

NTU



Everything Digital



Campus Tree Adoption Program

- Asian Scholars Focus on Migration
- Int'l Higher Education Features Shared Future
- Triumphs in Tissue Engineering

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The backs break through the defense and advance toward touchdown zone. (Photo courtesy of Chin Chiang Tsai)

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University Librarian Kuang-hua Chen: Serving Readers in Taiwan and Around the World

“The NTU Library has some of the best resources and services in Taiwan, I dare say in the world,” proclaims University Librarian Kuang-hua Chen.

A member of the Information Division of the NTU library system since 2006, as well as a professor of Library and Information Science, Kuang-hua Chen has accumulated rich experience in overseeing the library’s digital transformation and management. Under his leadership, the NTU Library has continued to innovate its services, to assist not only those who study and work at NTU but also the international academic community as well.

To this end, NTU Library has digitized many unique and precious collections of its own and

important collections in Taiwan so that those resources can be efficiently shared with people in academic circles around the world. Be it the official archives of the local government during the Qing Dynasty, diplomatic correspondence with the Kingdom of Ryukyu, manuscripts of master calligraphers, or even collections on various websites, NTU Library is dedicated to preserving precious resources with a rich history for all readers. In addition, the library is connected with many other collections elsewhere in the world so that their resources can circulate freely, winning praise from many local faculty members.

Voicing his vision for the NTU Library, Kuang-hua Chen remarks, “In addition to providing teaching

and research resources, the library also values offering personalize service.” With its magnificent architecture, the NTU Library is fitting place for patrons to admire precious works of art and listen fine music on vinyl records, which stir their senses and deepen their appreciation of the beautiful things in life.

As to resource sorting and collection strategies, the NTU Library has drawn up a blueprint called “GLAM.” By integrating digitalized resources from Gallery, Library, Archive, and Museum, the synergy can be maximized to enrich the library’s offerings with different dimensions and functions, allowing patrons enhanced services and access to the arts.

University Librarian Kuang-hua Chen.



NTU's First Virtual Commencement Ceremony

With the COVID-19 pandemic threatening Taiwan, virtual events have become the new norm. In response to the recent upsurge of the pandemic, NTU synthesized multiple video clips to hold its first virtual commencement ceremony, which aired on June 26. Even though the graduates and parents couldn't attend the event in person, the virtual commencement ceremony was replete with innovation and well-wishes, thanks to the joint efforts of the Office of Student Affairs and the students themselves.

This year, NTU awarded a total of 10,259 degrees. A virtual campus tour was produced by the NTU Minecraft team, with charming figures dressed in graduation gowns leading everyone around the NTU campus. Incredibly, members of the NTU Wind Band recorded their parts of the music performance in their own homes and then the clips were synthesized into a "pitch perfect" performance. Some student clubs also offered their well-wishes to the graduates at the end of the graduation ceremony and activities.

In his speech, NTU President Chung-Ming Kuan emphasized there would be many uncertainties in the post-pandemic era, but added that the graduates would be

entering a world full of challenges and opportunities. There would be no set answers to many questions, such as how the graduates could tackle the challenges with what they have learnt, or how they could distinguish themselves by making the most of the opportunities. In the final analysis, each individual graduate would just have to try their best. President Kuan also reminded the students that the true heroes of the day were the medical professionals on the frontline, fighting the pandemic. These medical professionals included many NTU professors and alumni who are doing their best to protect the health and well-being of every person in Taiwan. In closing, President Kuan expressed his confidence that the pandemic would be brought under control and wished the graduates good health and a bright future.

The guest of honor at this year's graduation ceremony was the founder and former CEO of Giant Group, Anthony Lo who graduated with a degree from the Department of Commerce (now the Department of Business Administration) in 1969. Anthony Lo shared his story with the new graduates as an example: when he graduated from NTU, he started working for Taiwan's largest trading company, full of ambition. Two years later, however, he

discovered that he was not interested in being a businessman. His heart was set on building an enterprise. Consequently, he gave up his stable, well-paid job to join a tiny bicycle company with only 38 employees, to pursue his own dream. Looking back, he considered this to be the best decision he ever made in his life.

Anthony Lo gave the graduates two tips for success based on "empathy." His first tip was to stand in the shoes of the customers, to realize how to create more value, and the second tip was to stand in the shoes of the operators, to facilitate sustainable development. Finally, he encouraged the graduates to listen to their inner hearts, be their authentic selves, and be one of a kind.

Three representatives of the graduating class delivered speeches this year. Yu-Hsuan Lin of the Department of Political Science spoke first. She enumerated "courage, flexibility, and self" as three crucial elements of personal growth that she learnt on campus. For her, "courage" meant doing what she thought was right, maintaining "flexibility" amidst changes was the way to be resilient, and listening to her inner voice was the way to overcome external pressures.

Shih-Feng Lin of the Department of Psychology spoke next. In his view, COVID-19 had made this year's graduates the most confused and yet unique in history. The pandemic had

taught people to cherish one other, and he personally came to realize that the things he was learning at NTU would help him to do good for others by exploring and creating value. To this end, he established the NTU Avizure Education Club with fellow students from various departments and countries. Club members traveled to rural areas in Taiwan, to help rural junior and senior high school students explore the meaning of learning and self-worth.

Last but not least, Seth Austin Harding, an American, spoke for the international graduates. He had come to NTU filled with trepidation and excitement, but sometimes he encountered frustrations along the way. The negative emotions he experienced made him feel trapped. Fortunately, he regained his passion in Computer Science and Information Engineering with the encouragement and guidance of staff members of the Student Counselling Center and his professors. He started the NTUAI club with his classmates to encourage students to conduct technical research. Moreover, he encouraged his peers to face difficulties with optimism to change themselves and those around them.

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| 1 | 1. Campus tour. |
| 2 | 2. Snapshots of the graduates. |
| 3 | 3. The graduates bid one another fond farewells. Graduate representatives from left to right: Shih-Feng Lin, Yu-Hsuan Lin and Seth Austin Harding. |
| 4 | 4. Musical performance by the NTU Wind Band. |



NTU Joins with Elite Universities Across the Globe to Discuss International Higher Education

NTU's Vice President for International Affairs, Prof. Hsiao-Wei Yuan, partnered with Prof. Cindy Fan, Vice Provost for International Studies and Global Engagement, UCLA and Dr. Caroline F. Benton, Vice President, University of Tsukuba in discussing current topics in international higher education at the 2021 NAFSA (Association of International Educators). As the world's largest international annual conference on education, this year's online conference featured the theme of "Designing Our Shared Future," with 3,600 higher education professionals from over 80 countries in attendance.

Engaging in distance international collaboration is a topic in higher education that has received increased attention during the global COVID-19 pandemic. Prof. Yuan delivered her keynote presentation "Transformation Toward Digital Collaboration and the Future of Learning" on June 2, offering such examples as the innovative short-term online program NTU Plus Academy, the online courses offered by the Association of East Asian Research Universities (AEARU), as well as the newly launched Global Learning Initiatives Program. At the same session, Prof. Fan discussed the organization of Webinar courses, and Dr. Benton spoke about the Jukebox transnational program. The presentation was featured by University World News on June 12 with the title of Transforming Learning through Digital Collaboration, a world-renowned higher education media outlet.

Prof. Yuan also worked with representatives from MIT, King's College London, and the University of Sydney at the Going Global Conference for Leaders of International Education hosted by the

British Council, with nearly 600 leaders in higher education from 70 countries in attendance.

Universities play an important role in realizing the 17 UN Sustainable Development Goals (SDGs). To this end, Prof. Yuan shared NTU's experience in her keynote speech "Localizing SDGs for Community Impact and Beyond" on June 17. Dr. Julie Newman, Director, MIT Office of Sustainability, also proposed the strategy of setting up the sustainable development systems and datapools for campuses. Additionally, Prof. Bronwyn Parry, Vice President & Vice Principal for Service, King's College London, presented a program for students to work on sustainable development issues through service-learning, while Director Amanda Sayan, Office of Global Engagement, University of Sydney, introduced their transnational online sustainability program.

As a top university in the world, NTU has contributed to the global community by proposing innovative models of higher education.

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1. University World News reports on the innovative higher education models at NTU.

2. Prof. Yuan discussed international higher education together with Prof. Cindy Fan, UCLA, and Dr. Caroline F. Benton, University of Tsukuba.

TAIWAN

Transforming learning through digital collaboration

Hsiao-Wei Yuan

COVID-19 has galvanised more innovation in cross-border online cooperation – encouraging the building of a virtual multicultural learning environment that facilitates collaborative problem-based learning and enhances students' analytical skills – and could lay the foundations for the future sustainability of higher education.







Food and Culture: 2021 KHU-NTU SDGs Program

Student advisors give KHU students a virtual tour around Taiwan.

NTU's Office of International Affairs organized a short-term Tailor Made online course for Kyung Hee University (KHU) in South Korea, held this past May 10-21. Professor Chau-Ti Ting of the Department of Life Science was enlisted to develop two weeks of interesting course content based on the United Nations' Sustainable Development Goals and Taiwanese food culture.

KHU has collaborated many times with NTU in developing courses on East Asian societies and cultures. Due to the COVID-19 pandemic, the course was held online this year. However, the course was as just action-packed as were its predecessors, but this time the different format inspired some new forms of interaction.

In order to integrate elements of sustainable development with Taiwanese food and culture,

Professor Jer-Ming Hu of NTU's Institute of Ecology and Evolutionary Biology teamed up with Associate Professor Yih-Ren Lin of the Graduate Institute of Humanities in Medicine, Taipei Medical University, in telling stories about the nature-respecting aborigines of Taiwan. Associate Professor Shun-Chern Tsaur discussed the rice culture present in Taiwan since the dawn of time and the food crisis the world will face in the future. Assistant Professor Shu-Wei Huang of the D-School explained the wheat fermentation process used to produce local wheat beer. Associate Professor Po-Yi Hung of the Department of Geography introduced Taiwan's tea products, the recent crisis faced by Taiwanese tea farmers, and the business opportunities associated with Bubble Tea.

The program's courses were both pre-recorded and

live-streamed. A virtual tour around Taiwan took the students around the island to Yilan, Taitung, Tainan, Yunlin, and Chiayi, to acquaint them with the historical backgrounds and environmental settings in which local delicacies were created. Many interesting missions were also integrated in the program, which won the praises of every participant.

Students from both universities also interacted on social media, to discuss the Gua-Bao shops, Korean snacks, and so on. Even though the pandemic changed the format of the program, every effort was made to reduce the sense of distance and foster closer connections between the participating faculty and students of the two universities. The experience has opened new possibilities for offering short-term online courses.

NTU CFRC Hosts the 6th CIFA Regional Symposium



The NTU Children and Family Research Center (CFRC), sponsored by CTBC Charity Foundation, partnered with the Consortium of Institutes on Family in the Asian Region (CIFA) in hosting the 6th CIFA Regional Symposium online during June 10-11, 2021. The Symposium theme was “Family First: Supporting Asian Families in the Era of Inclusive Growth.” The Symposium attracted 730 participants from 11 countries/regions in the world, with 400 experts, scholars, practitioners, students, and members of the general public at each session on average.

In the opening ceremony, NTU's Executive Vice President Dr. Ming-Syan Chen warmly welcomed all the participants from around the world. Moreover, CFRC invited former Taiwan President Ying-jeou Ma and CIFA President Patricia Chu to greet the participants online, as well. The closing ceremony was presided over by Professor Yen Feng, Director of CFRC.

The Symposium featured three keynote speeches, including “Family Well-Being (FWB) Index – Implications on Policy and Practice” presented by Dr. Anjali Doshi-Gandhi, Former Deputy Director General of the National Population and Family Development Board Malaysia, Ministry of Women, Family and Community Development, “Information & Communications

Technology (ICT) and the Family” by Prof. Susan Walker, Associate Professor of Family Social Science, University of Minnesota, USA, and “Supporting Families in the COVID-19 Pandemic: Inter-generation Approach” by Taiwan’s former Vice President Dr. Chien-Jen Chen.

Dr. Anjali Doshi-Gandhi explained how globalization, immigration and the pandemic have revolutionized the family structure. The Malaysian government developed the Family Happiness Index in 2011 as a vital reference for policy design, formulation, and evaluation. Prof. Susan Walker discussed how the interaction between technology and the family affects the parent-child relationship as well as the physical and mental health of every family member. Prof. Chien-Jen Chen explained Taiwan’s inter-generation family support policy during the pandemic. Not only did Taiwan manage to stop the virus at the border in the beginning, it has also effectively utilized high-tech tools and the National Health Insurance database to achieve great results in epidemic prevention.

1. 2021 summer symposium: Family First: Supporting Asian Families in the Era of Inclusive Growth.
2. Seed instructors invited for training of CFRC’s Positive Interpersonal & Life Orientation Training (PILOT).
3. Group presentation for instructor training of CRFC’s Positive Interpersonal & Life Orientation Training (PILOT).
4. 2019 summer symposium: Motivational Interviewing Workshop and Practical Skills Exercise.



Scan the QR code to visit the CFRC website.



Scan the QR code to read the CFRC newsletter.



Scan the QR code to
visit the GARC Website.

Group Photo.

NTU GARC and Seoul NUAC Host Asian Migration Workshop

NTU Global Asia Research Center (GARC) and Seoul National University Asia Center (SNUAC) co-hosted the “Asian Migration Workshop” on July 1. Scholars from Taiwan, South Korea, Japan, and Singapore shared their latest academic insights on the topic at the event. Due to the pandemic, the workshop was held online, featuring two presentation sessions and a roundtable discussion.

Founded in August 2017, GARC’s mission is to promote cross-societal and cross-cultural comparative studies in Asian studies as well as Taiwanese studies on the transnational or global scale. GARC also supports exchanges and collaborations among academic institutions and research teams around the world to enhance active participation, visibility, and influence of Taiwanese researchers in the global academic community.

The first presentation session topic was “Marriage Migration.” Prof. Minkyung Koh, Kyungpook National University; Profs. HaeRan Shin and Thi My Hang Bui, Seoul National University; and Profs. Tsung-Yi Michelle Huang and Chieh Hsu, NTU, addressed the experience of marriage migration from the perspectives of policy, development, the tourist gaze, and the labor market. The second presentation session topic was “Migrant Workers.” Profs. Pei-Chia Lan and Yen-Fen Tseng, NTU, and Prof. HyunJoo Jung, SNUAC & GSES Environmental Planning, offered their perspectives and insights on migrant workers.

Lastly, in the roundtable discussion, Prof. Jungwon Huh, SNUAC; Prof. Wako Asato, Kyoto University; Prof. Yasmin Ortiga, Singapore Management University; and Prof. Pei-Chia Lan and Research Assistant Yu-Wen Wang, NTU, discussed how migrants fared during the pandemic over the past year with COVID-19 wreaking havoc worldwide.

The two presentation sessions focused on migrants who migrated for marriage and work, respectively. In both sessions, the scholars not only discussed the migrants’ subjective experiences, life trajectories, and social networks but also critically reviewed the policies and systems of their home and host countries. In the roundtable discussion on the impact of COVID-19 on the migrants, the scholars addressed this additional stressor in the daily lives of the the migrants. Although it was held online, the Asian Migration Workshop was a successful occasion for the participating scholars from several countries to address the latest trends and theories in Asian migration research and have in-depth discussions.

NTU Researchers Take Tissue Engineering to the Next Level

A NTU research team has developed a new vapor-phased construction process to form scaffolding materials for tissue engineering. This process marks a significant advance in regenerative medicine, allowing breakthroughs in the repair and regeneration of tissues and organs. In recent years, scientists attempted modular approaches to forming scaffolds with superior physical and chemical complex molecular and structural flexibility, closely resembling the native extracellular matrix (ECM). However, serious problems ranging from cell-cell aggregation, distribution, and localization of multiple types of cells, co-culture of cell types, distribution and localization of biomolecules, limited and potential immune-responsive materials, and lack of surface modification of materials to the control of cell-material interaction, remained unsolved.

Professor Hsien-Yeh Chen of the Department of Chemical

Engineering, and Researchers at the Advanced Research Center for Green Materials Science and Technology and the NTU Molecular Imaging Center, led an interdisciplinary research team in developing a new fabrication process for forming scaffold materials. Their research findings were published in the globally renowned scientific journal *Nature Communications* in June 2021.

The new fabrication process offers the advantage of accommodating multiple biomolecules and living cells with built-in boundaries, which separate distinct compartments containing defined biological configurations and functions. The sophisticated procedure promises great potential for mass production, requiring only the use of vapor sublimation and deposition instead of costly, sophisticated equipment.

The research team also found that the advanced scaffolds formed by the new fabrication process exhibits extreme biocompatibility

and enhanced performance in cell proliferation, osteogenesis, and neurogenesis. In short, the new material can be arrayed in diverse geometric configurations and perform independent osteogenesis and angiogenesis activities from separate compartments.

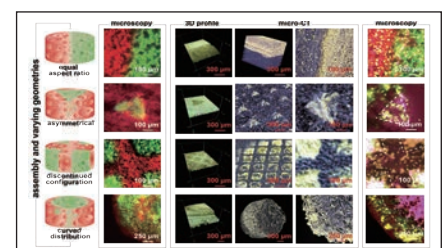
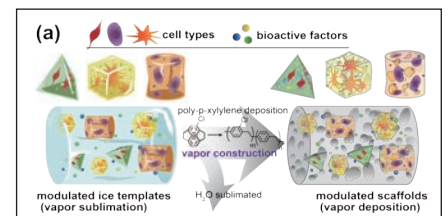
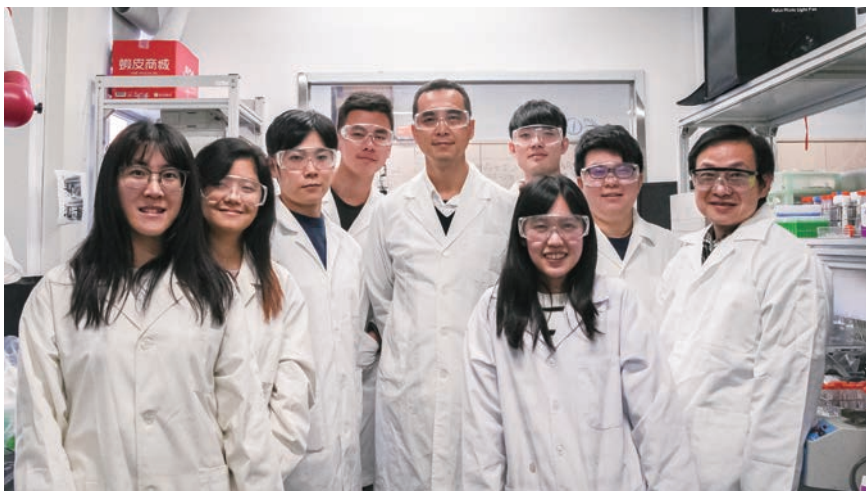
The research team included Senior Research Fellow, Dr. Chih-Yu Wu of the NTU Molecular Imaging Center, Ph.D. student, Ting-Ying Wu of NTU's Department of Chemical Engineering, and Prof. Chao-Wei Huang of the Department of Tropical Agriculture and International Cooperation, National Pingtung University of Science and Technology.



Scan the QR code to read the journal article.

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- 1.Group Photo.
- 2.Fabrication Process.
- 3.Scaffold Results.



New Cyanobacteria Casts Light on Mystery of Early Photosynthesis

Cyanobacteria, commonly known as blue-green algae, are the earliest organisms to perform photosynthesis and produce oxygen. They appeared around 2.5 billion years ago, pumping oxygen into the atmosphere that has enabled life on Earth to evolve and thrive.

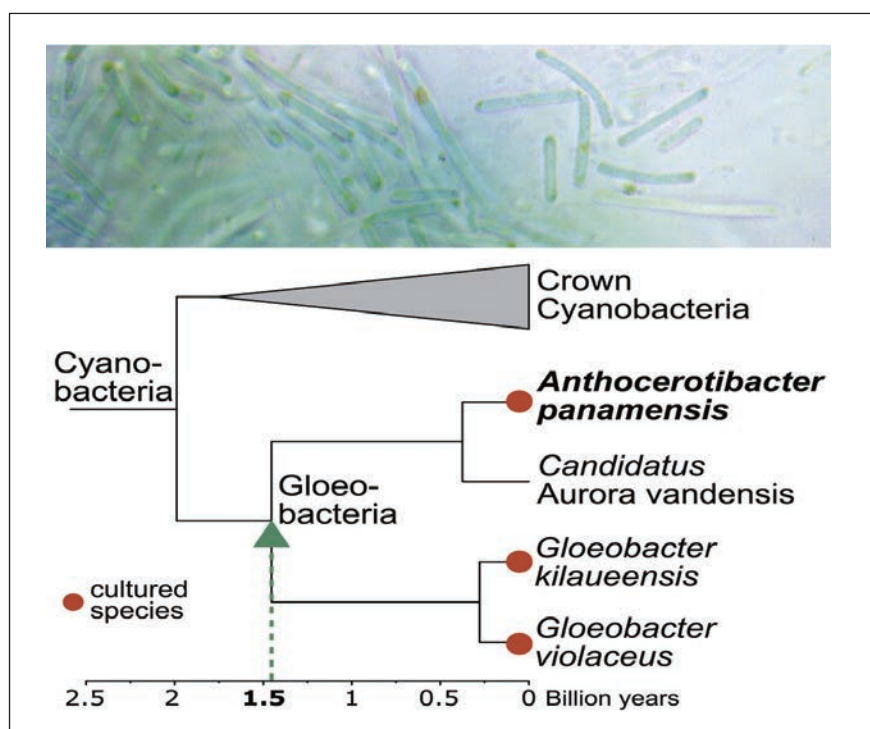
Led by Professor Ming-Yang Ho of NTU's Department of Life Science and Professor Fay-Wei Li of Cornell University, a team of researchers discovered unprecedented early-diverged cyanobacteria that promise to unveil the origin of photosynthesis. The research findings were published in *Current Biology* in May 2021.

Commenting on the research, Prof. Ho said: "We studied cyanobacteria because it is the key to understanding the evolution and diversity of photosynthesis." The team studied photosynthesis in existing cyanobacteria, algae, and plants in order to determine the change of this process overtime. "Obviously, we can't travel back in time to see how photosynthesis worked, yet we can infer paths of evolution through organisms that retain archaic features," remarked Prof. Ho.

At present, two genera of cyanobacteria have been identified: *thylakoid-containing Crown Cyanobacteria*, to which most cyanobacteria belong, and *thylakoid-less Gloeobacteria*, with only two cultured species. In past years, the lack of representative species in the earliest stages of evolution posed great challenges for researchers who study the evolution of photosynthesis.

In this study, the research team successfully isolated and cultured a novel cyanobacterium obtained from a rainforest in Panama, christening it *Anthocerotibacter panamensis*. The new species, which diverged 1.4 billion years ago, belongs to *Gloeobacteria*. Like other *Gloeobacteria*, *A. panamensis* lacks thylakoid and genes for the circadian clock, however its carotenoid biosynthesis pathway resembles *Crown Cyanobacteria*. On the other hand, unlike *Crown Cyanobacteria*, it lacks several genes for photosynthesis.

The research team's discovery and isolation of *A. panamensis* will allow scientists to fill a 2 to 1.4 billion-year gap in early evolutionary history and promises to reveal new insights into the evolution of photosynthesis. This research was supported by NTU, Ministry of Science and Technology (MOST) Young Scholar Fellowship Einstein Program, and Ministry of Education (MOE) Yushan Young Scholar Program.



Scan the QR code to read the journal article.

A microscopy image taken by Prof. Ho's research assistant, Pa Yu Chen, and a figure showing evolution of cyanobacteria drawn by Prof. Li.

What Maintains the Variation in Wild Mustard “Flavor”? NTU Study Published in *Nature Ecology & Evolution*

Why do mustard and wasabi go to your nose? Their flavors are produced by different types and byproducts of glucosinolate, a chemical compound found in Brassicaceae plants, including mustard, wasabi, and assorted others. While toxic to herbivorous insects in nature, these compounds are a good source of flavors for humans.

Depending on the precursor chemicals, there are many types of glucosinolates, but why does this polymorphism exist in nature? Dr. Cheng-Ruei Lee’s group at NTU’s Institute of Ecology and Evolutionary Biology collaborated with researchers at Duke University, USA, in examining the polymorphism of glucosinolate in the North American wild mustard plant. The team first identified a key gene controlling the synthesis of this chemical and found that the gene copy number differs among individuals. Each duplicate copy accumulated unique mutations that slightly changed their functions or else prevented the genes from functioning properly, resulting in distinct glucosinolate profiles among the wild mustard populations.

The team then investigated the consequences of such chemical differences to discover how these plant genetic and phenotypic variations could be actively maintained. Distinct natural environments feature different factors, such as drought stress and certain species of herbivorous insects. Such factors tilt natural selection to favor distinct types of glucosinolate profiles within plants, contributing to the geographical distribution of plant genotypes across North America.

Digging into plant genomics, the team next assembled the chromosome-level genome of this wild mustard species and examined over 500 individuals. After identifying the gene which

determines glucosinolate composition, the team found astonishing differences in the gene copy number. Normally the chance of random mutations occurring at desired sites of desired genes to generate specific novel functions is quite low; however, naturally-occurring gene duplication events occur, which treat genes as modules to quickly generate novel functions by multiple copy-pastes, minor adjustments, or deletions.

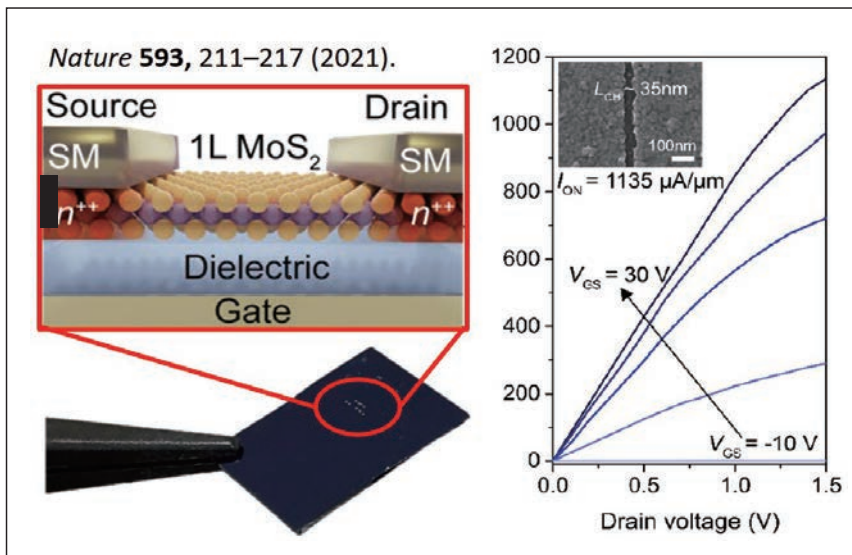
In pursuing this study, the research team conducted field ecological experiments, genetic mapping, biochemical analysis, and genomic big data analysis, and applied state-of-the-art third-generation sequencing technology for genome assembly. The study results answer a fundamental question that has long puzzled biologists; namely, why does biodiversity exist in nature?



Scan the QR code to read the journal article.

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1. Field experiment exposing plants to natural environments. (Photo courtesy of Cheng-Ruei Lee)
2. Lab experiment with caterpillar feeding on plants. (Photo courtesy of Lauren Carley)



Scan the QR code to read the journal article.

Device structure and its electrical properties.

Extending Moore's Law: NTU, TSMC & MIT's Collaboration Published in *Nature*

Research conducted by NTU in collaboration with Taiwan Semiconductor Manufacturing Co., Ltd. (TSMC) and Massachusetts Institute of Technology (MIT) has discovered that two-dimensional materials combined with semimetallic bismuth are capable of achieving extremely low resistance that approaches the quantum limit, which will be helpful in achieving the difficult challenge of realizing sub-1nm semiconductors. The results of their research have been published in the scientific journal *Nature*.

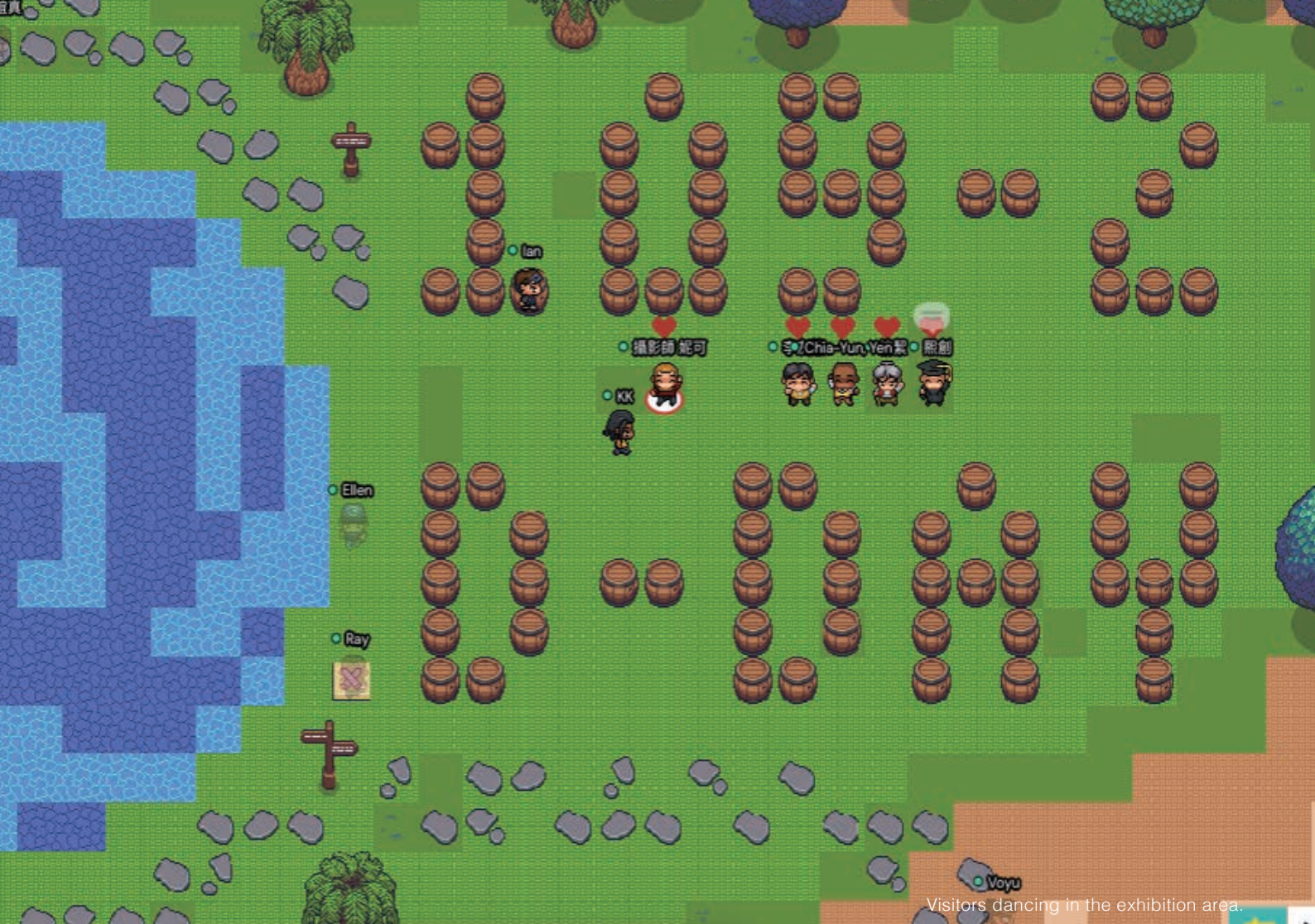
Currently mainstream silicon-based semiconductor manufacturing processes have advanced to the 5-nm and 3-nm nodes. The transistor count per unit area of the wafer is approaching the physical limit of silicon, the principal material used in current semiconductor manufacturing. The scientific community has always had high hopes for two-dimensional materials but has been unable to solve the high-resistance and low-current problems associated with two-dimensional materials.

The research paper jointly published by NTU, TSMC and MIT began with the discovery by the MIT team that the combination of semimetallic bismuth (Bi) electrodes with two-dimensional materials can significantly reduce resistance and increase current conduction. This was followed by the optimization of the Bi deposition process carried out by TSMC's Corporate Research. The NTU team then employed helium-ion beam lithography to successfully reduce the channel widths of the devices down to nanoscale, and breakthrough was finally achieved.

Prof. Chih-I Wu of the Dept. of Electrical Engineering and the Graduate Institute of Photonics and Optoelectronics at NTU further

explained that the research discovered that with the use of Bi contact electrode as the key structure, the performance of two-dimensional transistors is not only comparable to that of silicon-based semiconductors, but it also has the potential to be compatible with the mainstream silicon-based manufacturing process technology currently in operation, which may help circumvent the limitations of Moore's law going forward. Although still at an early stage of development, this new discovery may provide excellent conditions for the creation of next-generation chips.

Dr. Pin-Chun Shen, an MIT graduate, is the first author and corresponding author of this research paper. At NTU, Prof. Chih-I Wu and Dr. Ang-Sheng Chou, also from the Graduate Institute of Photonics and Optoelectronics, participated in the research and co-authored the paper.



Visitors dancing in the exhibition area.

NTU D-School Takes You to Town on D-Day

As the spring semester came to an end, faculty and students geared up to prepare for the first-ever online D-Day! “We want to build D-School’s D-Day into the most inspiring and fun online exhibition for college and university students,” said Deputy Vice President for Academic Affairs Kuei-Yuan Chan.

Special times call for special measures and NTU’s D-School has adopted various online tools to ensure that students gain the best learning experiences. The web-conferencing software Gather Town adopted to host the course “Design your life,” and “Game for Life : Reading and Re-designing Games for a Purpose” was used to make the students’ virtual interactions more human. Since Gather Town allows users to transform the virtual space into a creative and collaborative environment, D-Day was held on Gather Town this year.

The theme of this year’s D-Day was D-Bookstore and highlighted the 29 courses of the semester. The courses were categorized into six different themes and presented in the form of six classrooms. The main exhibition room was designed by Jack Chung and Alex Tsai while the separate exhibition classrooms were collaboratively created by D-School faculty and students. Over 100 students devoted more than 1000 hours to curating the exhibition in order to deliver the most innovative and immersive exhibition to the visitors. “The pandemic may stop our activities, but it cannot stop our creativity. We must face the pandemic period dauntlessly and seek opportunities to shine,” commented NTU President Chung-Ming Kuan.

D-Salon: Showing the Power to Change

The guests started flocking within five minutes after D-Day commenced, and the Dean of D-School, BY Chen, raised the curtain on the event. “I didn’t think I would have to speak for a virtual event. Everyone please seize the time to explore this unique and engaging exhibition!” Following Dean Chen’s remarks, students shared how the course “Bicycle City” had made the surroundings of Shuiyuan Market more cyclist-friendly and how “Introduction to Civic Education” had allowed students to listen to the voices of migrant workers and fishermen.

D-Bookstore: Exploring Ways of Thinking

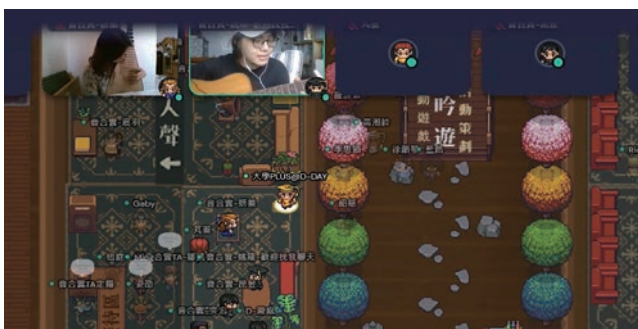
The six D-Day classrooms included design thinking, social action, arts and humanities, documentaries, learning tools, and innovative businesses. The semester’s 29 courses were spread out around the exhibition like 29 precious books, waiting to be stumbled upon.

The design thinking classroom was packed with student ingenuity—from interactive games to

thought-provoking designs on human interactions and communications; there wasn’t a dull moment for those wandering through its digital isles. The social action classroom solemnly touched on the muted presence of various minority issues. As each project closely interacted with related groups and organizations and sought out potential problems, their actions together cast a warm light on the furthest corners of Taiwan’s society. As visitors immersed themselves in the classrooms, they could not help but rethink the role they play in society. The arts and humanities’ online theatre, as the last theater standing in these times of COVID-19 lockdown, welcomed the “Filmmaker Bootcamp” students’ exclusive premier of the Cosmic Girl remake. The documentaries classroom highlighted the “Designing Your Life” course, in which students searched deeply for their creative direction, forged meaningful connections with their peers, honed observation and problem-solving abilities, and cultivated group decision-making skills.

The world is changing faster than ever before, thus industry leaders should offer guidance to their young talents. The innovative businesses classroom showcased the operational thinking of leading enterprises so that students could reach the caliber of professional business managers. Finally, the learning tools classroom led the students on a tour to explore skills for effective fieldwork, organizational management, critical thinking, and problem-solving.

At D-Bookstore, learning and hands-on experience are key. Students partner up to tackle problems by applying interdisciplinary knowledge. Here at D-School, students shape society and the world with the power of design.



Scan the QR code to join D-Day
@Gather Town.

1. Every exhibition room of D-Bookstore is a classroom that encourages interaction.
2. Students sharing on their project on the stage of D-salon.
3. Students from “The Art and Practice on Music Cooperation Course” giving a live performance.

NTU Sparks the Golden Age of Digital Transformation

Businesses around the world are opting for digital transformation, yet many find themselves caught in the throes of this "next big thing."

Consequently, Global Industry Platform of NTU System and NTU Industry Liaison Office co-held an online seminar on "Digital Transformation and Smart Management" on June 23, to share information on how digital technologies can revolutionize business strategies and cultivate a data-driven, flexible corporate culture.

"During the past several years, digital transformation has drawn wide attention, especially with the rise and the growth of network infrastructure. Digital technologies such as IoT, AI, and big data have also penetrated all aspects of our lives. The coronavirus has accelerated this change, and many companies are now leveraging digital power to improve operation efficiency, product quality, and customer experience. These technologies are breaking down barriers and building corporate competitiveness," declared Professor Pai-Chi Li, VP of NTU Office of Research and Development and Director of NTU Industry Liaison Office.

At the event, Professors Winston Hsu, Shih-wei Liao, and Phone Lin of NTU's Department of Computer Science and Information Engineering offered insights into how companies may best deploy digital technologies and strategies to drive growth. Prof. Hsu spotlighted the opportunities and challenges of AI and machine learning applications by sharing a variety of case studies, while Prof. Liao introduced the concept of ABCD (Artificial Intelligence, Blockchain, Cloud Computing, and Big Data) in fintech in best practices. Finally, Prof. Lin explained how big data and machine learning build algorithms for O&M automation, such as real-time detection, malfunction analysis, and resource allocation, to improve system performance and stability.

Grace Chang, CEO of NTU Industry Liaison Office summed up the proceedings with an inspiring reflection: "Digital transformation cannot be built in one day. Companies must overcome technical, cultural, and market challenges. Global Industry Platform of NTU System gathers the momentum of National Taiwan University, National Taiwan University of Science and Technology, National Taiwan Normal University, and Chang Gung University." Through a close partnership between industry and academia, industries way prepare well to transition into the future.

The screenshot shows a YouTube video player for the title "The First AI-Generated Movie Trailer – IBM TJ Watson". The video is from 20th Century Fox and has 3,008,495 views. The video player shows a scene from the movie Morgan. To the right of the video player are several news snippets: "IBEW NEWS: Watch the thrilling trailer IBM created for Morgan using artificial intelligence", "POPULAR SCIENCE: IBM WATSON CREATED THE FIRST-EVER MOVIE TRAILER FOR 'MORGAN'", "ADWEEK: IBM Watson creates the first AI-made film trailer – and it's incredibly creepy", "This trailer made by IBM's Watson proves AI knows how to creep you out", and "THE WRAP: 'Morgan' Trailer Made by IBM's Watson Computer Is Creepier Than the Real Thing (Video)". A QR code is also present in the top right corner. At the bottom of the video player, there are two awards listed: "Best Brave New Idea Paper Award in ACM Multimedia 2017" and "IBM Research Pat Goldberg Memorial Best Paper Award 2018". The video was published on August 31, 2016. A small video thumbnail of Professor Winston Hsu is visible in the top right corner of the overall image.

Professor Winston Hsu in NTU CSIE and GINM shares how deep learning technologies can be applied.

Trees, Alumni, Fund, and Environment Form a Green Circle

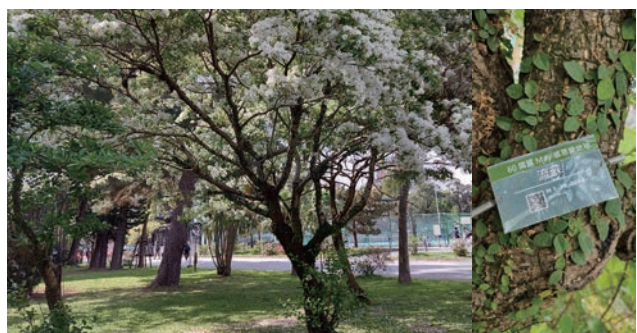
NTU launched the campus tree adoption program on Earth Day 2020 (April 22). To date, 112 trees have been adopted, with additional alumni donations provided for tree maintenance. To show NTU's gratitude, a green plaque is hung on each tree with the name of the donor, department/year of commencement, and a personal message.

A 1971 graduate of the International Trade Division of the Department of Commerce (now the Department of Business Administration), May E Ho has taken great interest in the program. She donated NT\$6,000 in December 2020 to adopt her first tree, chosen on her behalf by the university. The dedicated staff selected a bishop wood in her name near the College of Management with a plaque featuring May E Ho's own message of "Gratitude and Love for Mother Earth."

By this March, the Chinese fringetrees in full bloom on campus looked as if they were covered with beautiful snow. The lovely view prompted May E Ho to adopt a Chinese fringetree. She later visited the NTU campus with her classmates to show them the trees she adopted and encourage other alumni to join the adoption program. She demonstrates the spirit of charity with her small annual donations, which express her gratitude to her alma mater. She hopes to return to campus once the pandemic is over to look for new trees to adopt.

A 2020 master's graduate in Civil Engineering, Mickey Huang adopted a camphor tree in front of the department building with 5 classmates to express his gratitude to his thesis advisor, Prof. Chia-Pei Chou. Moved this gesture, Prof. Chou, currently NTU Executive Vice President, has adopted another camphor tree to express her warm wishes for all the graduates. She noted that donations to the university don't have to be big; small donations for the NTU Campus Tree Conservation Fund is a great way to cherish important natural resources.

This summer, three of Prof. Chou's graduate students will complete their studies and continue the great tradition by also adopting the camphor trees in front of the Department of Civil Engineering building. According to Prof. Chou, graduates from different years don't usually know one another very well. However, they can grow closer by adopting the same trees. She plans to promote with this great initiative, which serves as a connection between NTU and its extraordinary alumni!



1. Film with golden award given by the NTU Campus Tree Conservation Fund: If NTU Trees Could Talk.
2. Camphor tree adopted by Mickey Huang and his classmates in front of the Department of Civil Engineering building.
3. The Chinese fringetree adopted by alumnus May E Ho in full bloom.

NTU Girls Rugby: Advancing Fearlessly

Founded in 2015, NTU Girls Rugby is one of the few varsity women's rugby teams in Taiwan. The team has performed exceptionally ever since women's rugby sevens was included in the National Intercollegiate Athletic Games in 2018-- winning the title of "champion" three times in a row (in 2018, 2019 and 2021. The Games were canceled in 2020 due to the COVID-19 pandemic).

As rugby is not well-known in Taiwan, in the beginning most of the players were overseas Chinese students or foreign students. Consequently, the team was nicknamed the "Melting Pot." Since recruitment was difficult, at one point there were only three players on the team. Due to its outstanding performance, the team has grown steadily in recent years, attracting more and more players. While few Taiwanese students play rugby before college, those who dare to try it soon fall in love with this exciting sport, as well as the loving and liberating team spirit.

Students need no prior experience to join the NTU Girls Rugby, just a lot of passion and guts. Despite their heavy schoolwork, the team members train three times a week in their free time, besides the monthly friendly matches and daily morning training sessions before games. The coach and senior veteran players instruct and guide the new players in practicing the various skills and

strategies of the game, including passing, running, cutting, falling safely, tackling, and so forth. The players often find themselves covered in dirt from head to toe with countless scratches and bruises after not just games but practice sessions.

The solid training regimen not only hones the player's skills but cultivates their perseverance. It is the players' intensive training in such skills and perseverance that has led to the team to achieve such great results on the pitch. Although they come from a variety of departments and backgrounds, the team members develop tight bonds from all the time spent practicing and playing together. Besides organizing trips, the players signed up for the Dragon Boat Championships during the off-season. The terrific experience of practicing rowing together also created a lot of memories of their colorful college days.

Unfortunately, although the team was crowned "the champion" three times in a row at the National Intercollegiate Athletic Games, NTU Girls Rugby remains a student club with far fewer benefits and subsidies than the official school teams receive. The problem is that there are few women's varsity rugby teams and matches. However, NTU Girls Rugby thankfully receives assistance from NTU Rugby (the men's team) and generous donations from the alumni association, NTU

Rugby Association. Besides training and matches, NTU Girls Rugby actively promotes rugby as a sport by recruiting new members through such channels as the Club Exposition, its Facebook fan page, and PE classes.

NTU Girls Rugby is not only a growing team but the pioneer in women's varsity rugby here. Even though there are few women's teams around and recruiting new members is not an easy task, such obstacles can be overcome by the team members' motivation and sense of honor. In this and everything, they will continue to strive for the best score.

Rugby is not just a sport. The spirit of the game instills valuable life skills in the players, especially the determination to advance fearlessly. The team members are dedicated to passing on the great traditions of the game, as well as fighting for what they want in every aspect of their own life.



1. The backs break through the defense and advance toward touchdown zone. (Photo courtesy of Chin Chiang Tsai)
2. Breaking through the defense and advancing to touchdown zone. (Photo courtesy of National Cheng Kung University OB Po-Yu Chang)
3. Crowned as the champion of women's rugby sevens at the National Intercollegiate Athletic Games 2021. (Photo courtesy of Bill)



Changing Christians: What Changed After Salvation?



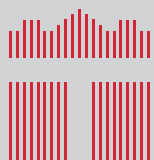
The book presents the development of Taiwan's Christian churches by integrating various perspectives of socialists, economists, population experts, and religion experts.

While Christianity is considered a foreign religion in Taiwan, its origin and development in Taiwan is significantly different than in the West and does not fit the context or discussion of Western religious sociology. For years, the research in religious sociology conducted in Taiwan has been influenced by the theories of Western religious sociology while overlooking Taiwanese history and culture. Additionally, most of the studies in religious sociology in Taiwan have been focused on new folk Buddhism, traditional folk religions, and other local religions, with scant attention paid to Christianity.

Changing Christians, Changing Churches: A Sociological Analysis of Christianity in Taiwan assembles the research of scholars in sociology, demography, economics, and religion. Drawing on data from the 2012 and 2017 National

Christianity Survey as well as the 2015 Taiwan Christian Missionary Survey, the book presents the development of the Christian Church in Taiwan from the perspectives of churches, preachers, and Christians. Utilizing the analytic tools of socio-demographic research, the book examines the differences in beliefs, practices, and identifications among different denominations in Taiwan. Furthermore, it presents diverse perspectives on macro (Taiwan's political, economic, and historical development); meso (local churches, inter-church networks, seminaries and organizations); and micro (individual believers) levels.

The editors of this book are Chin-Chun Yi, a Distinguished Research Fellow in the Institute of Sociology, Academia Sinica, and Kuo-Hsien Su, a professor in the Department of Sociology at NTU.



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