

NTU



HIGHLIGHTS

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2020

Leader's Profile:

Joanne S. Liu, Social Work Devotee

- Circular Economy Experiments
- Azalea Festival Live Online
- Innovative Healthcare Startup

Pharmacy Students Team up to Fight Pandemic

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Dr. Joanne S. Liu: Researcher of Domestic Violence, Protector of Women and Children

Stepping into the office of Associate Prof. Joanne S. Liu in NTU's Department of Social Work, one is greeted by a wall of books. Most of the books on display deal with social work and domestic violence case studies.

As a scholar and social worker, Dr. Liu has dedicated herself to teaching and research as well as advocating for victims of domestic violence. In November 2019, Dr. Liu received the Purple Ribbon Special Award from the Ministry of Health and Welfare for her contributions to child welfare and issues related to domestic violence.

"Nothing worth doing is ever easy," Dr. Liu says with a gentle but determined expression. On the road of advocacy, she has never contemplated the possibility of giving up. Having devoted herself to the prevention of domestic violence and the protection of children for almost two decades, she has always been at the frontline, examining major child abuse cases. She has advocated police inspections and early interventions in the event of serious child abuse cases, as well as retrospective analyses into the cause of death of children under six years of age.



About Dr. Joanne S. Liu

Joanne S. Liu is a faculty member of NTU's Department and Graduate Institute of Social Work. Liu is also the CEO of the Taiwan Healthcare Reform Foundation (THRF), a nongovernmental organization aimed to champion quality healthcare through health reform in Taiwan.

Liu obtained her Doctorate of Philosophy in 1998 from NTU's Graduate Institute of National Development. She has a wide range of research interests, notably, welfare services delivery, inter-agency collaboration in social welfare systems, child protection, and prevention of domestic violence.

Besides academic research, Liu currently holds several advisory appointments at the cabinet level, including for the Protection of Children and Youth Welfare and Rights Committee, the Domestic Violence and Sexual Assault Prevention Committee, and the Advisory Council of National Taiwan University Hospital.

Dr. Liu is outspoken about the insufficient resources being allocated to the welfare of children and adolescents. Given the rising public awareness of child abuse cases, Dr. Liu calls for more resources to be directed to child abuse prevention. She hopes to spotlight child abuse and raise public awareness of this serious problem. She also wants to do more for the victims of child abuse and domestic violence.

“In the event of domestic violence, infants and young children are powerless and don’t even have the ability to shout out or cry for help. Who can they count on to protect them?” Very young children have not yet developed a sense of self, and many can’t even talk yet. So, when there is violence at home, besides crying helplessly, they are incapable of doing anything. Dr. Liu cited several cases of parents committing suicide with their children. The children had no say at all, no one asked them if they wanted to die, too. In effect, they had been kidnapped and killed by their own parents.

Besides her university position, Dr. Liu is also the CEO of the Taiwan Healthcare Reform Foundation. Healthcare reform is a cause to which she has been devoted for nearly 20 years. Knowing little about healthcare and the law at first, she dedicated herself to mastering those fields and now devotes her time and effort to improving Taiwan’s healthcare environment.

Recalling when she first became an activist, Dr. Liu admits that she was young and impetuous. Since then, she has grown older and wiser, and now she is able to cooperate seamlessly with the public sector. Opportunities for change often arrive when there is an abundance of goodwill and connections among the parties involved. Dr. Liu claims that she did not know how to move with ease between her roles as a researcher and social worker at first; but, with time and experience, she has learned how to juggle her roles and to strike a balance. She empathizes with the sense of helplessness among those who are struggling at the frontlines, and she does her best to communicate with the public sector to prevent finger wagging later on.

Academic research often arises from practical need. In 2011, Dr. Liu set up the “Taiwan Against Gender-based Violence Clearinghouse,” a website offering a comprehensive collection of research and general materials written in or translated into Chinese. Dr. Liu describes this portal as an arsenal filled with the ammunition of knowledge. As a researcher, she sees herself as a problem-solver, providing logistical support for the social workers who are working tirelessly in the trenches.

As to domestic violence in Taiwan, Dr. Liu admits that just a tip of the iceberg has been disclosed to the public. She points out that the tolerance for violence in local society has exacerbated the



Q&A

1. What is your favorite food?

I eat everything, especially sinfully delicious food. Lately, I have been craving Korean-style fried chicken.

2. What do you do to unwind?

I work out, and I have a dog. I have a French bulldog, with wide-set eyes. When I look at my bulldog, I am reminded to adopt a broader perspective and stop sweating the small stuff.

3. What exercises do you do?

Zumba, aerobics, strength training, and aerial yoga.

incidence of domestic violence and child abuse in Taiwan. Traditionally, women have been repressed and often suffer in silence. In marital and family relationships, women are often considered to be the weaker and inferior sex. Children, too, are often subject to explicit or implicit violence as they grow up in their homes and at their schools, for example, when they observe their parents fight or bicker or when they are bullied at school. When exposed to violence for extended periods, some children, by osmosis, begin to resort to violence when they encounter trouble. Violence can also wreak havoc on the personality development and emotional wellbeing of children during their formative years.

Dr. Liu asserted that domestic violence and child abuse are prevalent in every social and economic class and that we must refrain from putting labels on specific groups of people.

There must be zero tolerance for violence, according to Dr. Liu. She reiterates that Taiwan needs to put in place protective mechanisms to safeguard the victims, including a rescue system. To the victims, domestic violence is a choppy and rapidly flowing river. Under the present system, a bridge for safe crossing has yet to be built. What we have now are just some temporarily placed stones that offer the victims respite, but few of them can manage to cross over to safety on the other side, yet. Very often, their only choice is to leap back to where they started after they feel worn out.



Confronting the nightmare of domestic violence, we need to offer more than just emergency shelters. A system that includes both long-term shelter and vocational training has to be set up, to help the victims not only overcome their predicaments but become self-supporting.

“Every childhood is worth fighting for.” Dr. Liu hopes to be the pair of invisible wings that would enable children to fly. Committed to practice as well as research, she will continue to devote her efforts to improving child welfare and preventing domestic violence in Taiwan.

4. What are your favorite movies?

I actually watch TV more often. I am watching the Korean television series, *Dr. Romantic*, and the American television series, *Grey’s Anatomy*.

5. What books have you been reading?

Matthew Syed’s *Black Box Thinking*, and *Yesterday, Today, and Tomorrow*, a book co-written by Shuichi Tsubata and Hideko Tsubata.

6. If you could attend university again, what would you major in?

The Department of Social Work is where I belong. I would study harder in every class if given another chance.

7. What would you say to your eighteen-year-old self?

“There is beauty in every stage of life. Enjoy the present moment. And grow up, because there are beautiful things waiting for you.”



Smart Ageing Tech wins the National Innovation Award with Jubo Healthcare Platform.

NTU Smart Healthcare Startup Wins the National Innovation Award

Research Center for Biotechnology and Medicine Policy hosted the 16th National Innovation Award Ceremony on December 16, 2019. Every year, the award seeks out innovations that have made a profound impact on industry, and recognizes innovative solutions, ideas, and products that contribute to social and economic development.

This year, Smart Ageing Tech, a startup originating in NTU, was presented the National Innovation Award in the “startup company category” of the “smart medicine and health technology group.” This award represents the highest honor for innovative research and development in the field, and Smart Ageing Tech was recognized for its success in building a smart healthcare platform to facilitate the digitalization of long-term care.

The founding of Smart Ageing Tech dates back to 2008, when Dr. Shi-Chung Jessy Kang of NTU’s Department of Civil Engineering led a group of

NTU students to design a project for the Shuang-Lien Elderly Center. Considering that most students were unaware of the effects of a steadily aging population, Dr. Kang established the NTU Smart Aging Alliance, collaborating with other faculty members to cultivate interdisciplinary talents and tackle problems regarding an aging society. After 10 years of research and field practice, Dr. Kang recruited a team of engineers, data scientists, designers, and consultants to establish Smart Ageing Tech in 2018. With the academic support of NTU and the incubation funding from the Ministry of Science and Technology (MOST), Smart Ageing Tech leveraged NTU’s research prowess and its software and hardware talents to create the “Jubo Healthcare Platform.” This platform utilizes healthcare data to solve the pain points of caregivers working at long-term care institutions, and it helps to improve the care experience by engaging family members in the process.

Dr. Kang and his team believe that a warm and inviting care environment can be created by leveraging the power of data. “Connect data. Connect People,” is the motto of Smart Ageing Tech; and the company will continue striving to offer one-stop services for caregivers and designing innovative business models for the long-term care industry.

Collaborating to Learn, Learning to Collaborate: 26th NTU Interdisciplinary Symposium

Every year NTU colleges take turns hosting the NTU Interdisciplinary Symposium in order to discuss how to facilitate and promote collaborations between colleagues. On December 3, 2019, the 26th NTU Interdisciplinary Symposium hosted by the College of Liberal Arts took place at the historical building of the College.

President Kuan opened the event by emphasizing the importance of the occasion and explained that the symposium was intended to help the participants learn more about the different colleges of NTU. Dean Mu-Hsuan Huang welcomed all participants and expressed hopes to elicit more recognition and support for the College in the future.

The symposium included academic lectures and a concert with dance. The academic lectures were chaired by Associate Dean Hsien-Chung Lee, and speakers included Chair Prof. Ming-Liang Hsieh of the Graduate Institute of Art History, Prof. Ya-Feng Wu of the Department of Foreign Languages and Literatures, and Associate Prof. Wei-Jane Lin of the Department of Library and Information Science.

Hsieh gave a lecture on “The Circulation of Ball Patterns: From Goryeo Celadon and Song Dynasty,” using the Tang dynasty’s Goryeo Celadon Lion Censer to explain that while the pattern of the piece had originated in the West, the ball and lion combination was a uniquely Chinese creation. Wu’s presented a talk on “Botany and Romantic Poetics: Erasmus Darwin and William Blake” in which she introduced the iconic works of Erasmus Darwin and illustrated how William Blake challenged Darwin’s progressive thought in his poetry. Finally, Lin presented her research on “Museum Exhibition and Audience Feedback.” Her research was an investigation of people and information, objects and the environment, and the overall effectiveness of museum exhibitions.

After the lectures, guests were ushered to the building’s main lobby for an immersive experience of the arts organized by Prof. Yuh-Wen Wang, Director of the Graduate Institute of Musicology. A troupe led by Hsuan Chang, Visiting Scholar from Indiana University, performed a series of composite pieces, featuring harpsichord and Chinese instruments, such as guqin, bamboo flute, pipa, and gaohu. Flutist Hsiao-Feng Lin then played two Taiwanese aboriginal instruments — the nose flute and jaw harp. In addition, dancer Chen Hsu improvised her moves with the music, mesmerizing the audience with stunning movements. The performances rounded off the symposium and the intellectual exchange ended on a positive, convivial note.

Group photo taken after the symposium and the concert.



NTU College of Liberal Arts Receives a Haiku Box from the Haiku Capital Matsuyama

Matsuyama, a city on Shikoku and the capital of Ehime Prefecture in Japan, is famed as the “Haiku Capital,” not only for being the home of famous haiku poets but also for its haiku boxes. Fifty years ago, the city began installing haiku boxes for people to post haiku poems, and now there are over 100 haiku boxes around the world. Haiku boxes resemble mailboxes. At each box, paper and pen are provided for visitors to compose a haiku. The visitors then drop their haiku into the box like a postcard, and the best haikus of the year are chosen and published by Matsuyama every following January.

On February 7, 2020, Shinichiro Umeoka, Deputy Mayor of Matsuyama, led a delegation to NTU’s College of Liberal Arts to present the “Haiku Capital, Matsuyama Haiku Box” to NTU. This was the first college in Taiwan to install a Matsuyama haiku box. The box was received by Hsien-Chung Lee, Vice Dean of the College of Liberal Arts, in the presence of Profs.

Shu-Wen Fan and Hui-Chun Lin of the Department of Japanese Language and Literature. Ming-Zhen Peng and Stephanine Chu, winners of the haiku box placed in Taipei City, posted their haikus and initiated the function of the haiku box at NTU.

Umeoka noted many similarities between Taipei and Matsuyama and emphasized how these commonalities bonded the two cities. He also expressed his desire for more collaborations and exchanges between the cities and their people, hoping that more people from Taiwan could discover the beauty of Matsuyama. The origin of the relationship between Matsuyama and NTU actually goes back further. Naoyoshi Ogawa, renowned as the Father of Taiwanese Linguistics, and Shiki Masaoka, a major haiku poet, were both from Matsuyama, and they studied together at Tokyo Imperial University. Ogawa became a professor at Taihoku Imperial University and his daughter Yoshiko Yoshino, who was born in Taipei, became a famous haiku poet.

Lee then took the stage to welcome the delegation and declared that the occasion was a meaningful one since the haiku box would not only inspire creativity but also foster cultural exchanges between Taiwan and Japan. Lee rounded off the event by reciting Jyan-Lung Lin’s haiku “The Pitcher”: “Amid the worst strike, and the best unfair ball, a man seeking imperfection,” leaving the attendees awestruck and pondering.

Group photo at the ceremony.



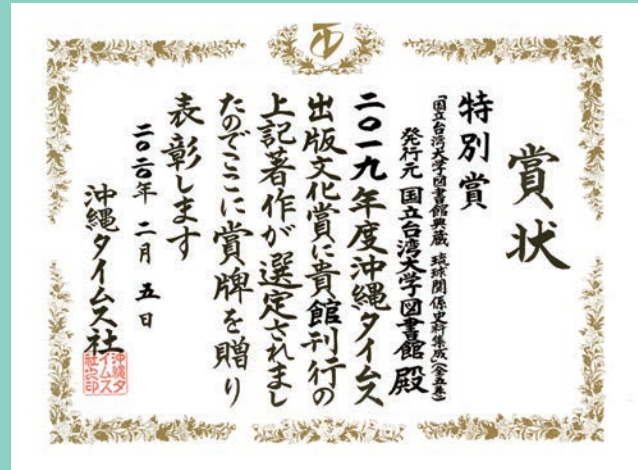
NTU Library Receives Okinawa Times Special Award

The collaborative production of NTU Library and the University of the Ryukyus—*Historical Archives of the Ryukyu Kingdom Housed at National Taiwan University Library: A Transcription, Vol. 1-5*—received the Special Award of the 40th Okinawa Times Book Awards, which is considered the most prestigious honor given to publications themed around Okinawa.

During the Taihoku Imperial University period, NTU accumulated and transcribed many significant historical materials and rare books concerning the Ryukyu Kingdom. After the bombardment of Okinawa in World War II, many of these archives held by NTU contained the last existing copies of these historical materials in the world. To better preserve and promote these historical materials, NTU initiated a project with the University of the Ryukyus to compile the contents of these materials in a five-volume anthology.

The five-volume *Historical Archives of the Ryukyu Kingdom* includes materials concerning China-Ryukyu relations during 1719-1866 (from the reign of Kangxi to the reign of Tongzhi in the Qing dynasty) and such valuable documents as *Kansen Nikki*, *Oyamise Nikki*, and *Ikoku Nikki*. The transcription, annotation, and translation work of these documents began in 2012, and the anthology was published in 2018.

This collaborative work was singled out for a special report by the Okinawa Times on February 4, 2020 and commended for including “first-class historical materials for studies on the Ryukyu Kingdom.” The Okinawa Times Book Awards are prestigious awards, which recognize Okinawa-themed Japanese publications that demonstrate social, cultural, and educational value. Among all the awards given, the Special Award is dedicated to publications that involve research teams and long-term editorship. This year marked the first time this award was given to a work published outside of Japan.



Award Certificate for the Special Award.

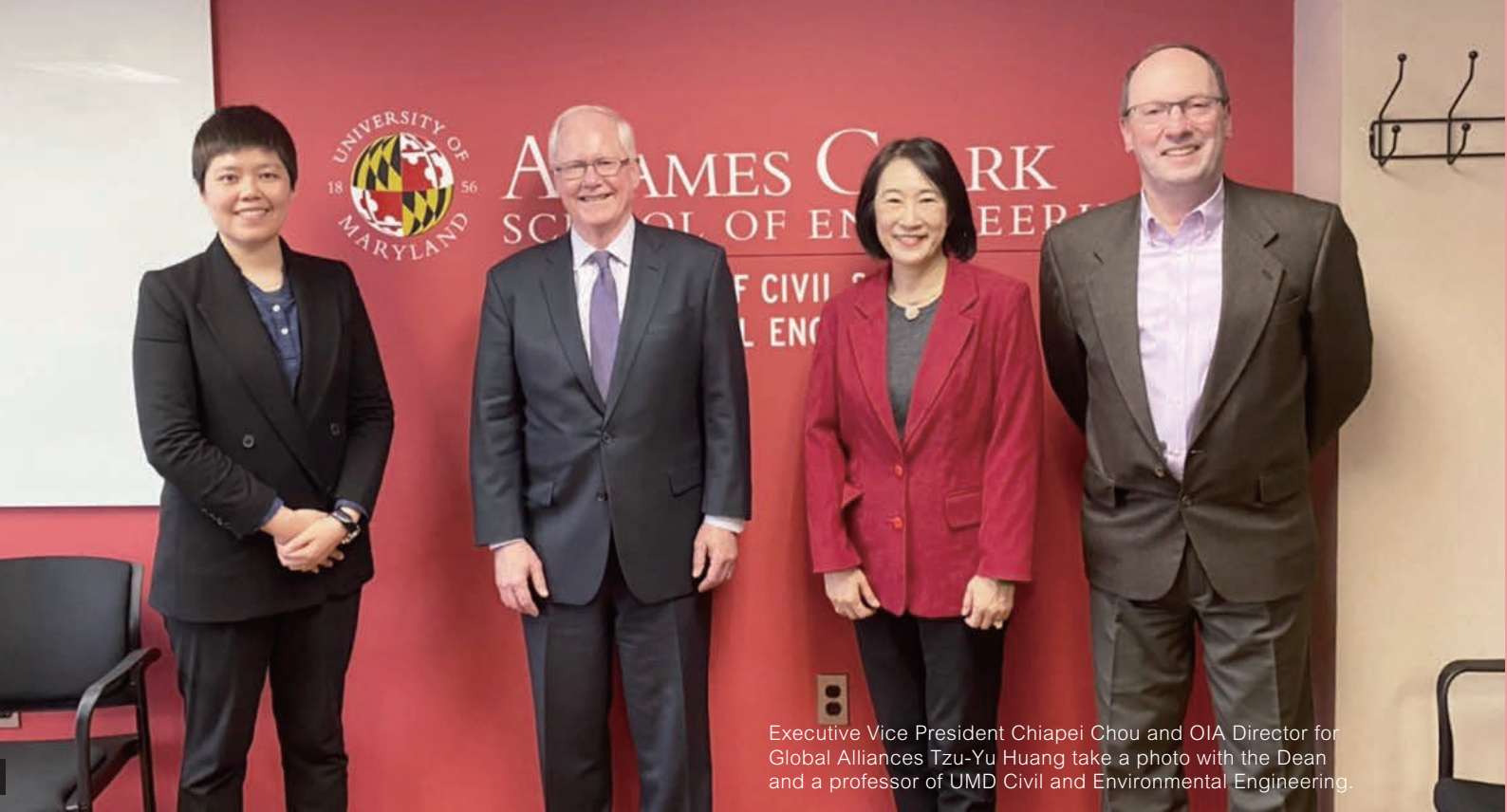


Group photo taken at the Okinawa Times Book Awards Ceremony. (Source: Front page of Okinawa Times on February 6, 2020)

The Okinawa Times award ceremony took place on February 5, 2020. The Special Award was given to co-editors Profs. Kiko Nishizato, Kurayoshi Takara, Kazuyuki Tomiyama, and Mamoru Akamine of the University of the Ryukyus, as well as to the publisher NTU Library. Prof. Muh-Chyun Tang, Associate University Librarian of NTU Library, attended the ceremony and received the award on behalf of the library.

References:

1. Akamine, Mamoru, “An Overall Introduction of *Historical Archives of the Ryukyu Kingdom Housed at National Taiwan University Library: A Transcription, Vol. 1-5*,” *NTU Library Newsletter*, no. 230 (June 2019).
2. Front pages of the *Okinawa Times* (newspaper) on January 16 and February 6, 2020.



Executive Vice President Chiapei Chou and OIA Director for Global Alliances Tzu-Yu Huang take a photo with the Dean and a professor of UMD Civil and Environmental Engineering.

NTU Joins Higher Education Leaders at the 2020 AIEA Annual Conference

The Association of International Education Administrators (AIEA) 2020 Annual Conference was held in Washington, D.C. from February 16-19. This year's conference was themed, "Rethinking Comprehensive Internationalization for a Global Generation," and the grand event brought together administrators of international affairs from institutions of higher education in 48 countries and 46 states of the United States. NTU was represented by Executive Vice President Chiapei Chou and Tzu-Yu Huang, Director for Global Alliances, Office of International Affairs.

The AIEA membership organization was established in November 1982. It is the only existing association dedicated exclusively to international education leadership. The mission of the organization includes shaping the future of higher education with strategies and policies in a global context, equipping leaders with the ability to advance the internationalization of higher education, and engaging in exchanges of ideas

through dialogue and collaboration. Currently, AIEA has more than 300 active members — all of which are prestigious international institutions of higher education.

The main theme of the conference highlighted the importance of educating young people to become global citizens. In an intricately connected global world, internationalization should cover all aspects of the mission of higher education institutions. The Academy should, therefore, leverage human resources and new technologies to overcome present challenges and rethink the concept of comprehensive internationalization. The conference included over 100 sessions and roundtable discussions. Pre-conference workshops also focused on such crucial topics as international strategic partnerships and exchanges. At the conference, leaders gave inspiring keynote speeches on major trends that impact the future of education and discussed opportunities for collaboration to meet the expectations of the global generation.

Since the beginning of 2009, NTU's Office of International Affairs (OIA) has been attending the conference. In recent years, OIA has been proactively collaborating with leading colleges around the world to publish papers at the conference and present keynote speeches to share the school's strategies and efforts to

advance internationalization. This year, Executive Vice President Chiapei Chou and OIA Director for Global Alliances Tzu-Yu Huang attended the conference on behalf of NTU to lead two sessions along with other four universities. This made NTU the only higher education institution in Taiwan to participate in and host a session at the conference.

The first session, titled “Perspectives on Strategy Development and Cultivating Learner-Centered Inclusive Internationalization,” was co-organized with Cornell University and the University of Sydney; the second session, titled “Interculturalization, Student Empowerment and Internationalization at Home,” was co-hosted with the University of South Carolina and the University of Ottawa. Chou and representatives from the University of South Carolina and the University of Ottawa shared their experiences in strategy development and cultivating learner-centered inclusive internationalization. In addition to the scheduled talking points, speakers also held discussions on the latest international events. Chou briefly spoke about the solutions and preventative measures that the Taiwanese government and NTU have introduced in response to the recent COVID-19 outbreak.

The other session was focused on “Interculturalization, Student Empowerment, and Internationalization at Home,” and Huang presented a speech on the evolution of international student communities, factors affecting the implementation of internationalization, and relevant institutional strategies. The speakers from Cornell University and the University of Sydney addressed the setbacks and challenges that their institutions encountered, as well as the help and support they offered their students. These sessions allowed NTU to join forces with other members, contribute institutional strategies, and share its experiences to substantially contribute to advancing the internationalization of higher education institutions around the globe.

In addition to the AIEA 2020 Annual Conference, the NTU delegation also visited the University of

Maryland, also in Washington, D.C. Since NTU and the University of Maryland signed an academic cooperation agreement in 1995, the number of exchange student projects between the schools has grown. Chou visited Associate Provost for Academic Planning & Program Elizabeth J. Beise, Associate Vice President for International Affairs Ross Lewin, and a representative of the College of Engineering, to discuss programs that would further strengthen the collaboration between the two universities. Regarding school-level collaborations, Chou used the success of NTU GIP-TRIAD, a joint degree program between NTU, the University of Tsukuba, and the University of Bordeaux, as an example to propose the idea of initiating co-funded programs devoted to research on United Nation’s Sustainable Development Goals. Regarding college-level collaborations, Chou stated that NTU would focus on promoting exchange programs in renewable energy, cybersecurity, 5G communications, and autonomous vehicles, and continue to explore other promising opportunities for collaboration.



Executive Vice President Chiapei Chou and the representatives of the University of South Carolina and the University of Ottawa.

NTU Actively Recruits Students from East Malaysia

From February 24 to March 6, a delegation from NTU's Office of International Affairs participated in the Taiwan Higher Education Fair, hosted jointly by the Federation of Alumni Association of Taiwan Universities in Malaysia and Sarawak Taiwan Graduates' Association in Sarawak and Sabah, two states in East Malaysia. The event was held in five cities, including Kuching, Sibul, Sarikei, Bintulu, and Kota Kinabalu over a two-week period, drawing over 4,000 visitors. The sessions in Kuching and Sibul attracted the most visitors.

The NTU booth attracted numerous enthusiastic prospective students with the help of local NTU alumni who had graduated years ago. These alumni generously shared their experience of studying at NTU with the visitors. Some freshmen who have enrolled for the upcoming academic year also pitched in. This year, NTU combined images of the exquisite flower species that adorn the campus — azalea, camellia, orchid, chrysanthemum, and delphinium — with Hakka elements in its promotional materials. The design caught the eye of the local high school students who flocked to the booth for application information.

NTU currently has nearly 700 Malaysian students, accounting for 24% of the university's overseas students and ranking first in number. Most of the Malaysian students hail from West Malaysia. To encourage more students from East Malaysia to apply, NTU participated in the Taiwan Higher Education Fair in East Malaysia. Due to the socioeconomic context, Malaysian students tend to be more interested in such fields as medicine, veterinary medicine, management, and information technology. Not only is NTU a world-renowned institution of higher education, it also offers abundant resources, including exchange opportunities, scholarships, and cutting-edge facilities. The unique "Undergraduate Programs through Recommendation by Overseas High School"

admissions program also makes NTU the best option for many Malaysian students.

The "Undergraduate Programs through Recommendation by Overseas Senior High School" program was launched in 2016 with the goal of attracting outstanding students from overseas to study in Taiwan. The application period opens every August, and students can apply with recommendations from their high schools. Besides their overall academic performance, the students' demonstrated potential in their chosen fields and extracurricular activities also give them a great advantage. This gives the students the opportunity to be accepted by popular departments, as the number of places open to them is not limited. Graduates of Chung Hua Middle School No. 1, Kuching and Sabah Tshung Tsin Secondary School have enrolled in the Departments of Agricultural Chemistry and Veterinary Medicine, respectively, through this channel, and will commence their studies at NTU in September.



Group photo with NTU alumni at the Taiwan Higher Education Fair in Bintulu.



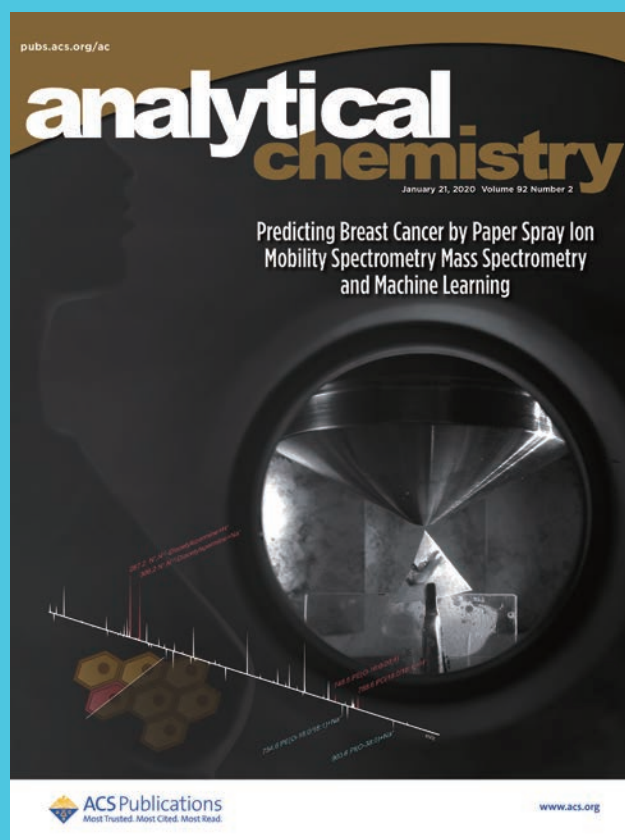
Group photo with NTU alumni, members of the Federation of Alumni Association of Taiwan Universities, Malaysia, and embassy staff in Kota Kinabalu.

NTU Makes Breakthrough for Breast Cancer Diagnosis

Breast cancer is one of the most commonly diagnosed female cancers in Taiwan, as well as one of the leading causes of female cancer deaths. Certainly, early detection and diagnosis are critical to improving breast cancer treatment outcomes and patient survival rates. Conventional screening procedures include a clinical breast exam, breast ultrasound, diagnostic mammogram, and magnetic resonance imaging (MRI), as well as biopsies, such as fine-needle aspiration or core biopsy, that are performed to determine whether the removed tissue sample indicates benign or malignant. This process is time-consuming and prone to biased interpretation. In the case of National Taiwan University Hospital (NTUH), patients might have to wait for 1-2 weeks before receiving a definite diagnosis. Research has shown that longer waiting time not only results in heavy psychological burden on the patients but is associated with poorer prognosis.

To tackle this problem, Prof. Cheng-Chih Hsu's research group at NTU's Department of Chemistry collaborated with Dr. Ming-Yang Wang of NTUH in developing a rapid, sensitive breast cancer diagnosis tool called PSI-FAIMS-MS platform, which can be performed within five minutes. The new platform utilizes paper spray ionization-mass spectrometry (PSI-MS) with field asymmetric waveform ion mobility spectrometry (FAIMS) to obtain the predictive metabolic and lipidomic profile from breast core needle biopsies. By combining a machine learning algorithm with pathological examination reports, the team developed a classification model that can successfully identify malignant breast tumors with an overall accuracy of 87.5%.

This diagnosis platform is more efficient and simpler to operate than conventional approaches; the entire process, including the chemical profiling of core needles biopsies, sample preparation, data acquisition, and tissue typing,



Front cover of *Analytical Chemistry*.



Prof. Cheng-Chih Hsu's team at NTU's Department of Chemistry.

can be carried out in the same operating room within several minutes. As a larger mass spectrometric dataset is built from clinical samples, the PSI-FAIMS-MS platform will be able to provide fast, cost-effective, and smart point-of-care testing (POCT) in clinics in the future. The team's work was accepted for publication and selected for the front cover of *Analytical Chemistry* of the January 21, 2020 issue. For the full text, please scan the QR code.



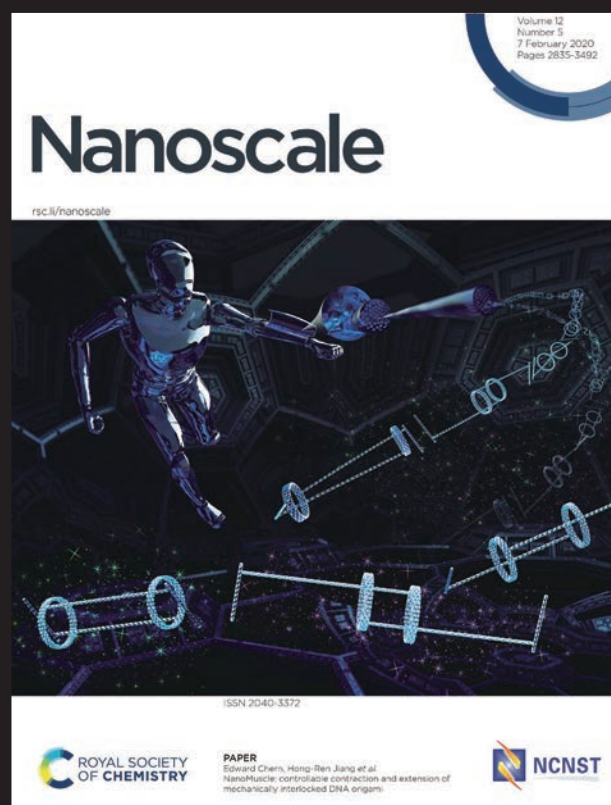
<https://pubs.acs.org/doi/10.1021/acs.analchem.9b03966>

Small is Powerful: NTU Advances Molecular Machinery with Bioinspired Nanostructure “NanoMuscle”

Over the past few decades, artificial molecular machines synthesized in supramolecular chemistry have attracted great interest. A team led by Associate Prof. Hong-Ren Jiang of NTU's Institute of Applied Mechanics employed mechanically interlocked DNA origami to construct a nanoscale molecular device called NanoMuscle. The results of his team's efforts proved that, by directly designing the nanomachines' thermodynamically stable state with DNA sequences, DNA origami technology presents an alternative approach to the construction of nanomachines.

The development of nanotechnology has led to a growing demand for precise control of material properties on the nanoscale. DNA origami is one of the latest techniques in nanotechnology that utilize DNA as building blocks to synthesize nanoparticles. This has enabled the construction of objects with unprecedented nanoscale geometric complexity via self-assembly, offering immense opportunities. DNA origami folds long strands of DNA into desired configurations to arrange the position of molecules. Since DNA origami consists mostly of multiple rigid subunits linked by flexible joints, it is capable of dynamic conformational changes that can be widely used in the building of higher-order mechanisms and machines.

Jiang's team leveraged mechanically interlocked DNA origami to construct NanoMuscle, a nanoscale molecular device controlled by adding specific DNA strands. This study, titled “NanoMuscle: Controllable Contraction and Extension of Mechanically Interlocked DNA Origami,” was published and featured as the cover story of *Nanoscale*, a prestigious journal of nanoscience, in the February 2020 issue.



Front cover of *Nanoscale*.

NanoMuscle consists of two monomers assembled as doubly threaded rotaxanes. With the exquisitely designed thermodynamic bistable state, NanoMuscle achieves one-dimensional contraction and extension. The team used gel electrophoresis to monitor NanoMuscle's multistep synthesis and further confirmed its reversible conformational change with transmission electron microscopy (TEM). Results suggest that by converting binding energy from DNA hybridization and Brownian motion to mechanical movements, NanoMuscle may help overcome the shortcomings of current mesoscale machinery.

These findings will help pave the way to the application of nanotechnology in electronics, biotechnology, medicine, avionics, and communication, and also allow the production of faster, smaller, and less expensive products. Other members on the team included Dr. Jiang's advisee, Yu-Chen Chao, a doctoral student of engineering and applied sciences at Harvard University, and Associate Prof. Edward Chern of NTU's Department of Biochemical Science and Technology.



Group photo at the training session.

Pharmacy Students on the Frontline of Fighting the Epidemic

On February 10, the Ching-Kang Foundation for Pharmacy Promotion and the NTU School of Pharmacy started a joint initiative, urging faculty members and students of the School to assist local pharmacies in distributing medical masks and relevant information. A training session was organized in the morning to match the student volunteers with the internship pharmacies, and they immediately went to work.

To cope with the coronavirus disease 2019 (COVID-19) pandemic, community NHI pharmacies have cooperated with the government in distributing rationed medical masks. During mask distribution, the pharmacists have also played an important role in sharing correct disease prevention information and preventing needless panic. While tasked with this important mission, most community NHI pharmacies are staffed with only one pharmacist. To prevent mask distribution from disrupting the regular prescription drug dispensing and other pharmacy services, this joint initiative to offer volunteer work was launched and has received positive responses from both pharmacies and schools of pharmacy all over Taiwan.

Li-Jiuan Shen, Dean of the NTU School of Pharmacy, said that the faculty and students had already visited the pharmacies which had signed an internship agreement with NTU one week earlier to start preparations. They observed the mask rationing system, explored feasible models of assistance, and later arranged volunteer training to help the pharmacies distribute masks

while sharing information on mask wearing and hand hygiene, in hopes of contributing their knowledge to society.

Given the limited number of students, the NTU School of Pharmacy can only support the pharmacies which have internship agreements with NTU. To extend the volunteer program to NHI pharmacies around Taiwan and to promote public understanding of pharmacists, NTU also reached out to enlist other schools of pharmacy. This program provides pharmacy students with early opportunities to work with the public, understand the role and functions of community NHI pharmacies, apply what they have learnt in class, and familiarize the public with the role of pharmacists as an integral part of the medical system. Tsai-Bin Wang, Chairman of the Ching-Kang Foundation for Pharmacy, has also pledged his full support to the NTU School of Pharmacy by offering necessary materials and training on operational procedures.

Dean Li-Jiuan Shen's fondest hope is that the volunteer program is carried out safely and smoothly, and that all members of the School contribute to society by assisting professional pharmacists during this challenging time.



Student volunteers from the School of Pharmacy work at community NHS pharmacy.

NTU Celebrates Long-Term Commitment, Deep Involvement, and Active Engagement

Volunteer and community service activities help prepare students to take responsibility as open-minded and principled citizens in a global community. While performing community services, students have the opportunity to observe firsthand how much their work and contributions really can make an impact on the world. NTU has always encouraged students to dedicate themselves to service and learning, and we especially support community service projects and groups that aim for long-term community building and involvement. Each year, a special ceremony is held to recognize the efforts of exemplary faculty members and students who have contributed to community service projects. On December 14, 2019, Prof. Chun-Neng Wang and four outstanding community service student groups, including “The Student Association of Social Work,” “The NTU World Volunteer Society,” “The NTU Kind Kids Service Group,” and “The

Sunshine Service Club,” were invited to attend the ceremony to share their experiences.

Prof. Wang and the students from NTU’s Department of Life Science and the Tongku Saveq Group have long worked with the indigenous Bunun community in the mountains of Nantou. They have conducted in-person and online tutoring for elementary and high school students in need of extra help with their schoolwork. This longstanding cooperation between the student groups and the indigenous people has enabled the students to adjust their services to local demand, fostering a sense of trust and mutual understanding. The students also strive to build on the foundation established by their predecessors and share their experiences and know-how with newcomers.

Student representatives from the four student associations gave presentations in the afternoon to describe their experiences of working with local communities. The common thread of the presentations was the importance of long-term commitment, deep involvement, and active engagement.

The Student Association of Social Work emphasized distributional justice in their social service projects. They have been providing social services for communities in the outlying island of Matsu. Not only do they help school children on

Group photo taken at the award ceremony.



Matsu by giving them online tutorials, they also journey to Matsu during the summer break to teach the school children there. By so doing, they hope to help amend the unequal distribution of education resources, as well as befriend and mentor the local school children on a long-term basis.

The NTU World Volunteers' Society has been hosting camp activities for elementary schools in Hualien on a regular basis during the winter break for many years. In the summer months, they go on month-long overseas service missions to Mumbai and Ladakh in India, as well as Nepal. The student group members shared their experiences at home and abroad, including their successes and failures, and provided much insight into the meaning of community services and volunteering and the actual implementation of the service programs.

The NTU Kind Kids Service Group was originally established in 1973 and serves five indigenous communities in Taitung County. The students provide tutoring services for indigenous children during their summer and winter holidays. In 1993, the group temporarily suspended club activities, but in 2012 it was re-registered as a student club. The NTU Kind Kids Service Group has returned to Taitung to work with indigenous communities, reviving the group's very long commitment to service.

The Sunshine Service Club is a group dedicated to long-term companionship, English teaching, and creativity. They have put down their roots in the Taoyuan and Chungli region, offering English classes to elementary school children to help them improve their basic English skills and begin to look at the world beyond Taiwan. The student volunteers are encouraged to be creative in curriculum design, and counselors provide support and help them fine-tune their curriculum plans.

Besides professional presentations and experience sharing, Prof. April Chiung-Tao Shen, Vice President for Student Affairs and Professor of the Department of Social Work, also attended the ceremony to commend the faculty members and students for their contributions and achievements. The Best Course Design Award was given to the NTU World Volunteers' Society; the Visual Storytelling Award was given to Lu-Chi Lin, Tze-Ting Chou, You-Cheng Nian, Chia-Rui Chang, and Peng-An Su; the Best Documentary Award was conferred to Li-Ying Hong, Guan-Wei Lee, Ya-Zhen Chou, and Chung-Chun Chen; Prof. Chung-Neng Wang was awarded the Outstanding Teacher Award, and Outstanding TA Awards were given to Li-Yun Liu and Li-Ching Huang. Nearly a hundred people were in attendance, and the atmosphere at the ceremony was convivial and filled with good cheer.



Winners of the Visual Storytelling Award.



Prof. Chun-Neng Wang (right) at the award ceremony.



Associate Prof. Ho-Chia Chueh (second from left, front row) and Associate Prof. Hiroshi Takeyama (fifth from left, front row) led a delegation of NTU and ALPHA students to join farming activities in Yuanshan Township, Yilan.



Students from ALPHA and NTU engage in exchange and discussion.

Students of ALPHA and NTU Gain Hands-On Experience in Rural Agriculture

Associate Prof. Hiroshi Takeyama led a delegation from the Awaji Landscape Planning & Horticulture Academy (ALPHA), a partner university of NTU, to participate in the course “Rural Agriculture Work Experience” in Yilan. Launched by Dr. Ho-Chia Chueh, Associate Professor of NTU’s Department of Bio-Industry Communication and Development, the course is a part of “University PLUS,” a new social responsibility platform that promotes environmentally-friendly food consumption and lifestyles. During the course, the participants actively exchanged their ideas on how to improve food and agricultural literacy as well as how to foster rural development.

Associate Prof. Chueh started the initiative of countryside agricultural experience in 2015, taking dozens of students to Shengou Village, Yilan to assist local farmers in their farming activities. The course is intended to offer the students hands-on rural experience by participating in farm work and getting to know local farmers. Besides food production, the students learn to appreciate the value of farming villages, agriculture, and farmers. At the same time, farmers enlighten the students about their work, the plight of rural development, as well as present-day agricultural issues. Over time, NTU students have become a vital driving force in realizing local rural revitalization.

ALPHA inked an international exchange and cooperation memorandum with NTU’s D-School to further collaborate on integrating food education with the development of rural communities. ALPHA is devoted to promoting local talent cultivation and local rural revitalization through landscape horticulture. By participating in the course, the delegation learned how hands-on experience can enhance the students’ food and agricultural literacy, as well as make tangible contributions to rural development. During the two-day visit, the participants helped local farmers plow their paddy fields, weed, and plant garlic. In the evening, the students prepared dinner together and spoke with the farmers about the aging rural population, the opportunities for young farmers, and how to improve citizens’ understanding of the relationship between agriculture and daily life.

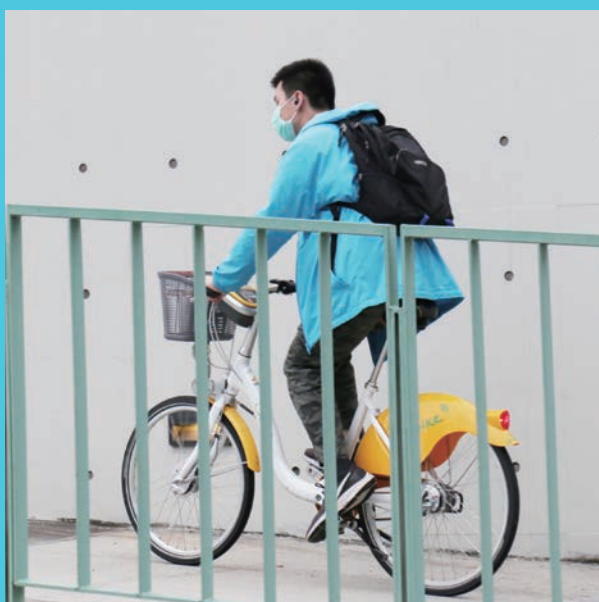
Associate Prof. Hiroshi Takeyama of ALPHA complimented this example of hands-on pedagogical practice at NTU. This course provides students from non-agricultural backgrounds the opportunity to learn about and experience the varied aspects of agriculture, farmers, and rural life. It helps them to understand agriculture on a personal level, namely, to realize that agriculture is not just the job to farmers and that what farmers produce is not just food. Instead, the farmer’s life and production are indispensable parts of everyone’s life. On the other hand, students with an agricultural background can seek ways to solve rural developmental problems through such hands-on field investigations. The delegation benefited greatly from the academic exchange with NTU and the priceless interactions with local farmers.

Environmental Protection Made Easy: NTU's Circular Economy Experiments

In recent years, a circular economy model of "renting rather than buying" has emerged around the world. It is a good way to make the most out of our resources, and thus lessen the burden on Mother Earth. NTU is not falling behind this trend. From transportation to food, a series of experiments have blossomed on campus.

Bicycles are the most common means of transportation for students at NTU. Besides owning a bicycle, students now have another popular option: YouBike. Until recently, most students preferred to own bicycles as the YouBike stations were located off campus. However, a three-month trial of YouBike 2.0 kicked off on NTU campus on January 15 of this year. Based on information gathered by YouBike, a total of 102 bike stations with 1,800 docks and 500 bicycles have been set up. The high station density has contributed to increased convenience, with stations for the shared bikes to be found close to all main buildings on campus.

In addition to service providers, students also engage in environmentally-friendly projects that can be carried out in daily life. For example,



YouBike 2.0 sets up multiple stations on campus to offer an alternative transport option.

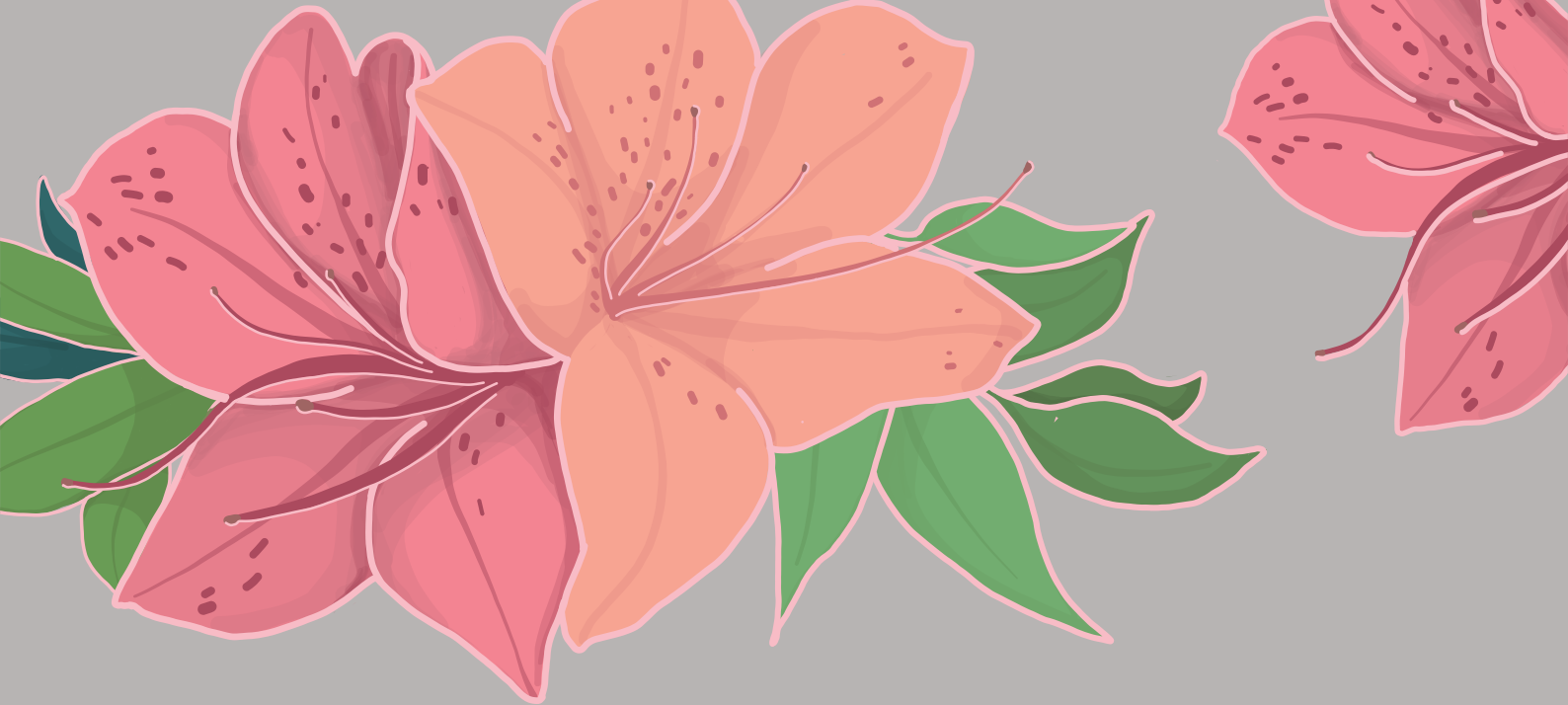


bubble tea is popular among students, and the several beverage stores on campus issue 5,000 disposable cups per day. Besides promoting a "bring your own cup" initiative, NTU's Better Team is looking into an alternative that could further reduce waste from disposable products.

After consulting the Tainan-based Good to Go Team, the Better Team aims to set up a scalable program of shared reusable cups. Backed by the NTUSA Department of Sustainability, the program made its debut during the university's 90th anniversary fair. Food-grade PP cups from ChingPiao could be rented for a deposit of NT\$20, which saved 1,800 disposable cups during the fair.

The Better Team started a 6-week trial in mid-May of last year during which it attracted 800 members and rented out 650 reusable cups. After a period of adjustment at the end of last year, the Better Team will continue to offer such services as returning rented cups at a different beverage store on campus. The procedure has been simplified with the option of renting cups with a student ID.

It is relatively easy to make an environmentally-friendly decision once, but the motivation to consistently contribute to sustainability is the real key. The seeds of a circular economy have been sown at NTU, and it is the university's fondest hope that all students can do their part for the planet.



Live-Streamed for the First Time: 2020 NTU Azalea Festival

**“Blooming azaleas inspire youthful hearts
At resplendent NTU to make their mark.”**

March is when azaleas start to bloom on NTU campus, setting the stage for the annual Azalea Festival. For the first time ever, the opening ceremony and department expo scheduled for March 14 and 15 were live-streamed on NTU’s YouTube channel, “NTU Campus.” A lucky draw for NTU souvenirs was organized during the session with a randomly appearing QR code. Once scanned, the participants could answer questions and leave their contact information. The list of prize winners was announced on March 17.

The university kicked off the 2020 Azalea Festival with a series of video clips. The “Song for NTU’s Azaleas,” an original creation based on the style of a campus folk song, was debuted in the opening clip. During the interviews, which were recorded on campus, the appearance of NTU President Chung-Ming Kuan was a nice surprise for the students. In his speech, President Kuan asserted that NTU had undergone a series of transformations in the

previous year, particularly in improving the quality of education and helping the students stride towards the future. Students are the most precious asset of NTU, and NTU cannot make progress if the students don’t have bright prospects. In the next part of the program, the student host and the President held a lightening round with many interesting quizzes and conversations along the way.

The department expo was a highlight that thousands of high school students across Taiwan looked forward to: each department showcased its curriculum and future developments. A live comment section was set up on the channel, for the viewers to raise questions during the live-streaming session. Each department also organized follow-up sessions to delve further into its distinctive teaching and research achievements. Please refer to the following links for further information.

Live-streaming of the opening ceremony of



Azalea Festival:
<http://event.ntu.edu.tw/azalea/2020/2020%20NUT%20Azalea.mp4>



Online department expo:
<http://event.ntu.edu.tw/azalea/2020/activityacademics.html>



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