清華

NATIONAL TSING HUA UNIVERSITY

NEWSLETTER

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NTHU PRESIDENT KAO WELCOMES FRESHMAN CLASS

The fall semester at National Tsing Hua University, which began on September 12, was preceded by an orientation for freshmen that started on September 7. During the orientation, president W. John Kao emphasized the importance of striking a balance between study and social life, which he compared to staying upright while riding an electric scooter---as he himself did in a film welcoming the new students.

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This year's freshman class consists of 2,400 students, 320 of whom are foreigners. Last year's orientation was held online due to the pandemic, but this year this exciting event was held in person.

The theme of this year's freshman orientation was "The City of the Future," and it was planned by a student team. The lead student organizer for the orientation was College of Nuclear Science undergraduate Pan Yenchih (潘彦致), who said that each new student was given a specially designed magnetic key that they used during the 3-day orientation as a student ID card while participating in the various activities held all over campus. The key was also used to accumulate points for a lottery and as a convenient way to carry out contact tracing because of the ongoing Covid-19 pandemic.

President Kao made a dramatic entrance in which light bars on both sides of the central aisle lit up as he went forwards, bumping elbows with students, and waving to the assembly. In addition, the student organizers also designed

a. NTHU president W. John Kao holding the unique magnetic plaque embossed with his portrait.
b. This year's freshman class consists of 2,400 students.
c. President Kao made a dramatic entrance in which the light bars on both sides of the central aisle lit up as he went forwards.
d. At the end of his speech, Kao took out his mobile phone, took a selfie with the assembly as the background, and posted it to his IG live feed.


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a unique magnetic plaque embossed with Kao's portrait; when it was sensed by a receiver, a speaker on the stage announced, "Freshman W. John Kao," along with his date of matriculation and his student number.

Kao smilingly pointed out that he is also a freshman of sorts since he became the president of NTHU only four months ago. During his speech, he asked the freshmen to stand up, shake hands with their classmates, and say hello to one another. In addition to welcoming the freshmen to NTHU, he told them that from now on they will have to make a lot of choices with respect to both their studies and social lives.

Kao recalled that when he was still in high school in the United States, his parents moved to Europe for work, leaving him to live alone. Every day he had to make a series of choices, mostly small ones, such as what to eat for breakfast, whether or not to wash his clothes, and whether or not to go to class. But there were also some big choices to be made, like which university to apply to and what to major in. As he explained, "I didn't know it at the time, but this was an essential part of growing up, becoming independent, and learning how to take responsibility for every choice I made."

President Kao riding an electric scooter in a film welcoming the new students.

But making the right choices is not easy. That's why Kao's advice to the freshman class is to try to strike a balance in whatever they choose. He further pointed out the need to maintain a parity between study, extracurricular activities, and socializing, and to make some time for oneself. And the same applies after graduation, since it's important to strike a balance between work and family life, and between a good salary and doing what you find meaningful and satisfying. In short, "Life is a balancing act!" concluded Kao.

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e President W. John Kao holding the unique magnetic plaque embossed with his portrait.
f. Last year's freshman orientation was held online due to the pandemic, but this year this exciting event was held in person.

At the end of his speech, Kao took out his mobile phone, took a selfie with the assembly as the background, and posted it to his IG live feed.

Tsou Yunhsi (鄒芸熹), a freshman in the Department of Education and Learning Technology, said that after listening to Kao's talk, she was reassured that she had made the right choice in coming to NTHU. Wang Yichen (王儀蓁), also a freshman in the Department of Education and Learning Technology, said that his plan for the next four years includes both expanding his horizons and honing his decision-making ability.

Due to the ongoing pandemic, all those who participated in the freshman orientation were required to have been fully vaccinated against Covid-19, or to submit a negative test result made within the past 48 hours; a rapid screening station was set up on campus for those who required it. For the fall semester, most classes will meet in person; any students who test positive for Covid-19 will be required to stay at home for one week.

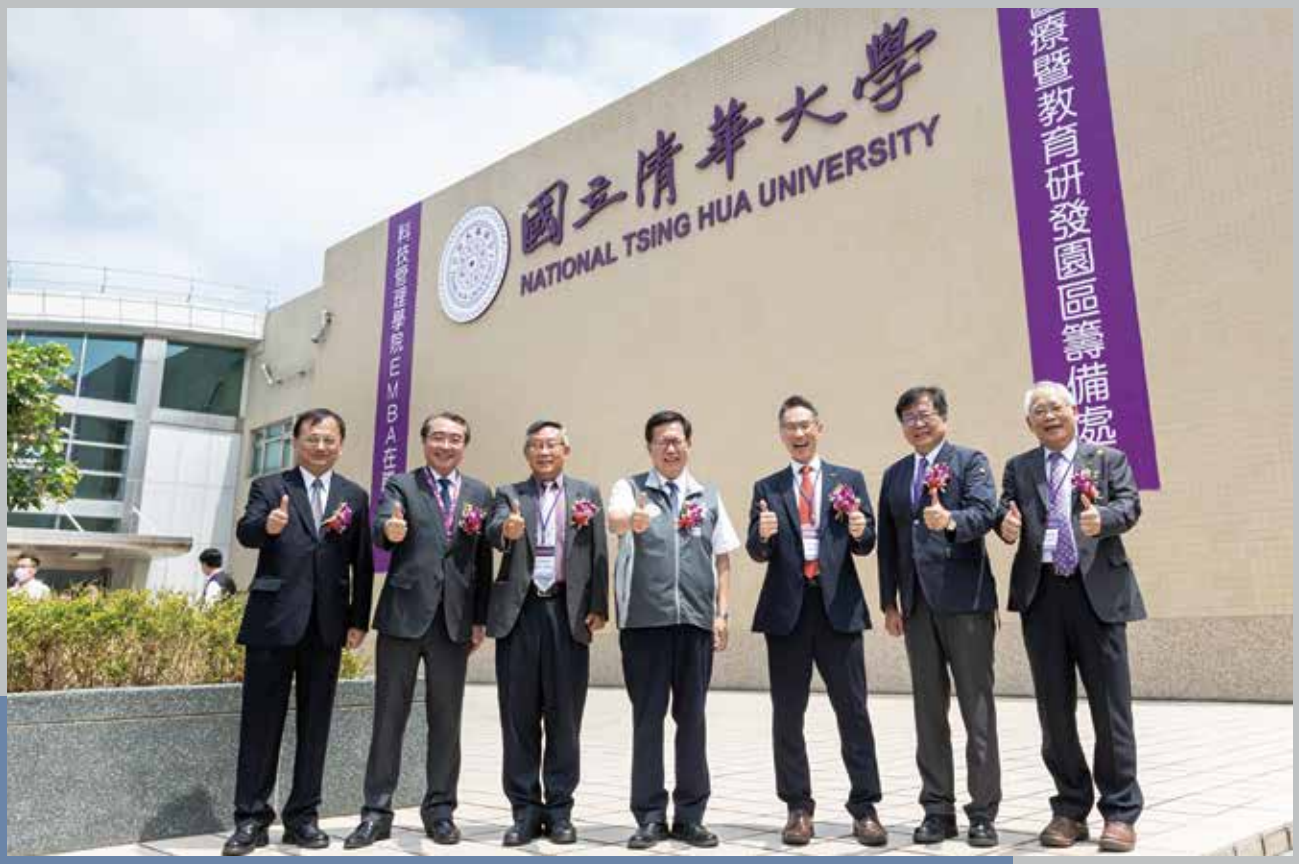
TSING HUA UNIVERSITY HOSPITAL PREPARATORY OFFICE OFFICIALLY OPENS IN TAOYUAN

On August 20, the Tsing Hua University Hospital Preparatory Office was officially opened in the Xinkong Building at the Taoyuan Metro Corporation's Qingpu Depot, which is only one MRT station away from the site where the Hospital will be built.

NTHU and the Taoyuan City Government have already signed a letter of intent outlining their plan to jointly establish a world-class medical center that will serve the local community; the plan also includes assistance in the training of bilingual teachers and support for science education and experimental education at Taoyuan's kindergartens, primary, and secondary schools.

The Preparatory Office was officially inaugurated by Taoyuan City mayor Cheng Wen-tsan (鄭文燦), NTHU president W. John Kao, and senior vice presidents Lyu Ping-chiang (呂平江) and Tai Nyan-hwa (戴念華), Taoyuan Metro chairman Liu Kun-yi (劉坤億), and Taoyuan Aerotropolis chairman Chen Hsi-chen (陳錫禎).

Mayor Cheng has played a key role in the early stages of the Hospital project. He pointed out that Taiwan is good at both



At the opening ceremony (right to left): NTHU senior vice presidents Tai Nyan-hwa(戴念華) and Lyu Ping-chiang(呂平江), NTHU president W. John Kao, Taoyuan City mayor Cheng Wen-tsan(鄭文燦), former NTHU president Hocheng Hong(賀陳弘), Taoyuan Metro chairman Liu Kun-yi(劉坤億), and Taoyuan Aerotropolis chairman Chen Hsi-chen(陳錫禎)

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a. Presidnet W. John Kao, and Taoyuan City mayor Cheng Wen-tsan signed the letter of intent to jointly establish a world-class medical center.
b. The Preparatory Office cum EMBA classroom officially inaugurated.

electronics and medical care, both of which are taught at NTHU, and that's why he has been such a staunch supporter of NTHU through all the difficulties which have arisen in the planning stage.

Cheng emphasized that it will take only ten minutes for an ambulance to go from the Taoyuan International Airport to the emergency room at the new hospital, and that in addition to cosmetic surgery and health examinations, the Hospital will also provide critical care and boron neutron capture therapy (BNCT).

Moreover, the Hospital is expected to become a leading center for the development of advanced cell regeneration technology.

President Kao said that this is a very important day for NTHU, in that the school has long had its sights set on medical education, and now the dream has finally come true, noting that "Today is a new milestone in this 50-kilometer journey from NTHU to Taoyuan, which has been going on for some 66 years."

Kao also noted that this year could be seen as the "year of medicine" at NTHU, since the first batch of medical students has recently been enrolled.

The Hospital will be located near the Hengshan Station (A16) of the Airport MRT line, on a parcel of land provided by Taoyuan City. The size of the parcel is 7.2 hectares, of which 5 hectares will be used for the Hospital itself, while the remaining 2.2 hectares will be used for the affiliated teaching and research facilities.

NTHU senior vice president Lyu Ping-chiang said that the BOT agreement will be finalized by the end of this year, and that construction will start next year, soon after the parcel is transferred. The Hospital is expected to be completed by the end of 2027 and opened in 2028.

The Hospital will initially have 200 general acute care beds, plus an intensive care unit, a respiratory care unit, negative pressure isolation rooms, and a psychiatric unit for both inpatients and outpatients, all of which will be gradually expanded over a number of years to reach a total capacity of 910 beds.

POST-BACCALAUREATE PROGRAM IN MEDICINE ENROLLS FIRST BATCH OF 23 STUDENTS

The Post-baccalaureate Program in Medicine at National Tsing Hua University has recently announced its first batch of 23 students, including 22 in the Natural Science Group and one in the Information Technology Group, all of whom have been awarded government scholarships. Among them is a student who gave up an admission offer from Yale University in the United States and a job offer from TSMC to enroll at NTHU, and a pharmacist who dropped out of school due to family circumstances. The entire cohort of medical students is eager to delve into cross-disciplinary medical research and primary medical services, and proud to be a part of this new chapter in the history of NTHU.

The director of the Post-baccalaureate Program in Medicine is Chou Hunghsueh (周宏學), who said that since it took longer than expected for the admission quota to be finalized by the Ministry of Education, the admissions exam was held shortly after the prospectus was published. Whereas 431 people applied for the Natural Science Group, there were only 28 applicants for the Information Technology Group, mainly because the exam differs from that previously used by postgraduate programs in medicine in that it requires taking the exam in biology and biochemistry at the same time as the exam in information science, leaving applicants with little time to prepare. It's expected that the Information Technology Group will begin enrolling a larger number of students from next year.

Chou said that the Program emphasizes interdisciplinary studies, and that the first batch of students majored in various subjects at university, including optoelectronics,

The Post-baccalaureate Program in Medicine at National Tsing Hua University has recently announced its first batch of 23 students.

chemistry, pharmacy, physical therapy, and life sciences. In addition to the written test, candidates were also evaluated on the basis of their application materials and an eight-stage interview process, during which particular attention was paid to their interest in working in areas of Taiwan with insufficient medical resources after graduation.

Among the first batch of students are three graduates of prestigious overseas schools, including the University of California, Los Angeles (UCLA). Yeh Yiyu (葉怡佑) graduated from the Department of Medical Engineering at the University of California, San Diego (UCSD), and has been offered admission to master's programs at Johns Hopkins University and three ivy league schools---Yale University, the University of Pennsylvania, and Columbia University. Due to the Covid-19 pandemic, she returned to Taiwan to take classes remotely. After class, she worked as a volunteer at a free clinic, which brought to her attention the shortage of manpower and front-line medical resources, resulting in her decision to apply to this innovative program at NTHU.

Yeh Yiyu (葉怡佑) decided to enroll at NTHU instead of Yale University, the University of Pennsylvania, and Columbia University.

Yeh is particularly interested in medical materials, and during university she participated in the development of a portable sepsis detector. She said that sepsis testing used to require a trip to a big hospital and that it took two days to get the results, but this portable and affordable device makes it possible to diagnose sepsis within six hours at a local clinic. Her experience working on this project strengthened her determination to apply to the Post-baccalaureate Program in Medicine at NTHU.

Yu Hanyu (游涵喻) took a leave of absence from graduate school so she could work as a pharmacist.

Also in the first batch of students is Yu Hanyu (游涵喻), who graduated from the Department of Pharmacy at National Taiwan University (NTU), during which time she worked as a teaching assistant and tutor to cover her tuition and living expenses. But in her first year of graduate school, due to her family's financial situation, she had to take a leave of absence so she could work as a pharmacist at a pharmacy near home. Now that her family's financial situation has improved, she has decided to resume her studies with the help of

a government scholarship.

Despite her demanding work schedule during university, Yu still managed to find time for volunteer work, including teaching English at a rural elementary school in Thailand. She also ran an English reading club and donated the proceeds to charity. During her leave of absence, she spent an hour every day as a companion to people suffering from depression, and it was this experience that led her to set her sights on becoming a psychiatrist.

The only student in the Information Technology Group is Chou Mingchin (周明瑾), who recently graduated from the Program for Science and Technology of Accelerator Light Source at National Yang Ming Chiao Tung University (NYCU), and who has already received a job offer from TSMC. During her M.A. studies, Chou developed an interest in medical technology, and she has decided to shift her focus to research on medical imaging and AI-assisted diagnosis.

Chou admits that it was not an easy decision to make, especially since she was under a lot of pressure from her parents to go into the technology industry after graduation, and convincing them that she was making the right choice took a lot of work. As she sees it, the way in which the Program integrates clinical medicine and basic medical research will open lots of doors for her after graduation. Her plan is to specialize in medical research and expand the use of advanced medical technology in remote areas as a way of making up for personnel shortages.

In essence, the mission of the Post-baccalaureate Program in Medicine is to train doctors to be completely adept in the ABCs of modern medicine---artificial intelligence, big data, and the cloud internet of things, so as to meet the medical challenges and opportunities of the next generation.

Chou Mingchin (周明瑾), the only student in the Information Technology Group.

SHINING FORTH: AN EXHIBITION OF WORKS BY CHINESE ARTISTS IN JAPAN

At the beginning of this year, the Japanese royal family bestowed a posthumous title on Master Yinyuan Longqi (Japanese: Ingen Ryūki), an important figure in Buddhism who played a prominent role in cultural exchanges between China and Japan during the late Ming and early Qing dynasties. On June 2, Professor Yang Rur-bin(楊儒賓) of the Graduate Institute of Philosophy and his wife, Professor Fang Sheng-ping(方聖平) of the Center for General Education, donated their personal collection of 177 paintings and works of calligraphy by Yinyuan to the NTHU Museum, which is scheduled to be completed next year.

Prof. Yang said that the significance of the number 177 is that this year Tsing Hua University celebrated its 111th anniversary and its 66th anniversary in Taiwan as NTHU (111 + 66 = 177).

The donation ceremony was held on the morning of June 2 at the Idea Hub in the Main Library. During the ceremony, president W. John Kao said that cultural relics are a kind of dialogue, which allow us to travel through time and space, providing insight into the past and present, and helping us to envision what the future has in store. He added, "The future of NTHU lies in the integration of the humanities, arts, and sciences."


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President Kao said that, rather than being put in storage only to gather dust, the Yinyuan collection will be easily available to researchers, the general public, and all who know how to see the future by looking into the past.

Also in attendance was former president Chen Lih-juann (陳力俊), who said that Prof. Yang used his modest salary and his expert knowledge to purchase a large number of cultural relics, commenting, "We all earn a salary, but Prof. Yang is the only person I've ever heard of who has returned to NTHU everything he's earned, plus a whole lot more." As for Professor Fang, she has a passion

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a. Kao (left) presenting Yang with a certificate of appreciation.
b. Yang (right) and Kao holding one of the scrolls in the collection.

c. Kao thanking Yang for his generous donation.
d. Chen Lih-juann(陳力俊) making a humorous comment about Yang's extraordinary generosity.
e. The exhibition is being curated by Hsieh Hsiao-chin(謝小芩), director of the Museum.
f. Amongst the attendees was Master Fazang(法藏法師), abbot of Wanfo Monastery in Tainan.

for nature conservation, and she provided the funding to establish the Tsing Hua Butterfly Garden. In this way, they embody the social commitment found in the second part of the NTHU motto.

Master Fazang, abbot of the Wanfo Temple in Nanxi Tainan, also attended the donation. He said that while in college he was initiated into Buddhism by Master Guangqin, who was a leading exponent in Taiwan of the Obaku school of Zen in Japan, and that one of the more interesting items in Prof. Yang's collection is a letter written by one of Guangqin's disciples. The letter, which was sent to the police, concerns the embezzlement of temple property by a disciple.

From the collection, Prof. Yang has selected 32 pieces of calligraphy, paintings, handwritten notes, long scrolls, etc., for inclusion in an exhibition titled "A Bridge Over Stormy Seas---Calligraphy and Paintings by Overseas Chinese in Japan," to be held in the gallery on the first floor of the Main Library.

Prof. Yang explained that the title of the exhibition refers to the fact that the numerous conflicts which have occurred between China and Japan in modern times have never completely cut off the ongoing cultural exchanges between the two nations in areas such as religion, scholarship, art, architecture, cuisine, medicine, calligraphy, and music. He also pointed out that the exhibition is presented through the lens of culture, rather than geopolitics.

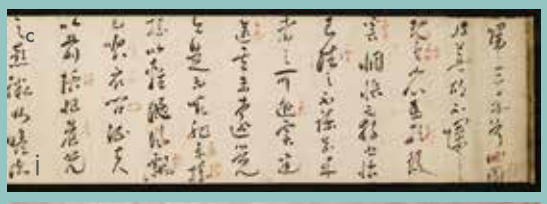
Prof. Yang said that most of the calligraphy in the exhibition is by Yinyuan, who came to Japan in 1654 in one of Cheng Chenggong's ships. In Japan, he propagated the Dharma and eventually established the Obaku sect of Zen Buddhism. He was also the founder of Senchado, one of the main tea ceremony traditions in Japan. In light of his enduring influence on Japanese culture, in February of this year the Emperor of Japan conferred on him the posthumous title Master Yantong---the seventh time he has been thus honored, the previous time being in 1972, when Emperor Showa conferred on him the posthumous title Master Huaguang.

Amongst the collection is a horizontal scroll of calligraphy by Yinyuan, which was purchased 20 years ago by Prof. Yang from an antique shop in Nagoya, Japan. The piece consists of the three characters tan hua hui, plus his inscription "Composed by the old

g. The exhibition is being curated by Hsieh Hsiao-chin(謝小芩), director of the Museum.
h. Yang introducing the scroll "Zhuang."
i. Yinyuan's "Tan hua hui."
j. "Guiqu laixi," a hand scroll from the Edo period, was composed by the noted calligrapher Fukami Gentai, and includes corrections written by his teacher, the Chinese Buddhist monk Duli.
k. The line in the scroll "Zhuang" that reads *junzi zhuangjing ziqiang* 君子莊敬自強 may have had a bearing on the formulation of the Tsing Hua motto, "Self-discipline and social commitment."

monk Yinyuan," all written in a smooth and flowing style exuding a palpable sense of natural spontaneity.

Also procured by Prof. Yang in Japan, and included in the exhibition, is a commentary by the noted Confucian scholar Zhu Shunshui in the form of a horizontal scroll. Zhu was a Ming loyalist who took refuge in Japan, where he eventually became a teacher of Tokugawa Mitsukuni, a powerful magnate of the Mito domain and prototype for a famous story about the adventures of a feudal lord who roamed about incognito.



Prof. Yang added that Zhu also introduced various Chinese craft and architectural techniques to Japan, which had a significant impact on the development of Japanese society and culture, and even influenced the Meiji Restoration. He also pointed out that the line in the scroll that reads *junzi zhuangjing ziqiang* 君子莊敬自強 may have had a bearing on the formulation of the Tsing Hua motto, "Self-discipline and social commitment."

Another interesting piece in the exhibition is "Guiqu laixi," a hand scroll from the Edo period. It was composed by the noted calligrapher Fukami Gentai, and includes corrections written by his teacher, the Chinese Buddhist monk Duli.

NTHU BRINGS CHINESE LANGUAGE AND TAIWANESE CULTURE TO AMERICAN UNIVERSITIES

NTHU has recently received a grant from the Ministry of Education's (MOE) Chinese Proficiency Program, and is preparing to send specially trained instructors to teach Chinese at top universities in the United States, including the University of Michigan, Ann Arbor. The Program will also bring students at US universities to Taiwan to study Chinese, engage in cultural activities, and assist in bilingual education at primary and secondary schools. In addition to deepening exchanges between Taiwan and the United States, the Program will also help raise awareness of Taiwan at American universities.

NTHU has signed memorandums of cooperation with the University of Illinois at Urbana-Champaign, Duke University, the University of Hawaii, and the University of Michigan, Ann Arbor, and has been sending Chinese teachers to the United States since the end of 2021. Duke University and the University of Hawaii have already sent six students to study Chinese at NTHU with support from the Chinese Proficiency Scholarship.

Language teaching as a form of cultural diplomacy

President for global affairs Yen Ta-jen (嚴大任) said that in addition to having extensive teaching experience, the Chinese instructors selected to go to the United States have also become adept in such traditional Chinese pastimes as paper-cutting, mahjong, and chess. Some of them are also skilled in playing the erhu, landscape painting, and Peking Opera makeup, all of which are highly effective forms of cultural diplomacy.

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a. President for global affairs Yen Ta-jen is eager to see more American exchange students studying Chinese at NTHU.
b. Teachers in the Chinese Proficiency Program at NTHU (left to right): Li Yu-an, Lin Mengting, Chen Ching-chia, and Chiu Yuting.
c. Exchange students from Duke University studying Chinese at NTHU (left to right): Cole Walker, Francis de Beixedon, Isadora Natalia Toledo, and Andrew Yue Qin.

Chen Ching-chia (陳敬佳), who has been teaching Chinese overseas for many years, is preparing to begin teaching at Duke University. Chiu Yuting (邱于庭) is currently a student in the Chinese language education group of the Interdisciplinary and International Master's Program. Chen and Chiu said that the Chinese teachers previously sent to the US by the MOE mainly taught at primary and middle schools, but now the program has been extended to include universities. In addition, each appointment is for a period of three years, which will bring even better results.

The Duke University students studying Chinese come from a variety of departments, and have clear learning goals and a positive attitude. Chiu said that her students are at the intermediate level in listening, speaking, reading, and writing, and that in the upcoming semester she is going to add a module on Taiwanese culture, including a group project focusing on the differences between Taiwanese and American culture.

Li Yu-an (李玉安), also a student in the Chinese language education group of the Interdisciplinary and International Master's Program, is going to teach Chinese at the University of Hawaii, where many of the students are the children of Chinese immigrants. Even though they can hardly speak Chinese, they have a strong interest in Chinese culture.

Members of the Chinese Proficiency Program at NTHU (left to right): Chinese teachers Lin Mengting (林孟婷)and Li Yu-an (李玉安), former vice president for global affairs Huang Chen-bin (黃承彬), former senior vice president Hsin Shih-chang (信世昌), president for global affairs Yen Ta-jen (嚴大任), and Chinese teachers Chen Ching-chia(陳敬佳) and Chiu Yuting (邱于庭).

Li uses supplemental classes and one-on-one conversation practice to familiarize her students with various aspects of Taiwanese culture, such as temple fairs and local cuisine. She has found that her students are fascinated by the diversity and richness of Taiwanese culture.

Learning the ropes from seasoned diplomats

Two of the American exchange students from Duke University are Cole Walker and Andrew Yue Qin, both of whom are already able to converse in Chinese. In addition to their Chinese classes at NTHU, they also have classes on Taiwanese history and culture, and have made field trips to Taipei, Tainan, and Hualien.

Also in the Program is Wu Kong, an African-American who began learning Chinese in elementary school, and who is already proficient in listening, speaking, reading, and writing. In addition to improving his Chinese, he hopes to share his experience abroad with African-American children so as to stimulate their interest in exploring the world. His career interests

d. Exchange students from Duke University studying Chinese at NTHU (left to right): Andrew Yue Qin, Francis de Beixedon, Cole Walker, and Isadora Natalia Toledo.
e. Exchange students from Duke University with former ROC ambassador to France Michel Lu (center).
f. Exchange students in the Chinese Proficiency Program visiting the Confucius Temple in Tainan.

are in diplomacy and non-profit organizations, two fields in which Chinese ability is a huge asset.

NTHU recently hosted a symposium featuring talks by former ROC ambassador to France Michel Lu (呂慶龍) and former ROC ambassador to Eswatini (formerly Swaziland) Chao Lin (趙麟). The American exchange students were pleased to have an opportunity to discuss such topics as public policy, diplomacy, and politics with the former ambassadors.

Yen said that National Tsing Hua University has signed memorandums of cooperation with the University of Michigan, Ann Arbor, Duke University, the University of Illinois at Urbana-Champaign and the University of Hawaii to provide Chinese language teachers through the Chinese Proficiency Program. NTHU has also signed agreements with the University of Hawaii, and the University of Illinois at Urbana-Champaign to set up Chinese language centers, arrange programs for exchange students, and jointly develop course materials. He hopes that similar programs will be implemented with European universities in the near future.

GROUNDBREAKING INSIGHTS INTO THE POSSIBILITY OF EXTRATERRESTRIAL LIFE

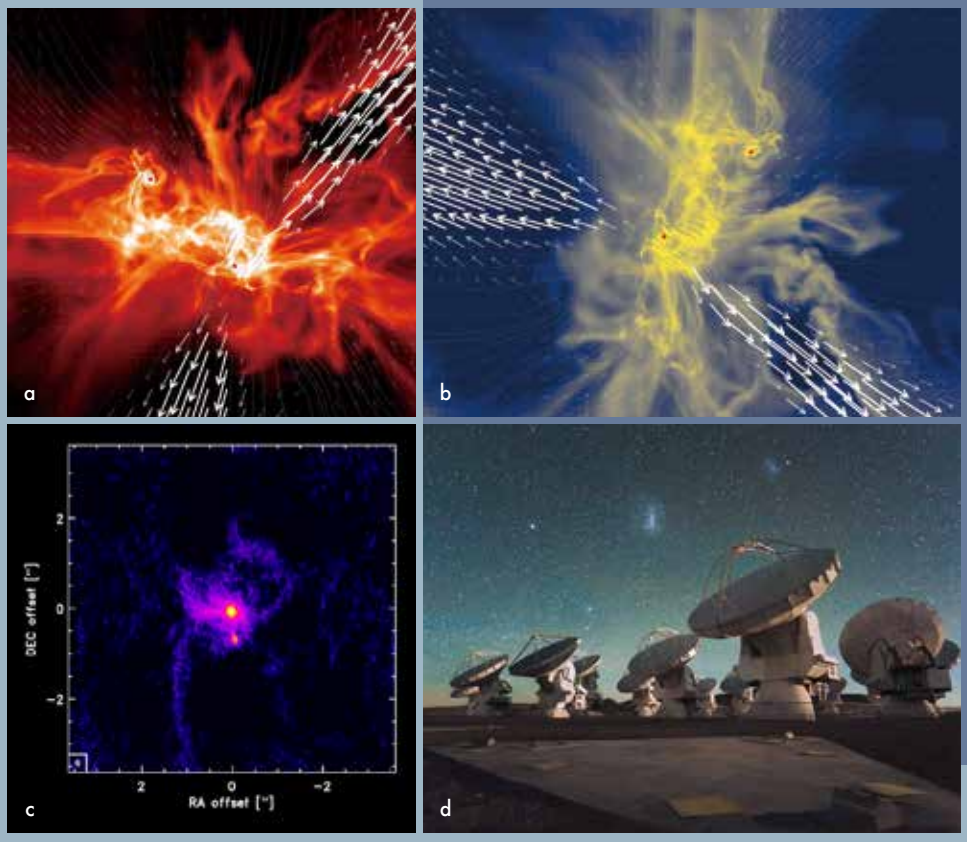
Astronomers have long been searching for signs of life in single star systems, which are similar to our own solar system. In one of the latest developments in this search, a research team that included Professor Daniel Harsono (何英宏) of the Institute of Astronomy and researchers at the University of Copenhagen in Denmark has discovered that the planets in a binary star system are the most likely places to have extraterrestrial life. Their research has recently been published in the top international journal *Nature*.

Prof. Harsono explained that a binary star system, which is composed of two stars orbiting each other, erupts about once every 100 years, whereas a single star system erupts once every 10,000 years. After a star erupts, the carbon, hydrogen, etc. that surround it have an opportunity to recombine to form the organic compounds that make up life.

Prof. Harsono said that about half of the stars in the Milky Way form binary star systems, appearing like two suns, and if the two stars are close enough to one another to be affected by each other's gravitational pull, they begin to orbit each other, resulting in a planetary environment which is very different from that of a single star system.

Since Earth is the only planet known to have life, astronomers looking for extraterrestrial life have tended to focus on single star systems. Scientists used to think that the orbit of planets belonging to a single star system is relatively simple, and unaffected by multiple large celestial bodies, making the temperature and illumination more stable, which is conducive to the survival of life. But this idea has been overturned by the latest findings.

A research team including Professor Daniel Harsono(何英宏) of the Institute of Astronomy has discovered that the planets in a binary star system are the most likely places to have extraterrestrial life.



a-b. If the two stars in a binary star system are close enough to one another to be affected by each other's gravitational pull, they begin to orbit each other, leading to an eruption.
c. Harsono's research team used the ALMA telescope to observe the two stars (yellow dots in image) in a binary star system orbiting each other.
d. Harsono's research team used the ALMA telescope located in the desert of northern Chile to observe the young binary star system NGC 1333-IRAS2A.

Prof. Harsono's research team used the ALMA telescope located in the desert of northern Chile to observe the young binary star system NGC 1333-IRAS2A, which was formed about 10,000 years ago at a distance of 1,000 light-years from Earth, and used the high-resolution snapshots they obtained to make a computerized simulation of its evolution.

The simulation showed that the flow of gas surrounding this young binary star was powerful and chaotic, leading to an eruption that sent massive amounts of material falling towards the star, making the star 10 to 100 times brighter, after which it returned to its normal state. During the eruption, the gas and dust in the planet-forming disk was torn apart and then re-accumulated, changing the planet's structure.

They found water, methanol, and other complex organics, as well as carbon-containing molecules with 9 to 12 atoms. They also discovered that the eruption of the binary star system destroyed the water and complex organic matter in the rock, so that the organic molecules were destroyed and rebuilt faster than in a single star system, which is more conducive to the origination of life.

Their research was supported by NTHU's Center for Informatics and Computation in Astronomy (CICA) and the Yushan Project of the Ministry of Education. The research team included a professor from the University of Michigan, and Prof. Harsono formulated the theoretical model based on the team's observations.

NASA is currently preparing to use the Webb Space Telescope that was launched late last year to observe complex organic molecules in binary star systems, and Prof. Harsono is in charge of the team that will observe the gas and dust around a young binary star system.

When asked if he believes that there is life on other planets, Harsono replied, "Of course there is! In such a vast universe, how could Earth be the only planet with life on it?"

INTERDISCIPLINARY RESEARCH TEAM DISCOVERS THE SECRET TO SUCCESS

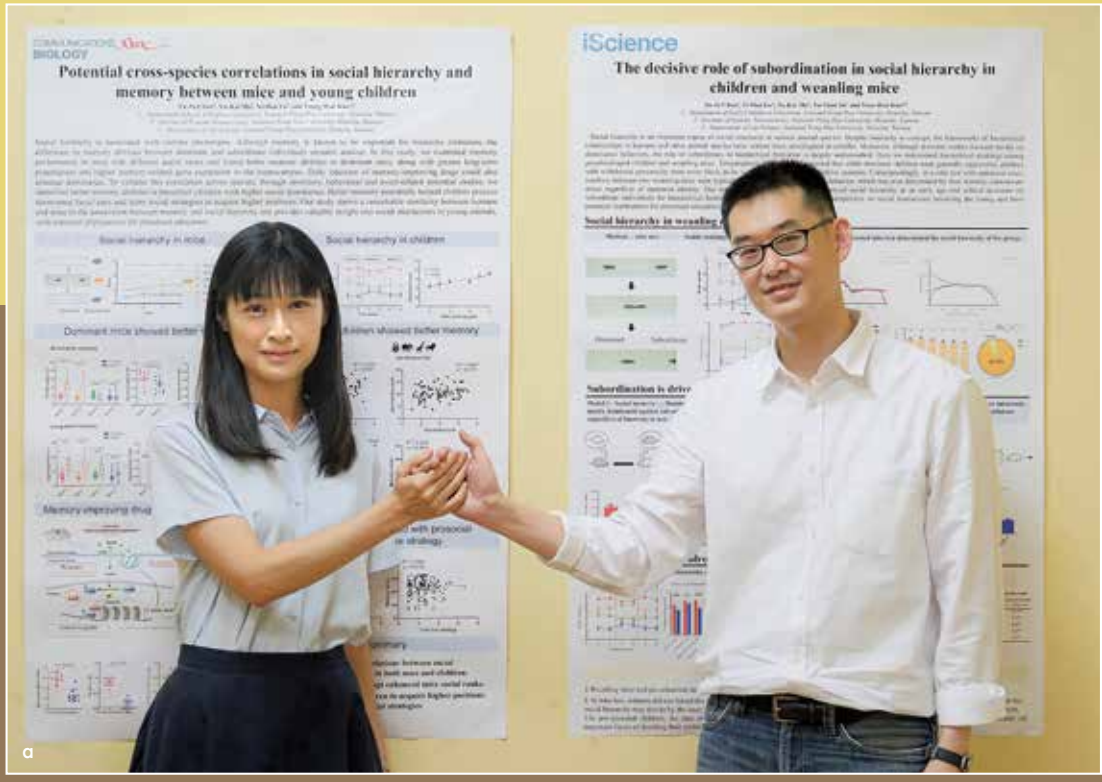
The key to success is not giving up! Cross-species research conducted by Professor Yu-Ju Chou(周育如) from the Department of Early Childhood Education and Professor Chung-Han Kuo(郭崇涵) from the Institute of Systems Neuroscience has found that the social hierarchies of children and mice are similarly formed at an early age. Surprisingly, they discovered that these hierarchies are not so much determined by who is stronger, but rather by who is willing to yield.

Their research was published in *iScience*, a sub-journal of *Cell*. They suggest that parents and teachers should pay close attention to social interaction among children, and provide extra guidance and encouragement to timid or submissive children.

The project began when Kuo noticed that children have a social hierarchy similar to mouse social structure during his time volunteering at a kindergarten. This observation led to his collaboration with Chou, who specializes in social interactions among children.

The experiment used to identify young mouse hierarchy is a "tube test," in which one mouse is forced to retreat by an opponent into a narrow tube. Surprisingly, the outcome is not determined by any particular behavior of the dominant mice, but rather by the inclination to yield among the submissive mice, which could be characterized as the "loser's decision."

The team also conducted behavioral experiments on preschoolers and attained similar results. Chou said that the children who won the competition didn't really need to exert too much effort. The losers either readily gave up or were easily convinced to acquiesce by their opponents. While some children



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a. Chou Yu-Ju(周育如) (left) and Kuo Chung-Han(郭崇涵) have found that social dominance is not so much determined by who is stronger, but rather by who is willing to yield.
b. The research team used a brain wave machine in their experiment on the memory of preschoolers.
c. The research team conducted a competition experiment on 216 preschoolers.

b

c

were able to dominate the game by commending others, submissive children were less persistent and more likely to retreat.

Kuo said the results suggest that sometimes the key to success is simply perseverance and holding fast to the original goal. Chou points out that parents and teachers should pay more attention to submissive and timid children. Improving their self-confidence by providing positive experiences of success will greatly benefit their interpersonal relationships.

The study was sponsored by the Office of Research and Development. The merger of NTHU with the National Hsinchu University of Education six years ago has resulted in extensive cooperation, including this exemplary research.

Chou and Kuo agreed that cross-disciplinary cooperation brings a new perspective to their research. Chou said that there are many ethical restrictions in human studies. In contrast, the fewer number of constraints in animal experiments allows researchers to perform more invasive manipulations in mice. Kuo said that, since mice cannot talk, we can only observe simple behaviors to interpret their social hierarchy. Children, on the other hand, have a much more complex and interesting range of behaviors.

In a follow-up project, Chou and Kuo teamed up with Dr. Yang Shih-Bing (楊世斌) from Academia Sinica and found a positive correlation between hierarchy and memory. The study showed that memory-improving drugs can enhance not only memory but also social dominance in mice. It also suggested that children with a better memory are good at adopting social strategies and recognizing dominant facial cues, which is conducive to leadership. This research has recently been published in the journal *Communications Biology.*

DIT ROBOTICS TAKES FOURTH PLACE IN EUROBOT COMPETITION

The NTHU student team DIT Robotics recently participated in the Eurobot robot competition and came in fourth place among 150 international teams. In 2019, the team came in fifth place in the same competition.

Due to the Covid-19 pandemic, Eurobot was suspended for two years. Yet DIT Robotics continued to prepare for the competition by developing a more advanced multi-sensor positioning system with an omnidirectional chassis, which greatly improved the robot's positioning accuracy and moving efficiency.

The theme of this year's Eurobot competition was "archaeology," and each team entered two fully automated robots. During a 100-second period, each robot had to avoid obstacles, identify red, blue, green, and other hexagonal objects, bring them back to the base, arrange them on the display cabinet, and replace fake statues with real ones.

a

In the first round of the five qualifying matches, DIT Robotics ranked fourth in global points, thereby entering the quarterfinals of the second round. The final was held on May 29, with DIT Robotics represented by Department of Power Mechanical Engineering students Cheng Chaowei (鄭兆瑋) and Chen Ching (陳靜), who were draped in the NTHU flag and ROC flag, respectively. They beat the Tunisian team in the first match, but then lost to Austria and France, finally coming in fourth place. First place went to Serbia, Austria came in second, and France came in third.

Team captain Cheng Chaowei said that their impressive performance was the result of all the steady effort they put into updating their system over the past two years, despite being unable to compete abroad. On top of that, from October of last year, they spent most evenings testing and troubleshooting late

a. DIT Robotics took fourth place in this year's Eurobot competition.
b-c. The two robots made by DIT Robotics in the competition with the team from Tunisia.
d. Team captain Cheng Chaowei (鄭兆瑋) (center) draped in the NTHU school flag, and Chen Ching (陳靜) (left) draped in the ROC flag.
e. DIT Robotics took fourth place in this year's Eurobot competition.

b


c

into the night, and even worked all night a few times. The result was an amazingly agile robot, capable of moving at various angles while simultaneously rotating.

Cheng said that during the 100 second period, the robot had to automatically complete all the tasks, so all possible mistakes had to be eliminated in advance.

Chao Chiaohsuan (趙喬萱), a sophomore in the College of Technology Management, said that even though the team members were all vaccinated, it still wasn't easy convincing their parents that it was safe to go abroad while the Covid-19 pandemic was still an issue. Of course, they were also concerned that a team member getting infected would hinder their performance, but as it turned out, they all remained Covid free.

The team's advisor was Professor Chen Rong-shun (陳榮順), who was unable to attend the competition due to his teaching responsibilities, but remained in close contact with the team during the event. He also watched the live broadcast online,

DIT Robotics with team advisor Chen Rong-shun(陳榮順) (center).

cheered for his team, and was delighted with their performance.

Prof. Chen said that the team members were mainly sophomores and juniors, and that they were good at seeking advice from their senior classmates when they encountered problems in such areas as image processing, positioning, and communications. Furthermore, they excelled at taking the initiative to look up information, and their strong performance in the competition demonstrates their problem-solving abilities.

The 12 members of the team were Li Weishan, Chen Yufen, Dai Yong, Chen Yanting, Chen Ching, Peng Chenyu, Chen Jiamin, Cheng Chaowei, Liu Haoyu, Lu Guanlun, Hsiao Chingwen, all of the Department of Power Mechanical Engineering; and Chao Chiaohsuan of the College of Technology Management.

DIT Robotics was sponsored by the Department of Power Mechanical Engineering, the College of Engineering, the NTHU Alumni Association, the Zhumeng program, Argosy Technology, Fittech, El Monte Nursery, Excetek, and STMicroelectronics, among others.


d

e

RESEARCHERS DISCOVER RACIAL BIAS IN AI DIAGNOSIS

Is artificial intelligence (AI) racist? Professor Kuo Po-Chih (郭柏志) of the Department of Computer Science, together with colleagues at MIT and Emory, have recently found that AI deep learning algorithms can determine the race of a patient from X-rays and computed tomography (CT) scans, and that this can affect the accuracy of a diagnosis. It is still unclear how AI is able to make this distinction.

Kuo said that in recent years the medical field has begun to make extensive use of AI to increase the speed and accuracy of diagnosis and treatment. AI deep learning systems make it possible for computers to train themselves for use in the development of recognition models, and the US Food and Drug Administration (FDA) has also approved AI devices for use in the interpretation of X-rays and CT scans. Yet AI's use has also given rise to some challenging ethical concerns relating to racial bias.

The research team, which included members from MIT, Stanford University, Emory University and the University of Toronto, analyzed the chest, cervical vertebrae, and hand X-rays, as well as the chest CT scans, of more than 200,000 patients, and discovered that AI could actually be contributing to racial discrimination. The team's research has been published in a recent issue of the top journal

Professor Kuo Po-Chih (center) of the Department of Computer Science and his students Chen Li-Ching (陳立晴) (left) and Wang Ryan (王瑞恩) (right).

a. Professor Kuo is an outspoken advocate for racial equality in AI medical applications.
b. Professor Kuo (right) and his students discussing how AI is able to distinguish the race of a patient from a hand X-ray.

Lancet Digital Health and has attracted much media attention.

One of the team members, a professor at Emory, was so amazed when they found that AI can determine race from X-rays with an accuracy rate of 90% that she could hardly believe it, thinking that something must have gone wrong. Some of the other team members also found the implications of the results to be deeply troubling.

Kuo said that the team initially guessed that AI could determine race from bone density, since blacks have a higher bone density than whites, but it was later found that this was not the case. Pointing to an X-ray of a hand, Kuo said that they discovered that AI determines race from the third knuckle of the middle and index fingers, and that even radiologists with 20 or 30 years of experience are unable to do so.

Even more concerning for the research team was that the racial identification provided by AI affects the accuracy of medical image interpretation. Kuo said that they found that the false negative rate for the medical images of blacks was 28%, but only 17% for whites. Moreover, the misinterpretation of medical images affects the allocation of medical resources, such as emergency treatment and medical benefits.

The research team also included two seniors from the Department of Computer Science, Wang Ryan (王瑞恩) and Chen Li-Ching (陳立晴). Wang, who was in charge of analyzing the AI models, said that it's not often that undergraduates have a chance to participate in such a large-scale multinational research project, and that he gained a wealth of valuable experience.

CHENGGONG LAKE UNDERGOING RENOVATION

As one of the main landmarks at NTHU, Chenggong Lake holds a special place in the memories of alumni, and it is also popular among Hsinchu residents as a great place for a stroll or to take wedding photos. However, due to sedimentation building up over many years the water has become rather murky. Thus, the school has recently decided to dredge the Lake, which in terms of area will be one of the largest renovation projects ever carried out at NTHU. In addition to removing silt and improving water quality, thanks to funding from alumni donations, the project will include the construction of a dock and the restoration of the bucolic lakeside trail.

a

The draining of the water and removal of the fish began in August, and so far over one metric ton of fish have been netted. In an amazing display of hands-on supervision, vice president for general affairs Yan Dung-yung donned a pair of waders, plunged into the lake, and held up a bighead carp more than a meter long. The bighead carp, variegated carp, and silver carp will be moved to Kunming Lake, whereas the African carp, an exotic species, will be handed over to businesses that can make use of them.

The Office of General Affairs said that after draining the water and removing the silt, the surrounding area will be landscaped and a stairway leading into the water will be installed on one section of the shoreline; the renovation project is expected to be completed by April 2023.

Among the three lakes on campus---Chenggong Lake, Kunming Lake, and Hsiangsi Lake---Chenggong Lake is the largest, with an area

a. Renovation plan for Chenggong Lake.
b. Workers netting fish in the half-drained lake.
c. So far over one metric ton of fish have been removed from the lake, including bighead carp, variegated carp, silver carp, and African carp.
d. Vice president for general affairs Yan Dung-yung (顏東勇) (left) holding up a bighead carp more than a meter long.


b


c

Chenggong Lake figures prominently in the memories of everyone who has been a part of the NTHU community.

of about three hectares. It was excavated for fire suppression during the Japanese colonial era. In the early days of NTHU, the lake was pristine and full of aquatic life, and hungry students used to catch fish in the lake to supplement their diets during those days of scarcity. However, due to the lack of an inlet to replenish the lake, the water quality has steadily deteriorated.

At the end of 2019, the University announced a fundraising campaign for the renovation of Chenggong Lake, which immediately received an enthusiastic response from alumni at home and abroad. The renovation project will cost about NT$75 million, about 70% of which has been raised so far.

Alumni Association president Tsai Jinbu (蔡進步) said that swan-shaped boats were brought in for the school's anniversary last year, and that lots of alumni went out on the lake, reviving their fond memories of boating on the lake during their student days. Thus, it was decided to include the installation of boating facilities in the renovation project.

In recognition of Tsai's impressive fundraising efforts for the project, the renovated and expanded dock will be named the Jinbu Dock.

Tsai graduated from the Department of Power Mechanical Engineering in 1981. One of his favorite leisure activities at NTHU was going out to the pavilion in the middle of Chenggong Lake late at night, and fishing while one of his classmates played guitar and sang folk songs. He fondly recalled how one time he caught more fish than could be eaten in a day, and how he kept the remaining fish in his bathroom.

d

For some time now it has been impossible to walk around the entire lake, since one part of the shoreline is obstructed by the perimeter wall of the Industrial Technology Research Institute. The renovation will rectify this by the addition of an elevated walkway over this section of the lake, which has been donated by Jordan Hu (胡國琳), who graduated from the Department of Mathematics in 1984.

Hu, who now lives in New York, displayed a graduation photo of himself with his parents and girlfriend next to Chenggong Lake. Since then, his parents have passed away, his girlfriend has become his wife, and he has established a successful career. He said that he hopes to return with his family for the school's anniversary next year and take a walk on the new trail that will finally circle the entire lake.

Alumni from the departments of nuclear engineering, mathematics, physics, and chemistry who graduated in 1970 have donated a total of NT$11 million to the renovation project, and in recognition of their generous contribution the area next to the lake will be named the "1970 Park." The park will feature shade trees, tables, and chairs, and will be open to the public.

Representing the class of 1970 was former NTHU president Chen Wen-tsuen (陳文村), who said that Chenggong Lake was the center of student life in the early years of NTHU, since the dormitories, cafeteria, and campus shop were all located next to it. He also recollected that rowing boats on the lake was a favorite leisure activity, and that many of his classmates were quite skilled at rowing. He added that the aim of the project is to restore the lake to its pristine state, replete with pellucid waters and the melodious songs of birds nesting on its shore.

On the small island on the east side of the lake, popularly known as Xigua Island, will be erected a new pavilion. The island will be renamed Yuning Island in recognition of the generous donation for the renovation made by Chen Yuning (陳昱寧) of the class of 1974.

e. Simulation of the Jinbu Dock to be built on Chenggong Lake.
f. Simulation of the elevated walkway and the adjacent aquatic plants.
g. Simulation of the 1970 Park.
h. Simulation of the pavilion to be built on Yuning Island.

i. Old photo of Tsai Jinbu (蔡進步) and his children feeding fish from the Kegong Bridge.
j. 1984 graduation photo of alumnus Jordan Hu (胡國琳) with his girlfriend and parents.
k. Chen Yuning (陳昱寧) (second from left) in a 1973 photo with members of the Astronomy Club which she helped establish.

Chen said that the charm of Chenggong Lake is one of her most cherished memories from her time at NTHU, and that the natural beauty of the campus was one of the things that attracted her to NTHU in the first place. She now lives in the United States, but hopes that when her descendants see this small island they will understand the important role NTHU played in her life.

The Office of General Affairs said that the renovation project includes a natural water filtration system using aquatic plants to clean the water and control algae.

If the fundraising campaign meets its goal, then the project will include renovating the Kegong Bridge and Jimei Pavilion. Thus, it is hoped that more alumni will come forth to support the project while the lake is still dry, lest this once-in-a-lifetime opportunity be missed.

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2023 Fall Program (Graduate): Dec/14/2022 - Feb/21/2023 (15:00 Taiwan Time)
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101, Section 2, Kuang-Fu Road, Hsinchu 300044, Taiwan R.O.C.
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