separation by liquid chromatography, ionization and detection by MS instruments (Figure 2).

Besides disease detection and diagnosis, metabolomics experiments can be applied to improve risk assessment, prognosis and

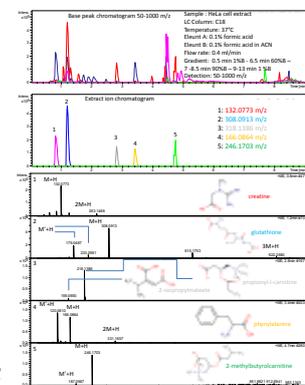


Fig. 2

prediction of therapeutic responses. Furthermore, they are useful for a broad range of studies, including metabolic flux, host-pathogen interactions, drug and xenobiotics biotransformation, drug efficacy and toxicity, fermentation monitoring, nutraceutical/functional food analysis, plant phenotyping and crop trait development optimization.

However, further efforts are needed in the development of mathematical models and algorithms to facilitate the application of metabolomic information and the development of approaches to the integration of metabolomic information in the context of systems biology.



DEPARTMENT DOGS BRIGHTEN THE LIVES OF THE ANTHROPOLOGY STUDENTS AT NTU

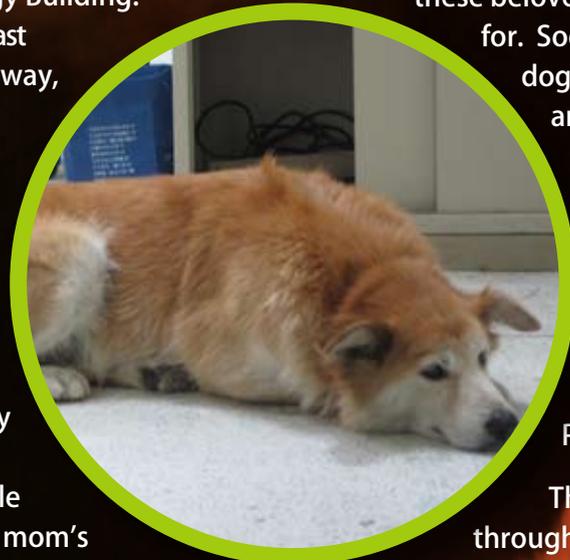
While graduates of the Department of Anthropology, now absorbed in their professional careers, might have forgotten the knowledge they acquired at NTU, one thing is certain: they will never forget the two department dogs Hsiao Hei (Little Blacky) and Hsiao Pang (Little Fatty) who brightened their lives as students at NTU.



About twelve years ago, a stray dog named Hsiao Hei bore a litter beneath the Department of Anthropology Building. At the time, the department's last department dog had passed away, so when the anthropology students saw Hsiao Hei they felt touched. Many people encouraged the department to adopt her as the new department dog, which it did.

Hsiao Hei's pups gradually were adopted by good Samaritans, save for one little runt who liked to stay by its mom's side at the Department of Anthropology. Because this pup was a pudgy little fur ball, everyone called it Hsiao Pang (Little Fatty).

Hsiao Hei loves to be near people. She snuggles up against anyone who comes to the department building, and revels in rolling on her back to get a tummy rub. Yet, she occasionally displays her maternal instinct and teaches Hsiao Pang a lesson. Hsiao Pang, however, is easy going. Though Hsiao Pang likes to get attention, she usually curls up in the grass or finds an air conditioned



classroom to sleep in. When the classroom's air conditioning is turned off or it is not cool enough, Hsiao Pang will stare at the students there with sad eyes, hoping they will have a heart and switch on the air conditioner!

A deep love exists between Hsiao Hei, Hsiao Pang and the anthropology students and faculty. The Department of Anthropology Animal Society was established to raise funds and enlist new students to ensure that these beloved dogs will always be cared for.

Society members have the dogs vaccinated, take them for annual health checks and purchase dog food and skin treatment for them. The society even set up an online Bulletin Board System, "AnthroDoggy," where members can check on how Hsiao Hei and Hsiao Pang are doing.

The dogs share their love through loyalty and devotion. They like to accompany students on their way to and from class, and even accompany them around campus and escort them to the MRT station.



lift!

Victoria, an Anthropology student says, "Seeing Hsiao Hei and Hsiao Pang makes me know I've returned to the Anthropology Building." She loves seeing them walk into the classroom and even nap and snore during the class -- their bright cuteness always gives her a

Asia Physical Therapy Student Association Holds First Congress at NTU



The First Congress of the Asia Physical Therapy Student Association was held at NTU from July 8-11. The congress was held by the APTSA Promotion Group and NTU's School and Graduate Institute of Physical Therapy. A total of 101 participants from nine countries and regions in Asia, including Indonesia, Japan, Korea, Malaysia, the Philippines, Singapore, Taiwan, Thailand and Hong Kong, were in attendance. The congress aimed to promote regional cooperation and interaction among physical therapy students in Asia, and to finalize the APTSA's constitution.

The congress opened with speeches by Dr. Suh-fang Jeng, dean of the NTU School and Graduate Institute of Physical Therapy, Dr. Fang-jen Lee, head of the NTU Graduate Institute of Molecular Medicine, Prof. Wen-jen Chieng, president of the Physical Therapy Association of the ROC, Dr. Rong-ju Cherng, chair of National Cheng Kung University's Department of Physical Therapy, Dr. Pei-fang Tang, supervisor of the APTSA Promotion Group, and Kuan-yin Lin, coordinator of the APTSA Promotion Group.

Later in the day, student representatives gave presentations on the physical therapy education systems in their countries and at their schools. That evening, a welcome party was held to bring attendees together for food, speeches, music, dance and party games.

During the next two days, student representatives discussed and finalized the APTSA's constitution. They decided on the official name of APTSA, its mission statement and objectives, member obligations and privileges, activities, and funding. They elected the association executive committee members for 2010-11. Kazuya Yoshimura (Kio University, Japan) was elected president, and Mae Madeleine Ng Ang (University of the Philippines Manila, the Philippines) was elected vice president. It was also decided APTSA would hold an annual congress, and that the next congress would be held in Japan.

The highlight of day three was a symposium on sports injury prevention, which included presentations and demonstrations about sports injuries and orthopedic physical therapy.

The day after the congress the attendees went on a city tour which gave them the chance to socialize as well as experience the beauty of Taiwan and the hospitality the Taiwanese people.

Biodiversity Center Hosts 2nd Cross-Strait Biodiversity and Forest Conservation Conference



The NTU Biodiversity Center hosted the Second Cross-Strait Biodiversity and Forest Conservation Conference from June 28-30. The conference included representatives of the Chinese Academy of Sciences, China's State Forestry Administration and Fujian Province's National Nature Preserve and Forestry Department.

During the three-day conference, over 150 scholars and experts discussed a wide range of pressing issues.

Conference topics included forest and biodiversity policy in Taiwan and China, ecological functions and biodiversity of constructed wetlands, plantation management and thinning, the biodiversity value of Taroko National Park, biodiversity and international trade, elderly forest tourism planning and satisfaction, and the relationship between species biodiversity and biomass accumulation of the mid-subtropical *Castanopsis eyrei* forest on Wu Yi Mountain under different spatial scales.

Prof. Ching-lung Lee, a former Minister of Agriculture of Taiwan and now an adjunct professor of horticulture at NTU, presented the opening remarks and was interviewed by local and Chinese media. He pointed out that extensive cross-strait cooperation on research and protection could contribute greatly to biological diversity and sustainable development on both sides of the Taiwan Strait and globally.

Prominent Scholars Attend 4th Conference on Language, Discourse and Cognition

The NTU Graduate Institute of Linguistics hosted the 4th Conference on Language, Discourse and Cognition (CLDC 2010) from May 1-2. This conference is one of the most important annual events held by GIL and attracts scholars from around the world to share their research and discuss cutting-edge topics in linguistics. In addition to the conference's focus on the interaction between language and cognition, each year the organizers choose a special focus topic involving the relationship between mind and language from different perspectives. The hot topic of "Pragmatics and Cognitive Linguistics" was the focus topic at CLDC 2010.

Among the many eminent scholars to participate and deliver talks at



this conference were Stanford University's Prof. Elizabeth C. Traugott, Showa Women's University's Prof. Yoshihiko Ikegami, and Prof. Chinfa Lien from Taiwan's National Tsing Hua University. They attracted a large audience and an increased submission of papers for presentation this year. To accommodate the large number

of submissions, the CLDC committee arranged a research paper poster session for the first time this year.

In a first for the CLDC, a pre-conference workshop was added and held on April 30. The workshop included panel discussions on "Pragmatic Markers in Asian Languages." Each conference session was led by a distinguished linguistics scholar, including NTU GIL's Prof. Shuanfan Huang and Prof. Wen-yu Chiang, Stanford University's Prof. Traugott, Showa Women's University's Prof. Ikegami, Hong Kong Polytechnic University's Foong Hap Yap, Wheaton College Graduate School's Prof. Vitoria Rau, University of California, Los Angeles' Prof. Shoichi Iwasaki, and University of Hawaii's Prof. Lawrence Reid.

NTU Engineers Visit Hebei Province in China to Discuss Renewable Energy



NTU engineers pose in front of a wind turbine at the Chongli Wind Power Plant in Hebei Province, China.

An NTU College of Engineering delegation visited Hebei Province to exchange ideas on new and renewable energy and environment-friendly architecture technologies from July 28 to August 1.

The NTU delegation visited Chongli Wind Power Plant, Yingli Solar Group, Hebei University, Shijiazhuang Tiedao University, Hebei Education Department, Caofeidian Industrial Zone and Yanshan University. The delegation and its counterparts in Hebei discussed new trends and the latest research in renewable energy as well as related research and investment policies in Taiwan and China.

The Chongli Wind Power Plant and Yingli Solar Group

are highly efficient in their construction and operations. The Chongli Wind Power Plant is in northwest Hebei Province and has 116 wind turbines spread over 90 km². Supplied by Spain's Gamesa and Denmark's Vestas, each turbine is rated at 850 kw, giving the plant a total capacity of 98.6 MW. Constructed in only three years, the plant has allowed a 130,000-ton reduction in annual CO₂ emissions.

Yingli Solar Group is a leading vertically-integrated manufacturer of photovoltaic cells. It has an annual production of 1 GW of solar cell modules. The thinness of Yingli's polycrystalline silicon wafers has improved from 280 μm in 2005 to 180 μm, and its energy consumption for polycrystalline silicon ingot production has been reduced from 12.59 kW/kg to 8.38 kW/kg.

Universities in Hebei and the Hebei Education Department were eager to acquire any information and resources they could get to upgrade their research capacity and make Hebei Province more advanced. This visit proved fruitful for both sides and further interaction is anticipated and considered important.

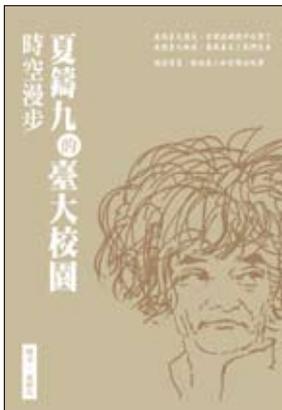
The NTU delegation believes it is necessary for NTU to share information on the latest progress of its green energy research with Taiwan's private renewable energy companies, universities and official organizations.

NTU Press Allows Everyone to Embrace Knowledge without Gaps

Knowledge must be read and understood,
We need authors who are willing to converse with the public
If you are willing to become a giant
Let the reader stand on your shoulders
And through the viewpoints and words you have constructed
See the world's past and future,
Yours will become a good book that all should possess

Eliminating the gaps in the dialogue between knowledge and the people is NTU Press's goal for its non-academic book series.

National Taiwan University Press's announcement soliciting manuscripts for its non-academic book series reflects its desire to cultivate exceptional authors. Exceptional authors are crucial to publishing good books. Profound theories and discourse require advanced writing skills to present knowledge in a manner suitable for the average person to read, to impact and change the lives of the readers, and to create a boundless positive influence on the Chinese language community. This is the ultimate significance of NTU Press's publications.



Book Series 1: Voyager

This series encompasses knowledge pertaining to the humanities and science. *Chu-joe Hsia's NTU Campus Voyage Through Space and Time*, the new book by Professor Chu-joe Hsia, Dean of the Graduate Institute of Building and Planning, has been published. It portrays a tour of the NTU campus from the point of

view of an intellectual in which the thin and delicate frame of a university intellectual is contrasted against the lush and verdant subtropical flora. Only two months after its publication, it went into its second printing. This book was named on the new book release list of the *China Times* newspaper's literary page and critic Chao Yang interviewed the author on his radio program.

Book Series 2: Communication, Culture and Society

A literary report marking the tenth anniversary of the 921 Earthquake has been published in this series. The author, famous photographer Tsang-sang Chang, has long been concerned about the quake and provides on-the-scene interviews.

Book Series 3: General Education/ Proficient

NTU Press has published general education books and composition teaching books that have impressed readers with their fresh layout and design. Many have received positive reviews, including *From Sentence to Structure—An Academic Paper Composition Guide*, which made it into the top-five on books.com's bestsellers list for books in its category.



Announcement: Important Year-end Publications

NTU Press will publish the *Wenxing Wang Manuscripts* book set in mid-November. This will contain the manuscripts for the two novels *Backed Against the Sea* and *Family Catastrophe* along with a collection of manuscript research papers by international scholars. This is a major event in the field of Taiwanese manuscript research as well as an unprecedented publishing project.

College of Engineering Increasing its Student Exchanges with Foreign Universities

The NTU College of Engineering has boosted the number of student exchange agreements it has with foreign universities by inking four new agreements between May and September.

The college signed exchange agreements with three Asia-Oceania Top University League on Engineering members: Thailand's Chulalongkorn University, the Korea Advanced Institute of Science and Technology and the University of Malaya. The College is actively promoting student exchange programs with its fellow AOTULE members. The college also signed an agreement with Oregon State University's College of Engineering.

These new agreements add to those signed with China's Guangxi University, Shanghai Jiao Tong University and Peking University in mid-April.

With so many newly-signed agreements and student exchange programs underway, the college held the 2010 Outgoing Exchange Student Seminar on October 15 to introduce its sister schools to NTU students and start the work of recruiting outgoing exchange students for 2011. The seminar was expected to draw over 100 students.

Dr. Tung-tien Sun Speaks at the College of Life Science on New Student Day

Dean of the College of Life Science Grace Chu-fang Lo often reminds us that “opportunity goes to those who are prepared.” On the college’s New Student Day, Dean Lo expressed her hopes for the new students. She declared that we each possess our innate value and that everyone is unique, and called on the students to set goals, make good use of NTU’s outstanding environment and resources, pursue innovation with courage, strengthen their thinking abilities, stimulate their originality, continue being curious, think as well as study, pursue general education, develop their individual qualities, as well as expand and improve themselves so as to make the most of their golden years as university students.

This was the college’s first New Students Day and everyone at the college felt honored to mark the day with a series of lectures by Academia Sinica Academician Dr. Tung-tien Sun. Dr. Sun graduated from the NTU Department of Agricultural Chemistry in 1967 and earned a Ph.D. in biochemistry from the University of California, Davis, in 1974. Sun has received numerous academic honors and produced many outstanding research achievements. He is currently the Rudolf L. Baer Professor of Dermatology at the New York University Langone Medical Center. In 2001, Dr. Sun began offering short-term courses addressing scientific writing and scientific attitudes because he sees an inadequacy of education in these areas.

Dr. Sun’s New Students Day lectures addressed two topics: “How Do We Achieve Our Life Goals?” and “From Science to Writing.” The second topic was divided into

“Documentary Analysis,” “Experimental Design,” “Thesis Writing” and “Oral Reports.”

In “Documentary Analysis,” Sun emphasized efficient reading, identification of important content and note taking, and suggested the use of thematic categorization. In “Experimental Design,” he stressed risk assessment and said not to blindly believe authority. He stated researchers should adopt a rigorous attitude, plan careful experimental designs and clearly record the process and results of each experiment. He declared that this attitude should ultimately become a habit and personal quality.

“Thesis Writing,” Sun stated, calls for the analysis and organization of the data results of an experiment as well as the design of graphics. Based on the volume of content, researchers need to determine the size of graphics with an emphasis on clarity and brevity. He added that an outline should be produced based on a content analysis of related documents.

For “Oral Reports,” Dr. Sun said there are about three forms of presentation and that reports should be linked logically to be convincing and provoke curiosity. Each report should make one main point. Reports must be succinct and clear, and place priority on quality content. Report titles need to be brief and enticing, and complexity should be avoided regarding the report’s background issues. The scope of the report should move from broad to narrow then return to breadth. Finally, it is important that oral reports be completed on time.

Academia Sinica Academician Dr. Tung-tien Sun’s copious body language and good sense of humor kept the auditorium packed and led to endless discussion following his lecture.



NTU at a Glance



NTU Museums ran a study camp for kids this summer using handicrafts and games to introduce children to the historical treasures archived here on campus.

NTU Museums ran a study camp for kids this summer using handicrafts and games to introduce children to the historical treasures archived here on campus. Though only in its inaugural year, the three-day camp was fully booked in short order. Students from as far away as Hualien and Kaohsiung applied. Once camp activities commenced, the kids found themselves absorbed in the fascinating classes that combined scholarly knowledge with everyday applications.

On the first day, students visited the Museum of Medical Humanities, the NTU Herbarium and the Museum of Zoology. Each student was presented with a frog skeleton as a class souvenir at the end of the day.

On the second day, the kids visited the Gallery of NTU History and Geo-specimen Cottage as well as the Insectarium, a highlight of the camp for those who loved stag beetles.



The camp concluded with a day of visits to the Museum of Archives, the NTU Heritage Hall of Physics, where a scientific experiment class was taught using an electric motor and nanomagnetic particles, and the NTU Agricultural Exhibition Hall, where master "tree bark art" craftsman Yung-mo Lee showed the kids how to make works of art from natural, environmentally-friendly materials.



congratulations!

NTU Advances to 127th Place in SJTU Academic Ranking of World Universities

NTU is delighted to find itself ranked 127th in Shanghai Jiao Tong University's 2010 Academic Ranking of World Universities. NTU climbed 23 spots in this year's ranking, and continues to hold its position as the leading university among universities in Taiwan, Hong Kong and China.

Moreover, NTU surpassed the 145th-ranked National University of Singapore for the first time, and added to its lead over Seoul National University, which is ranked 148th.

NTU's strong standing in the ranking is an affirmation of the effective use NTU has made of the generous funding it has received under the Ministry of Education's "five year-NT\$50 billion" education subsidy plan.

While NTU improved in all of the ranking's categories this year, it saw its greatest advancement in the category for highly-cited researchers, in which its score increased from 10.3 last year to 16.1. The university also experienced a significant rise in its score for articles published in *Nature* and *Science*, which ascended from 9.9 to 11.6.



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