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CONTENTS

NTHU

IN MEMORY OF FORMER NTHU PRESIDENT SHEN CHUN-SHAN

a Former NTHU president Shen Chun-shan passed away on September 12, 2018, at the age of 87.

b Shen being sworn in as NTHU president in 1994.

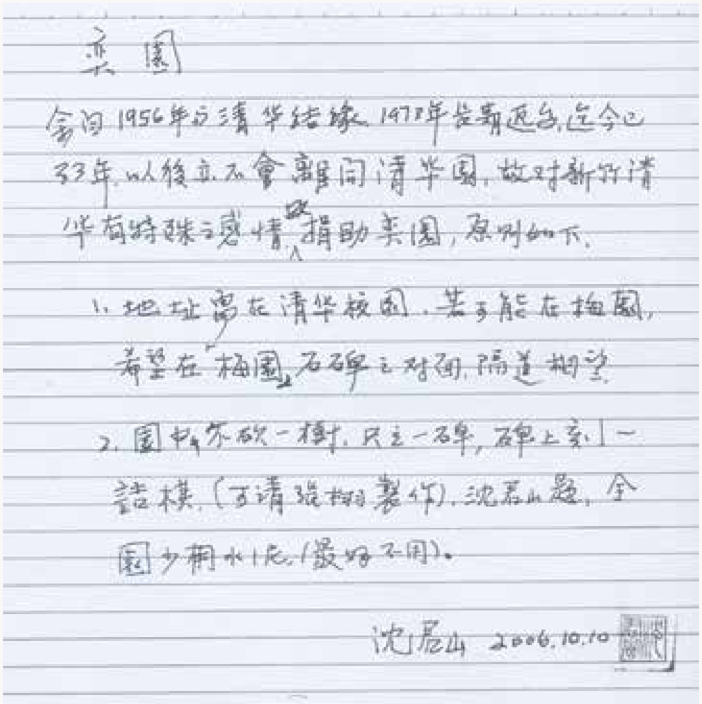
Dr. Shen Chun-shan, a well-known physicist, died at 10:00 am on September 12 at Mackay Memorial Hospital at the age of 87 with his wife and son at his side.

After his third serious stroke in 2007, Shen was placed in a residence on the NTHU campus and was carefully taken care of by a housekeeper and a caregiver for 11 years.

Unexpectedly, on September 5th of this year Shen was admitted to hospital due to a fever and abdominal distension. After examination, the intestine was found to be ruptured. Considering that he had been bedridden for many years, Shen's wife and his son, a physician, decided against invasive surgery and instead to allow him to die naturally and peacefully.

NTHU president Hocheng Hong and several professors visited Shen on many occasions during his long convalescence. He said that Shen loved and devoted his entire career to NTHU and that he will always be remembered by the entire Tsinghua community.

Shen's family said that he had no particular religious beliefs and requested that following his death he should be cremated without a funeral service.


奕園

余自1956年与清华结缘，1973年[illegible]返台，迄今已33年，以後亦不會離開清华園，故对新竹清华有特殊之感情，拟捐助奕園，原则如下。

1、地址需在清华校園，若能在梅園，希望在梅園石碑之对面，隔道相望。

2、園中不砍一樹，只立一碑，碑上刻一詰棋（可请张栩书作），沈君山題，全園少用水泥（最好不用）。

沈君山 2006.10.10

Memo written by Shen in 2006 stating his intention to establish a Go Garden on the NTHU campus.

Also found in the Go Garden is a piece of public art titled Confrontation, Conversation.

The name plaque on the Go Pavilion.

In accordance with Shen's wishes, NTHU will hold a brief memorial service to give his friends and colleagues a chance to share their reminiscences.

Shen was born in 1932. After obtaining his Ph.D. in physics from the University of Maryland, he was a researcher at Princeton University and NASA, and taught at Purdue University.

When NTHU was reestablished in Taiwan in 1956 Shen served as assistant to President Mei Yi-chi and teaching assistant to professor Wu Ta-you. In 1973 he returned to Taiwan to teach at NTHU's Department of Physics. While teaching at NTHU Shen served as dean of the College of Science (1973-1979 and 1984-1987), the chairman of the Preparatory Committee of the College of Humanities and Social Sciences (1982-1984), the chairman of the Preparatory Committee of the College of Life Science (1987-1988), and the chairman of the Commission of General Education (1987-1988). In 1993 he was appointed president of NTHU and continued in that position until his retirement in 1997.

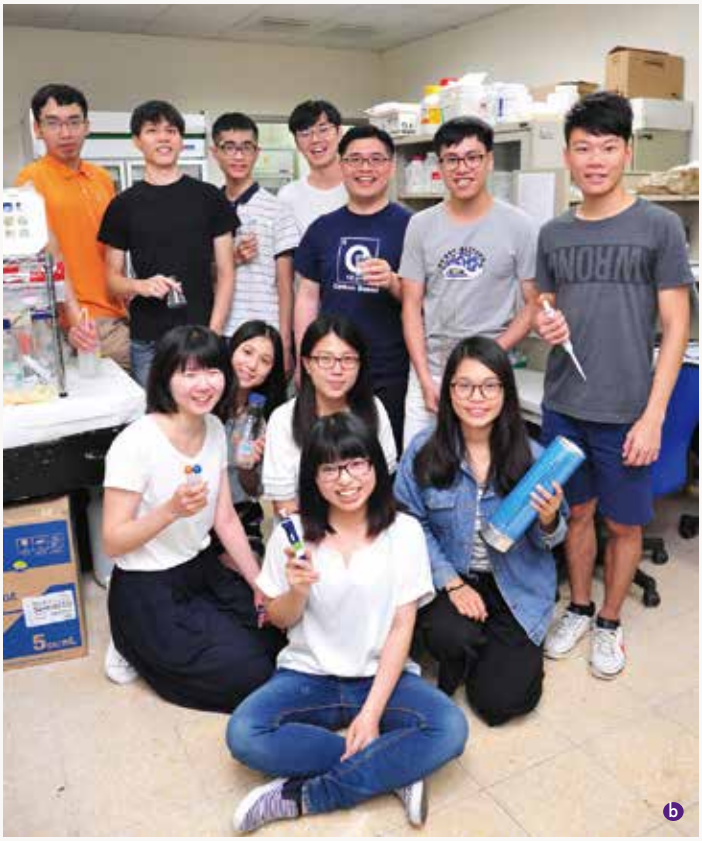
In 2006 Shen wrote a memo stating: "My association with Tsinghua began in 1956, and in 1973 I returned to Taiwan for good. It has been 33 years since then, and I have no plans to leave Tsinghua in the future. Therefore, as a way of expressing my special connection with Hsinchu and Tsinghua, I plan to arrange for a go garden to be established on the NTHU campus." Unfortunately, Shen had another stroke and went into a coma shortly afterwards, but his wish was finally fulfilled with the completion of the Go Garden in 2013.

Shen also used his superb skill in go to raise funds for the school. In 1995, while discussing fundraising for the school with a group of business leaders, Mr. Robert H. C. Tsao, the chairman of United Microelectronics Corporation, challenged Shen to a game of go and agreed to donate 10,000 dollars to NTHU for every point won by Shen. At first, Shen thought that Tsao was talking about Taiwan dollars, but as it turned out he meant US dollars, and Shen ended up raising NT$15 million for NTHU.

NTHU RESEARCH TEAM EXPLORES THE WORLD OF WATER AT LOW TEMPERATURES

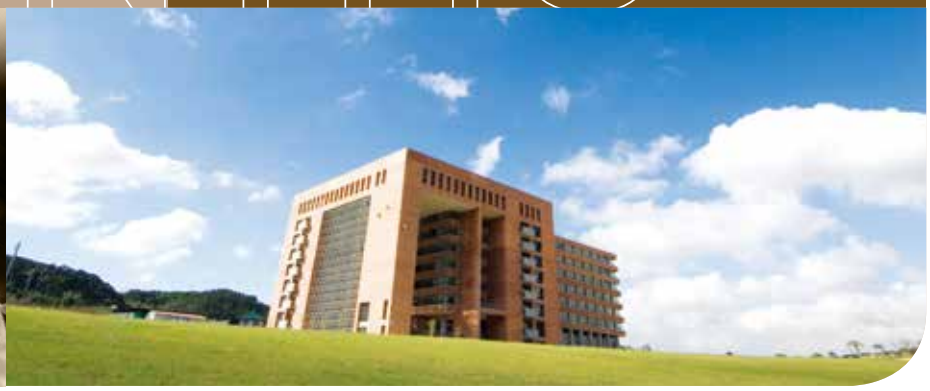
If intergalactic travel by a manned spacecraft ever becomes possible, it will take hundreds of years to reach another galaxy. In light of the average human life span at present, such an undertaking will thus require the use of cryonics—freezing a living body and later reviving it. One of the major hurdles facing the development of cryonics is that frozen cells can't fully recover their original functions. However, Prof. Chiang Yun-wei of the Department of Chemistry has used a technique known as saturation-transfer electron spin resonance (ST-ESR) to verify that there are two different liquid phases at a temperature of -93°C, constituting a major advance in the field of cryonics.

Together with his doctoral student Kuo Yun-hsuan, Chiang has presented his findings in a paper titled, "*Slow Dynamics around a Protein and Its Coupling to Solvent*," in which they unveil the mystery surrounding the interaction between water and protein. It was previously believed that water invariably controls the movement of proteins, but their study demonstrates that this is not always the case. Their paper recently appeared in the American journal *ACS Central Science*, and is the first full-length paper by Taiwanese researchers ever published by the journal. Their breakthrough was featured on the journal's



ⓐ Chiang specializes in the study of water molecules.

ⓑ Prof. Chiang Yun-wei of the Department of Chemistry and his research team.



Chiang's breakthrough research was featured on the homepage of the ACS Central Science website.

website under the headline "*Water 'Slaves' Protein Motions?*" The Highly Complex Behavior of Simple Water Molecules Water is the most important element of living organisms. All who has a grade school education knows that water exists in three different states, and most people know the boiling point and freezing point of water. But for Prof. Chiang water is anything but simple. As he puts it, "water molecules are extremely simple, but their behavior is highly complex!" For example, most people believe that there is only one kind of ice, when in fact researcher has so far identified 21 different kinds of ice crystals, and its derived thermodynamic phase diagram is unexpectedly rich and brilliant. There are still many unknowns, and the behavior of water is an important field of contemporary physical chemistry research.

There is only one ST-ESR system in Taiwan, costing more than NT$40 million, and by using it to measure the movement of water molecules at low temperatures Chiang's research team has observed that a "liquid-liquid critical phenomenon" occurs at temperatures between -33˚C to -93˚C.

They also found that at temperatures below -13˚C, an aqueous solution containing trace amounts of glycerin enters "liquid state one," and that at -83˚C it enters "liquid state two," both of which are quite stable. However, their densities and forms of movement are different, which seems counterintuitive, since both states are liquids consisting of the same elements, yet at low temperatures these elements separate from each other and remain on the surface of the protein. Chiang explains that as soon as fruit is frozen at a low temperature the cells swell, making freezing a rather ineffective means of preservation, since it tends to cause protein damage. If one day it becomes possible for spacecraft to travel to distant galaxies over the course of many light years, any humans on board will have to be placed in a state of suspended animation using cryonic technology, which currently exists only in sci-fi novels, but Chiang's research team has made a big step towards making it a reality.

Emancipated Protein Dynamics

Chiang's research helps to unlock the mystery of the interaction between water

and protein. It is well known that proteins must have water to function properly, but is water just a foil to protein? Or does it act more like a guide? This topic has been hotly debated in the scientific community for more than 20 years.

Chiang says that because the interaction between protein and water molecules is highly persistent and dense, it is quite difficult to clarify exactly how it works. Many researchers have attempted to do so by using low temperatures to slow down the molecular movements. Chiang's research team has also adopted this approach, but has also used ST-ESR, which has made it possible to observe slow-scale motion that had never been seen before.

Next, the team used site-directed mutagenesis to regulate the length of the protein side chains and to change the physical properties of their single side chains. This made it possible to clearly discern the individual movements of the protein and water molecules and to verify that many protein elements can indeed be emancipated from the control of water molecules, thereby overturning the widespread belief that water invariably dominates the movement of protein. Chiang points out that the movement of protein molecules is so complex that even with the most advanced supercomputers, it is still impossible to simulate every detail of their movement. From a mathematical point of view, his study proposes 5 to 10 basic movement elements of protein. They also observed the side chain motions (large movement) of protein at a low temperature, rotamer jumps between groups (medium movement), and structural fluctuations (small movement).

Chiang illustrates this with the example of building a skyscraper. In contrast to an ordinary brick wall, a skyscraper requires a steel frame, the floors and walls of which are finished with concrete. Chiang has found that basic dynamic elements of protein are a lot like that steel frame. And observing these basic dynamic elements of protein can help scientists to better understand how proteins use these movements to change their structure and function and how they work within cells.

Explorations at -93˚C

Kuo graduated from NTHU last year and is the first author of this paper. He is currently completing his alternative military service and preparing to go abroad for postdoctoral research. Chiang says that he has been very impressed by Kuo's enthusiasm and persistence, and that he is one of only a handful of people in the world proficient in ST-ESR technology.

Chiang is currently planning to continue using ST-ESR technology to explore the interaction between proteins and water molecules at even lower temperatures. As he puts it, "There's still a lot learn at temperatures below -93˚C!"

INNOVATIVE STEP COUNTER DEVELOPED BY NTHU ALUMNI

ⓐ Huang Hsi-wen (left) and husband Ma Hsi-pin have jointly developed a trailblazing step counter.
ⓑ In conjunction with a mobile app, the chip calculates distance walked and also provides GPS functionality.

The smart bracelets that counts your footsteps are popular all over the world, but have to be frequently taken off for charging. However, a husband and wife team consisting of Mrs. Huang Hsi-wen and Professor Ma Hsi-pin, both graduated from NTHU's Department of Physics over 20 years ago, have developed a "smartcube" that has the same capability but doesn't need to be recharged for three years. It also has a positioning function and can be embedded in the heel of a shoe. It has sold well throughout the United States and is a fine example of the outstanding innovative products being developed at the Tsinghua Lab.

Recently a number of well-known brands of athletic shoes have been inserting smart chips into their heels, but the products available at present only count steps and are much more expensive than average shoes. By contrast, the product developed by Huang, one of the founders of Gyro Systems, also has GPS positioning, but without the high price tag.

Tiny Yet Powerful

Huang and Ma were formerly classmates at NTHU. After working separately for more than 20 years in business and academic, they decided to work together to develop a new product, and that's how the smartcube came about. The chip is the size of a piece of candy and weighs only 7 grams. In conjunction with a mobile app, the smartcube tells you how many steps and kilometers you have walked, and where you were walking.

Professor Ma teaches at NTHU's Department of Electrical Engineering, and provided Huang with technical assistance. He said that Huang was a highly diligent student, and that she used her solid theoretical foundation to overcome the limits of power consumption. Using four hours of walking per day as the basis, the chip doesn't need to be recharged for three years, a total of 4,400 hours of walking.

Ma said that the cost of a chip is negligible in comparison to the cost of the shoes, and that it's imperative to produce chips which are nearly 100 percent free of defects, since any problem with the chip will result in costly returns, and the brand's reputation would be damaged.

The Challenges of Innovation

Overcoming various problems one by one, Huang and Ma managed to finally succeed in making chips which an American manufacturer has begun installing in its handmade casual shoes sold on a TV shopping platform. The manufacturer's first order was for 20,000 chips, and four months

Producing a chip free of defects requires extensive testing.

The step counter developed by Huang and Ma is inserted into the sole of a shoe and also has a GPS function.

later the second order was for 200,000; the next order is expected to be for more than one million. Presently a number of well-known manufacturers of athletic shoes have contacted Huang to discuss cooperation.

After recounting all the hardships involved in starting a business, Huang commented, "The road of entrepreneurship is full of difficulties; it's not for everyone." However, Huang adds, "but if you are really set on starting a business, then you have to come to Tsinghua, where you'll get all kinds of support."

A Tsinghua Enthusiast

Huang said that she first visited NTHU on a school trip during her elementary school years, and that she was so impressed with the beautiful campus that afterwards she set her sights on gaining admission to Tsinghua University.

While studying at NTHU, Huang was awarded the Mei Yi-chi Memorial Scholarship and eagerly participated in various activities. She said that her proudest moment was when she served as the captain of the NTHU Cheering Squad at the annual Meizhu Tournament, at which she also served as a scorekeeper and a member of the women's volleyball team. Her husband received the Academic Achievement Award three times.

After deciding to set out on the road of entrepreneurship, in 2015 Huang rented a space of 15 pings in the Innovation Incubation Center. The next year, the Tsinghua Lab was completed, and she was amongst the first batch of businesses to move in.

Jumping for joy in front of the Tsinghua Lab.

a During the two-day orientation program which began on September 4, President Hocheng pointed out the importance of regularly spending some quiet time alone.
b President Hocheng (center) with members of the A Cappella Club of the Nanda Campus.

PRESIDENT HOCHENG'S FIVE SUGGESTIONS FOR THE FRESHMEN CLASS

The new school year began in early September, and during the orientation program President Hocheng Hong encouraged the incoming students to take time out of their busy schedules, go to a quiet place, and turn off their mobile phones for 15 minutes. He explained that "Being alone is the key to deep thinking. If you are always interacting with others and compulsively fidgeting with your mobile phone, it's difficult to think creatively."

The two-day orientation program for the 2,000-plus new students began on September 4. During the program President Hocheng offered five suggestions: spend some quiet time alone; actively participate in student clubs; make good use of the winter and summer vacations; read the classics; and confer with knowledgeable people.

The Importance of Spending Time Alone

President Hocheng said that it is normal and necessary for college students to spend a few hours a day socializing and participating in extracurricular activities. But it is just as important to leave a little time for oneself. "Find a quiet place, turn off your mobile phone, and reflect on how things are going and how you are feeling." He said that doing this for as little as 15 minutes a day brings peace of mind and facilitates the assimilation of new information.

President Hocheng said that when he was in college, he would often sit on the lakeside at sunset to appreciate the glistening reflections on the water, and that this brought him a lot of inspiration and deepened his thinking.

Learning by Conferring with Knowledgeable People

President Hocheng also encouraged the freshmen to actively seek advice from teachers, alumni, and other knowledgeable people. "If you learn about someone with a very interesting idea, get together with a few classmates and invite that person to join you for a simple lunch."

President Hocheng believes that interacting with interesting people of various ages stimulates the imagination and encourages new ways of thinking.

Interestingly, President Hocheng suggested that the new students should also consider conferring with people who hold views which are different from their own, since doing so is a good way of challenging one's assumptions and stereotypes.

Learning by Reading Classics

President Hocheng also suggested that students should choose between one and three classics that are relatively deep and difficult to read, and make a close reading of

The two-day freshman orientation program began on September 4.

them during the summer or winter vacations, "Even if you only read one or two pages a day."

He said that during his college days he chose to read the abridged version of A Study of History, a 12-volume work by the British historian Arnold Toynbee, and that the volume titled Challenge and Response has had a lasting influence on his way of responding to challenges and crises.

President Hocheng recommended that students consider reading Principles of Communication Engineering by Irwin Jacobs, the American founder of the telecommunications equipment company Qualcomm. He said that Jacobs was awarded an honorary doctorate by NTHU and that since its publication some 50 years ago, this book has become the Bible of communication engineering, and is thus well worth reading.

President Hocheng said, "Politicians often talk about social equality and justice, but what is equality? What is justice? And what is a society?" He suggested that by systematically studying the classics in an in-depth manner, students can enhance their ability to think critically and engage in intelligent discussions.
He added that sometimes our views are mistaken, and that being open to correction is the sign of a truly wise person.

Participation in Extracurricular Activities

President Hocheng suggested that freshmen select one or two student clubs from amongst the 100-plus in existence, and actively participate, since "You'll get out of it exactly what you put into it."

President Hocheng said that during his time as a university student he was a member of the China Service Team. He recalled that that was around the time when Taiwan lost its seat in the United Nations and the United States ended its diplomatic ties with Taiwan. As a result, many university students in Taiwan were eager to step forward and serve the nation. On many occasions, President Hocheng has mentioned that the experience he gained with the China Service Team has had a major impact on his career.

Make Good Use of the Winter and Summer Vacations

The lives of primary and secondary school students in Taiwan are largely regulated by the school calendar. Even during summer and winter vacations there is homework and supplementary classes. Thus President Hocheng told the new students, "While in college you have a lot more freedom, and it's entirely up to you as to how you will spend your summer and winter breaks. You might cycle around the island, do an internship, or read a classic—it's up to you but be sure to do something meaningful!"

ⓐ NTHU President Hocheng Hong presenting the honorary alumni certificate to Ms. Chen.
ⓑ Ms. Chen Shu-chu and NTHU President Hocheng Hong.

TWO PHILANTHROPISTS AWARDED WITH NTHU HONORARY ALUMNI

Ms. Chen Shu-chu and Mr. Lee Kim Yew, one from Kaohsiung, Taiwan and the other from Malaysia were presented with the NTHU Honorary Alumni Award last June in two separate ceremonies to commemorate their respective philanthropic efforts that best exemplify NTHU's motto, ie. "Self discipline and social commitment."

On the evening of June 16, NTHU conferred an Honorary Alumni Award to Ms. Chen Shu-chu, widely acclaimed as a model of philanthropy. The conferral ceremony was held in Kaohsiung in conjunction with a meeting of NTHU alumni in southern Taiwan. The event was attended by over 150 members of the NTHU community who welcomed Chen with a standing ovation.

Chen was nominated by Professor Yang Rur-bin of the Department of Chinese Literature and Professor Tzeng Chyng-shyan of the Department of Life Science. The honorary alumni certificate was presented by President Hocheng Hong, and a lifetime alumni card was presented to Chen by Vice President and Chief of Staff Lyu Ping-chiang. Chen is the fourth person to receive this distinction.

Chen said that she only graduated from elementary school and was quite surprised to learn that NTHU would award an honorary alumni status to a simple vegetable seller like her.

When Chen learned that there are more than 10,000 students at NTHU, she urged all of them to put aside NT$10 or 20 a day for future donation to a worthy cause. She also pointed out that you don't have to have lots of money to be a philanthropist and that helping people brings a special kind of inner happiness that encourages you to do even more. Chen also said that she is grateful for all the guidance she has received from her elementary school teachers.

President Hocheng said that Chen fully embodies NTHU's school motto, "Self-discipline and social commitment," and that her virtues are beyond mere words. He lauded her as "a person of character," who has devoted herself to philanthropy for decades. He also said that what most people think of as great achievements are insignificant relative to her selfless generosity, adding that "I feel small in front of her." President Hocheng also pointed out that what Chen advocates is simple and clear, but not every one can do it, especially consistently over time, like Ms. Chen has.

Prof. Yang pointed out that of all the touching stories in the world, none quite matches that of Chen's, whose simplicity and generosity have become legendary. He said that the key to her success has been to concentrate on a single undertaking,

a Chen was nominated by Professor Yang Rur-bin (left) and Professor Tzeng Chyng-shyan.

b Ms. Chen being escorted into the hall by Alumni Association President Hsieh Yong-Fen (left) and NTHU President Hocheng Hong (right).

just like Mei Yi-chi did when he established NTHU in Taiwan; although their undertakings differed, their approach was the same. Yang also said that in addition to academic and economic success, NTHU should encourage the cultivation of character and wholesome values, an ideal shared by the leading educators in the East and West, and that Taiwan is very fortunate to have such a paragon of virtue as Ms. Chen.

Ms. Chen Shu-chu, a native of Taitung, Taiwan, was born in 1950. Upon completing elementary school at the age of 13 she started selling vegetables at a market in Taitung in order to support her family and to help her younger brother continue his education. For many decades she has been working six days a week, 18 hours a day, with utmost sincerity, integrity, and diligence, and no matter how much money she earns, she spends very little on herself, and donates most of her earnings to charity. Over the years she has donated more than NT$10 million to orphanages, schools, hospitals, and is planning to set up a charitable foundation. Her good deeds have received much attention at home and abroad.

When the Taiwanese film director Ang Lee heard about Chen he was so deeply touched that he recommended her to Time magazine for inclusion in its issue on the 100 most influential people in the world. In his nomination he states, "What's so wonderful about Chen's achievement is not its extraordinariness but that it is so simple and matter of fact in its generosity … of all she has given away, her greatest gift is her example."

In 2010 she was selected by Forbes Asia as one of its 48 Heroes of Philanthropy, Time magazine ranked her as one of the top 100 influential individuals in the world, Reader's Digest named her the fourth recipient of its Asian of the Year award, and the Ministry of Education awarded her its Education and Culture Medal. In 2012 she was awarded the Magsaysay Award. Despite all the acclaim, Chen maintains a simple lifestyle and a humble attitude. She said that her only reason for accepting an award is to inspire others to emulate her example.

On June 30th, NTHU awarded honorary alumnus status to Mr. Lee Kim Yew, a leader of the overseas Chinese community in Malaysia, for his outstanding philanthropic activities, including assisting Malaysian students to study at NTHU. The event was attended by Lee's friend Ma Ying-jeou, the former President of the Republic of China.

Before attending the ceremony, Lee visited the Mei Memorial Garden on campus to pay his respects at the sepulcher of Mei Yi-chi, the first President of NTHU in Taiwan. He said that he

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a Recipients of the Country Heights Filial Piety Scholarship offering Lee a bouquet of flowers as a token of appreciation.
b NTHU President Hocheng (left) presenting Lee with the honorary alumnus certificate.
c Former President Ma Ying-jeou was on hand to congratulate Lee.

is greatly honored to become an honorary alumnus of NTHU, and that if his mother were still alive, she would also be most pleased.

Lee believes that Chinese culture is founded on filial piety and fraternal love. Several years ago he established a scholarship at NTHU in honor of his mother, and now that he is an honorary alumnus he is hoping to do even more.

During the ceremony Lee announced that together with a number of other entrepreneurs he is planning to raise RM10 million (NT$75 million) to set up a student loan fund to help Malaysian students study at NTHU, with repayment terms based on a sliding scale. He is also planning to help NTHU promote preschool education, since early childhood education is the optimal period for cultivating a wholesome character.

President Hocheng Hong pointed out that, as a highly successful overseas Chinese businessman, Lee is in an excellent position for promoting traditional Chinese ethics. He said that Lee's favorite maxim is "Without personal ethics, a business won't succeed," and that its application has brought excellent results for Lee. As a result, in recent years Lee has been able to help lots of Malaysian students to expand their horizons by studying in Taiwan.

On Lee's request, President Hocheng once gave a talk in Malaysia on the theme of NTHU's motto, "Self-discipline and social commitment." Lee said that if he had known about this motto earlier, he would have sent his son to study at NTHU rather than in England.

President Ma said that Lee has been crucial in promoting Chinese ethical culture overseas. He said that Lee once invited him to give a speech at Southern University College in Malaysia, and that Lee provided everyone who attended with a free copy of Wang Yangming's Record of Instructions. He said that he was very impressed, and expects that Lee's becoming an honorary alumnus of NTHU will help to enhance Taiwan-Malaysia relations.
Lee is the founder and Chairman of the Country Heights Holdings Berhad group of companies. In order to recognize his outstanding contributions to society, the royal family of Malaysia has honored Lee with the title "Tan Sri," the second most senior title at the federal level. Lee was only 41 years old when he received the title, making him the youngest Chinese-Malaysian to ever receive it.

In 2014 Lee donated NT$16 million to establish the Country Heights Filial Piety Scholarship, which supports outstanding

Lee said that he is deeply honored to become an honorary alumnus of NTHU.

students from Malaysia enrolled at NTHU. Every year the scholarship is awarded to ten students with excellent grades and exemplary character, and is open to students of any ethnicity, including Malays, Chinese, and Indians. The recipients receive NT$100,000 per year for up to 4 years, and so far the scholarship has benefited 31 students.

In November last year Lee visited our campus to meet with the current recipients of the scholarship. He received a standing ovation from the grateful Malaysian students, many of them said that without this scholarship they would have found it impossible to enroll at any college, let alone NTHU.

During the ceremony, Ong Huini, a second-year student of the Department of Chinese Literature, presented Lee with a bouquet of flowers to express her appreciation for the scholarship. She said that she first learned about the scholarship when she decided to apply to NTHU, and that after enrolling one of her seniors encouraged her to apply.

Ong said that she feels very fortunate to have been awarded the scholarship, thanks to which she can give full attention to her studies. She also said that Lee's philanthropic spirit has made a strong impression on her and that she hopes to emulate his generosity after she graduates.

Lee was born in a poor rural family in 1955. After graduating from high school at the age of 17, he borrowed RM100 from his brother and went to Kuala Lumpur to make his way in the world. After stints in a printing company, an antique furniture store, and as a salesman, at the age of 20 he founded his own company, and by the age of 21 he had already earned his first million. Lee later made real estate the focus of his efforts, and eventually established a business empire in Malaysia.

Lee takes traditional Confucian ethics as his guide in life, and requires all of his employees to uphold the ethical principles laid out in the Confucian classic. He often says, "Seeing that filial piety is the foundation of virtue, if a person does not even respect his parents, how can you expect him to be loyal to the company?" For Lee, the essence of the Confucian tradition is encouraging goodness and rectifying evil, and that this is also the key to a happy life. This is why he named the scholarship the "Country Heights Filial Piety Scholarship."

NTHU TEAM GARNERS AWARDS AT THE 2018 ASC STUDENT SUPERCOMPUTER CHALLENGE

A team of students from the Departments of Computer Science and Mathematics participating in the finals of the 2018 ASC Student Supercomputer Challenge came out amongst the top 20, broke the record for an accelerated supercomputer system, won the Highest LINPACK award, and the First Class award.

Members of the NTHU team with their mentor (from left): Scott Cheng, Chang Ron, You Liyu, Prof. Jerry Chou, Wang Yucheng, and Johnny Lin.

The ASC Student Supercomputer Challenge has been held annually for the past seven years, and is the largest such event in the world. This year's competition was held at Nanchang University in China. More than 300 teams from around the world signed up and 20 teams advanced to the finals. The NTHU team was led by Chen Weijun of the Department of Computer Science and Scott Cheng of the Department of Mathematics. The remaining four members were You Liyu, Wang Yucheng, Chang Ron, and Yang Tienchi, all of the Department of Computer Science.

The team's advisor was Prof. Jerry Chou of the Department of Computer Science, who for many years has been training students to participate in similar competitions. As required the team must be composed of undergraduate students regardless of their majors. In the competition each team uses a super-computing computer system built by the team to complete several calculation tasks in different application domains under certain power and time constraints. Each team's score is based on the number of calculations completed and the amount of time used. In addition to applying textbook knowledge, the team must also find novel ways to solve the real-world problems presented in the competition.

Members of the NTHU team at the 2018 ASC Student Supercomputer Challenge (from left): Yang Tienchi, Wang Yucheng, Chang Ron, You Liyu, Scott Cheng, (organizer), Chen Weijun, and Hsu Kengjui.

In this competition, the NTHU team achieved a continuous floating-point operations per second (FLOPS) of 42.99 megabits for the overall system under the constraint of 3,000 watts of power consumption. Floating-point refers to a numeric value with a decimal, and FLOPS is used to determine the computing power of a computer. One TFlops/s represents one megaflop of floating-point operations per second. The team's outstanding performance was a significant improvement over the record set at the 2017 ASC, for which it won the Highest LINPACK award and the First Class award.

Team leader Chen Weijun said that all the team members had been preparing for at least one year, including winter and summer vacations, typically meeting every week to discuss their works. In addition, a lot of time was spent reading research papers and testing applications.

Prof. Chou thanked the Department of Computer Science for its support, Quanta Cloud Technology and Quanta Computers for providing travel funds and computer equipment, and the National Center for High-performance Computing (NCHC) for assistance with calculation software technology, all of which were instrumental in the team's outstanding performance. He also said that he is looking forward to seeing a new generation of talented students in Taiwan applying themselves to the development of high-performance computing.

NTHU is a traditional powerhouse in the university supercomputer competitions. At competitions held in the United States, the NTHU team won the overall prize in 2010 and 2011, and won the Highest LINPACK award in 2007, 2008, and 2014; at a competition held in China in 2012 the NTHU team won the second prize.

LOW-CARBON GREEN ENERGY SUMMER SCHOOL

ⓐ Participants on the last day of the Low-carbon Green Energy Summer School.
ⓑ Visiting the nuclear reactor at NTHU.

In 2012 NTHU's Department of Engineering and System Science, the Department of Engineering Physics at Tsinghua University in Beijing, and the Department of Mechanical and Biomedical Engineering at the City University of Hong Kong signed a memorandum of cooperation detailing their plans to take turns organizing the Low-carbon Green Energy Summer School. This year's program was organized by the Department of Engineering Physics at Tsinghua University in Beijing, and included both academic and cultural exchanges.

Balancing Energy Sources

During the program participants engaged in numerous discussions on energy issues on both sides of the Taiwan Strait. The Taiwan segment of the program included a visit to the Green Energy and Environment Laboratories of the Industrial Technology Research Institute, where the participants discussed such issues as the uncertain future of nuclear power in Taiwan. Gao Zhiqiang, a junior in the Department of Mechanical and Biomedical Engineering at the City University of Hong Kong, said that he was surprised to hear that Taiwan is planning to phase out nuclear energy by 2025.

In Gao's opinion, nuclear energy is also a low-carbon energy option which should be developed with the same emphasis given to wind power and solar energy. In his view, despite the uncertain future of nuclear energy in Taiwan, those with a background in nuclear engineering will continue to be in high demand. Wu Shushen, also a student from Hong Kong City University, said that we need to have a mix of energy sources, rather than over-emphasizing on renewable energy.

Li Haoxin, also a student from Hong Kong City University, said that mainland China has attached great importance to nuclear power in recent years, and that lots of students are eager to gain admission to a university department related to nuclear engineering. He also noted that talented students studying nuclear engineering at Tsinghua in Beijing are often recruited by companies even before they graduate, and may even have their tuition fees paid by the company.

Sharing Common Interests

The participants were divided into five groups of 11 or 12 students. In each of the three locations the local students acted as hosts by leading visits to various tourist attractions, and during the program the participants got to know each other quite well. Lots of close friendships were made, resulting in a teary departure at the Taoyuan

Airport when the program ended in early August.

Some of the participants said that during the Beijing segment of the program the World Cup soccer match was being held in Russia, so they had a World Cup party of fried chicken and beer, and that they also went out for some authentic Beijing roast duck at a local eatery. While in Hong Kong, the participants were lucky enough to catch the last horse race of the season. During the Taiwan segment, the participants visited Yilan, Nantou, Taichung, and visited a night market. According to a participant from Beijing, everyone became like old friends, and also put on some extra weight.

Wu admitted that he was a bit disappointed when it turned out that his group didn't have any female members. However, the 11 guys in his group hit it off so well that they were soon talking non-stop and even began using communication software to chat at night, much to the detriment of their teacher's sleep. He also said that their teacher told them that it's not possible to learn very much in an one-month program, so the emphasis is on getting to know students from different places.

Kao Tienhong, a student at NTHU's Department of Engineering and System Science, said that the program helped him broaden his horizons and get to know his future colleagues, adding that he found the participants from Beijing to be eloquent speakers and quick thinkers, and those from Hong Kong to be friendly, lively, and humorous and he had learned a lot from them. The participants from Hong Kong found that the professors from Beijing were more serious and rigorous, in contrast to those from Taiwan, who often used jokes, humor, and current events to attract students' attention.

c Making the most of the final day of the program.
d Many new friendships were started during the one-month program.

Learning about the Latest Energy Technologies

Director of the Department of Engineering and System Science Professor Wu Yung-hsien said that NTHU is the only university in Taiwan, Hong Kong, and China with a nuclear reactor for research, and that visiting this facility was the highlight of the program for many of the participants. He also said that the teachers participating in the program are authorities in such areas as hydrogen energy, nuclear energy, solar energy, energy policy, fuel cells, and hydrogen storage.

Wu pointed out that the Department of Engineering and System Science encourages its students to participate in exchange programs with Hong Kong and China by covering half the cost of air tickets, visas, and insurance. As for food and accommodation, these are provided by each host school, so that each participant's personal expenses comes to less than NT$10,000. Some past participants have gone on to earn a double master's degree at Tsinghua in Beijing or follow up on overseas employment opportunities.

DIABOLO DIPLOMACY AT THE UNITED NATIONS' 9TH UNIVERSITY SCHOLARS LEADERSHIP SYMPOSIUM

a Chiu Yishu of the Institute of Technology Management in the USLS's official promotional video.

Three female students from NTHU recently participated in the United Nations-sponsored University Scholars Leadership Symposium (USLS). Among them, Chiu Yishu of the Institute of Technology Management put on a dazzling diabolo performance at the event. In addition to appearing in the Symposium's official promotional video, she also performed at the closing ceremony. Her superb diabolo skills dazzled participants from all over the world.

Since Taiwan is not a member of the United Nations it was not possible to display Taiwan's national flag at the event, and Chiu was feeling rather dejected as she watched the other representatives waving their national flags. However, she still managed to proudly display Taiwan's national colors by using a red and blue diabolo in her performance and by wearing a cheongsam with a Hakka pattern on the first day of the event.

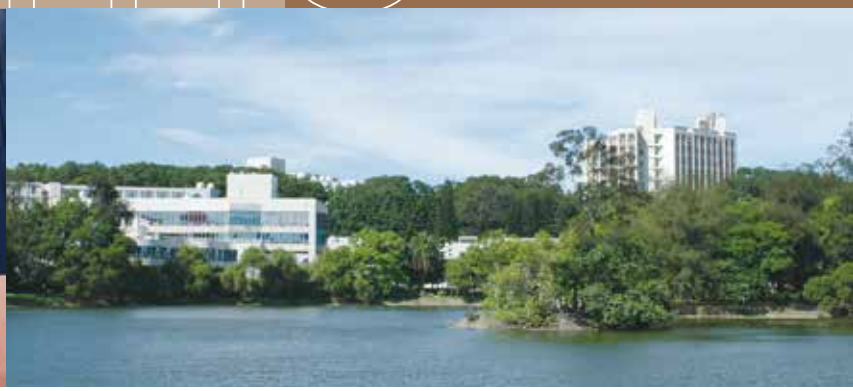
The USLS is hosted by Humanitarian Affairs of the United Kingdom and the United Nations Development Programme and was held at the United Nations Conference Centre in Bangkok in early August. The 2018 conference was attended by 1,057 youth delegates from 87 countries. In addition to inspiring speeches and discussion sessions, the conference also included a special "service day."

A Woman of Many Talents

On the service day Chiu went to one of Bangkok's slums, where she gave the children English lessons, helped to tidy up the school, and donated some supplies she collected for the program. Her group also led a touching song and dance session. Chiu, who began spinning the diabolo at a young age, also taught the children how to spin it. Little did she know that the film of her demonstration would be included in the symposiums' publicity film, and that she would be invited to perform at the closing ceremony.

For her performance during the closing ceremony, Chiu was given a mere 3 minutes and 20 seconds, placing her under considerable restrain. But when she stepped onto the stage, bolstered by the applause of all the friends she had made in the past five days, she came through with one of her best performances ever. The choreographer of the ceremony was so impressed that he told her, "If you come back next year, I will give you ten minutes!"

Chiu is a woman of many talents. In addition to winning Taiwan's national diabolo championship, she also won a gold medal in Taiwan's collegiate table tennis



b Chiu was the only delegate to perform in the closing ceremony of the USLS.
c Chiu wearing a cheongsam with a Hakka pattern at the USLS.

tournament; won the first prize at the Tsing Hua Entrepreneurship Day; has served as the international youth ambassador of the Ministry of Foreign Affairs; was the runner-up at Miss Taiwan 2017; and will represent Taiwan at next year's Miss International beauty pageant.

NTHU's Three Emissaries at the USLS

As a way of encouraging students to expand their horizons and gain overseas experience, every year NTHU provides subsidies for students to participate in the USLS. This year, in addition to Chiu, NTHU was also represented by Anna Chou of the Department of Life Science and Janice Kao of the Department of Industrial Engineering and Engineering Management.

Chou, who is about to enter her senior year, said that because of her strong interest in international exchange, she regularly participates in related extracurricular activities. She also frequently visits the website of the Office of Global Affairs, and that's how she learned about the USLS; she applied and was awarded a travel subsidy of NT$10,000. During the summer vacation of her sophomore year she went to Kenya as part of the NTHU International Volunteer Society, and next year is planning to participate in cross-strait cultural and entrepreneurial exchange camps. She is also applying to exchange programs at NTHU's sister schools in China, Fudan University and Zhejiang University.

On the "service day" Chou joined a group which helped to clean up a watercourse choked by water hyacinth, and was much surprised when her group succeeded in removing 40 tons of these invasive water plants in less than four hours.

Janice Kao, who is about to enter her junior year, took advantage of the afternoon tea party to make friends from all over the world and observe the different ways of thinking among Western and Asian students.

In her senior year Chiu participated in an exchange program at Zhejiang University and will soon participate in another exchange program at NTHU's sister school in Germany, the University of Tübingen. She encourages her younger classmates to participate in international programs to gain valuable experience and broadening their cultural horizons.

CHEN NIEN-CHIN RETAINS HER CROWN AT THE WORLD UNIVERSITY BOXING CHAMPIONSHIP

a Chen (left) with her coach Ke Wenming.

Chen Nien-chin, a senior of the Department of Physical Education, recently participated in the 2018 World University Boxing Championship held in Russia, and in the finals on the evening of September 6th successfully defended her crown. Under the guidance of her coach Ke Wenming, Chen won the women's middleweight (75 kg) championship, which she had previously won in the 2016 World University Boxing Championship held in Thailand.

The 2018 World University Boxing Championship opened on September 1st in Elista, Russia. Chen's first match was with Hungary's Petra Stateman and Chen scored a 5-0 victory to advance to the finals. In the finals, Chen won a gold medal with a 3-2 victory over Russian Anna Afinogenova.

Hailed by the media as the "Amis War Goddess" and the "Boxing Queen," Chen's first adult tournament was the Bulgarian Invitational in 2015; in 2016 she won the bronze medal in the 75 kg class at the World Amateur Women's Boxing Championship, thereby qualifying for the 2016 Olympic Games in Rio, where she advanced to the top 16; in 2017 she won a gold medal in the 75 kg class at the Ulaanbaatar Cup, and also won a gold medal at the same event in 2018 competing in the 69 kg class.

"Chen is in good shape this year, and she hasn't lost a single match," commented Coach Ke. Chen didn't compete in this year's Asian Games in Jakarta because they didn't include a women's 69 kg or 75 kg class. However, she did attend the event, both to cheer for fellow NTHU boxer Tu Po-wei and to participate in a local training program.

Chen said that she prepared for her latest match by increasing her flexibility and refining her strategy in the ring. With a height of 169 cm, Chen is shorter than most heavyweight female boxers. But when Ke discovered how quick and agile she is, he devised for Chen a kind of rising punch which has been particularly effective against taller opponents. Moreover, on the official website of the World University Boxing Championship, Chen is described as a "strong opponent."

"My ultimate goal is to win a gold medal for Taiwan in the 2020 Tokyo Olympics," says Chen.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EXPERIMENTAL EDUCATION IMPLEMENTED AT NTHU

Experimental education in Taiwan now extends from primary and secondary school to university. An experimental education program proposed by NTHU has been approved by the Ministry of Education for a total of seven sophomores, each of whom has designed their own curriculum for the next three years and selected their advisor. Credit for overseas study can also be earned. Now university education can be tailor made to allow for maximum freedom.

Breaking the Credit Mold

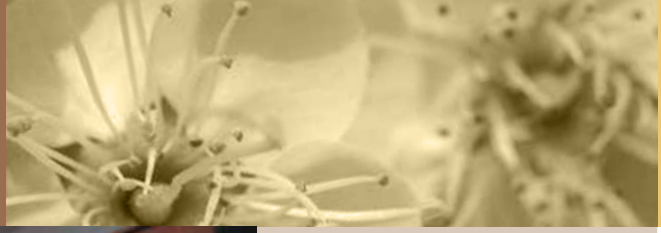
In 2015 NTHU set up the Extraordinary Student Program which grants admission based an interview rather than standardized tests. In order to meet the needs of these students, Tsinghua launched the Individualized Education Plan last year to provide a more flexible and diverse curriculum. However, some students still felt that this was inadequate. It is expected that the Tsinghua Experimental Education Program will help to solve this problem.

According to NTHU's Vice President of Academic Affairs Tai Nyan-Hwa, the newly-developed Experimental Education Program breaks all the learning and credit molds. There are almost no other restrictions besides the 28 compulsory credits still required. Students in the program can major in Waldorf education, STEAM education, innovative education, or e-commerce, taking classes on campus or off campus, as long as their plan is approved by the supervising committee.
For example, Tai said that in most of the counterpart programs at other universities, the scope for selecting coursework is highly limited. By contrast, students in the NTHU program largely design their own curriculum, as long as their plan is approved by their committee.

Off Campus Credits

Tai said that the students' coursework can include general classes, atypical classroom courses, off-campus internships, and international study. Students are encouraged to study in different fields and regions. Some students' study plans include going overseas to study and engage in fieldwork, and one student is planning to act as a citizen journalist and write an in-depth research report.

Tai said that each participating student is guided by an advisory committee of 3-5 faculty members headed by a full-time teacher at NTHU.
In addition to each of the more than 20 students who are enrolled in the special admission program, the experimental education program is also open to 1% of the college students in any department. "This year there wasn't much time to apply, but I believe that there will be quite a few next year," said Tai.
Tai pointed out that all students participating in the experimental education program must complete a special



ⓐ Li Meng Yi (left) and Su Chi-Wei (right), both entered Tsinghua University under the Extraordinary Student Program and have now joined the Experimental Education Program.
ⓑ Lin Fangru, who was admitted under the Extraordinary Student Program has also joined the Experimental Education Program.

Dean of Academic Affairs Tai Nyan-Hwa, the newly-developed Experimental Education Program breaks all the learning and credit molds.

report and publish it publicly before graduation. As for the degree earned, it will be either a B.S. or B.A., depending on the student's curriculum, and can also indicate the student's specialization.

If a student in the experimental program finds it unsuitable, he can switch back to a conventional program. Tai said that the experimental students can return to their original department.

Tai also said that the experimental education program will definitely not be easier than the general academic system, and that students in the program have to be highly motivated and independent. He also stressed that experimental education is not suitable for everyone. If college students are uncertain about their future career, it may be safer to choose an existing discipline.

Exploring New Directions

Su Chi Wei, who has won four RoboCup championships, entered NTHU under the special admissions program a year ago and is about to enter his sophomore year. He originally joined the Department of Industrial Engineering and Industrial Management, but after starting his own business he decided to apply to the Tsinghua Experimental Education Program.

Su Chi-Wei said that he wanted to major in STEAM education, which integrates science, technology, engineering, art and mathematics. The experimental education program allows him to freely choose various courses he wants to study, such as brain science.

Li Meng Yi, who gained special admission based on his expertise in magic squares and transferred to the Department of Computer Science in his sophomore year has also decided to join the first batch of experimental education students at NTHU.

Li Meng Yi said that it is great to be able to study at NTHU due to its constant striving to improve the educational environment. He has already completed an internship with a foreign company and has opened a magic box course. The experimental program allows him to give more attention to internship and practice, rather than sitting in the classroom to listen to theoretical courses.

Lin Fangru, who was admitted under the special admissions program and then joined the Department of Humanities and Social Sciences, is majoring in "Socio-cultural Analysis and Innovation." She said that Tsinghua's experimental education program is student-centered and encourages individuality.

One of the unsolved issues regarding the experimental education program is how it will work out if a graduate of the program applies to graduate school. However, Lin expects that completing the program will provide her with a wide range of future career choices.

NATIONAL TSING HUA UNIVERSITY WELCOMES INTERNATIONAL STUDENTS

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Fall Semester Application Graduate Program: January 1~March 15
Undergraduate Program: November 15~February 15
Spring Semester Application: August 15 to October 16

Exchange Student
Fall Semester Application: February 1~ April 15
Spring Semester Application: September 1~November 1

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