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# NTU

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## HIGHLIGHTS

### Food Safety Center Targets Food Scandals

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Peking U Delegates Visit NTU

Alumni Win US Tech &  
Innovation Medals

NTU's Got Talent

**Leaders Profile**

# Astrophysicist at the South Pole





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## Vice President for Academics and Research

**LIANG-GEE CHEN**

Here at Taida, we offer a full spectrum of disciplines to more than 30,000 students. To help our students transform their knowledge into products of real economic value, we set up the NTU Garage program as a platform that allows students apply their academic accomplishments to give back to society. Besides encouraging students to uphold an ecological spirit in creating their businesses, the program urges its participants to seize opportunities to work with others from different disciplines so they can benefit from the synergistic integration of knowledge and techniques and form startup teams of unparalleled abilities.

Most participants in NTU Garage are NTU students and professors. As their skills remain concentrated in academic disciplines, many lack the marketing experience to go up against other startups in the real world of business. Therefore, the program has invited lecturers from the business community to present their experiences to help our startup teams acquire skills that will enable them to promote the fruits of their R&D to a global market.

Meanwhile, Taida is also expanding its student exchange programs with its international partners. For example, I traveled to Australia in February to sign student exchange agreements with a number of our Australian counterparts, including the University of Sydney. While there, I noticed that a majority of Australia's universities share a trait: international students comprise 15-30% of their student bodies. I believe that NTU should emulate this policy by more actively recruiting international students.

Some might challenge this proposition by asking why Taida, as Taiwan's leader of higher education, would not instead offer more openings to Taiwanese students. I believe that installing students with a diversity of stimulation can advantage their futures, whether in academics or business; therefore, increasing our international enrollment channels helps to expose NTU students to a wider range of stimulation from overseas. It is in fact due to NTU's leadership position that the university's local students have an even greater need to understand the international academic community as well as issues concerning the international society.

It is also our mission to inspire Taida's international students to become citizens of the world. While at NTU, students from abroad discover that Taiwan's welcoming English-language environment and free and democratic society facilitate their efforts to learn about Taiwanese society and experience the nation's mix of cultures. I encourage international students to not only develop their knowledge while here, but to also take advantage of the university's wide offering of student clubs to cultivate friendships with Taiwanese students and make the most of their time at Taida.



# First Taiwanese Scientist to Visit South Pole Searches for Cosmic Neutrinos

## INTERVIEW WITH PROF. PISIN CHEN

*In December of 2011, Taiwan's ROC national flag waved its red, white, and blue salute to the vast whiteness of the Amundsen-Scott South Pole Station's icy plateau for the first time in history. What makes this event especially significant is that the person who unfurled the flag, renowned Taiwanese astrophysicist, Pisin Chen, director of the NTU Leung Center for Cosmology and Particle Astrophysics (LeCosPA), himself embodies another first for the nation.*

### Education

- University of California, Los Angeles, Ph.D. in Physics

### Personal honors

- J. J. Sakurai Memorial Fellowship in Theoretical Particle Physics, 1983
- Fellow of American Physical Society, 1994
- 4th Prize in Essay Competition on Gravitation, Gravity Research Foundation, 1995
- 3rd Prize in Essay Competition in Gravitation, Gravity Research Foundation, 2001
- Outstanding Scholar Fellowship (the Carry-On Position), Ministry of Education, 2007
- Outstanding Scholar Award, Foundation for the Advancement of Outstanding Scholarship, 2007
- Outstanding Faculty Research Award, National Taiwan University, 2007

### Research interests

- Theoretical cosmology, including the nature of dark matter and dark energy, inflation and cosmic evolution in the early universe
- Theoretical particle astrophysics, such as ultra-high-energy cosmic rays (UHECR) and cosmic neutrinos
- Laboratory investigation of critical issues in high-energy astrophysics and cosmology using high intensity particle and photon beams
- Experimental detection of ultra-high-energy cosmic neutrinos



# Leaders Profile

Prof. Chen, in visiting the science station as an organizer and co-international spokesperson for the Askaryan Radio Array (ARA) project, was the first scientist from Taiwan to set foot on Antarctica for the purpose of conducting scientific research at the South Pole.

The ARA project is aimed at capturing traces of ultra-high-energy cosmic neutrinos called GZK neutrinos as they transverse the thick polar ice sheet. Encompassing an area of 200 square kilometers,



▲ Having forgotten to pack a national flag, Prof. Pisin Chen spent three days drawing a flag by hand so he could unfurl it at the South Pole.

the ARA utilizes a massive network of radio antennae buried deep beneath the Antarctic ice to capture

the neutrinos. Prof. Chen and his international teammates hope to obtain clues that will enable scientists to look back to the time of the origins of the universe.

Before returning to Taiwan in 2007, Prof. Chen had already begun collaborating on another international project that exploited the unique conditions at the South Pole. Called the Antarctic Impulse Transient Antenna (ANITA), the project launched a high-altitude helium balloon carrying an array of sensitive radio antennae that rode circumpolar winds to circle the South Pole at 35,000 meters. Like the ARA, ANITA was designed to detect the interactions of cosmic neutrinos with the ice sheet.

Ultra-high-energy cosmic neutrinos are a form of dark matter created during interactions between ultra-high-energy cosmic rays and the cosmic microwave background. Tiny even by subatomic standards, the particles carry no electrical charge and generally do not interact with other particles as they travel through the universe. Most of the neutrinos in the region of the Earth come from the sun, and, if you are reading this during the daytime, billions upon billions of solar neutrinos are currently passing through your body without even touching you.

While neutrinos fortunately do not interact with the human body or



impact our health, the thickness of the dense polar ice cap, which reaches 3,000 meters, means there is a chance they are likely to collide with atoms in the ice. It is the signals emitted by these rare collisions that the ARA experiment aims to detect.

Buried 200 meters beneath the surface of the ice, the ARA's antennae read pulses of radio-frequency radiation generated when neutrinos crash into atoms of the polar ice. Prof. Chen and his colleagues then use these readings to analyze the properties and origins of neutrinos. If they succeed in discovering neutrinos that come from the edges of the expanding universe, they will be able to provide scientists with new data that could shed light on the origins of the universe.

Highlighting Taiwan's prominent role in the project, Prof. Chen says,

## A question-and-answer session with Prof. Pisin Chen

### What is your greatest interest besides physics?

Painting. The earliest watercolor I still have is of the Presidential Office Building, which was located near my dormitory when I was in my fifth year of elementary school. Later, I would often carry my easel to the seaside and mountains all over Taiwan to find scenery to paint.

### What profession would you pursue if you weren't conducting physics research?

Perhaps I would be an architect. Up until high school, my vocational ambition was architecture. For instance, once during my childhood, when my family's Japanese-style house required remodeling, I drew the floor plan and blueprints myself. To my surprise, my father actually used them. It was only upon studying the theory of relativity during my first year of high school that I was finally lured away by the exquisite beauty of physics that so enraptured Prof. Ta-You Wu<sup>1</sup>.

<sup>1</sup>"Ta-You Wu is a world-renowned Chinese atomic and nuclear theoretical physicist (1907–2000) who has been called the "Father of Chinese Physics."

“Although the most important resource provider was the United States, we in Taiwan not only took responsibility for the construction of ten of the 37 antenna stations, we also contributed to the research and development of the antennae technology. Taiwan was not only a participant; it was the second highest ranked resource provider.”

NTU's success in this major international collaboration was the

result of Prof. Chen's distinguished leadership and scholarship. Yet, he also enjoyed a little help from an old friend who has also made his mark in the world.

In 2007, the year Prof. Chen returned to NTU as a faculty member, his former NTU Department of Physics classmate and co-founder and vice president of Quanta Computers, Chee-Chun Leung, donated NT\$200 million to NTU for the establishment of LeCosPA. Later in 2012, Leung provided an additional donation of NT\$570 million for the construction of a building and the establishment of an endowment for the research center.

With this enormous financial backing, Prof. Chen built LeCosPA into a much sought-after working destination for astrophysicists from

around the globe. Visibly pleased with the accomplishments, Prof. Chen says, “We hire only one or two new postdoctoral researchers each year; however, as our compensation and research standards are on a par with the best universities in Europe and North America, we have received applications from about 100 outstanding international scholars annually these last few years.”

As for his continuing search for neutrinos, Prof. Chen declares, “Detecting cosmic neutrinos is one of the most important and most cutting-edge areas of research in astrophysics. The resulting data would enable human knowledge to get closer to the goal of explaining the profound mysteries of the origins of the universe.”

## First Taiwanese Scientist to Visit South Pole Searches for Cosmic Neutrinos



▲ Prof. Pisin Chen, the first Taiwanese scientist to conduct research at the South Pole, poses proudly next to his ROC flag at the South Pole.



▲ Prof. Pisin Chen stands between the ROC and Norwegian flags at the South Pole.



▲ Prof. Pisin Chen poses in front of a wind turbine that provides power to the Askaryan Radio Array's antennae.

### A question-and-answer session with Prof. Pisin Chen

#### Why did you return to Taida to teach?

I am aware of the gap in terms of resources between Taiwan and the United States. Nevertheless, I also believe that it is human drive that determines whether we are capable of success. I've always felt since schoolchild that I had received a wealth of cultivation and education from the nation and society. Therefore, by the time I had achieved a certain measure of success scholastically, I decided it was the appropriate time to give back to society.

#### How did it feel to visit the South Pole?

It was an immense honor to be able to represent the ROC in carrying out the first scientific research project at the South Pole in the nation's one hundred year history. This is not my personal honor; rather, it symbolizes my giving back to Taiwan's society. Prior to setting out, I underwent numerous health exams as well as an arduous five-day journey in a hard-to-come-by seat and sleeping berth on a US military plane. After getting over a bit of discomfort, I discovered that I forgot to pack the national flag I had prepared. Consequently, I spent three days in the research station drawing a national flag by hand so that I could plant it at the South Pole near the research station and take a photograph with it.

#### What teaching materials for the popularization of science have impressed you the most recently?

One major event lately was the discovery of gravitational waves. Brian Greene of Columbia University went on the popular talk show “The Late Show” to explain how gravitational waves were discovered. He demonstrated a simple Michelson interferometer on live TV. Not only did the host and audience feel amazed, even I felt that the effect of this live visual simulation was really extremely powerful.





## Startup Incubator Celebrates Renovations and Reorientation

**N**TU Garage celebrated its reopening following recent renovations with a tea reception on February 17. As the event took place during the Lunar New Year period, NTU President Pan-Chyr Yang and Executive Vice President for Academics and Research Liang-Gee Chen took the opportunity to share New Year's wishes with Taida's young entrepreneurs.

During its renovation, the campus startup incubator staff did not simply upgrade its facilities, it also reoriented its operational focus under the theme “validate ideas, strengthen teams, and actualize entrepreneurial passion” with the goal of creating winning teams by better assisting the young entrepreneurs in such vital areas as business plan validation. Bolstered by these improvements, the new NTU Garage is now even more equipped to provide NTU's startup teams with both the tools and inspiration they need to ensure their products get started with a fighting chance in the marketplace.

Reflecting its operational goal of facilitating transparent communication and exchanges, NTU Garage applied an open-concept design in its renovations,



boosting the capacity of its working space by adding 40% more seating. The program has also implemented a new staggered-stage system allowing the existing and in-coming teams to have an overlapping three-month period to share experiences and build connections.

Apart from these improvements, the incubator has also enhanced its project management mechanism to provide immediate solutions to problems teams encounter. This allows the teams to rapidly recalibrate the direction of product development when necessary.

Building on its original accounting and legal services, the NTU Garage has also enlisted more partners from both on and off campus, including the new D-School@NTU project, the global seed fund and startup accelerator 500 Startups, the Chinese Consumer Center, and the up-and-coming QSearch. Courses cover such topics as user interviews and research, product design thinking, persona building, model-view-presenter (MVP) design, and team leadership.

# TWO-MONTH EXHIBITION INTEGRATES ART INTO CAMPUS LIFE



Tin-Yan Wong fabricated the interactive works “Chameleon” and “Animal Bikes” out of discarded wood pallets. They are waiting for you to take a ride on the lawn near The Odeum.

Meanwhile, artist Wen-Fu Yu used bamboo, feathers, and wire netting to fashion “The Camphor Tree’s New Feather Coat,” located outside of the NTU College of Law. At the College of Social Science, Yao-Chung Liu’s neon signs, entitled “Fan of X,” feature the famous lines “The truth is out there” and “They are watching” from the popular television series, *The X-Files*.

Lennartz-Lembeck’s “Beautiful Stranger” installation is a teepee-style tent created from a colorful patchwork of knitted yarn draped around bamboo poles. The tent is a collection of individual patches of knitted together by housewives, young people, and refugees who found themselves suddenly living in Germany. By connecting the patches into a single artwork, the piece represents different people from around the world coming together for a common cause.

**T**he campus-wide exhibition Very Fun Park@NTU opened on March 9, delivering a dazzling array of fun and inspiring contemporary art to every corner of the NTU Main Campus.

Organized by the NTU Center for the Arts in collaboration with the Fubon Art Foundation, the two-month event features works by Taiwanese artists as well as the German artist Ute Lennartz-Lembeck. The artworks are installed in public spaces to integrate art into campus life and directly engage members of the NTU community and the general public. Running until May 3, the exhibition offers numerous activities, including a series of art lectures, a lucky prize drawing, and guided tours.

More than half of the works on display this year are brand new pieces created by the artists especially for this exhibition.

This includes Ya-Chu Kang’s work “Sun Dried Fish II—The Migration,” a multimedia creation made of wool, fabric, thread, net, wire, moss, water, sugar, milk, luminous powder, and printing paste. The work is displayed in front of the laundromat across from the Xiao Xiao Fu Commissary. Hong Kong-based artist







## FOOD SAFETY CENTER PRESENTS ANALYSIS OF 32 FOOD SCANDALS IN 2015

*In the wake of the series of food safety scandals in Taiwan, Taida established the NTU Food Safety Center in January of 2015 to play an active role in improving the nation's overall well being in food consumption.*

The center is first and foremost tasked with making specific legal and policy recommendations for the government. It also plans and conducts research aimed at strengthening food risk assessments and food production safety, all the while operating an effective food raw materials database and food safety website.

In addition, the Ministry of Health and Welfare has charged the FSC with organizing a professional inspection team that assists the ministry in inspecting enterprises for compliance with food safety laws. The team undertakes observation visits to enterprises to check on their occupational safety and health management systems. In 2015, the FSC completed 116 inspections, with 83.5% of the enterprises passing, and conducted 1,602 observation visits, which found 8.2% of the enterprises required improvements.

On February 18, the FSC and NTU Center for Public Policy and Law held a press conference featuring 14 professors and professionals with expertise in law, social science, food management, public health, and toxicology. The experts presented their analysis of 32 major food safety incidents in 2015 and identified five major food safety issues: illegal toxins and industrial chemical compounds in food, the management of pesticide residues in imported raw materials, the use of expired ingredients to produce food, inadequate campus lunch management, and legal liability for food safety incidents.



# STUDENT STARTUP'S MULTI-FUNCTIONAL 3D PRINTER WINS GOLD AT iF DESIGN AWARDS

*The student startup company FLUX Technology Inc. claimed gold at the 2016 iF Design Awards for the design of its innovative multi-functional Flux Delta 3D printer. In the nation's best performance in the prestigious competition to date, Taida's Flux was one of five teams from Taiwan to receive a Gold Award at the awards ceremony in Munich, Germany on February 26.*

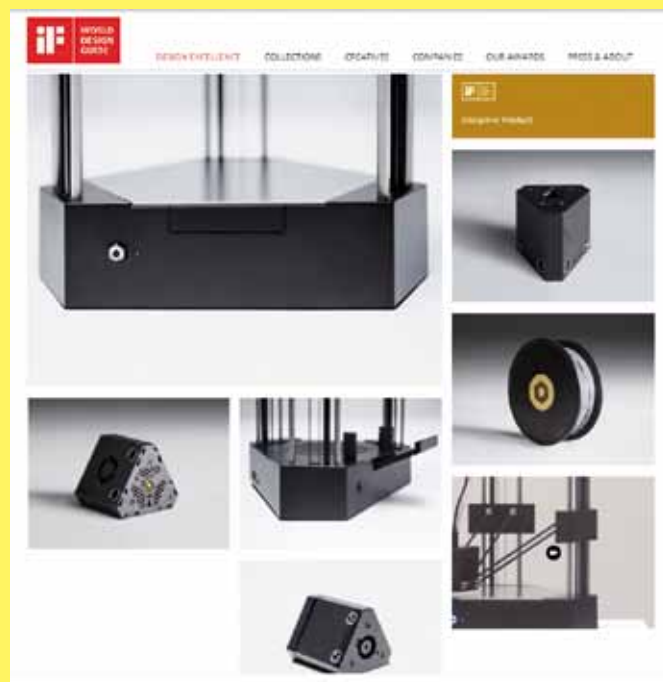
The students designed the FLUX Delta with modular interchangeable toolheads that enable users to switch heads to conduct 3D printing, scanning, laser engraving, and other tasks. Priced affordably for the consumer market, the versatile desktop device is controlled via smartphone using mobile apps, which is even more significant since users can operate it from anywhere at anytime.

In awarding FLUX a Gold Award-- the Oscar of the design world-- the iF jury praised the "precision" of the 3D printer's design, calling it "easy to maintain and update," "a highly professional tool," and "outstanding in every single detail."



FLUX has been on quite a roll, from its rapidly and highly successful Kickstarter crowdfunding drive in December of 2014 to its iF gold in February. Adding to these achievements, the FLUX Delta also won a CES Innovation Award in the 3D printing category at the Consumer Electronics Show in Las Vegas in early January.

Meanwhile, *Forbes* included FLUX Technology's cofounder and CEO Simon Ko in its first 30 Under 30 Asia this year. The business magazine's listing showcases young people in Asia who have demonstrated entrepreneurial spirit, leadership, and a potential to change the world.





## TAIDA PRESIDENT AND ALUMNI RECEIVE TOP US INVENTION AND INNOVATION HONORS



**N**TU President Pan-Chyr Yang and two overseas Taida alumni were recognized last year with several of the most prestigious honors granted in the United States for achievement in technological innovation and invention.

In an official announcement on December 22, the White House named alumni Nancy Ho (Department of Chemical Engineering, Class of 1957) and Chen-ming Calvin Hu (Department of Electrical Engineering, Class of 1968) among the eight recipients of the 2015 National Medal of Technology and Innovation. Meanwhile, also in December, President Yang was elected as a fellow of the National Academy of Inventors.

The National Medal of Technology and Innovation is the highest honor conferred by the US government in recognition of people who have made lasting contributions to technological innovation. The NMTI is considered to be on the same level as the US National Medal of Science. US President Barack Obama personally presented Ho and Hu with their medals during an official presentation ceremony for the 2015 National Medal of Technology and Innovation and National Medal of Science at the White House on January 22.



Ho, the only female medal recipient in 2015, is a research professor emerita at Purdue University's School of Chemical Engineering, where she works to improve industrial microorganisms at the Laboratory of Renewable Resources Engineering. Ho also serves as president of Green Tech America, the biotech company she founded to produce

and market recombinant *Saccharomyces* yeast that she developed for the production of cellulosic ethanol.

Relying on recombinant DNA techniques, her work has greatly increased the efficiency of yeast in the production of ethanol from

cellulosic plant materials. Ho's innovative yeast, named the Ho-Purdue yeast, has created new possibilities for the generation of energy from biomass, enabling ethanol producers to turn to plentiful agricultural waste, from corn stalks to even grasses, instead of using valuable edible feedstocks, such as corn.

Meanwhile, Hu is a venerated pioneer in the field of semiconductors who has enjoyed an illustrious career spanning academia and industry. The Academia Sinica fellow is a distinguished professor of microelectronics at the University of California, Berkeley, and served as the first chief technology officer of Taiwan Semiconductor Manufacturing Company from 2001 to 2004.



The NTU alumnus has dedicated his life to making integrated circuits that are not only smaller, but more energy efficient, more powerful, and more reliable. The BSIM (Berkeley Short-Channel IGFET Model) models Hu created were adopted as international industry standards in 1996. He continues to upgrade these IC design models, sharing them with the world free of charge. The production value of chips designed using Hu's models reaches well into the hundreds of billions of US dollars.

President Yang was elected as a fellow of the National Academy of Inventors in view of his international leadership in the field of lung cancer research. Yang has made revolutionary contributions to humanity by developing new concepts and approaches for the treatment of lung cancer and leading his researchers in creating a new generation of cancer treatment strategies based on his innovations.

The prestigious honors bestowed on President Yang and alumni Ho and Hu in the United States are the pride of the NTU community and demonstrate again that Taida cultivates global leaders in innovation.

# President Yang Welcomes Peking University President Lin to PKU Day@NTU

On the first day of the event, representatives of 11 NTU academic and administrative units, including the College of Liberal Arts, College of Science, College of Electrical Engineering, University Library, and Office of Student Affairs, hosted meetings with their counterparts from Peking University to share current practices and explore new ideas in research, education, community service, and resource sharing.

On the morning of March 24, President Yang and President Lin led their senior administrators in holding a joint meeting to discuss future areas of cooperation. President Yang presented a brief introduction to NTU's history and development, after which President Lin delivered his vision for PKU.

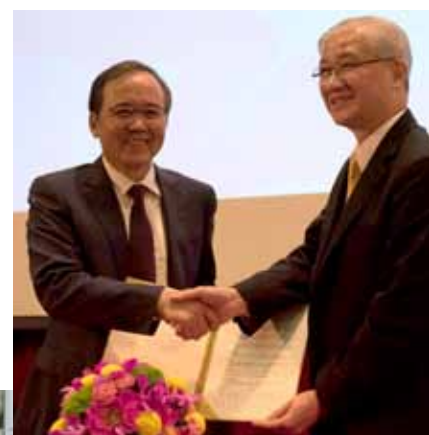
In his address, President Lin pointed to the importance of combining general education and professional training when cultivating future leaders. He also emphasized that promoting social and educational equality is part of Peking University's mission.



▲ President Pan-Chyr Yang (right) and Peking University President Jianhua Lin smile while exchanging gifts.

*NTU President Pan-Chyr Yang welcomed Peking University President Jian-Hua Lin to our campus during the 2016 Peking University Day@National Taiwan University on March 23-24. President Lin headed a major delegation of 75 PKU faculty members, administrators and students to participate in the event, which was organized with the goal of building on the long history of scholarly exchanges between the two leading institutions.*

► President Yang (right) and PKU President Lin shake hands after signing a memorandum of understanding.



▼ Students ask questions following speeches delivered by the presidents of NTU and PKU.



▲ President Yang (right) leads PKU President Lin (second from right) on a tour of a special exhibition devoted to former NTU President Chien Szu-liang.





▲ Speakers discuss air and water pollution during a public forum jointly hosted by NTU and PKU.

▼ President Yang (right) and PKU President Lin appear on stage during the opening ceremony of the 2016 Peking

During the meeting, President Yang and President Lin also signed a memorandum of understanding for an NTU-PKU student community service cooperation program as well as a joint Master's degree agreement between our College of Management and PKU's Guanghua School of Management.

The afternoon of March 24 was dedicated to a public forum on the problem of air and water pollution jointly hosted by the two universities. Moderated by Associate Dean Chun-Chieh Wu of the College of Science, the forum provided an opportunity for faculty members and graduate students of both universities to present their research on air and water pollution. Researchers from both sides emphasized the vital role of interdisciplinary cooperation in solving

contemporary challenges and stressed the importance of environmental education.

That evening, the two-day event came to a close on a high note with a performance called "Our Youth—NTU and PKU Campus Folk Song Concert."

The 2016 PKU Day@NTU marked the third time the two universities have come together for a joint event. Peking University is scheduled to host NTU Day@PKU next year, which will permit NTU and PKU to continue their conversation on joint research, education, and community service as they strive for global excellence in the Chinese-speaking world.





# UNIVERSITY OF TÜBINGEN PRESIDENT VISITS CAMPUS AS PART OF RESEARCH WORLD TOUR

▲ Representatives of NTU and the University of Tübingen engage in conversation before sharing a meal.

**N**TU President Pan-Chyr Yang received a delegation from the University of Tübingen led by President Bernd Engler on March 3. The delegation's visit provided an opportunity for the two longtime partners to discuss new areas of possible collaboration, including neuroscience, cancer research, philosophy, archaeology, law, and social sciences.

President Engler made his visit to the Taida campus as part of the "Tübingen Research World Tour," during which he and UT faculty members traveled around the world to strengthen partnerships with universities worldwide as well as to showcase the newly established Tübingen Research Campus.

UT pursues world-class research in eleven core areas across the humanities, life sciences, environmental and natural sciences, social sciences, and scientific archaeology. Meanwhile, the historic university town of Tübingen is home to such prestigious research establishments as the Max Planck Institutes, the Leibniz Association, which includes 87 non-university research institutes, and the Helmholtz Association of German Research Centers, which comprises the largest scientific organization in Germany, among others.

Taking advantage of the location, the prestigious German university established the TRC to further promote the many top-level non-university research institutes located in the city. The TRC therefore offers NTU and the University of Tübingen a unique platform for enhanced research collaboration.

The NTU and UT partnership began in 2006 when a university-to-university agreement and a student exchange program agreement

▼ President Pan-Chyr Yang and University of Tübingen President Bernd Engler discuss university affairs during their meeting.



were signed. The partners are currently conducting joint research in social sciences, political science, sociology, law, geosciences, physical and theoretical chemistry, psychology, cognition and perception, and plant physiology.

The other delegates who accompanied President Engler on his visit to Taida included Dr. Gunter Schubert, Director of UT's European Research Center on Contemporary Taiwan; Dr. Bernd Heinrich, UT Chair of Criminal Law, Law of Criminal Procedure, and Copyright Law; Prof. Shu-Hsiung Wu, NTU alumna, Lecturer of Modern Chinese at the UT Department of Chinese and Korean Studies' Institute of Asian and Oriental Studies, and member of the European Research Center on Contemporary Taiwan Support Team; and European Union Liaison Officer Elisabeth Baier.





▲ Kazutoh Ishida of Stanford University introduces Stanford's American Language and Culture Program while visiting NTU.

*Only two months away, summer vacation is fast approaching. While not every student has made plans for the summer, those who have completed registration for NTU's exciting Summer Abroad Programs are already making preparations for a unique and enriching experience that combines intensive study with the adventure of traveling and living in another country.*

The Office of International Affairs works in close collaboration with prestigious universities and educational institutions around the world to devise three- to six-week programs that meet the needs of NTU students. These short-term programs immerse students in different educational environments with different classroom atmospheres, allowing them to learn about not just the local culture but the cultures of other classmates from around the globe as well.

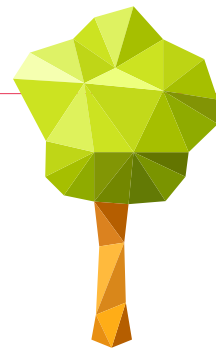
These valuable experiences broaden the students' international vision and cultivate their cross-cultural communication skills; the experiences also lead to major improvements in their foreign language skills. Furthermore, after returning to NTU, the students can

## Summer Abroad Students Prepare for Overseas Study and Adventure

apply to have the grades and credits they earned overseas transferred to NTU.

This coming summer, NTU students will take part in summer programs at eleven partner universities in seven countries. All highly-ranked educational institutions, they include the University of California, Berkeley, Stanford University, and the University of Pennsylvania in the United States, Hertford College at University of Oxford in Britain, the University of British Columbia in Canada, the IÉSEG School of Management at France's Lille Catholic University, the Free University of Berlin, University of Hamburg, and Heidelberg University in Germany, Spain's Complutense University of Madrid, and Sophia University of Japan.

To promote the program, the OIA arranged a series of information sessions during January and March to provide interested students with details concerning the specific programs offered at different universities in different countries this summer. Students who participated in previous summer programs were also invited to share their wonderful and fulfilling experiences abroad. Moreover, Marc Porto of the IÉSEG School of Management's Summer Academy and Kazutoh Ishida of the American Language and Culture Program at Stanford University both visited the NTU campus to personally introduce their respective programs to the NTU students.



## INDIGENOUS STUDENT CLUB SEEKS OUT ROOTS OF TRIBAL CULTURE

**1** Indigenous elders of Chunyang Village keep warm by a fire as they tell their stories and sing their songs.

**2** Indigenous artist Mega Walis integrates elements of traditional Seediq culture into his artistic creations.

**3** Seediq hunter Lung-Hua Lee (far right) shares his hunting experiences with members of NTU's Absoundtrack.



Although times have changed, their spirit still inspires the next generation of indigenous children. That's why in 1992 Taida's indigenous students founded Absoundtrack so that they could develop their own approaches to furthering the efforts of their predecessors.

The club holds regular weekly meetings to discuss important issues, such as rights to ancestral land, the significance of using aboriginal names, anti-nuclear awareness, indigenous autonomy, and the preservation of traditional culture. The club's members consider social issues from the point of view of indigenous peoples and engage in social movements to express their views, propose solutions, and draw attention to the plight of aboriginal peoples.

Apart from social issues and social movements, Absoundtrack also works to promote their traditional indigenous cultures among the public. The club organizes exhibitions and music forums every year to give the public an opportunity to personally experience the cultural variety among different ethnic cultures.

One of the club's major events is the Annual Rite, during which participants visit an indigenous community to learn about the roots of tribal culture and contemplate their personal ethnic consciousness while learning about the local culture and developing their appreciation of the tribal community.

This year's Annual Rite will take place on May 21. The students plan to journey into the depths of the rugged mountains of Nantou County's Renai Township to spend time learning about the culture of the Seediq people of Chunyang Village.

**A**bsoundtrack is NTU's indigenous people's student club. Made up of members from different tribal groups, the club serves as a cultural salon where aboriginal students from both tribal communities and urban areas come together to search for identity, share life experiences, build friendships, learn about their ethnic culture, and discuss social issues. Speaking up for Taiwan's indigenous people, the club's goal is to make its voice heard in mainstream society and to promote understanding and diversity in our society.

The 1980s in Taiwan witnessed an awakening of indigenous ethnic consciousness and the birth of numerous indigenous social movements. During this wave of awareness, a multitude of people took to the streets to fight for fairness and justice for Taiwan's indigenous peoples.



# Research Achievements

## Study Reveals Inducing Endoplasmic Reticulum Stress Regulates Golgi Apparatus

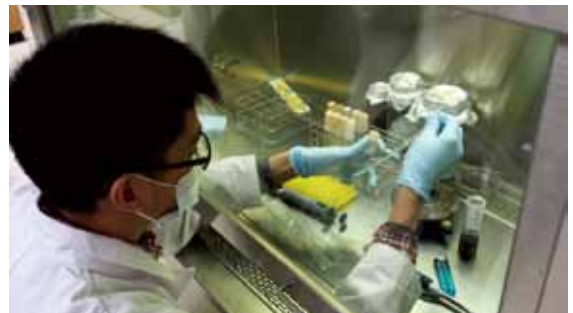
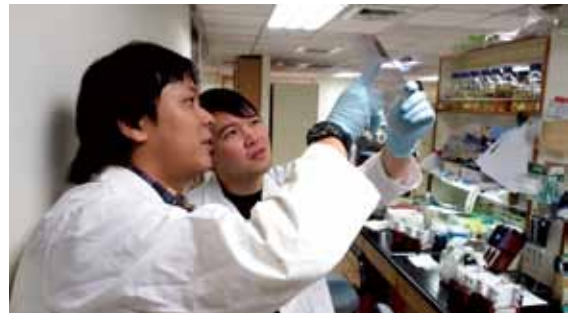


Researchers led by Prof. Fang-Jen S. Lee of the College of Medicine's Institute of Molecular Medicine recently published an innovative study revealing for the first time that inducing stress in a cell's endoplasmic reticulum regulates signal transduction and vesicular transport performed by the Golgi apparatus. As numerous investigations have implicated the ER in prion and neurodegenerative diseases, the team's discovery has opened new research directions for understanding the role of endoplasmic reticulum stress in causing these diseases.

The study, titled "Unfolded Protein Response Regulates Yeast Small GTPase Arl1p Activation at Late Golgi via Phosphorylation of Arf GEF Syt1p," attracted the attention of researchers around the world when it appeared in the *Proceedings of the National Academy of Sciences* on March 10.

The endoplasmic reticulum is an organelle in the cells of eukaryotic organisms. It serves a crucial role as it is a starting point for the synthesis, packaging, and transport of proteins and lipids. Proteins manufactured within the endoplasmic reticulum are first folded, processed, and modified before being delivered to the Golgi apparatus. Upon receiving the proteins, the Golgi apparatus makes additional modifications, packs them up by type, and ultimately sends them to the cell membrane via vesicular transport, or to the extracellular space through secretion. The functioning of this mechanism is vital to sustaining the life of the organism.

Stress from the cell's external environment or variations to its genes internally will lead to abnormally folded proteins. The accumulation of these abnormal proteins within the endoplasmic



reticulum causes endoplasmic reticulum stress as well as an increase in the unfolded protein response.

Endoplasmic reticulum has been indicated to affect such diseases as Alzheimer's and Parkinson's, as well as diabetes and cancer. Further research into the cell's regulation of the unfolded protein response is expected to significantly advance our understanding of cell physiology and human diseases.

This latest study relied on the yeast *Saccharomyces cerevisiae* as its model organism. Prof. Lee's laboratory has for years made use of this eukaryotic organism, commonly known as brewer's yeast, as a means to understand the regulatory mechanisms that control vesicular transport.

The study demonstrated that while endoplasmic reticulum stress induced by unfolded proteins influences the distribution of proteins in the Golgi apparatus through signal transduction, it also regulates vesicular transport within the Golgi. Based on these findings, Prof. Lee's team has set its future research focus on gaining a better understanding of the control mechanism that the Golgi apparatus depends on to address the accumulation quality of unfolded proteins and how the Golgi is impacted by endoplasmic reticulum stress.



# Scholarships Enable PhD Students to Earn Degrees While Working in Industry



reception in the fall of 2015. During the talks, which drew hundreds of interested students, executives from the program's partner enterprises discussed the technical challenges confronting global telecommunications companies while introducing career opportunities for doctoral students at their companies.

MediaTek executives Dr. Tsung-Yu Chiou and Dr. Pei-Kai Liao led the first career talk on September 21. Speaking on the topic, "Applications for Smartphones and Wearable Devices; Technology and Standardization in 5G Communication," the two addressed technical challenges and opportunities in several exciting areas, including cell signal positioning, indoor positioning based on WiFi and MEMS (microelectromechanical systems) sensor signals, as well as activity and gesture recognition by MEMS sensor signals.

The speakers noted that imagery resolution permitted by GNSS (Global Navigation Satellite System), which is typically used for conventional indoor positioning technology, requires further improvements if mobile devices wish to provide more precise information. GNSS remains incapable of determining floor level, for instance. To address this limitation, some researchers have proposed solutions that combine WiFi with MEMS in the hopes to overcome the shortcomings currently bound to GNSS technology.

During the talk, Dr. Liao also presented an overview of technology and standardization regarding 5G wireless communication systems. He pointed out that, moving forward, the emergence of the Internet of Things will spur a massive increase in both the volume of data and number of mobile devices. This inevitable growth will require the next-generation standard to deal with associated Quality of Service (QoS) issues to enable companies to provide their services to thousands of users at the same time. Dr. Liao added that many countries have already developed a number of technologies targeted at meeting 5G standards.

In their forward-looking discussion, the MediaTek executives also talked about the future of 5G applications, their possible working scenarios, as well as unresolved challenges that remain to be solved. Looking into the future, the speakers told their potential PhD employees to look out for mmWave as one of the potential candidates for 5G communication systems.

The Graduate Institute of Communication Engineering provides scholarships through its Communication Excellence Cultivation Program to encourage doctoral students to earn their Ph.Ds while working in the private sector. In 2015, six industry partners, i.e., the Industrial Technology Research Institute, Institute for Information Industry, WistronNeWeb, ASUS, Realtek Semiconductor, and Mediatek, collaborated with NTU in rolling out the program.

The GICE designed the five-year Ph.D scholarship incentive in coordination with the Ministry of Education's Industry-Academia Cooperation Program. With sponsorship from industrial enterprises and research institutes, the program is an integration of academic theory with real-world practice with the goal of cultivating research and development talent.

The Communication Excellence Cultivation Program grants scholarships of NT\$2,500,000 over five years to eight full-time first-year Master's students and NT\$1,500,000 over four years to two full-time first-year Ph.D students.

To attract applicants, the GICE organized a series of career talks as well as an open house



# Teaching and Learning



## ICLP Students Demonstrate Mandarin Proficiency in Lantern Festival Performances

Nearly 100 Mandarin learners and other international students participated in a music and performance festival co-organized by NTU's International Chinese Language Program during this year's Taipei Lantern Festival on February 22. The event took place at the Taipei Expo Park under the theme "Happy Chinese Learning, Happy Lantern Festival" and was planned by the Ministry of Education in support of its international campaign to promote Taiwan as the ideal destination for studying Mandarin.

Students of the ICLP demonstrated their Mandarin proficiency through songs and readings of Lantern Festival riddles during the event, which also offered guided tours of the colorful lanterns on display at the venue.

Alicia Therese Parshall of the United States performed a translated version of the song "Where Is Your Boy" by the American rock band Fall Out Boys. Composer and ethnomusicologist Juliane Bridget Jones of the United States performed and sang two songs she composed in Mandarin, "Soul Sense" and "Hey, Shadow." She was accompanied on cello by South Korean student Kyumin Lee.

Another American student, Meredith Nevler Derecho, performed and sang a Hakka folk song. Amanda Marie Bogan shared her impressions of the Lantern Festival and joined 15 other international students from countries including Norway, Japan, and the United States in reading Lantern Festival riddles.



# Accessibility Information Added to Online Campus Map

The Office of General Affairs added accessibility information to Taida's online campus map (<http://map.ntu.edu.tw>) in December as a way to facilitate the movement around campus of students, faculty members, and visitors who have disabilities. The map now shows the location of all of the campus' access ramps and entrances, restrooms, elevators, and exclusive parking (for both cars and scooters) designed for use by people with disabilities.



In 2002, the OGA initiated a campaign to create barrier-free access to older buildings that were constructed before the concept of accessibility was understood. As of 2015, the vast majority of the campus's buildings offered access ramps and restrooms for people with disabilities.

Following the inclusion of the accessibility information in December, the OGA sought recommendations from the map's users based on their experiences and has since augmented the online map's features to supply such useful information as photos of restroom interiors as well as the widths of restroom and elevator entrances.



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