

NTU



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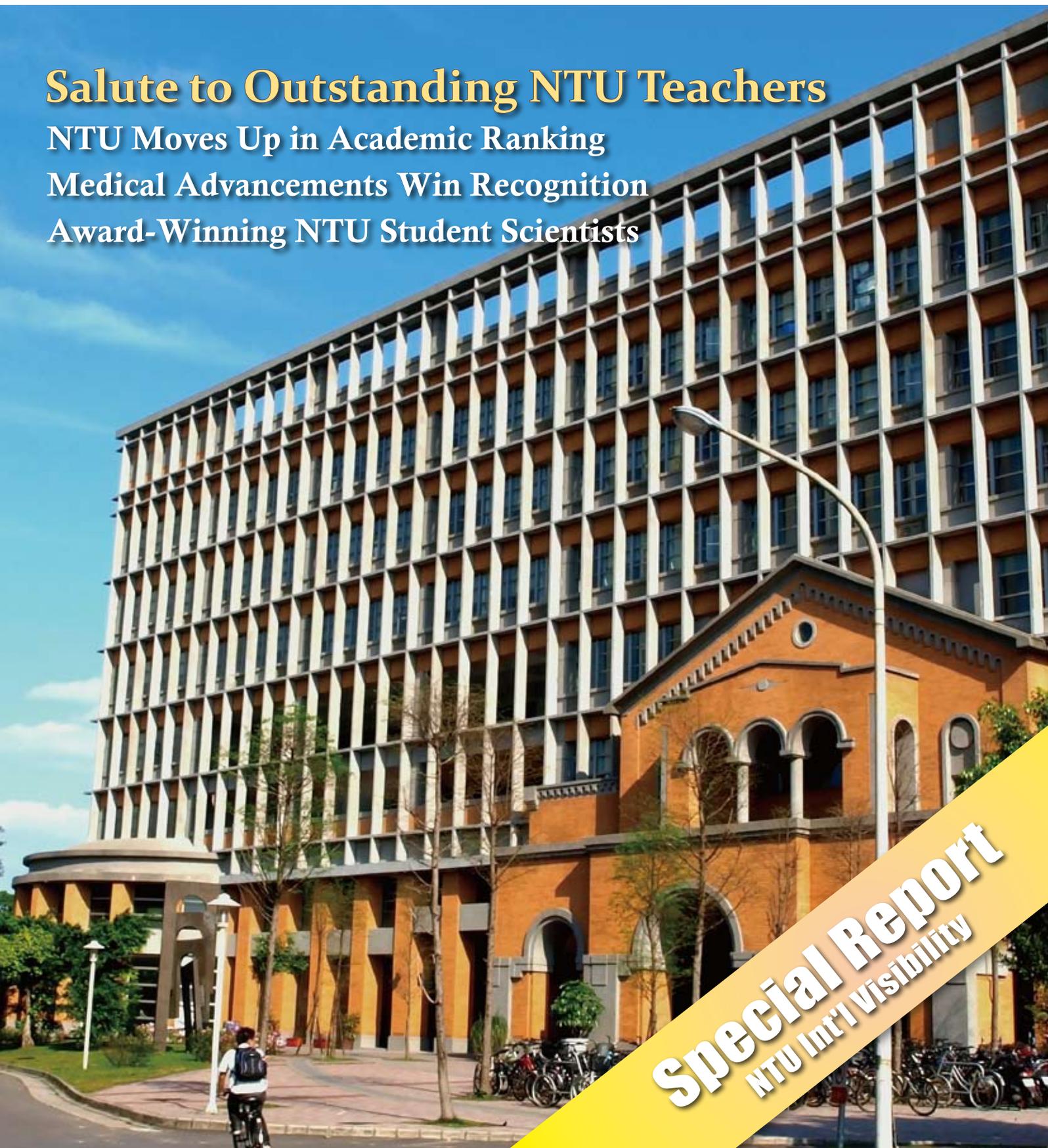
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Salute to Outstanding NTU Teachers

NTU Moves Up in Academic Ranking

Medical Advancements Win Recognition

Award-Winning NTU Student Scientists



Special Report
NTU InCI Visibility



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iNTU Campus Map Application Available for Smart Phones



From the President's Office

NTU has set the goal of joining the ranks of the world's top 50 universities as part of the second stage of its Aim for the Top University Project. The university recently garnered a ranking of 87th in the 2011 QS World University Rankings, our best performance yet. This demonstrates the university continues to advance in world rankings and that becoming one of the world's 50 most elite universities is not an unachievable dream.

The university has initiated three major international cooperation projects as a means of achieving this goal. This March, the College of Electrical Engineering and Computer Science joined Intel in establishing the Intel-NTU Connected Context Computing Center, which will focus on the development of machine-to-machine technologies.

NTU is also working with the University of Texas at Houston MD Anderson Cancer Center to open a cancer research center and with the UCLA California NanoSystem Institute to pursue cutting-edge biomedical nanotechnology research.

Concerned about the problems facing humanity, the university has established a climate change and sustainable development center as well as a health science and intelligent living center. The former aims to develop a forecasting model to identify areas that might suffer natural disasters in the event of a typhoon, while the latter is designing a telemedicine management system in order to provide healthcare services at a distance.

On other fronts, NTU hopes to encourage a third of its undergraduate students to participate in overseas programs during their studies, and will increase Mandarin courses for international students in order to improve their Mandarin skills and provide greater incentives to study at NTU.

李嗣涔

President
Dr. Si-chen Lee

President Lee Leads Delegation on Historic Trip to Russia



The NTU delegation appears in a group photo at M.V. Lomonosov Moscow State University.

NTU President Si-chen Lee set off on an historic nine-day trip to Russia on September 9. His visit included the first formal bilateral meetings between the heads of institutions of higher learning in Taiwan and Russia. The NTU delegation included Dean of the Office of Research and Development Ji-wang Chern, Deputy Dean of the Office of International Affairs Hsin-yu Lin and Vice Superintendent of the NTU Hospital Hong-nerng Ho. During the nine day trip, NTU inked academic exchange agreements with several prestigious Russian institutions.

President Lee's delegation visited M.V. Lomonosov Moscow State University, Saint Petersburg State University, the Scientific-Educational Center of Nanotechnologies of the Saint Petersburg Academic University of the Russian Academy of Sciences, the National Research University of Electronic Technology and the

The NTU delegation to Russia poses for a group photo at the National Research University of Electronic Technology.



NTU President Si-chen Lee presents Zhores Ivanovich Alferov, president of the Saint Petersburg Academic University, with a gift on behalf of NTU.

Institute of Radio-engineering and Electronics of the Russian Academy of Sciences.

During the visit, President Lee signed a graduate student exchange agreement with M.V. Lomonosov Moscow State University and an inter-institution agreement as well as a student exchange agreement with Saint Petersburg State University. Taiwan's National Science Council also signed an inter-institution agreement with the National Research University of Electronic Technology.

The signing of four agreements with three leading Russian institutions established a firm foundation for a new era of cooperation between institutions of higher learning in Taiwan and Russia, and demonstrates the great success of President Lee's trip.

Beside these historic agreements, President Lee also met with several prominent Russians, including

Zhores Ivanovich Alferov, president of the Saint Petersburg Academic University and winner of the Nobel Prize in Physics for 2000. The two discussed possible cooperation plans for the future and hoped that their meeting would lead to



The NTU delegation listens to a briefing introducing research progress at the Institute of Radio-engineering and Electronics.

deepening relations between their institutions. President Lee also extended his heartfelt invitation to President Alferov to visit NTU. President Alferov responded enthusiastically that he would do his best to schedule a visit to NTU.

President Lee met with Saint Petersburg State University President Nikolai Mikhailovich Kropachev on September 12 and M.V. Lomonosov Moscow State University President Victor Antonovich Sadovnichiy on September 15. These two institutions enjoy the special status of being the only ones to fall under the direct administration of the Russian federal government.



PRESIDENT LEE VISITS RESEARCH CENTERS IN CALIFORNIA IN PURSUIT OF COOPERATION



NTU President Si-chen Lee led an NTU delegation to California August 22-26 to pursue technology cooperation agreements with leading research institutes there. The delegation included NTU Vice President Ming-je Tang, Dean of the College of Medicine Pan-chyr Yang, Prof. Min-liang Kuo of the Graduate Institute of Toxicology and Dean of the College of Life Science Chu-fang Lo.

On August 23, the delegation paid a visit to the University of California, Irvine, where Vice Chancellor for Research John Hemminger briefed the group on UCI's academic and research efforts. With a student body of about 27,000, UCI is known for its research in technology but is also strong in linguistics, social sciences and neurobiology, as well.

While at UCI, the delegation visited the California Institute

for Telecommunications and Information Technology, aka Calit2, where it was hosted by Calit2 Director G.P. Li. Jointly established by UCI and the University of California, San Diego, the institute utilizes the strengths of academia, government and industry cooperation.

On August 24, Lee and his delegation visited the University of California, Los Angeles, where they were welcomed by Executive Vice Chancellor Scott Waugh. While there, they also met with Paul Weiss, director of the California NanoSystems Institute, who briefed them on the institute's organization and research. CNSI employs 120 professors from 29 different research units, specializing in such fields as science, engineering, medicine, health care, law and art. The institute produces world-class research in

biomedicine, devices, energy and the environment.

President Lee's delegation called on the University of California, San Francisco, on August 25. UCSF is a world leader in health sciences education and research as well as patient care. The university boasts three Nobel laureates and 43 members of the United States National Academy of Sciences. UCSF's priorities include biochemistry, chemical biology, cancer research and hospitals.

On August 26, the delegation met with Senior Associate Dean Curt Frank of the School of Engineering at Stanford University. The school's main research areas are information technology, nanotechnology, bioengineering, energy and the environment, and curriculum. The delegation also called on F.K. Chang, director of the school's Structures and Composites Laboratory. Chang conducts research on composite materials for high-value structures, such as airplanes and bridges.

President Lee Honors Outstanding NTU Teachers on Teachers' Day

This year's NTU Teachers' Day Tea Reception was held on September 23. During the formal gathering, NTU President Si-chen Lee recognized NTU's outstanding teachers by presenting this year's Professor Emeritus Certificates, Distinguished Professor Certificates, Senior Outstanding Teacher Awards, NTU Chair Professor Certificates, Teacher Service Awards, Outstanding Mentor Awards, Teaching Excellence Teacher Awards and Academic Research Achievement Excellence Teacher Awards.

President Lee declared to the audience, "On Teachers' Day, we on one hand extend our hearty congratulations to each and every teacher while on the other we encourage ourselves, because education is our most fundamental aim. We must teach our students well! The students who enter your classrooms are your greatest compensation."

Lee emphasized, "NTU's three new world-class research centers will speed us along the way to becoming the best in the world in these fields. Moreover, in the area of education, the Office of Academic Affairs has formulated the second stage of an entirely new plan based on outcome-based education that will help teachers solve students' shortcomings."



NTU Hosts International Symposium on Library Values and Planning

The symposium "Approaches to Valuing and Planning the Library" was held at the NTU Library on September 7. Organized by the NTU Library, National Cheng Kung University Library, The Elsevier Foundation and Elsevier Taiwan L.L.C., the symposium was designed to promote greater efficiency in the planning of library operations to create value for a new era of libraries and better serve academic researchers.



Lizabeth Wilson, Dean of University Libraries at the University of Washington, delivered the speech, "From Vision to Reality: Effective Tools for Library Planning." She spoke about her library winning the 2004 Association of College and Research Libraries Excellence in Academic Libraries Award as well as its efforts to meet the new challenges of this era. Dean Wilson emphasized that libraries in the 21st century are positioned between both real and virtual spaces and stressed that in planning and implementing reforms of library services and facilities, library administrators must first grasp and evaluate the real needs of each library user to create services that meet the actual needs of each user and thus enhance value.

Paula Kaufman, the Juanita J. and Robert E. Simpson Dean of Libraries and University Librarian at the University of Illinois at Urbana-Champaign, spoke on the core values of libraries in this day and age in her talk, "It's not Good Enough to be 'Good' Anymore: Approaches to Valuing the Library." She noted that there are a variety of methods for weighing core values, including measuring library usage volumes and downloading volumes, conducting interviews and even applying the concept of return on investment. Dean Kaufman discussed a wide range of research conducted by various libraries to measure core values and pointed out that understanding these different models will allow a library to determine the methods that are most appropriate for analyzing its own values.

Thomas Leonard, University Librarian at the University of California at Berkeley, spoke on, "New People are Coming to Our Libraries: Donors and Consultants." He noted that since library funding by universities is on the decline, donations are increasingly important. He described how his library maintains communications with its donors and the results of these efforts, and discussed several myths that arise concerning the handling of donations. Leonard also explained how consultants helped improve his library's efficiency by suggesting the use of spider charts rather than branch charts for the library's organizational structure.

Jack Huang, regional marketing manager of APAC-Elsevier, spoke on, "Collaboration, Competition and the Drivers of Research: Implications for Libraries." He explained that researchers require fast and efficient channels for high-quality information as well as effective services and assistance to achieve their research goals. Huang also noted that libraries must understand user needs and exploit their limited resources and funding to provide new services and create new value for this new era.

President Lee Meets with Alumni in Southern California



NTU President Si-chen Lee participates in a banquet with the NTU Alumni Association of Southern California.

On September 23, during his trip to California to visit research centers, NTU President Si-chen Lee met with the NTU Alumni Association of Southern California to update them about the university's outlook and the new challenges it faces. Over 200 NTU alumni attended the meeting.

President Lee pointed out that the MOE's first-stage five-year "Aim for the Top University Project" commenced in 2006, and that NTU broke into the top 100 in the Times Higher Education World University Rankings, when it claimed 95th place in 2009.

He said the university's development plan has entered the second stage and declared that the university's next goal is to vault into the ranks of the world's 50 best universities.



NTU Moves Up to 123rd in Academic Ranking of World Universities

NTU moved up four steps from last year to reach 123rd in the 2011 Academic Ranking of World Universities released by Shanghai Jiaotong University on August 15. Besides continuing its climb among world universities, NTU stands at the top of all universities in Taiwan, Hong Kong, Macao and China.

In the ranking's broad subject fields, NTU ranks 29th worldwide for Engineering/Technology and



Computer Science and in the 76th to 100th bracket for Natural Sciences and Mathematics. The university is 32nd in the world in the subject field of Computer Science.

Prof. Mu-hsuan Huang of the Department and Graduate Institute of Library and Information Science attributes NTU's top ranking among universities in Taiwan, Hong Kong, Macao and China primarily to its high volume of publications in Science Citation Index and Social Science Citation Index listed journals, noting that university faculty and students published nearly 5,000 such articles in 2010. She adds that NTU's high number of highly-cited papers is another factor.

NTU Doctor Shares Experiences in Fighting Hepatitis in the Journal *Hepatology*

Prof. Ding-shinn Chen, a distinguished chair professor of the College of Medicine, published the article "Fighting Against Viral Hepatitis: Lessons from Taiwan" in the Master's Perspective column of the August issue of *Hepatology* (2011; 54:381-392), the world's most influential journal in the field of liver studies. In the article, Chen speaks from his personal perspective in detailing Taiwan's remarkable success in research and prevention efforts related to viral hepatitis, chronic liver diseases and liver cancer. Chen played a key role in helping Taiwan's government implement its Viral Hepatitis Control Program, which significantly reduced the carrier rate of hepatitis B and cut the incidence rate of hepatocellular carcinoma.

In the paper, Chen points out that viral hepatitis and its sequelae are a serious health issue for all of humankind, including Taiwan. He relates how he became interested in medical research while in medical school as well as his early research efforts on hepatitis B and C. He goes on to describe his pioneering use of injections of interferon-alpha coupled with orally administered ribavirin to treat patients suffering from chronic hepatitis C, as well as his research concerning the hepatitis D virus. Chen reviews these experiences from the point of view of his role in Taiwan's efforts in fighting viral hepatitis over the last 40 years.

Chen concludes by discussing issues that remain to be resolved and makes insightful predictions regarding changes in liver diseases in Taiwan he expects to emerge from the middle of the 21st century.

During the 1970s, Chen and his colleagues at the College of Medicine found that 80% to 90% of patients in Taiwan with chronic hepatitis, cirrhosis or liver cancer had chronic hepatitis B, and that even 15% to 20% of healthy people had chronic hepatitis B. They also demonstrated the significant role played by the vertical transmission from mother to child during childbirth in the spread of chronic hepatitis B. Chen's team went on to prove that this vertical transmission of hepatitis B was the primary cause of liver cancer in Taiwan. In conducting research at the molecular level, they also provided some of the world's earliest proof of the correlation between the hepatitis B virus and liver cancer.



NTU Veterinarian Elected as Sole Taiwanese ACVO Founder Diplomate

Prof. Chung-tien Lin, a chief veterinarian at the School of Veterinary Medicine's Institute of Veterinary Clinical Science and the NTU Veterinary Hospital, was elected founder diplomate of the Asian College of Veterinary Ophthalmologists (AicVO). Selected following a stringent review process carried out by the AicVO Credential Committee, formed by the American College of Veterinary Ophthalmologists and European College of Veterinary Ophthalmologists, Prof. Lin is the sole veterinary ophthalmologist in Taiwan to enjoy this honor.



The application criteria are high and the conditions numerous for being eligible to be recommended for election as an AicVO founder diplomate. In fact, there are hundreds of veterinary ophthalmologists in Asia, but less than 15 of them meet the stringent standards set by the AicVO Credential Committee. In the end, only five received recommendation. As for the other AicVO founder diplomats, three are from Japan and one is from South Korea.

Prof. Lin graduated from the NTU Department of Veterinary Science (now the School of Veterinary Medicine) in 1991 and went on to earn his PhD in veterinary ophthalmology from the University of Cambridge in 1999. In addition to his work at NTU, Prof. Lin is an executive editor and member of the article review committee for *Veterinary Ophthalmology*, the journal of the American College of Veterinary Ophthalmologists and European College of Veterinary Ophthalmologists. Lin is the only member of the journal's review committee from Asia. In recent years, Prof. Lin received awards for teaching excellence from the College of Bio-Resources and Agriculture as well as Science Citation Index awards for an outstanding journal and outstanding journal article.

Chair Professor Yoko Ota Named Honorary Life Fellow for Quaternary Research

Prof. Yoko Ota, a distinguished chair professor of the Department of Geosciences, was named an Honorary Life Fellow at the 18th Congress of the International Union for Quaternary Research, which was held in Bern, Switzerland, July 21-27. She was among just eight scholars to receive this honor this year.

The International Union for Quaternary Research (INQUA) was established in 1928. Its mission is to study changes in Earth's environment that have occurred during the last 2.6 million years--the Quaternary period. The union holds its congress every four years. Taiwan is an official INQUA member.

Prof. Ota served as vice-president for INQUA's "Shoreline" and "Neotectonic" topics from 1995 to 1999. She also organized the "Sea Level Change During the Last 30,000 Years" special program for the INQUA Congress in Beijing, China in 1991 and the "Paleoseismology" special program for the INQUA Congress in Cairns, Australia in 2007.

Prof. Ota earned her PhD from the University of Tokyo Department of Education in 1960 and began teaching in the Department of Geology at Yokohama National University in 1963. Ota is dedicated to Quaternary and active tectonics research and has travelled five continents. She has published over 80 research papers in English and more than 250 in Japanese and is renowned for her penetrating insight.

Prof. Ota came to NTU as a distinguished chair professor in 2007. She is also a visiting research fellow at the Geological Survey of Japan, and has traveled the globe conducting research and field work with the U.S. Geological Survey and New Zealand Geological Survey.



Two College of Engineering Professors Receive 2011 Cho-chang Tsung Chair Award

Prof. Yunn-shiuan Liao of the Department of Mechanical Engineering and Prof. Tsung-tsong Wu of the Institute of Applied Mechanics were named recipients of the 2011 Cho-chang Tsung Chair Award. Prof. Wu also received this award in 2010.

The Cho-chang Tsung Foundation of Education established this annual chair award in order to promote advances in all fields of engineering at the NTU College of Engineering. Each year, the award is presented to no more than two NTU engineering professors who make high level contributions in their fields of research or who achieve exceptional success in the promotion of industry-academia cooperation. The award includes an NT\$400,000 prize. Those who claim the award twice receive a lifetime honor and are no longer eligible.

Prof. Liao is an NTU distinguished professor and past recipient of the National Science Council Outstanding Research Award. He graduated from the NTU Department of Mechanical Engineering in 1973 and received his doctorate from the University of Wisconsin-Madison in 1980. Dedicated to education, Prof. Liao has cultivated countless engineering professionals in Taiwan in his 30 years as an NTU educator. He conducts innovative research, specializing in the areas of metal cutting principles, non-traditional machining process, machine tool dynamics and control, and quality control and reliability. Prof. Liao's articles have appeared repeatedly in prestigious domestic and international journals and he has published 110 Science Citation Index and Engineering Index papers during his career. He holds nearly 20 domestic and international patents.



In addition to his academic research, Prof. Liao is concerned about the development of domestic industries and works to improve industrial technologies and boost international competitiveness. The many local manufacturers he has helped include Chi Mei Corp., Kinik Co., CHMER EDM and Lien Sheng Mechanical and Electrical Co.

Prof. Wu is also an NTU distinguished professor and former recipient of the National Science Council Outstanding Research Award. He graduated from NTU in 1977 and, after earning his PhD from Cornell University in 1987, returned to Taiwan to teach at the Institute of Applied Mechanics. He has achieved great success in theoretical analysis, research and engineering applications involving wave mechanics. His research interests include wave mechanics, RF ultrasonic sensing systems, phononic crystal and frequency filters and nondestructive evaluation.

Besides teaching and research, Prof. Wu has served as an education administrator and strives to improve Taiwan's technology research environment. He also served as director of the Institute of Applied Mechanics, president of Taiwan's Society of Mechanics and as a high-level technology consultant to the government. In 2009, Prof. Wu organized the IUTAM Symposium on Recent Advances of Acoustic Waves in Solids for the first time in Taiwan. He also helped organize the Phononics 2011 symposium, which was held in the United States in May. Recently, he served as the associate editor of the international journal *Ultrasonics*.

NTU Alumnus Chih-yuan Lu Wins 2012 IEEE Frederik Philips Award



NTU alumnus Chih-yuan (C.Y.) Lu (Class of '72, Department of Physics) was named the recipient of the 2012 Institute of Electrical and Electronics Engineers Frederik Philips Award, known as the Oscar of technology. The IEEE singled out Lu, who is president of Taiwan's Macronix International Co., "for leadership and contributions to research, development and industrial alliances in semiconductor technology." Lu is the first person from Taiwan, Hong Kong or China to earn this recognition. With the 36,000 members from 175 countries, the IEEE plays a highly influential role in the world of industry. In 2010, NTU presented Lu with an Outstanding Alumnus Award.

2011 NTU Summer+ Program Draws 55 International Students



Students perform a skit to demonstrate their Mandarin skills.

Following its inauguration in 2010, the NTU Summer+ Program marked another successful summer this July and August. The Office of International Affairs designed this program for international students who are interested in conducting short-term study at NTU and learning about local Taiwanese culture. As an indication of the program's growing popularity, the number of students who enrolled in the program expanded from 17 last summer to 55 this summer.

The program offers two intensive series of courses. This year, the six-week "Summer Program for Laboratory Research and Culture" ran from July 18 to August 26, while the four-week "Exploring Taiwan @ NTU- Summer Intensive Program for Chinese and Culture" ran from August 1 to 26.

The NTU colleges that participated in this year's laboratory program included the College of Science, College of Electrical Engineering and Computer Science, College of Engineering, College of Bio-Resources and Agriculture, College of Life Science and College of Public Health. Most of the students who joined the program came from NTU partner universities. There were three from the University of Illinois at Urbana Champaign and 15 from NTU partner universities in China, including Fudan University, Nanjing University, Nankai University, Tianjin University and the University of Science and Technology Beijing. Other students came from the University of Malaya, University of Toronto and King's College London. Besides working in the laboratory, the students also took elective courses offered in the language and culture program.

"Exploring Taiwan @ NTU- Summer Intensive Program for Chinese and Culture" drew students

Students perform a skit to demonstrate their Mandarin skills.



from the United States, Canada, Japan, South Korea, Italy, Germany, France, the Netherlands, Austria, Israel and Australia.

The International Chinese Language Program provided 15 hours of Mandarin Chinese language instruction per week. Professors from NTU and Academia Sinica taught the program's culture courses, which included "Population and Gender in Taiwan," "Taiwanese Immigration to Overseas Countries," "Indigenous Population and Society," "Satellites and Typhoons," "Tea Industry and Culture in Taiwan," "Taiwanese History," "Introduction to Taiwan Movies" and "Introduction to Taiwan Music." This program also organized field trips to the National Palace Museum, the Central Weather Bureau, Yang Ming Mountain and the Puppetry Art Center of Taipei as well as a three-day trip that took the students to central Taiwan to experience the local Taiwanese and aboriginal cultures.

On the final day of each of the programs, the students were required to mount the stage to give ten-minute presentations on their coursework. The students in the laboratory program presented overviews of their laboratory experiments while those in the language and culture program showcased their Mandarin skills in giving speeches or performances.

Following the completion of the programs, most of the students returned to their countries, though some chose to stay in Taiwan to continue their Mandarin studies or enroll as exchange students.

International students enjoy themselves during a cultural visit to Lukang.



NEW INTERNATIONAL STUDENTS WELCOMED WITH FUN PHOTOGRAPHY CONTEST



New international students strike poses from the movie Kung Fu Panda.

NNTU's new international undergraduate students were welcomed to their new campus with the event, "Where to eat? What to do? What's fun at NTU," on September 12. Organized by the Office of International Affairs, NTU International Student Information Service, NTU Foreign Student Association and NTU Japanese Student Association, the event featured a lighthearted photography contest to help familiarize the new NTU students with the campus and created opportunities for them to make friends with other international students.

The photography contest was designed to double as a campus tour activity by designating 20 spots around campus and the surrounding area for the students to visit. The organizers also set up ten humorous award categories to make the contest all the more amusing. The awards included most scenic spots award, most creative award,

 The British and Italian teams join up for a happy photo at the Fu Bell.



most athletic spirit award, most humorous award, most grotesque award, most sexy award, most dramatic award, most traditional award, most strange award and most delicious food award.

On the day of the event, the international students first assembled at the Prince House Shui Yuan Dormitory where NTU Foreign Student Association Vice President Katherine Maria Buck kicked things off with a brief introduction, which set the festive mood for the day. The students then divided into groups according to language. Experienced group leaders served as the new students' campus tour guides.

Before setting out, the group members discussed which awards they would try for and devised strategies for victory. When they were ready, the groups embarked on their whirlwind campus tours, which took them to many of the university's most scenic and interesting spots.

After returning to the dormitory, the group leaders uploaded their groups' photographs into a computer for judging. The students then gathered to view each other's photographs and enjoyed a break during which they recalled the events of the day as they partook of a spread of snacks and drinks. The lively scene of students of

different cultures from around the globe interacting with each other was fascinating. The enthusiastic gestures and expressions captured in the photographs and the selection of campus spots reflected the new students' first experiences and impressions of the NTU campus. Each and every photograph drew an enthusiastic round of applause.

Following intense discussion,



 Students help themselves to snacks and drinks at the Prince House Shui Yuan Dormitory.

the judges finally decided on the winners. The day ended with an amusing awards ceremony that filled the room with roars of laughter and ensured that everyone left with new friends and a smile.

Attracting nearly 100 students, the welcoming event was a great success. All of the new students expressed their satisfaction with the event and encouraged the organizers to hold similar activities in the future.

SUPER 8 STUDENT TEAM WINS 6TH UTECHZONE MACHINE VISION PRIZE

This past summer, a student team from the Biophotonics and Bioimaging Laboratory of the College of Bioresources and Agriculture's Department of Bio-Industrial Mechatronics Engineering won the 6th Utechzone Machine Vision Prize. Calling themselves "Super 8," the team of eight students bested 22 other student and industry teams from Taiwan and China to claim the competition's top prize of NT\$500,000. This is the third year that a team from the Biophotonics and Bioimaging Laboratory has won this competition.

Kicking off with preliminary competitions in May, the competition lasted for more than two months. Prizes were awarded at the 24th IPPR Conference on Computer Vision, Graphics and Image Processing on August 22.

This annual competition is sponsored by Utechzone Co., a local company that mainly designs, manufactures and distributes automated optical inspection systems, including a line of intelligent vision security products for surveillance. Co-sponsors include Taiwan's Image Processing and Pattern Recognition Society and Automated Optical Inspection Equipment Association as well as the China Society of Image and Graphics.

The theme of this year's competition was facial recognition systems. It covered the four topics of age recognition, facial expression recognition,

facial recognition and gender recognition.

Facial recognition imaging technologies can be used in a wide variety of applications, including digital cameras, mobile telecommunications, biometric recognition and security systems. The competition therefore challenged the student teams to address academic theory as well as industrial applications. For each of the competition's topics, the teams submitted their work for software verification and scoring and were required to make on-stage presentations of their research papers. The Super 8 team was rated among the best for software verification and paper presentations.

The Super 8 team was made up of undergraduate and graduate students from the Department of Bio-Industrial Mechatronics Engineering and guided by Prof. Ta-te Lin. Competition was tough; other teams were from such prestigious institutions as Taiwan's National Tsing Hua University, National Chiao Tung University and Chung Hua University as well as China's Anhui University. The Department of Bio-Industrial Mechatronics Engineering's repeated strong showing in this event has won them recognition from industry, government and academia for their demonstrated prowess in the cutting-edge field of machine vision research.



STUDENT SHARES THOUGHTS ON PARTICIPATING IN UC DAVIS GREAT PROGRAM

Students who participated in the UC Davis GREAT Program come together for a photograph.

The The Global Research Experience in Advanced Technology Program at the University of California, Davis, gives students from partner universities opportunities to engage in advanced research with the university's faculty. Pei-yun Tsai, a graduate student at the College of Life Science's Institute of Zoology, shares her GREAT experience below.

I would first like to thank my professors and family for giving me the opportunity to take part in the GREAT Program. During the ten-week course, we attended class or took a field trip an average of twice a week. The rest of the time, we conducted experiments in the laboratories of our choosing. During the last week there were more formal oral reports and poster presentations.

About 30% of the students were selected to present oral reports. After constant practice and revisions by my professors, I was finally able to deliver my report smoothly and make most of those from outside of my field understand the research I conducted.

This experience was very valuable. It allowed me to learn to be independent in an unfamiliar environment. Even more important was the great interaction with the professors.



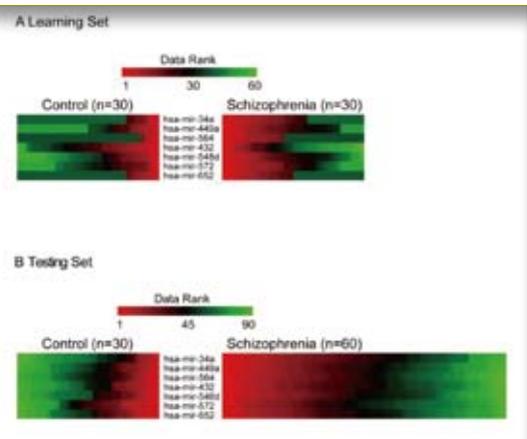
ARTICLE ON NEWBORN GENETIC SCREENING FOR HEARING IMPAIRMENT PUBLISHED IN *PLoS ONE*

The article “Newborn Genetic Screening for Hearing Impairment: A Preliminary Study at a Tertiary Center” by an interdisciplinary team of researchers from NTU Hospital and the College of Medicine was published in the online journal *PLoS ONE* last July. The article suggests that conducting newborn genetic screening for common deafness-associated mutations may help make up for the limitations in the universal newborn hearing screening that is in current use.

Hearing impairment in children is a common disease. Although universal newborn hearing screening is used at present, its effectiveness is limited because of its low penetration rate and because it does not identify slight, mild, progressive and late-onset hearing impairment. The NTU researchers therefore designed a genetic screening platform to test newborns for four common deafness-associated genetic mutations. In their preliminary study, the researchers paired genetic screening for deafness with hearing screening to test 1,017 newborns. They identified hearing impairment in 17 (1.6%) of the subjects. Genetic screening offers the benefit of detecting slight, mild, progressive and late-onset hearing impairment.

In Taiwan, approximately 3 out of every 1,000 infants suffer from mild to severe sensorineural

A comparison of: (A) the TLDA-based miRNA expression levels between the schizophrenia patients (n = 30) and the controls (n = 30) for the seven miRNAs; and (B) quantitative RT-PCR-based miRNA expression levels between the schizophrenia patients (n = 60) and the controls (n = 30) for the same seven miRNAs.



hearing impairment. If those with slight or late-onset impairment are added to this, the percentage of the school-aged population with hearing impairment could be as high as 1-5%. In recent years, researchers have discovered that genetic mutations play an important role in childhood hearing impairment. Therefore, newborn genetic screening could serve to augment existing newborn hearing screening.

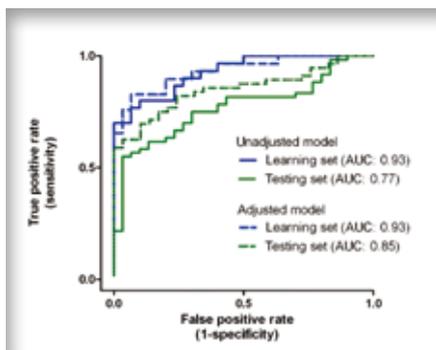
To perform the genetic screening, the NTU team took a bloodspot from the heel stick of each infant one hour after birth in order to extract a DNA sample. This is a minimally invasive procedure that provides samples that can be stored or transported for long periods, making it easy to perform and thus potentially beneficial to newborns in remote areas with no access to hearing screening.

Genetic screening is also a tool for the early assessment of

future hearing development. It helps physicians detect hearing impairment and supplies valuable information to support genetic counseling to families. This would allow hearing impaired children to obtain therapy as early as possible. Genetic counseling and prenatal testing could also provide important information to parents who want to have another child.

Language learning is closely interconnected with development of hearing. The time from birth to three years is a critical period for the development of hearing, and the period up to six months is the most important for normal hearing and language development. Infants with slight or mild hearing impairment are able to achieve more normal language and physical and mental development if they receive therapy before six months. Those diagnosed after six months will suffer a significant impact on the development of their language and social skills. Early detection and treatment are essential for helping hearing impaired children develop more normally.

The team’s article can be viewed online at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0022314>.



The area under the receiver operative characteristics curve of the seven-miRNA signature in the learning (in blue color) and testing (in green color) sets, respectively, without (in solid line) or with (in dotted line) adjustment for age, gender, education and tobacco smoking.

RESEARCHERS IDENTIFY POTENTIAL BLOOD BIOMARKERS FOR SCHIZOPHRENIA IN *PLoS ONE* ARTICLE



The article, "MicroRNA Expression Aberration as Potential Peripheral Blood Biomarkers for Schizophrenia," by researchers at the Genetic Epidemiology Core Laboratory of the Research Center for Medical Excellence was published in the online journal *PLoS ONE* last June. In the article, seven microRNAs (miRNAs) are identified that might serve as a mononuclear leukocyte-based miRNA biomarker signatures for the detection of schizophrenia.

Since brain tissue is not readily accessible, a new focus in the search for biomarkers for schizophrenia is blood-based expression profiling of non-protein coding genes, such as microRNAs which regulate gene expression by inhibiting the translation of messenger RNAs. Researchers at the Genetic Epidemiology Core Laboratory aimed to identify potential miRNA signatures for schizophrenia by comparing genome-wide miRNA expression profiles in patients with schizophrenia versus those in healthy controls.

Recently, a seven-miRNA signature (hsa-miR-34a, miR-449a, miR-564, miR-432, miR-548d, miR-572 and miR-652) was derived by comparing genome-wide miRNA expression profiles in patients with schizophrenia with those in healthy controls, with a prediction accuracy rate ranging from 73.3% to 83.1%. Intriguingly, these miRNAs were correlated differentially with patients' negative symptoms, neurocognitive performance scores and event-related potentials.

The researchers' findings demonstrate the potential utility of mononuclear leukocyte-based

miRNA signatures as biomarkers for schizophrenia, which could help in the elucidation of the etiology of schizophrenia as well as in the provision of better treatments. The results of correlation between clinical symptoms and miRNA expression levels suggest that lymphocyte could reflect the metabolism of brain cells, and may be exploited as a neural and possible genetic probe in studies of psychiatric disorders.

Since a specific miRNA might be involved in coordinated regulation of protein expression in functional networks, these kinds of biomarkers might contribute to the new development of targeted therapeutic interventions in the near future. The authors conclude that genome-wide miRNA profiling is a feasible way to identify potential biomarkers for schizophrenia, and the seven-miRNA signature warrants further investigation.

Shortly after the paper was published, a similar paper was published online in *Molecular Psychiatry* (Gardiner et al. doi:10.1038/mp.2011.78). There is one miRNA overlapping between the two studies: miRNA (has-miR-432), which is located at 14q32.12. Even more intriguing, a recent paper by the same group on QTL linkage scan of niacin flush response using TSLs also identified a linkage signal at 14q32.12 (NPL-Z scores = 3.39, genome-wide empirical $p = 0.03$) (Lien Y-J et al. *Schizophrenia Bulletin*. 2011; doi: 10.1093/schbul/sbr054). All of these point to a potential locus worthy of further investigation into the underpinning etiology of schizophrenia.

The article may be viewed in full at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0021635>.

NTU Physicists Participating in Multinational Neutrino Oscillation Experiment in China



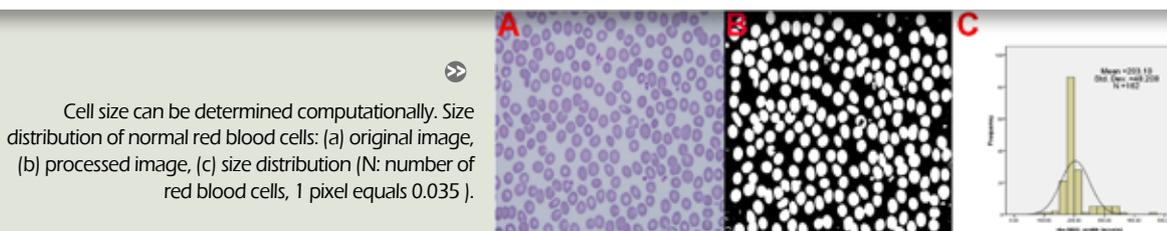
A team of NTU physicists is participating in the Daya Bay Reactor Neutrino Experiment at the Daya Bay Nuclear Power Plant in Shenzhen City, Guangdong, China, just 55 kilometers from Hong Kong. The multinational experiment utilizes the large volume of antineutrinos produced by the plant's three reactors to study neutrino oscillations, and has achieved the most accurate measurements of the mixing angle θ_{13} to date; the precise measurement of the mixing angle θ_{13} is among the most important topics in neutrino physics.

The experiment is aimed to explain the lack of parity between matter and antimatter in the universe.

NTU physicists are also working with the Aberdeen Tunnel Underground Laboratory located between two traffic tunnels on Hong Kong Island. The lab's personnel have installed equipment to detect cosmic rays and particles to support the Daya Bay experiment by measuring background radiation in a similar underground environment.

Neutrinos are particles produced by nuclear reactions that carry no electrical charge. The Big Bang, the cores of stars (such as the Sun) and nuclear reactors are therefore sources of an immense volume of neutrinos. Neutrinos pass easily through the human body, buildings and even the entire Earth itself, and experience almost no reaction with matter, meaning they are extremely difficult to detect. At present, three "flavors" of neutrinos are known: electron neutrinos, muon neutrinos and tau neutrinos. In the process of propagation, the flavors are constantly changing from one flavor into the other two flavors; this is called neutrino oscillation.

Tissue Bank Lab Developing Advanced Imaging Techniques for Diagnosing Lymphoma



Cell size can be determined computationally. Size distribution of normal red blood cells: (a) original image, (b) processed image, (c) size distribution (N: number of red blood cells, 1 pixel equals 0.035).

Despite tremendous advances in molecular biology and medicine, pathology findings based on microscopic examinations of biopsy specimens remain the most important criteria in the diagnosis of cancers. The past decades have also witnessed rapid developments in computerized imaging methods.

At the Research Center for Medical Excellence's Tissue Bank Core Laboratory, investigators have pioneered integrating image techniques to distinguish look-alike pathologies. The lab has applied advanced image processing techniques, such as equalization, edge detection and calculation of widths of cells, to ascertain cell size distribution, which is a vital determinant for the diagnosis of lymphoma.

Recently, the Tissue Bank has successfully developed novel techniques, such as sample entropy, multi-scale complexity (MSC) and detrended fluctuation algorithm (DFA) to study nonstationary and nonlinear signals. These algorithms could be used to process biopsies and transform classical visual images into digitalized data that identify distinct categories of lymphoma. Additionally, working from the point of view of systems biology, the lab's researchers have used computational models, such as artificial neural networks, to analyze multi-variable, multi-scale and large-scale systems based on underlying molecular processes to predict behaviors in response to natural and artificial perturbations.

These projects are collaborations between Prof. Chung-wu Lin at the Tissue Bank and Prof. Jiann-shing Shieh at the Yuan Ze University Department of Mechanical Engineering. Dr. M.F. Abbod of Brunel University in the United Kingdom and Dr. C.K. Peng of Harvard Medical School have also contributed valuable discussions.

FRESH NTU MILK, A TASTY PART OF NTU'S HISTORY



You might be surprised to learn that NTU makes and sells its own fresh milk right here on campus. NTU Milk is produced by the Animal Husbandry Section of the College of Bio-Resources and Agriculture on the Animal Husbandry Plot of the NTU Experimental

Farm, located just across Keelung Road from the NTU Main Campus.

The fresh milk goes on sale at retail outlets on campus everyday at 7:30 a.m. and 3:00 p.m. It's best to arrive early though, as buyers eager to get a hold of this fresh-from-the-cow milk begin lining up over an hour before it hits the shelves.

The farm's cows are milked at 5:00 a.m. and 5:00 p.m. every day. At 8:00 a.m., the raw milk is delivered to the milk processing plant in the Animal Husbandry Plot where it is homogenized and pasteurized before being bottled.

The farm currently has 52 dairy cows, of which around 23 produce milk. Daily production is between 400 to 500 liters.

The quality and flavor of NTU Milk is attributed to the cows' diet. They enjoy a nutritious diet of Bermuda grass hay, alfalfa imported from the United States and fresh grass grown on the Experimental Farm's Ankang Branch, located in Xindian. The milk is also free of antibiotics and preservatives.

Experimental Farm Technician Woan-lin Chen also provides another crucial ingredient to the milking process: music for the cows. When it is milking time, he turns on the radio to a station that plays old Taiwanese songs for the cows to enjoy. When they hear the music, they automatically get into line and make their way to the milking station.

The history of NTU Milk can be traced back to the early days of the Japanese period. In 1897, two years after the

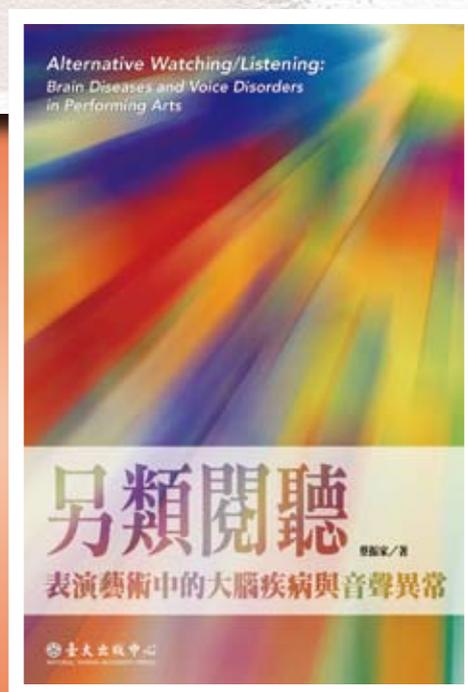
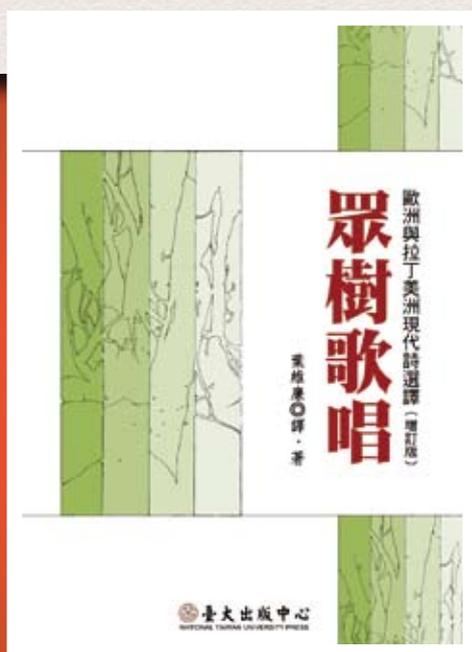


arrival of the Japanese, the Japanese government first imported Holstein dairy cows to northern Taiwan. Technician Chen reported that the NTU farm began producing milk around 1928 but that it was only provided for free to patients of the predecessor of NTU Hospital. It was only after 1945 that the milk began to be sold on campus.

To check out the source of this fresh milk for yourself, walk over to the Animal Husbandry Plot at No. 50, Lane 155, Section 3, Keelung Road. The farm also raises goats, chickens and hogs. Other products sold by the Animal Husbandry Section include goat's milk, liquid yogurt, soy milk, sausage, smoked bacon and meatballs. In addition to being used for food products, some of the animals are used in experiments.



NTU Press Adds Two New Works to Its Catalog



Wai-lim Yip's *All the Trees Sing: Translations from Modern European and Latin American Poets* and Chen-gia Tsai's *Alternative Watching/Listening: Brain Diseases and Voice Disorders in Performing Arts* are among the excellent publications released by National Taiwan University Press in recent months.

In his poetry collection, Yip, a bilingual poet, practices both domesticating translation and foreignizing translation in the discovery and recreation of pure language. Following the different incarnations of Orpheus in the modern world, from those of Rainer Maria Rilke to Octavio Paz, Yip has authored a work of exquisite translation and intense poetic feeling that allows the Chinese language world to hear a lyricism matching that of mythology.

A special feature of Yip's collection is that it couples his translated poems with illustrations by world-class Chinese artists to achieve a new dialogue between poetry and visual art. Among these numerous artists are the poet artists Guan Guan and Bi Guo, the multitalented Wucius Wong, who is considered one of Hong Kong's three best poets, the abstract artist Zhuang Zhe and the air force captain and artist Wu Hao.

The "Alternative Watching/Listening" in the title of Tsai's book is not intended to imply that the artworks considered therein are in themselves particularly alternative, but refers rather to Tsai's approach of observing these works from the perspective of mental and physiological pathology.

The author has chosen to limit his exploration to brain diseases and voice disorders due to their relatively direct relationships to the performing arts. He does not set out to provide single, exclusive interpretations of these works, but instead presents additional interdisciplinary research topics and thoughts.

One sensitive issue Tsai raises is the relationship between manic depression and artistic talent. Though there are treatments for this condition, an artist might find it self-defeating to opt for treatment because, once the manic state is suppressed by medication, the artist may have lost his or her source of artistic inspiration.

Chair Professor David Ho Teaches Intensive Plant Biochemistry Summer Course



Academia Sinica Academician David Tuan-hua Ho, an internationally renowned Taiwanese plant biologist who is a professor at the Washington University in St. Louis Department of Biology, taught an intensive summer course called “Metabolic Biochemistry Made Easy” at the College of Life Science from August 15 to August 19.

Meeting from 9:00 a.m. to 5:00 p.m. each day, the course focused on carbohydrate metabolism, lipid metabolism and protein metabolism. Dr. Ho presented the students in the course with systematic overviews of these three main forms of metabolism that occur in plant biochemistry. Ho’s energetic personality and eloquent speaking style coupled with his esteemed academic knowledge captivated the students and meant not a seat in the lecture hall was left empty. Each of the students benefited greatly from the course and expressed the desire that it be offered again next year.

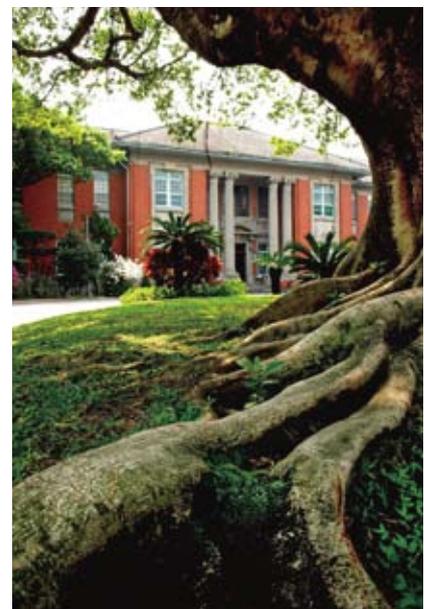
Dr. Ho graduated from the Department of Botany at the NTU College of Science in 1970. He then moved to the United States where he ultimately took up a position as a professor at the Washington University in St. Louis Department

of Biology. Ho is now recognized as a leading international authority in the fields of plant physiology, plant biochemistry and plant molecular biology and is praised around the world for his research into cold tolerance in plants. He also served recently as president of the American Society of Plant Biology.

Dr. Ho enjoyed the honor of being elected as an academician at Academia Sinica at an early age, and although he works in the United States, he has always been deeply concerned about the development of plant sciences in Taiwan and has been enthusiastic in providing guidance to scientists here as well.

Over the last ten years, Ho has acted as general convener of Taiwan’s National Science and Technology Program for Agricultural Biotechnology, a position in which he has participated in the formulation of government policy and promotion of agricultural biotechnology in Taiwan. During this time, Dr. Ho has been director of the Academia Sinica Institute of Plant and Microbial Biology and has made outstanding contributions to that institute’s operations.

Three years ago, the College of Life Science named Dr. Ho a chair professor at the Institute of Plant Biology in order to take advantage of his talent and experience. This was intended primarily to give the institute’s students and faculty the opportunity to communicate with him and absorb his research experience. As chair professor, Dr. Ho has offered invaluable recommendations that have led to great improvements in both education and research at the institute. The significant advances achieved by the institute’s students and faculty over these years would have been impossible without his contributions.



Student Team Claims Top Prize at 11th Macronix Golden Silicon Awards



A student team from the Graduate Institute of Electronics Engineering's Digital Signal Processing/IC Design Lab took the top Diamond Award in the design category as well as the Most Creative Award in the 11th Macronix Golden Silicon Awards--The Semiconductor Design and Application Competition. The NTU team won the awards for its design of a 216fps 4096×2160p 3DTV set-top box system on a chip for free-viewpoint 3DTV applications.

The awards ceremony for the annual competition, sponsored by Macronix International Co. and the Macronix Education Foundation,

was held on July 22. During the ceremony, the team was presented with an NT\$330,000 prize by Macronix International's chairman Miin Wu. The team, led by Prof. Liang-gee Chen,

included NTU students Pei-kuei Tsung, Kuan-yu Chen, Hsuan-hung Chen and Sung-fang Tsai.

Three trends have emerged in the competition in recent years: more females are participating, more undergraduate teams are entering, and an increasing number of interdisciplinary teams are entering the fray.

At the awards ceremony, Nobel Laureate and former Academia Sinica

president Yuan-tse Lee praised the active participation of women in the competition as a highly positive development and affirmed his belief that women's potential technological creativity fully equals that of men. He concluded that women inject a greater diversity of voices and creativity into the competition.

Macronix Chairman Wu stressed that innovation requires strategy, including the ability to predict the future as well as to think outside the box based on core skills and learning, so as to bring forward creative new products that enhance human life.

Student Team's Solar Aquacleaner Wins Second Place at 2011 Green Tech

A team of students from the Department and Graduate Institute of Chemical Engineering claimed second place at the 2011 Green Tech competition. Their entry, the Solar Aquacleaner, has a light concentrator that collects the energy of sunlight, and relies on the reaction between a reusable photocatalyst and sunlight to break down the pollutants in water for water purification. The team, which also received the competition's Creativity Award and Popularity Award, highlighted how its invention could meet the needs of fish farmers for clean water if it were commercialized.

The Teco Technology Foundation started the annual Green Tech

competition in 2006. The foundation hopes to stimulate young people to take action to achieve energy conservation and carbon reduction. This year's competition attracted 110 teams from around Taiwan. Teams from Kun Shan University and National Ilan University took first and third place respectively.

The Solar Aquacleaner team received guidance from Prof. Jeffrey Chi-sheng Wu of the Department of Chemical Engineering and was captained by graduate student Yi-ting Wu. The team's solar water purifier is inexpensive to produce, and a device the size of a small or medium cardboard box is sufficient to clean the



water in a 15-20 liter fish tank, meaning it shows a great deal of potential for commercialization.

Fish farms in Taiwan pump massive volumes of groundwater in order to provide fresh water for their operations. Unfortunately, this has created severe land subsidence problems that have exacerbated flooding during typhoons and even threatened the safety of the High Speed Rail. The Solar Aquacleaner would allow fish farms to reuse their water and break their dependence on groundwater.

iNTU Campus Map Application Available for Smart Phones



The Computer and Information Networking Center released its iNTU campus map application for iPhone and Android smart phones last June. The development of this application is part of the center's efforts to bring the campus' information services into the age of mobile Internet services.

The iNTU application includes a campus map, campus directory, event calendar and activity information. The application's Unit Search and Telecom Search allow users to rapidly find the locations of buildings and offices on the NTU campus and to directly make phone calls and send emails. The

Campus Map function helps users locate buildings and scenic spots and provides directions, as well. Users who wish to attend symposia or learn about upcoming activities can use the application to find up-to-date information. iNTU also provides links to NTUbe where users can view videos of campus events, such as graduation ceremonies and the NTU Art Festival.

iNTU is available for free download at App Store and Android Market. Though the center released iNTU last June, it continues to upgrade the application's functions and expects to release an upgraded version by the end of the year. Also available at App Store is the NTU Tour Guide application. This application uses GPS to lead personalized campus tours based on the user's location.



NTU RANKED 87TH IN 2011 QS WORLD UNIVERSITY RANKINGS

NTU earned a ranking of 87th in the 2011 QS World University Rankings. This is the university's best performance in this ranking to date. Moreover, NTU is also the only university in Taiwan to have been ranked among the world's top 100 universities.

The QS World University Rankings are calculated based on six indicators: academic reputation (40%), employer reputation (10%), citations per faculty (20%), faculty student ratio (20%), proportion of international students (5%) and proportion of international faculty (5%). Academic reputation is determined based on a survey of academics around the world; NTU drew 32,000 survey responses this year. Employer reputation is figured through a survey of employers that hire on an international scale; the university drew 16,000 responses.

NTU Dean of Research and Development Ji-wang Chern cites the university's low faculty student ratio and proportion of international faculty as reasons for its not making further progress in the rankings. Dean Chern says the university must continue to pursue cooperation projects with other institutions in Taiwan and around the world.



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