

# NTU



## NEWSLETTER

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## Happy Birthday, NTU

Int'l Scholars, Students Celebrate Cultural Diversity  
Symposium on Natural Medicine  
Activities in Memory of Darwin



**Special Report**  
New Chemistry Building



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## NTU AT A GLANCE

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# NTU Celebrates 81<sup>st</sup> Anniversary with Awards and Tea Party in November

**N**TU marked the 81<sup>st</sup> anniversary of its founding with a formal celebration at the NTU Sports Center on the morning of November 15. NTU President Si-chen Lee presided over the event, and two outstanding local scholars, Mr. Yung-ho Tsao and Dr. Jacqueline Whang-Peng, were presented with honorary doctorates and six NTU alumni received outstanding alumni awards. In addition to current students and faculty members, the celebration was attended by former NTU presidents as well as by alumni and honored guests from around Taiwan and the world. Following the formal ceremony, the university held an anniversary tea party while student clubs conducted a first-ever United Student Club-Alumni Public Service ceremony.

Mr. Tsao has accumulated numerous achievements in the field of Taiwan history research, and his contributions to laying the foundation for and the development of this area of research are enormous. He also stands out for his persistent effort in promoting Taiwan studies on the international stage. Tsao, who was mostly self-educated, dedicated himself to the cultivation of his students. He has earned great admiration from his peers and is seen as a shining example for others to follow.

Dr. Whang-Peng has conducted research in the areas of cancer genetics and medical oncology for decades, and emerged as a pioneering researcher on the transformation of cancers cells. She published over 365 research papers and earned countless awards and honors in Taiwan and abroad. These achievements speak to the great recognition she has garnered in domestic and international academic circles.

Outstanding NTU alumni awards were presented to: Dr. Daniel S. P. Yang (graduate of the Department of Foreign Languages and Literatures) in the category of the arts and humanities; Dr. Chao-han Liu (graduate of the Department of Electrical Engineering) and Dr. Chih-ming Ho (graduate of the Department of Mechanical Engineering) in the



category of academics; Dr. Min-huan Kao (graduate of the Department of Electrical Engineering) in the category of business and commerce; and Mrs. Jenny Chang (graduate of the Department of Chinese Literature) and Dr. Chin-kun Wang (graduate of the Institute of Food Science and Technology) in the category of social services.

In a first for NTU, the United Student Club-Alumni Public Service ceremony brought together student clubs and NTU alumni to perform community services during the time of the university's anniversary celebration. This community service reflects the spirit of the university's motto: "Integrity, Diligence, Patriotism and Philanthropy".

In addition to these activities, Emeritus Prof. Herbert Han-pao Ma donated a number of paintings and works of calligraphy to the College of Law to commemorate the opening its new buildings. The works will be displayed prominently in the new law buildings.



## NTU Advances to 95<sup>th</sup> in The Times World University Rankings 2009

**N**TU has broken into the top 100 world universities for the first time with an overall ranking of 95<sup>th</sup> place in *The Times* Higher Education-QS World University Rankings 2009, which was released in *The Times Higher Education Supplement* on October 8. Taiwan's leading university made a dramatic leap of 29 places in this year's rankings compared to its 124<sup>th</sup>-place rank in *The Times'* 2008 survey.

Moreover, while NTU's entrance into the realm of the world's top 100 institutions speaks to its overall strengths, its standings in individual academic categories were even more impressive. Among world universities, it ranked 45<sup>th</sup> in life sciences and biomedicine, 47<sup>th</sup> in engineering and IT, 51<sup>st</sup> in natural sciences, 58<sup>th</sup> in social sciences and 60<sup>th</sup> in arts and humanities.

Among the 16 Asian universities in the top 100, which are led again by the University of

Tokyo at 22<sup>nd</sup>, NTU stands in 15<sup>th</sup> place, just ahead of the 97<sup>th</sup>-place ranked Tohoku University. NTU is the sole local university to be rated along with the top 200 universities in this year's survey.

NTU's advance in *The Times'* rankings provides heartening empirical proof that the university is succeeding in its effort to join the ranks of the world's most elite academic institutions.

## Former US Secretary of Labor Elaine Chao Urges Students to be Confident in October Speech

**E**laine Chao, who served as the 24<sup>th</sup> United States secretary of labor under former President George W. Bush for the entirety of his eight-year presidency, presented a speech entitled "Chinese Heart, American Mind, World Harmony" to nearly 200 students here at NTU on October 27. Chao, who was born in Taiwan in 1953 and moved to the US at the age of eight, set a historical precedent in US government by becoming the first ethnic-Chinese American as well as the first Asian American woman to be appointed to a post in a presidential cabinet.

In her speech, Chao related her experience of growing up in an immigrant ethnic-Chinese household in American society. She affirmed repeatedly the influence of ethnic-Chinese culture on her family upbringing as well as the development of her career, while detailing the importance of verbal commu-



⊗ Former US Secretary of Labor Elaine Chao (second from left) meets with university officials during her visit to NTU.

nication and the absence of class consciousness in the US. Chao encouraged the students in the audience to be confident and straightforward in their communications and to seek greater cross-cultural understanding in order to join together in the pursuit of world harmony.

Chao urged the students in the audience who wished to travel to the US for study or employment to disregard the class status of others and express themselves with courage so as to make themselves be noticed. She went on to stress

that the US is a verbal society, while Asia places emphasis on listening. Highlighting another cultural contrast, Chao contended that whereas ethnic-Chinese people attempt always to improve on their weaknesses, Americans on the other hand seek constantly to enhance their strengths. She therefore exhorted the students to remember to first learn the skill of chipping in on conversations when they arrive in the US.

Responding to questions from the audience, Chao maintained that President Ma Ying-jeou loves his country and its people ardently. She said that the US views Taiwan's recent open policy toward China with optimism, and sees this policy as nudging Taiwan and China on a positive course towards mutual understanding. Chao concluded by encouraging the students to pursue their dreams with courage.



# NTU-based European Union Center in Taiwan Promotes Academic and Cultural Exchanges



1. Officials pose during the inauguration of the EU Center on May 22, 2009. 2. Students and faculty gather for a photo during the 2009 Summer School on EU Studies. 3. Participants attend the EU Exhibition on Climate Change during its stop at NTU. 4. Nicolas Baudouin, policy officer on political and economic affairs for the European Economic and Trade Office, addresses the audience during the opening of the EU Exhibition on Climate Change at NTU.

The European Union Center in Taiwan (EUTW) was established for the purposes of fostering a deeper understanding of the EU and its policies in Taiwan and serving as a platform for EU-focused exchanges and cooperation with academic institutions and the public in Taiwan. As the lead university in a consortium of seven major universities in Taiwan selected to take part in the operation of the EUTW, NTU serves as the home base for the Center, and the university's vice president for administrative affairs, Prof. Tzong-ho Bau, acts as the Center's current director.

The Center was inaugurated on May 22, 2009, following the signing of an agreement between NTU and the European Commission on December 31, 2008. Besides NTU, the consortium of universities includes National Chengchi University, Fu Jen Catholic University, Tamkang University, National Chung Hsing University, National Sun Yat-sen University and National Dong Hwa University.

During the past half year, the Center has been active in pursuing its mission. It sponsored a series of forums that addressed recent developments in the EU, including the commemoration of the fall of the Berlin Wall, the future of the euro in global financial markets and the EU's policy on climate change. Summer school programs were held at two consortium universities to provide high school teachers with the opportunity to learn more about the EU. The EUTW co-hosted a European film and culture festival at NTU. The Center has also created a scholarship program to enable outstanding students to participate in short-term study programs in the EU.

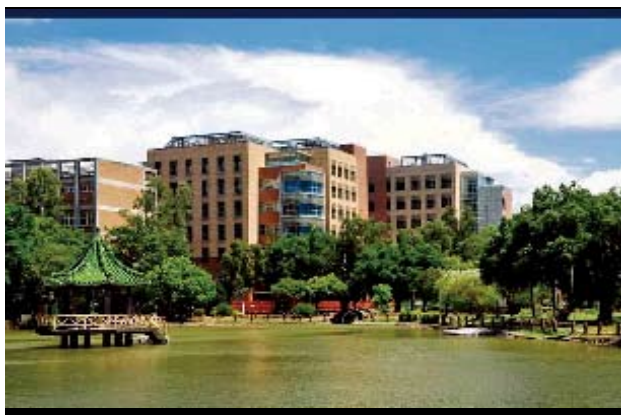
At the end of October, NTU established the EU Research Group. Consisting of professors from such disciplines as political science, economics, cultural studies, language, public health, energy and climate change research, the group is expected to promote EU studies in a wide variety of NTU departments.

Among the major events that EUTW held in November 2009 were an international conference on the impact of the Lisbon Treaty on the EU on November 9 and the first Taiwan-Europe Higher Education Conference, held in Kaohsiung on November 10. In addition, the EU Exhibition on Climate Change kicked off at the Kaohsiung Arena on November 13.

In 2010, the EUTW will develop EU study programs at all consortium universities, offer weekend programs on EU policies for influential people in Taiwan, provide collections of EU-related books for EU study spaces to be set up at major libraries, publish a series of books on the EU and an online newsletter, and hold international symposia.

While NTU serves as the EUTW headquarters, each member university also has an EU Center on its campus. The EUTW is governed by an advisory board, which is its highest oversight authority, along with a consultative committee that provides additional advice. The Center is managed by a director who is assisted by two executive directors. The Center's secretariat is composed of an executive secretary and two program coordinators, who are supported by part-time staff.

## New Chemistry Building Opens Owing to Generous Donations from Industry and Alumni



▲ The Department of Chemistry's new Ji-Shue Hall rises in the background behind Drunken Moon Lake.

On November 12, an inauguration ceremony for the opening of the second building of the Department of Chemistry's two building teaching and research complex took place amidst an illustrious field of honored guests on hand to offer their congratulations. Called Building B, or more formally Ji-Shue Hall in honor of a major donation received from Taiwan Semiconductor Manufacturing Co., it is the first building on the NTU campus to be constructed as a result of large-scale financial contributions provided by NTU alumni and Taiwan's industrial community.

At the opening ceremony, NTU President Si-chen Lee stood side by side with such powerful academic and industrial luminaries as former Academia Sinica President Dr. Yuan-tseh Lee, TSMC Chairman Morris Chang, TSMC Cultural and Educational Foundation Chairman F.C. Tseng, TASCOC Chemical Corp. Chairman Cheng-ching Wu, San-Fu Chemical Ltd. Chairman Su-ming Cheng and former NTU President Wei-chao Chen.

Ji-Shue Hall stands next to Drunken Moon Lake on the site of three previous Department of Chemistry buildings. It is a fully-modern chemistry teaching and research facility boasting eight stories above ground and one basement level. While NTU provided funding for the building's construction, it was only through Dr. Yuan-tseh Lee's courting of local enterprises and NTU alumni that significant

donations were garnered and the building became a reality. TSMC contributed NT\$120 million, while TASCOC Chemical Corp. and China Fangda Group each provided NT\$50 million. Additional funds were accumulated through donations from the department's current faculty and staff as well as hundreds of department alumni.

Building A, also known as Phase 1, of the complex opened for use in June 2005. Building B, however, provides an even greater amount of floor space than Building A and houses research and teaching facilities as well as conference rooms for international exchanges. The building's basement level is home to an advanced instrument center occupying nearly 1,800 square feet. This center provides an 800MHz nuclear magnetic resonance spectrometer along with a variety of electron microscopes. Also, the basement houses a bioclean room and a dust-free room for use in biotechnology research as well as various precision instruments.

Floor 1 contains a large lecture hall with seating capacity of 170 and the Department of Chemistry History Hall. The second floor features a number of large lecture rooms and computer classrooms suitable for both classes and seminars. Floors 3 to 7 are all occupied by modern laboratories. These laboratories provide separate ventilation systems, laboratory tables, and pharmaceutical and waste solvent storage spaces depending on the requirements of the research conducted there. Floor 8 is equipped with a high-pressure laboratory that can accommodate special experiments and instruments.

This new building was constructed in compliance with stringent safety and environmental regulations, and is capable of providing approximately 800 students and instructors with a comfortable, safe research environment. This research center will play a major role in further projecting the Department of Chemistry onto the world stage.



## NTU's Ranking Climbs to 150<sup>th</sup> in 2009 Academic Ranking of World Universities

**N**TU garnered a ranking of 150<sup>th</sup> in the 2009 Academic Ranking of World Universities, which was released by Shanghai Jiao Tong University on October 30. Up from 164<sup>th</sup> in 2008, NTU's ranking remains the highest of universities in Taiwan, Hong Kong and China.

The ARWU rates universities based on six weighted indicators: the number of alumni with Nobel Prizes and

Fields Medals (10%), number of staff with Nobel Prizes and Fields Medals (20%), number of highly-cited researchers selected by Thomson Scientific (20%), number of articles published in *Nature* and *Science* (20%), number of articles indexed in Science Citation Index Expanded and Social Sciences Citation Index (20%), and per-capita performance relative to the size of an institution (10%).

Seven of the nearly 200 universities in Taiwan are ranked among the top 500 in the 2009 ARWU. They are in order: NTU at 150<sup>th</sup>, National Cheng Kung University at 262<sup>nd</sup>, National Tsing Hua University at 302<sup>nd</sup>, National Chiao Tung University at 327<sup>th</sup>, Chang Gung University at 409<sup>th</sup>, National Central University and National Yang Ming University at 450<sup>th</sup>.

## Former NTU Distinguished Research Chair Professor Charles K. Kao Wins 2009 Physics Nobel

**F**ormer NTU Distinguished Research Chair Professor Charles K. Kao was named winner of half of the 2009 Nobel Prize in Physics "for groundbreaking achievements concerning the transmission of light in fibers for optical communication" in October. NTU is delighted that Dr. Kao has received this highest form of recognition, and is honored to have shared a relationship with him.

The College of Electrical Engineering and Computer Science's Graduate Institute of Communication Engineering first invited Dr. Kao, widely known as the "Father of Fiber Optic Communications," to accept a position as distinguished research chair professor and guide research in the institute in 2003. Dr. Kao had previously accepted an invitation extended by the institute's faculty



Dr. Charles K. Kao, a former distinguished research chair professor at NTU, won half of the 2009 Nobel Prize in Physics.

to serve as the keynote speaker at IEEE Globecom 2002 in Taipei.

Dr. Kao, who was born in Shanghai, China, in 1933, first proposed the concept of, as well as the technological basis for, using light to replace electricity for the transmission of information in 1966. His groundbreaking achievements led ultimately to the use of optical glass fibers for the transmission of data that forms the basis of today's high-speed communication society.

This technology now conveys practically all of the world's telephone and information traffic, allowing voice, data, images, animation, movies and music to be transmitted around the globe almost instantaneously. The Nobel Foundation notes that, if all of the optical fiber circling the earth were attached end-to-end, it would come to more than one billion kilometers long, and that thousands of kilometers of fiber are being added to this every hour.

The other half of this year's Nobel Prize in Physics is shared by Dr. Willard S. Boyle and Dr. George E. Smith "for the invention of an imaging semiconductor circuit – the CCD sensor." Their technology, the charge-coupled device, is the electronic eye of digital cameras.



## History Professor's Picture Book of Taiwan's History Nominated for Top 100 at East Asia Publishers Conference

**T**aiwan *Lishi Tushuo* (Taiwan's History Through Pictures), by Prof. Wan-yao Chou of the Department of History, was nominated for inclusion in the "Top 100 Books of East Asia" at the 2009 East Asia Publishers Conference. Taiwan's representative at this year's conference specially pointed out that, while 15 Taiwan books were nominated, Chou's book was strongly recommended by all scholars as a highly representative work on Taiwan's history.

Prof. Chou's book has been praised for both factual integrity

as well as accessibility to the average reader. Moreover, it is noted for its early adoption of the island of Taiwan as its historical starting point. In this way, Prof. Chou offered the fresh approach of presenting Taiwanese history by beginning with the island's aboriginal peoples and avoiding the old Sino-centric approach of starting with the island's occupation by ethnic Chinese.

First published in October 1997, *Taiwan Lishi Tushuo* was reprinted over 20 times with nearly 100,000 copies produced. A Korean version

was released in 2003, while a Japanese version, with revised and enlarged content including a section on the postwar period, was published in 2007. A revised Chinese version, with the new section on the postwar period as well as two additional chapters, will be issued at the end of 2009.



## NTU Team Wins Prestigious DAC/ISSCC Student Design Contest for Fourth Time

**A** team of six NTU students from the Graduate Institute of Electronic Engineering grabbed first prize in the DAC/ISSCC Student Design Contest at the 46th Design Automation Conference on July 27. Under the guidance of Prof. Liang-gee Chen, the team managed to claim the gold with their submission entitled "4096'2160 Multiview Video Encoder Chip for 3D/Quad HDTV Applications." The team set an International Solid-State Circuit Conference record by becoming the fourth NTU team to win the annual contest. This also marked the second consecutive year that a team led by Prof. Chen has been announced winner.

The team's winning design was for a video encoder chip capable of simultaneously providing high-resolution three-dimensional television and ultra-high resolution 4K x 2K television. Its encoding capacity is 3.4 times

that of video encoders currently on the market. The chip moreover offers advantages such as low power consumption, low cost and low memory bandwidth. The chip is expected to become the core technology for next-generation ultra-high resolution television and three-dimensional video, and push the world toward more advanced three-dimensional television and larger ultra-high resolution screens. It has the potential to generate enormous business opportunities for Taiwan by helping the nation's image processing industry make an early entrance into the era of ultra-high resolution and boosting the development of three-dimensional imaging products.

The annual DAC/ISSCC Student Design Contest stands as the most prestigious conference contest

▶ A member of the NTU team receives his award at the DAC/ISSCC Student Design Contest in July.



in international computer aided design and chip design. For teams to win, they must design and develop chip products that make significant contributions to the chip industry or stand out as major breakthroughs. Over 60 world-class universities participated in this year's contest, and other winning teams included Stanford University, UC Berkeley and the University of Illinois at Urbana/Champaign. It is also noteworthy that the team from Taiwan's National Tsing Hua University, which was advised by NTU graduate Prof. Hsi-pin Ma, also made the winner's list.





## ICLP Students Represent NTU at CCTV Chinese Contest in Beijing

Three students from NTU's International Chinese Language Program traveled to Beijing to participate in the Hanyu Dasai, a Chinese contest held by China Central Television, this August. The two-week televised contest brought together one hundred students from around the globe to test their Chinese proficiency, cultural knowledge and performance skills.

ICLP students Trish Hayward, David Demres and Bryan K. Beaudoin, who comprised the three-member Taiwan contingent, honed their Chinese ability and knowledge of Chinese culture, history, geography and poetry throughout the summer semester in preparation for the event in daily cram sessions led by ICLP instructors. ICLP instructor Cui-ping Hu accompanied and coached them in Beijing

During the first stage of the contest, contestants toured the Confucius Temple and Han Mei Lin Museum. In one round they drew random quotes from the Analects and stood before the cameras and a panel of judges to analyze each passage and provide a personal response. Other scored events



Contestants crowd the stage during the final round and awards ceremony of the CCTV Hanyu Dasai in Beijing in August.

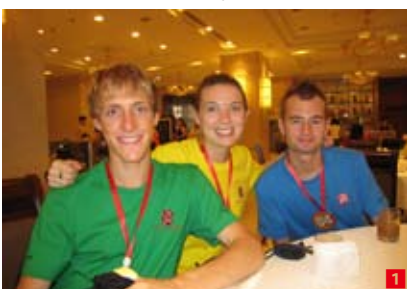
required contestants to speak generally and spontaneously about their interest in Chinese culture, and tested their grasp of Chinese idiomatic expressions and history. The top thirty contestants, Beaudoin among them, progressed to the finals.

A group of thirty-some ICLP teachers, teachers in training, staff and administrators, including ICLP Director and Department of Foreign Languages and Literatures Chair Yan-wing Leung, happened to be in Beijing for a training program. Many headed to CCTV's studios to support

Beaudoin as he competed to enter the final nine. He was eliminated during that round, but earned high scores and cheers for his speech about *douhua*, a Taiwanese dessert.

Hawyard and Demres have since returned to the United States to complete degrees at Stanford and Yale, respectively. Beaudoin is pursuing a masters degree at NTU. Videos of each round are available on CCTV's official website: <http://big5.cctv.com/gate/big5/news.cctv.com/special/hanyu/hanyudasai/index.shtml>.

1. The ICLP's Hanyu Dasai contestants: (from left to right) David Demres, Trish Hayward and Bryan K. Beaudoin 2. (from left to right) Mr. Beaudoin and Ms. Hayward meet writer Ta-chun Chang. 3. (from left to right) Mr. Beaudoin, Mr. Demres and Ms. Hayward show their team



## NTU Shakespeare Forum Draws International Scholars to Fourth Annual Conference in November

The NTU Shakespeare Forum presented its fourth annual conference, "Shakespeare in Culture," November 26-28. This high-profile international event drew speakers from Bangladesh, China, Hong Kong, Ireland, Italy, Japan, Korea, Macao, Malaysia, the Philippines, Singapore, Taiwan, the United Kingdom and the United States. Keynote speakers included Richard Burt, Dennis Kennedy and Ann Thompson, all renowned scholars in their respective fields. As a stage for interdisciplinary approaches to Shakespeare, the conference hosted over thirty scholarly presentations as well as two live performances, a hands-on computer workshop, a teaching and acting workshop and a book exhibit.

A highlight of the conference was the premier of *Bond*, a Bangzi opera adaptation of *The Merchant of Venice* starring Hailing Wang of the Taiwan Bangzi Company, at Taipei's Metropolitan Hall. Both the translator and co-playwright, Ching-hsi Perng, former dean of the College of Liberal Arts, and the director, Po-shen Lu, are members of the forum. Selections from this intercultural production were previewed in London last September at the British Shakespeare Association conference, which was hosted by King's College London and Shakespeare's Globe Theater, and impressed Shakespeareans from all over the world.

The forum team is made up of fourteen faculty members from the Department of Foreign Languages and Literatures and the Department of Drama and Theater who devote themselves to building



academic networks and advancing general interest in literature and the arts. Often in collaboration with the NTU Library and the NTU Center for the Arts, the forum invites Shakespeareans from home and abroad to conduct lectures, workshops and performances throughout the year. Past guests have included David Bevington, Douglas Brooks, Zhaoxiang Cheng, Joseph Graves, Alexander C. Y. Huang, Daphne Lei, Ruru Li, Sonia Massai, Charles Ross, Hai-ming Wei, Hsing-kuo Wu and Daniel S. P. Yang.

Envisioning itself as the vanguard of Taiwan's Shakespearean studies, the forum formed Taiwan ShakeScene to unite local scholars with theater professionals in 2008. Its website [www.ShakeScene.tw](http://www.ShakeScene.tw) is a hub for information about Shakespeare-related performances, scholarly events

and publications in Taiwan. In addition, the forum is constructing the Taiwan Shakespeare Database by collecting, cataloguing and digitizing audio-visual materials, manuscripts and publications. The database will ultimately be a powerful research tool for those interested in Taiwan's theater history and intercultural activities.

Though firmly rooted in Taiwan, the forum has a global outlook with a special focus on the Asia-Pacific region. The 2008 roundtable discussion "Shakespeare in Asia" held at Taiwan ShakeScene's inaugural venture was a first attempt to engage ten regional Shakespeareans, including from China, India, Japan, Korea, Malaysia, the Philippines and Taiwan, in intra-Asia dialogue. In 2009, the forum held a seminar on "Localizing Shakespeare in Asia" under the auspices of the British Shakespeare Association conference. Continuing its dialogue with its Asian colleagues, the forum plans to organize another symposium at NTU in 2010.

For more information about the NTU Shakespeare Forum and updates on its events, please visit [www.Shakespeare.tw](http://www.Shakespeare.tw) or send inquiries to [NTU@Shakespeare.tw](mailto:NTU@Shakespeare.tw).

### Three-day Exhibition and Festival Highlights Malaysian Culture in October

The three-day Malaysian Cultural Exhibition and Festival took place in NTU's Global Lounge at the end of October. It included a performance by a Malaysian dance troupe and an exhibition exploring Malaysia's cultural, social and economic landscape. The opening and closing ceremonies were attended by many senior officials of NTU, the Malaysian Friendship and Trade Center, the Ministry of Foreign Affairs



## NTU Celebrates India's Diwali Festival to Foster Cultural Understanding in October

NTU hosted Taipei's pre-eminent Diwali celebration on Sunday, October 18. Local students performed Bollywood classics, Indian masters students and PhD candidates offered a cultural and entertaining lineup of acts, and political and academic officials showed up to take in the festivities. The NTU Indian Diwali Celebration 2009 showed to Taipei that relations between Indian and Taiwan amount to more than yoga, dance and *Slumdog Millionaire*.

The international and Indian academic, diplomatic and student community came together to celebrate the Indian *Festival of Lights*, as Diwali is popularly known. Attendees not only learned of India's long cultural history, but the event also raised money to support the victims of Typhoon Morakot in the Philippines.

The night's celebration testified to the increased understanding, international scope and sense of community derived from long-term academic exchanges and international programs. Most Indian students at NTU study in masters and PhD programs, staying for up to six years in some



Dancers perform a traditional Indian dance at NTU's Diwali celebration in October.

cases. Relations between India and Taiwan are greatly strengthened through these programs.

In 2009, *Slumdog Millionaire* opened in Taiwan to popular reviews and increased the already fevered interest of the Taiwanese people in Indian dance, yoga, clothing and culture. Bus advertisements touting "Incredible India" can be seen weaving through Taipei's traffic, and in recent months the India-Taipei Association hosted the Indian Festival and Seminar on Indian Economy in the city. Yet, as popular as Indian culture is in Taiwan, more long-term cooperation is needed to foster the sort of deep interaction that builds long-lasting relationships. And, it seems the academic world of NTU is leading the way.

and the Ministry of Education. NTU student clubs provided support for the event.

At present, over 400 Malaysian students are studying at NTU and there is a long history of overseas Chinese students from Malaysia choosing Taiwan as their study abroad destination.

The diverse cultural history and makeup of Malaysia often goes unobserved in Taiwan as most Malaysians studying and working here are of Chinese descent. However, the festival celebrated the diversity that is Malaysia and provided a rare opportunity for NTU students to gain an understanding of the unique composition of a country that brands itself as "Truly Asia".

## Latino Students Share Their Culture at NTU's First Fiesta Latina in October

Fiesta Latina, NTU's first Latino exhibition, took place in NTU's Global Lounge on October 23. NTU's Latino and local students joined together with special Latino guests from other universities in celebrating the diversity of Latino culture with performances and displays of the rich blend of folklore, traditions, food and drink, and artistic talent found throughout Latin America.

Honduran student Maria Elena Tejeda, cultural coordinator of the NTU Foreign Students' Association, kicked off the festivities before handing over the microphone to the master of ceremonies, Sebastián Morúa Hernández of Costa Rica. Sebastián gave a brief introduction to the history of Latin America, a theme that was later elaborated on by Peruvian student Lidia Pezo in a presentation called "Latin Customs: What is a Latino?".

Members of the NTU Coffee Club served Costa Rican, Colombian and Brazilian black coffee, the perfect accompaniment to discussions about the importance of the coffee bean in Latin America's economy and the cultural aspects of coffee consumption in Hispanic America. Additional items on the Fiesta Latina menu included Cuban, Mexican and Peruvian cuisine as well as Latin American inspired cocktails.

However, the event wasn't limited to talk and tasty food and drinks. Latin songs and Salsa dances, trivia games offering prizes and a performance by Alma Itana, a Latino band formed by Latin American students studying at National Central University, all made for a very entertaining evening.



## CQSE Uses Supercomputer Built from Common Graphics Cards to Study Quantum Physics

The Center for Quantum Science and Engineering has built an inexpensive supercomputer from common graphics cards. The center is using this supercomputer in large-scale computational studies of novel quantum physics, ranging from the strong interaction at the subatomic scale to the strongly correlated electrons in condensed matter physics, to the cosmology at the astronomical scale.

Over the last two years, the graphics processing units on graphics cards have emerged as powerful devices for high-performance computing, even though they were designed primarily for graphics display and computer games. With a price of only NT\$14,000, a graphics card like the Nvidia GTX285 can deliver over 100 Gflops of sustained computing power, which is 10-100 times faster than a single CPU. The reason behind the overwhelming floating-point capability of GPUs is that they were designed for intensive and highly parallel computations (i.e., graphics rendering), in which more transistors are devoted to data processing rather than data caching and flow control. Thus, a GPU cannot stand alone in a computer system but works only as a powerful floating-point coprocessor of the CPU.

With a GPU card, one can immediately turn any PC into a personal supercomputer. This creates great opportunities for taking on many scientific and engineering problems that require enormous number-crunching power. Recall that over the past 50 years every ten-fold jump in computing power spurred the development of new ways of computing, which in turn led to many scientific breakthroughs.

The GPU supercomputer at CQSE is comprised of 16 units of the Nvidia Tesla S1070 (with a total of 16 x 4 GPUs and 16 x 64 Gbytes and a peak 64 Tflops) connected to 16 servers (with a total of 16 x 2 Intel Quadcore CPUs and 16 x 32 Gbytes). The center has developed highly efficient CUDA (Compute Unified Device Architecture) codes for computationally challenging problems in quantum chromodynamics, quantum spin systems and astrophysics.

The GPU supercomputer has allowed the center to attain 8 Tflops (sustained) at a price NT\$5,000,000.



The GPU supercomputer at the Center for Quantum Science and Engineering

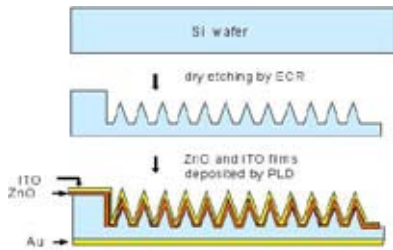
It can consequently tackle many large-scale computations without using prohibitively expensive supercomputers. Furthermore, the price/performance ratio of the CQSE's GPU supercomputer is less than 1/100 that of a conventional supercomputer, such as the IBM BlueGene/L, and has only 1/10 of the power consumption of the IBM BlueGene/L.

The lattice quantum chromodynamics group (TWQCD) at NTU is the first group in the world to use a GPU cluster to perform large-scale simulations of lattice QCD with exact chiral symmetry. Currently, there are only three groups around the world that are capable of simulating lattice QCD with exact chiral symmetry.

The center is proud that its GPU cluster outperforms all conventional supercomputers to such a great degree, whether in terms of flops per dollar or flops per watt. Its success has inspired many lattice QCD groups around the world, including those in the United States, Italy and Germany, to set up large GPU clusters with several hundred GPUs connected through InfiniBand switches.



# NTU Produces Electroluminescence from ZnO/Si-nanotips Array Light Emitting Diodes



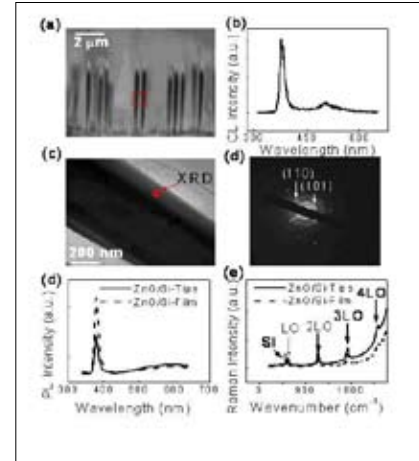
(A) Schematic diagrams showing the fabrication technique of our ZnO/Si-nanotips LED array.

**B**ecause of a wealth of promising applications of nanomaterials in many different areas, nanostructures have attracted world-wide interest in such diverse fields as nanophotonics, solar cells, electrochromic displays, lasers and light emitting diodes. In particular, research has shown that electrically-driven light emission is possible in a hetero-junction nanostructure, where carrier injection occurs across the p-n junction. However, the p-n junctions in an individual nanoscale device can only provide a small injection current, which greatly limits the resulting light intensity for practical applications.

Researchers at NTU's Graduate Institute of Photonics and Optoelectronics have developed a new and general approach to generating sufficient carrier injection and efficient light emission from a Si nanotip array. They have shown that it is feasible to fabricate nanotip LED arrays on a Si substrate operating with very low voltage ( $\sim 2.4$  V). Their new approach for fabricating efficient, large-area silicon-based nanotip LED array could pave

the way for integrating Si ultra-large-scale integrated circuits with electro-optics to overcome the speed limitations of electrical interconnects and to add extra functions to silicon chips.

Previously, it was reported that semiconducting nanowires can be applied on LEDs. However, random entangled structure, poor crystalline quality and, in particular, limited scalability are issues that have to be overcome for practical device applications. The institute's researchers used a novel approach to fabricating silicon nanotip arrays by self-masked dry etching (SMDE). This SMDE technique is simple, compatible with current semiconductor technologies and cost effective. On the other hand, other research has shown that pulsed laser deposition (PLD) can be used to coat nanowires with various kinds of materials, despite large lattice mismatch. To overcome the difficulty of insufficient carrier injection in nanoscale junctions and avoid the compensation effect in homo-junction materials, the scientists have grown an n-type ZnO layer by PLD on top of the p-type silicon nanotip array to form p-n hetero-junctions. It is well known that high quality ZnO films can be grown by the PLD method. Due to its high optical transmissions in the infrared region, the researchers chose ZnO as the n-type material for the infrared LED. The deposited n-type ZnO layer has a carrier concentration of



(a) A scanning electron microscope picture of silicon nanotips after coating ZnO using pulse laser deposition. (b) Cathodoluminescence (CL) spectrum taken from the square region drawn in the middle of the nanotip array as shown in Fig. 2(a). (c) Transmission electron microscopy image of ZnO/Si-nanotips and (d) Selective-area electron-diffraction (SAED) pattern taken from the square region drawn in the middle of the nanotip array as shown in Fig. 2(c). (e) Photoluminescence spectra and (f) multi-phonon Raman spectra of ZnO film coated on silicon nanotips and flat substrate.

about  $10^{16}$  cm<sup>-3</sup> and so, together with the p-type silicon nanotips, a well-defined p-n junction essential for an electrically driven nanotip LED array can be developed.

The researchers point out that the combination of SMDE and PLD techniques provides an excellent route for the fabrication of well aligned nanotip LED with high efficiency. The techniques involved are simple, compatible with current semiconductor technologies and low cost. The production of highly efficient nanotip LED arrays shows that this approach could provide a route for integrating optoelectronic devices based on silicon materials as well as various hybrid material systems.

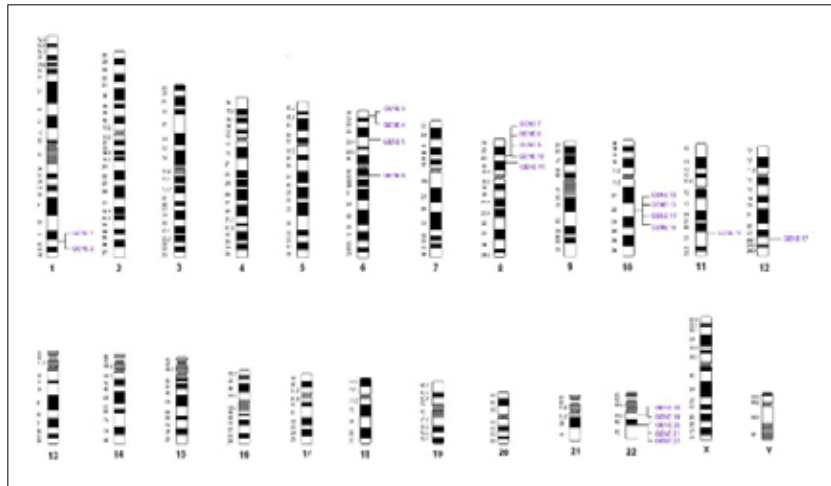


# SOPAS Investigates Genetic and Environmental Causes of Schizophrenia

The Taida Schizophrenia Research Team (Taida-SORT) is undertaking a three-year multidisciplinary research project called, "A Study on the Pathogenesis of Schizophrenia" (SOPAS). The project focuses on the pathogenic factors of genetic variations and neurobiological and cognitive functional impairment in relation to the clinical phenotype of schizophrenia, and takes advantage of the latest clinical, neurobiological and cognitive science approaches and technologies, including molecular genetics, molecular biology, brain imaging, electrophysiology, pharmacology and neuroanatomy. The team members come from throughout National Taiwan University, including the College of Medicine, College of Public Health, College of Science, College of Life Science, College of Engineering and College of Liberal Arts.

Schizophrenia is a devastating chronic disease which usually emerges during adolescence or young adulthood and develops into a chronic condition. This severe mental illness has a profound impact on the patient and his or her family, and often leads to great social costs, as well. Continued research into schizophrenia's pathogenic factors is expected to provide the scientific knowledge that will bring about a revolutionary new stage in the disease's treatment and prevention.

In Taiwan, there are about 80,000 people suffering from schizophrenia, and there are a great many more afflicted with a mild schizophrenia spectrum disorder. Schizophrenia is a complex disorder with multiple vulnerability genes, and it has a high heritability ( $h^2=0.7$ ). Environmental factors may contribute only 0.3 to the



Ⓐ Ideogram of human chromosome regions harboring candidate vulnerability genes of schizophrenia based on Taiwanese family samples of schizophrenia. Risk chromosome region include 1q42.1, 6p24, 15q14, 8p21, 10q22-23, 22q12. There are 22 candidate vulnerability genes (GENE1~GENE22) located in these risk chromosome regions.

total variance in its etiology. The Taida Schizophrenia Research Team has discovered around 20 potential vulnerability genes using positional cloning and association studies and nine potential risk SNP polymorphisms (RPMs) using direct sequencing studies. The primary task of the SOPAS project is to test the neurobiological and clinical validity of these potential vulnerability genes and risk SNPs found in Taiwanese schizophrenia subjects.

The SOPAS project is divided into six projects. Four of these projects are clinical sample studies: (1) A Clinical and Neurobiological Study on Candidate Vulnerability Genes of Schizophrenia; (2) Functional and Structural Dysconnectivity of Working Memory in Patients with Schizophrenia: A combined fMRI and diffusion spectrum imaging study; (3) Psychological Profiles of Schizophrenia and the Underlying Cognition Mechanisms: A Clinical Normative and Developmental Study; and (4) Role(s) of Orexins, the Hypothalamic Peptide Agonists of a Novel Orphan GPCR, in the Pathogenesis of Schizophrenia: Basic to Clinical Studies.

These clinical validly studies are designed to test the following three hypotheses: (a) The identified 20 candidate vulnerability genes (CVGs) can be clustered into three groups of CVGs and/or three groups of SNP RPMs with specific functional genetic pathways corresponding to a three-subtype model of the clinical phenotype of schizophrenia; (b) The RPMs cluster of the specific CVG group has a specific correlation with neurobiological indicators of structural and functional variables, as well as treatment outcome of schizophrenia; and (c) There is gene-gene interaction, such as synergic or additive effects in various neurobiological and clinical parameters.

The two other SOPAS projects are animal model studies: (5) Interaction Between Psychological and Social Stress and Gonad Hormone in Pathogenesis of Schizophrenia: A Study on DISC1 and NRG1 Mice and (6) The Role of Schizophrenia-like Genes of NRG1 and DISC1 in Neuron Development and Neuronal Degeneration.



## NTU Holds Series of Activities to Celebrate Darwin's 200<sup>th</sup> Birthday in 2009

In 2009, NTU joined the global celebration of the 200<sup>th</sup> anniversary of Charles Darwin's birth and the 150<sup>th</sup> anniversary of the publication of his milestone, *The Origin of Species*, by organizing a series of seminars, exhibitions and artistic events in coordination with the 2009 Formosa Science Festival–Darwin NOW. These events were arranged through the joint efforts of the College of Life Science, the British Council, the National Museum of Natural Sciences, the National Taiwan Museum and other organizations. They served to draw public attention to the impact of Darwin and his theory of evolution, not just on science, but on everyday life.



M.O.V.E Theatre Group performed its new play, *After Darwin*, to help NTU celebrate Charles Darwin's birthday.

NTU ran two year-long seminars, one for the general public, and one for advanced audiences that invited internationally renowned scholars to discuss their research on evolution.

In addition, as part of its Exploration Lectureship of Sciences, NTU's Center for the Advancement of Science Education offered a lecture series designed for the

general public called "Darwin's Revolutionary Road."

Successfully bringing art and science together, M.O.V.E Theatre Group performed its new play, *After Darwin*, with support from the College of Life Science in supplying stage props.

An exhibition entitled Bio-Arts was held as part of the NTU Art Festival. Also, concurrent with the Bio-Arts exhibition, a small exhibition about evolution was held at NTU's Agricultural Exhibition Hall. The British Council provided much of the content on display, while NTU faculty members and students provided translations for the exhibits. Special topics included the evolution of whales and seed plants.

## Department of Geosciences Hosts International Symposium on Natural Disasters Around the Pacific in August

NTU hosted the 5<sup>th</sup> APRU Research Symposium on Multi-Hazards Around the Pacific Rim on August 17-18. Subtitled "Earthquake, Tsunami, Volcanic and Geological Hazards and Approaches for Mitigation," the symposium addressed six topics: Cyclone and Groundwater, Earthquake, Earthquake–Chi-Chi and Wenchuan Earthquakes, Earthquake–Forecasting and Early Warning, Multi-approaches for Hazards Mitigation, and Tsunami.

The symposium brought together leading researchers in the fields of seismology, geology, volcanology, earth and environmental sciences, civil engineering and related social sciences for the purpose of better understanding the complex mechanisms of natural disasters and reducing losses from multi-hazards.

The conference featured two internationally renowned geophysicists as keynote speakers. The first was Prof. John Suppe, a distinguished chair research professor in the NTU Department of Geosciences who researches structural geology and tectonics. He presented a speech on "The Structure of the Chi-Chi Earthquake, and its Relationship to Large-scale Tectonics and Mechanics," in which he addressed the importance as well as the mechanism of the Chi-Chi Earthquake that struck Taiwan on September 21, 1999.

Prof. Suppe was followed by Prof. John B. Rundle of the University of California, Davis, who is an interdisciplinary professor working in that university's departments of physics, civil engineering and

geology. Prof. Rundle studies the dynamics of earthquakes through numerical simulations, pattern analysis of complex systems, dynamics of driven nonlinear Earth systems and adaptation in general systems. He lectured on "Earthquake Forecasting: Data, Physics, Methods, Validation and Applications."

Following the symposium, many attendees chose to take part in an optional two-day field trip to investigate *in-situ* the Chelungpu fault and the severe damage caused by the Chi-Chi Earthquake in central Taiwan.

The Association of Pacific Rim Universities is a consortium of 42 institutional members in countries circling the Pacific Ocean rim.



## English-language “Exploring Taiwan” Expands Horizons for Both Local and International Students

“Exploring Taiwan — Geography and Environmental Resources” is one of the few courses being offered in English at NTU, although English-language courses are becoming a major component of the university’s effort to attract more international students. The course’s coordinator is Prof. Nora Chiang of the Department of Geography. Prof. Chiang is joined by 12 other instructors in teaching the course, which accepts up to fifty students.

The local and international students who enroll in the course want to learn about Taiwan’s unique landscapes and cultures. The course’s instructors, who are selected because of their areas of expertise, enhance their lectures

with slides of maps, graphs and landscapes of Taiwan, as well as documentary films and even music.

Prof. Chiang learned her multi-faceted teaching technique when she taught “Multi-cultural Australia in the New Millennium” from 1999 to 2001 with a small team of instructors who flew to Taiwan from Australia.

Prof. Chiang’s goals for the course include giving each student the opportunity to appreciate the concept of diversity. For local students this means learning about the different nationalities and cultures represented by the international students in the class while for the students from outside

Taiwan this means learning about the differences between the ethnicities and nationalities within Asia.

About one-third of the international students taking the course come from multicultural backgrounds. It is eye-opening for the local students to come into contact with so many international students with multi-cultural backgrounds and thus experience the impact of globalization first hand.

Altogether 137 students from 34 countries have taken “Exploring Taiwan” in the three years it has been offered.

## Expanded Taiwan Studies Program Offers Four Courses in English

This academic year, the Graduate Institute of Taiwan Literature has expanded the number of topic categories covered in its Taiwan Studies Program from six to eleven and opened four courses taught in English. Taiwan Studies has long been one of NTU’s strong suits, and the university anticipates the expansion of this program, especially to broaden the worldview of local students as well as provide international and exchange students the opportunity to obtain a deeper and more comprehensive understanding of Taiwan.

At present, the program’s categories include: Taiwan literature, Taiwan’s languages, Taiwan art, Taiwan history, Taiwan politics, economics, society and law,



Students fill the lecture hall to explore creativity in the course “Artistic Taiwan—Creation is Life”.

gender and ethnicity in Taiwan, Taiwan culture, Taiwan’s natural environment, Taiwan’s bio-resources and agriculture, Taiwan’s technology and Taiwan’s medicine and public health system.

The program’s four English-language courses are: “Introduction to Taiwan’s Modern and Contemporary Culture,” “Languages in Taiwan,” “Exploring Taiwan—Geographical Environment and Resources” and

“Scientific Taiwan.” In the future, the program will offer three to five courses taught in English each semester.

This fall semester, the course “Scientific Taiwan—Discussing Weather Forecasting and Disaster Prevention and Rescue in the Wake of Typhoon Marokot” was taught by Prof. George Tai-jeen Chen who analyzed the severe disaster caused by Typhoon Marokot in southern Taiwan this past August. For “Artistic Taiwan—Creation is Life,” NTU invited the world-recognized playwright and theater director Stan Sheng-chuan Lai to engage students in discussions on the essence of creation from the point of view of creativity and based on his own experiences.





## Center for the Advancement of Science Education Delivers the Joys of Science to the Public

NTU established the Center for the Advancement of Science Education (CASE) in October 2008. CASE is committed to science education and communicating the joys of science to the general public. It has established the Exploration Lecture Series and set up a lively website to achieve these goals.

CASE's Exploration Lectures were inspired by the Christmas Lectures initiated by Michael Faraday of the Royal Institution of Great Britain in 1825. Faraday believed that pioneering science could be conveyed to a general audience in an entertaining style. These lectures continue to this day.

The Exploration Lectures present ten lectures based on a



common theme each semester. They incorporate science history to enable people who lack a deep understanding of the subjects to follow along.

The first series, presented in the spring of 2009, was "Darwin's Revolutionary Road." These lectures covered such subjects as evolution, anthropology and microbiology, and the lecture hall was packed with young and old attendees.

⊞ 'A Window and Platform for Popular Science Education'

The fall 2009 Exploration Lectures centered on astronomy, physics and mathematics. They led audiences through the tunnel of history, setting off from early Greek astronomy and mathematics and continuing through the great scientific revolutions led by such independent-minded scientists as Copernicus, Kepler, Galileo and Newton.

CASE has also established a website for popular science education. The site delivers videos of its lectures via live streaming and media on demand. It is the goal of CASE to play the leading role in open courseware on fundamental science in the Chinese language.

## Zoonoses Research Center Delivers H1N1 and Avian Flu Prevention Message to Elementary Schools

In response to the global spread of the H1N1 virus this year, NTU's Zoonoses Research Center designed the "H1N1 and Avian Flu Virus Education and Awareness Activity," which it delivered to elementary schools in Taipei City to disseminate important information about epidemic prevention measures. This activity is an extension of the "Avian Flu Education and Awareness Explanation Activity" the center has conducted at the request of the Taipei Municipal Institute for Animal Health since 2006.

The center received requests for activity visits from over 20 elementary schools since registration began in June. In the end, the center was able to take

its activity to ten schools. The activity was designed around colorful illustrations so it was fun and easy for the young students to understand the origins, characteristics, types and transmission channels of the H1N1 and avian flu viruses as well as to educate them on methods to prevent the viruses' spread.

The activity included various games and contests in which the students could win prizes. These games and contests aroused the students to review and remember what they had learned. As the activity's main theme was "Wash Your Hands", the center awarded students with bars of soap inscribed with the "Wash Your Hands" logo.



⊞ Elementary school students respond enthusiastically to the Zoonoses Research Center's H1N1 awareness activity.

The center wrapped up its visits to the elementary schools on October 12. The students' attentive listening and active responses to the questions in the games and contests testified that the center had succeeded in conveying its message. The center hopes that this prevention information will help students understand the current epidemic and stymie its further development and transmission.



## NTU Hospital Yun-Lin Branch Holds Symposium on Development Trends of Natural Medicine

The Yun-Lin Branch of National Taiwan University Hospital held a symposium on “Development Trends and Outlook for Natural Medicine in Asia.” Experts attending the symposium were in unanimous agreement that government should adopt a positive view towards the development and expansion of natural medicine. They agreed that rather than continue to force this form of treatment to exist under the table, the government should play an active role in integrating Western medicine with natural medicine so as to guarantee public safety through transparent mechanisms, such as legislation, education and certification.

Invited speakers included Dr. Ziguang Yang, former member

of the US National Institutes of Health National Center for Complementary and Alternative Medicine, former Vice Minister of Taiwan’s Department of Health Yaw-tang Shih and numerous well-known natural medicine practitioners.

Dr. Yang raised California’s Chinese medicine legislation as an example and stressed that, if natural medicine is to become mainstream, it must be systematized. He stated that in the end there must be regulation and integration for the public to be able to make choices and assessments.

Former Vice Minister Shih noted that early education is the key to making the development

of natural medicine in Taiwan more comprehensive and universal. He said that students at medical colleges need to be exposed to natural medicine from the beginning so as to correct the misperception that non-traditional Western medicine is not professional or efficacious.

Dr. King-jen Chang of the NTU Hospital Department of Surgery added that positive legislation is necessary and that the government should even establish an organization to legalize natural medicine and achieve the goals of innovation, theory, effectiveness, efficiency, education and regulation.

## Angiogenesis Research Center Brings NTU Scholars Together to Promote Biotech Industry

The Angiogenesis Research Center is an interdisciplinary, forward-looking and locally-focused research team. Its members are clinical physicians and scholars drawn from the College of Medicine, College of Engineering’s Institute of Applied Mechanics, College of Electrical Engineering and Computer Science, and College of Bio-Resources and Agriculture who share a common dream. They desire to achieve results in angiogenesis research that will facilitate the development of medical products that are medically effective and have market value. Their research is also expected to foster the development of Taiwan’s knowledge economy and biotechnology industry.



Scenes from a symposium covering new knowledge in angiogenesis and cancer research

As for research, the center aims to promote and integrate all angiogenesis-related research within the university, seek out collaborative projects with other institutions, and invite internationally-renowned scholars to visit NTU and provide guidance. As for teaching, the center works to hold symposia on angiogenesis, assist in the opening of angiogenesis courses and invite domestic and international

scholars to teach courses. The center aims to establish a platform to assist interested NTU colleagues as well as to assist industry in the form of technological guidance and the cultivation of talented professionals.

The members of ARC pursue both basic and applied research. They endeavor to bring their academic research achievements in line with the needs of industry so as to spur the development of the nation’s biotechnology industry. Examples include the technology transfers of a device that permits patients to assess the hardness of their blood vessels and a computer-assisted ultrasound diagnostic system that helps doctors avoid unnecessary invasive testing.

# NTU at a Glance



## European Film Festival and Cultural Exhibition Introduces Eight Countries in October

During the entire month of October, NTU Library joined hands with the Office of International Affairs, the Department of Foreign Languages and Literatures Second Foreign Languages Committee, and the European Union Center in Taiwan, which is based at NTU, to present the "This October • I Have a Rendezvous with Europe: Film Festival & Cultural Exhibition." During the exhibition, which focused on the eight nations of Russia, France, Germany, Greece, Portugal, Spain, Ireland and Italy, the first floor of the NTU Library was home to a display of hundreds books and multimedia presentations as well as travel information about Europe and information on 52 of NTU's partner universities in Europe.



The film festival screened eight movies selected by the Second Foreign Languages Committee: *12 Razgnevannyh Muzhchin*, *Mon Oncle*, *Der Untergang*, *Politiki Kouzina*, *Central do Brazil*, *Goya's Ghosts*, *The Wind that Shakes the Barley* and *Quando Sei Nato Non Puoi Più Nasconderti*. Foreign language faculty proficient in the languages of the films attended each screening to discuss the films with the audiences. They sought to stir students' international awareness and cultural sensitivity as well as encourage them to seek international experiences. The response to these films was great. One film attracted an audience of over 180 people.

Five short films were produced to promote this event. In the films, four NTU European students introduced their countries and discussed their differences with Taiwan. The amusing films drew enthusiastic reactions from the audience during their screenings at the event's opening ceremony.

More information is available at <http://europe.lib.ntu.edu.tw/>.

# ***The Financial Times* Ranks the NTU College of Management's EMBA Program at Number 40 Worldwide in 2009**

The NTU College of Management's Executive Master of Business Administration program has placed number 40 worldwide in the *Financial Times*' worldwide ranking of business schools in 2009. The EMBA program also ranked first in Taiwan.

The *Financial Times* began evaluating NTU's EMBA program in 2007. The British business newspaper evaluates business management programs based on international management education, internationalization, research outcomes and publications, and average student salary. The program ranked 43<sup>rd</sup> in 2008 and 50<sup>th</sup> in 2007.

In its effort to internationalize, the EMBA program has been dispatching faculty to Harvard Business School to study the Harvard case teaching method every year since 2005. In addition, the program invites professors from major international business schools to present lectures for EMBA students.

As for academic research and publications, the College of Management's professors have outstanding publishing rates in the top 40 business journals and have been rated "superior" in the QS World University Rankings 2009, which placed NTU at number 95 among universities worldwide.



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