

FOCUS | ACADEMIC | HONORS | INTERNATIONAL | CAMPUS LIFE

NCU NEWSLETTER



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National Central University Establishes the Department of Law and Government

National Central University (NCU) has announced the establishment of a new Department of Law and Government, which is scheduled to begin student recruitment in the 2026 academic year. Building on the existing Graduate Institute of Law and Government, the new department adopts an integrated law-and-governance approach to address complex contemporary challenges, including environmental and climate governance, AI and digital governance, administrative regulation, and legislative design. The program aims to cultivate professionals equipped with both solid legal expertise and a broad public governance perspective, contributing to national policymaking and social innovation.

Practical engagement is a key feature of the department. It continues long-standing collaborations with courts, government legal affairs offices, law firms, and nonprofit organizations, offering institutional internships and civic engagement courses. The Legal Services Center, originally established under the Graduate Institute, will be incorporated into departmental operations and work with volunteer lawyers to provide free legal consultations to both on-campus and off-campus communities, thereby fulfilling the University's commitment to social responsibility.

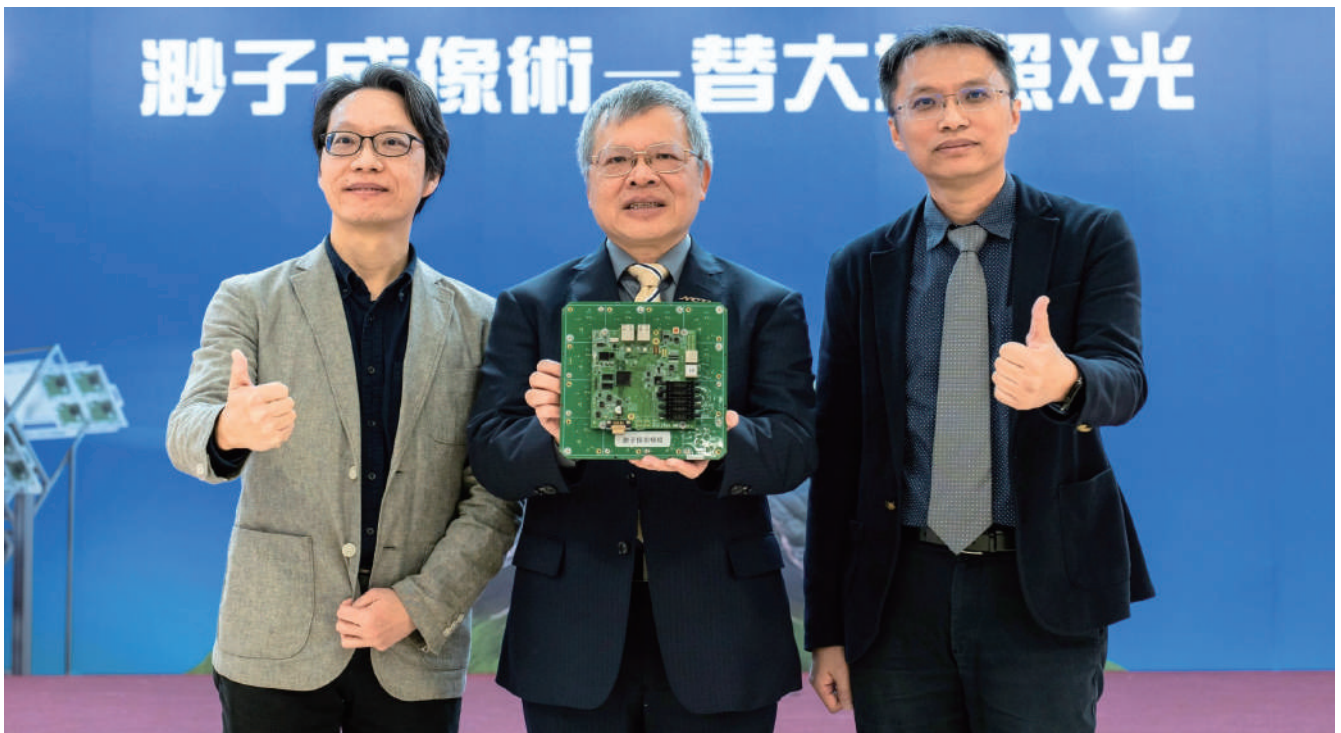
NCU's strong interdisciplinary resources further enrich the program. The department will collaborate with the Graduate College of Sustainability and Green Energy (SAGE) to develop legal and policy solutions for issues such as net-zero transition and just transition. It will also work with the College of Hakka Studies and the Center for General Education to advance academic and policy research on cultural diversity, ethnic relations, and social equity.

The undergraduate curriculum balances academic depth with practical relevance. Students complete a 72-credit professional core in law and government through a structured combination of required and elective courses, complemented by general education and foreign language studies. The program also connects with university-wide credit programs and interdisciplinary bachelor's pathways, encouraging cross-department learning and offering flexible options for dual specializations.



Muography Opens New Frontiers for Innovation in Taiwan, Led by National Central University

Muography—widely regarded as a powerful technique for probing the hidden interior of mountains and geological structures—is emerging as a breakthrough technology in Taiwan. Research teams from National Central University (NCU) and the Institute of Physics, Academia Sinica, have developed a new generation of muon detectors and successfully applied Muography to Earth sciences, redefining traditional geophysical exploration and injecting new momentum into sustainable national development.



National Central University presents innovative research breakthroughs in Muography.



Research teams from National Central University and the Institute of Physics, Academia Sinica collaboratively develop a new generation of muon detectors.

Professor Kuo Chia-Ming of NCU's Department of Physics explained that muons are fundamental particles produced when cosmic rays interact with Earth's atmosphere. Thanks to their exceptional penetrating power, muons can pass through hundreds of meters of rock, making them ideal probes for Muography-based subsurface imaging. The research team employs scintillators combined with silicon photomultipliers (SiPMs) to construct a compact, low-power, and highly stable sensing system. This design is well suited for long-term field deployment and significantly reduces equipment size and maintenance requirements—key factors enabling the successful implementation of Muography in Taiwan.

Professor Chen Chien-Chih of NCU's Department of Earth Sciences noted that Taiwan's complex geological setting, steep terrain, and exposure to multiple natural hazards—including volcanoes, landslides, geothermal activity, and underground engineering challenges—make it an ideal natural laboratory for Muography research. Beyond academic advances, the technology holds strong potential for practical applications, such as geothermal resource development, geological carbon dioxide storage, and even site assessment and monitoring for high-level radioactive waste disposal.

In early 2025, the team completed Taiwan's first field Muography experiment above the sediment-control tunnel at Shihmen Reservoir in Taoyuan. By the end of 2025, the researchers plan to focus on the Datun Volcano Group near Taipei, using Muography to reconstruct internal density structures. The results are expected to enhance understanding of volcanic hydrothermal systems and potential volcanic activity. Looking ahead, the team aims to deploy four large-scale Muography detector arrays to enable multi-directional observations and transition the technology from exploration to continuous monitoring.

From cosmic rays to the depths of mountains, and from high-energy physics to Earth sciences, this interdisciplinary collaboration is turning the once science-fiction concept of "X-raying the Earth" into a practical and transformative reality.



Muography successfully transforms conventional geophysical exploration techniques.

Typhoons Found to Suppress Marine Heatwaves, NCU Research Reveals

Typhoons are often viewed as symbols of natural disaster, yet a new study led by Director Prof. Iam-Fei Pun from the Graduate Institute of Hydrological and Oceanic Sciences (IHOS) at National Central University (NCU) shows that these powerful storms can also act as “natural regulators” of marine heatwaves. The research team found that typhoons can effectively terminate ongoing marine heatwaves and delay their reformation. The discovery, which highlights a critical interaction between typhoons and the ocean, was recently published in *Science Advances*.

Marine heatwaves have received unprecedented scientific attention since the beginning of this century due to their devastating impacts on marine ecosystems. Prolonged periods of abnormally warm ocean temperatures can trigger widespread coral bleaching, alter fish habitats, reduce fishery yields, and ultimately lead to significant economic and social consequences. Typhoons, however, generate intense vertical mixing in the ocean, drawing colder subsurface water upward and cooling the upper ocean. This injection of cold water acts like a timely countermeasure that removes excess heat.

By analyzing 85 typhoon–marine heatwave cases in the Northwest Pacific over the past decade, the NCU team found that 99% of marine heatwaves dissipated after a typhoon’s passage. The study further reveals that the onset of a subsequent marine heatwave is delayed by approximately five to seven days for every degree of typhoon-induced sea surface cooling.

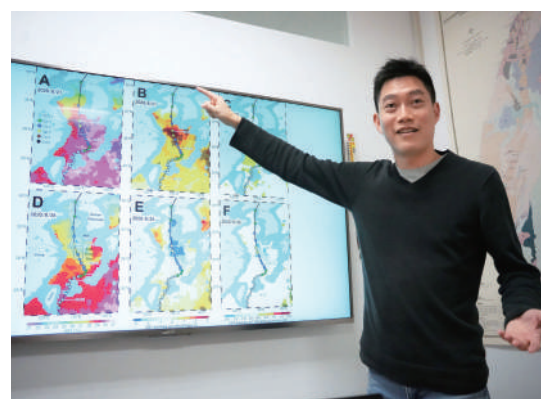
Prof. Pun emphasizes that the findings underscore the critical role typhoons play in the dynamics of marine heatwaves. As climate change intensifies the frequency and severity of extreme ocean and weather events, understanding the interactions between typhoons and marine heatwaves is essential for improving predictions of extreme climate events in a warming world.

Link to the paper :

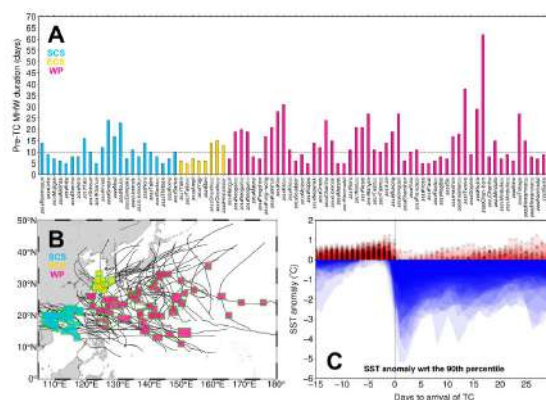
<https://www.science.org/doi/10.1126/sciadv.adw8070>



Research led by Prof. Iam-Fei Pun at NCU shows that typhoons act as “natural regulators” of marine heatwaves, with the findings published in *Science Advances*.



The team’s initial study focused on Typhoon Bavi, which hit the East China Sea in 2020 and produced a sea surface cooling of up to 7°C.



A decade-long analysis of 85 typhoons showed that each 1°C of typhoon-induced sea surface cooling delays the development of a marine heatwave by 5–7 days.

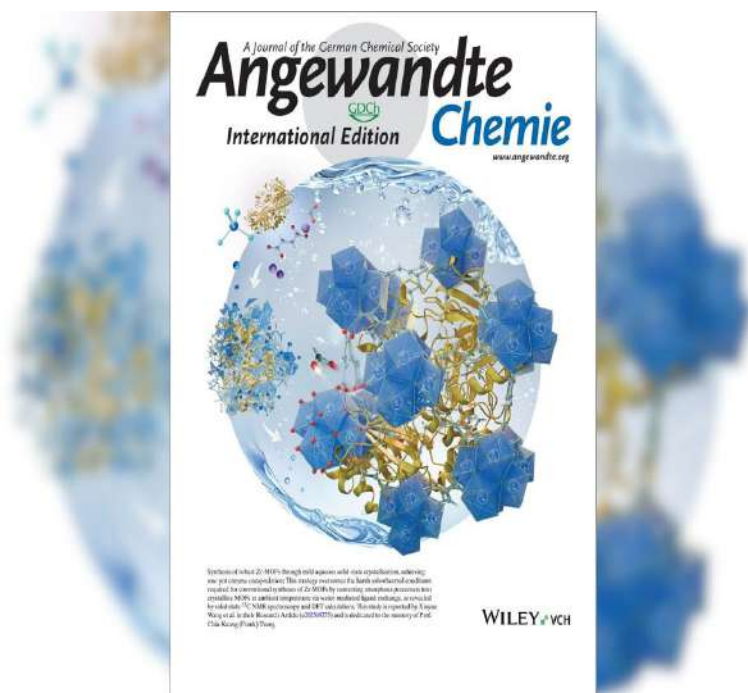
NCU Positions MOFs as the Next Key Materials for Biomedicine and Rare-Earth Recycling

A research team led by Professor Shieh Fa-Kuen from the Department of Chemistry at National Central University has pioneered a solid-state crystallization in aqueous phase (SSC) strategy that enables the formation of robust zirconium-based metal–organic frameworks (MOFs) under near-ambient, water-based conditions. This breakthrough allows enzymes to be safely encapsulated during the crystallization process, achieving the long-standing goal of protecting active biomolecules under truly mild synthesis conditions. The team's findings were selected as a cover story in the flagship chemistry journal *Angewandte Chemie*. Additionally, this work is dedicated to the memory of a dear friend, an outstanding collaborator of the BioMOF team in Taiwan, Prof. Chia-Kuang (Frank) Tsung, who passed away from COVID-19 in Boston on January 5, 2021.

Professor Shieh's team pioneered a mild, one-pot, water-based synthesis that preserves enzyme activity for industrial catalysis and drug delivery. His group also established the field of MOF Chemical Biology, which focuses on encapsulating biomolecules within MOFs while maintaining their native function.

However, synthesizing highly stable zirconium-based MOFs had long been a major challenge. To overcome this obstacle, Professor Shieh collaborated with Professor Tsai Hui-Hsu and Professor Chou Lien-Yang of ShanghaiTech University, and together they developed the solid-state crystallization (SSC) strategy, successfully addressing this long-standing problem.

This technique enables the formation of durable zirconium-based MOFs in near-room-temperature aqueous solutions while firmly encapsulating enzymes within the tough MOF structure. It paves a new path for biomedical applications, advances the practical use of efficient biocatalysts, and offers promising potential for expansion into green-technology domains such as rare-earth recycling.



NCU International Collaboration Confirms a Strongly Gravitationally Lensed Superluminous Supernova

A superluminous supernova is one of the brightest stellar explosions in the universe, and when a foreground galaxy gravitationally lenses it into multiple images, it becomes an exceptionally rare system that can be used to measure key cosmological parameters. Recently, Assistant Professor Ting-Wan Chen and her team at the Graduate Institute of Astronomy, National Central University (NCU), in collaboration with international groups including the Technical University of Munich and the Max Planck Institute for Astrophysics, carried out imaging and spectroscopic studies of SN 2025wny (nicknamed SN Winny) and confirmed it as a galaxy-scale, strongly gravitationally lensed supernova system.

In this international collaboration, the NCU team played a central role in key observing and data-analysis efforts, providing crucial data to confirm this rare strongly gravitationally lensed supernova system. Assistant Professor Ting-Wan Chen's team used the Lulin One-meter Telescope (LOT) for image confirmation and photometric monitoring. She noted that on nights with good weather and excellent seeing, LOT images can even resolve the individual lensed images of SN Winny, providing key observational constraints for the photometric analysis and lens modeling.

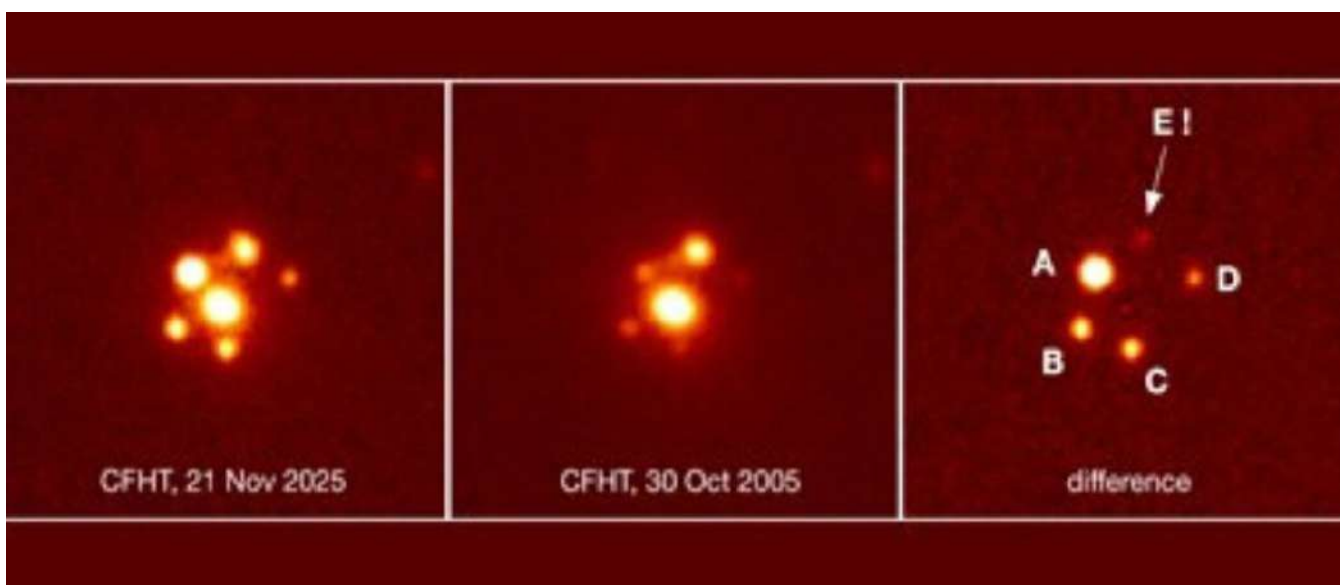


The Lulin One-meter Telescope (LOT) obtained imaging on 29 September 2025, confirming the first strongly gravitationally lensed superluminous supernova, SN 2025wny (nicknamed SN Winny), and has continued photometric monitoring. Image credit: Ting-Wan Chen, Amar Aryan, and Stefan Taubenberger.

Postdoctoral researcher Dr. Amar Aryan analyzed r-band imaging from the Canada-France-Hawaii Telescope (CFHT) and identified an additional transient point source near the previously reported multiple images. He reported it via a Transient Name Server AstroNote as a possible fifth lensed image. Using the positions of all five copies, Leon Ecker and Allan Schweinfurth et al., built the first model of the lens mass distribution. On the data-processing side, the DETECT tool developed by graduate student Yu-Hsing Lee independently flagged this bright transient through routine cross-matching between newly discovered transients and Dark Energy Spectroscopic Instrument (DESI) galaxy data. This substantially improves candidate-identification efficiency and rapid follow-up capability, providing a robust basis for precise measurements of the time delays between the multiple images.

Assistant Professor Ting-Wan Chen explained that gravitational lensing is like a natural magnifying glass in the universe: it bends the light from the same background object along multiple paths, allowing us to see several “duplicate” images. Because each light path travels a different distance and experiences a different amount of gravitational bending, the light reaches Earth at different times, so the images can brighten at different moments. By precisely measuring these time delays between the multiple images and combining them with a mass-distribution model of the lensing galaxy, the team can constrain cosmological distances and key parameters of the Universe’s expansion, such as the Hubble constant. First author of the paper Dr. Stefan Taubenberger added that, unlike the cosmic distance ladder, this is a one-step method, with fewer and completely different sources of systematic uncertainty, helping to clarify the long-standing Hubble tension.

For further details, please refer to the articles published/submitted in *Astronomy & Astrophysics* at: Taubenberger et al.: <https://arxiv.org/abs/2510.21694> Ecker, Schweinfurth et al: <http://arxiv.org/abs/2602.16620>



CFHT/MegaCam imaging obtained on 21 November 2025 reveals a possible fifth lensed image of SN 2025wny (SN Winny), marked with the letter E. Image credit: Amar Aryan, Ting-Wan Chen, and Stefan Taubenberger.

Steady Progress Toward Excellence: NCU Ranks in 12 Subjects in the 2026 QS World University Rankings by Subject

The international higher education evaluation organization Quacquarelli Symonds (QS) has released the 2026 QS World University Rankings by Subject, in which National Central University (NCU) is ranked in 12 subjects. Among them, Petroleum Engineering stands out, placing in the 101–150 range. Geology and Geophysics are both ranked in the 201–250 range globally, while Earth & Marine Sciences is ranked 201–275.



In addition to Earth sciences and Petroleum Engineering, other ranked subjects include Physics & Astronomy (351–400) and Chemistry (601–700). In engineering, Chemical Engineering and Electrical & Electronic Engineering are both ranked 401–450, while Mechanical, Aeronautical & Manufacturing Engineering is placed in the 451–500 range. Computer Science & Information Systems is ranked 601–650 globally.

In the social sciences, Economics & Econometrics is ranked 451–500, and Business & Management Studies falls within the 551–600 range, highlighting NCU's growing international visibility beyond its traditional strengths in science and engineering.



Photo courtesy of the Carbon Storage and Geothermal Research Center

國立中央大學 2026 QS 學科排名	
★ 新進榜：石油工程 101-150名	
101-150名	» 石油工程
201-250名	» 地質學；地球物理學
201-275名	» 地球與海洋科學
351-400名	» 物理與天文學
401-450名	» 電機與電子工程；化學工程
451-500名	» 經濟與計量經濟；機械、航空與製造工程
551-600名	» 企業與管理研究
601-650名	» 電腦科學與資訊系統
601-700名	» 化學

Chart compiled by the Office of Institutional Research

Only University Nationwide: NCU Receives Ministry of Education's Arts Education Contribution Award for Outstanding Schools

The 12th Arts Education Contribution Award, organized by the Ministry of Education, held its award ceremony on December 16 at the Nanhai Theater. National Central University (NCU), recognized for its long-standing commitment to interdisciplinary arts education, comprehensive arts support system, and cultivation of culturally literate talent, received the Outstanding School Award—becoming the only university in Taiwan to earn this distinction. President Hsiao Shu-San attended the ceremony in person to accept the award.



At NCU, the College of Liberal Arts and the Center for General Education collaboratively design a wide range of university-wide arts courses. These programs guide students from a foundation in the humanities to interdisciplinary exploration across technology, visual media, theater, and social practice. In addition to gaining aesthetic appreciation and artistic knowledge, students develop strong practical and creative skills through graduation performances, curatorial projects, and participation in national music and dance competitions—enhancing their future career prospects.

NCU emphasizes that arts education is not merely professional training, but a vital foundation for cultivating aesthetic sensibility and humanistic values. This award represents national recognition of the university's sustained efforts and reaffirms its commitment to advancing diverse arts education and enriching cultural perspectives—ensuring that art and the humanities remain an essential part of students' lives.



NCU and Srinakharinwirot University Forge New Partnership, Energizing International Collaboration

National Central University (NCU) in Taiwan and Srinakharinwirot University (SWU) in Thailand signed a Memorandum of Understanding on November 12, marking a major step forward in bilateral academic cooperation. The MOU paves the way for faculty and student exchanges, joint research and publications, and expanded student mobility and cross-border learning programs—affirming both universities' commitment to deeper educational collaboration and shared academic development.

The partnership was facilitated by NCU's Asian Institute for Impact Measurement and Management (AIIMM). NCU President Hsiao Shu-San and SWU President Dr. Cholvit Jearajit represented their respective institutions at the signing ceremony, symbolizing a strengthened alliance between the two universities—particularly in the areas of sustainable education, social impact, and management studies.

Both sides expressed their intention to explore additional opportunities for collaboration, such as co-organizing international forums, promoting joint research among faculty and students, offering short-term overseas study programs, and expanding student exchange initiatives. These efforts aim to foster deeper and more sustained academic engagement between Taiwan and Thailand.

Prof. Shen Chien-Wen, Director of NCU's AIIMM, noted that the partnership will enhance NCU's role in the global field of impact measurement and management. He emphasized that the collaboration will create meaningful opportunities for cross-border academic exchange and open a new chapter in Taiwan–Thailand higher education cooperation focused on social impact and sustainability.



2025 International Forum on Space Biomedicine: Advancing a New Era of Global Education and Industry Collaboration

The Center for Astronautical Physics and Engineering (CAPE) at National Central University (NCU) has long been dedicated to advancing research in space technology, space biomedicine, and engineering. By actively integrating domestic and international research capabilities, CAPE continues to propel Taiwan's space research onto the global stage. The International Forum on Space Biomedicine in 2025 brought together leading experts from academia and industry in Taiwan and Japan to explore the latest developments in space medicine education, microgravity research, and regenerative medicine technologies.

The forum featured Professor Masafumi Muratani of University of Tsukuba, a leading authority in space biomedicine, who shared Japan's latest research advances in space genomics and biomedical science. Both sides plan to jointly launch an international space biomedicine course next year. Through cross-border teaching and collaborative research, the initiative aims to cultivate a new generation of researchers with a global perspective in space medicine, thereby strengthening Taiwan's competitiveness in this field.

On the industry application front, the forum also invited Professor Emeritus Louis Yuge of Hiroshima University, a key figure in space biomedicine and rehabilitation technology, to share innovative applications of microgravity technologies in medical rehabilitation and regenerative medicine.

The forum opens new horizons for both education and industry by connecting international expertise, academic research capacity, and industrial needs, fostering cross-border collaboration and technological advancement.





NCU Launches 2026 Pine & Sakura Festival, Creating a Vibrant Springtime Campus Celebration

National Central University (NCU) officially launched its newly established spring campus event, the Pine & Sakura Festival, on February 6 at the Zhongda Lake Plaza. Running through March 7, the month-long festival celebrates the symbolic meanings of its name: the pine, representing resilience through winter and the university's solid academic foundation; and the cherry blossom, a harbinger of spring symbolizing innovation, vitality, and renewal. More than just a seasonal celebration, the festival aims to infuse the academic environment with a stronger sense of arts, culture, and campus identity.

The opening ceremony kicked off with lively performances by student clubs, including the Guitar Club and the Popular Music Club, setting an energetic tone for the festival and filling the campus with the spirit of spring. From stage performances to event planning, the festival highlights students' creativity and dedication, reflecting NCU's culture of encouraging initiative and hands-on learning.

NCU President Hsiao Shu-San noted that the value of a university extends beyond classrooms and research, and is also reflected in students' engagement with campus life and the connections they build with one another. The university has long supported student-led initiatives and hopes that through the Pine & Sakura Festival, faculty and students alike can pause amid their busy schedules to rediscover the beauty and warmth of campus life.



Youth in Action Respond to Post-Disaster Needs: NCU Faculty and Students Recognized by the Premier

Premier Cho Jung-Tai received representatives of faculty and students from 30 universities across Taiwan at the Executive Yuan on January 26, recognizing their participation in post-disaster recovery efforts in Guangfu Township, Hualien County. He commended the younger generation for responding to societal needs through concrete actions, demonstrating the long-term impact of higher education's engagement in public issues.

National Central University (NCU) was represented by Vice President for Student Affairs Chen Szu-Yu and student Luo Xiang-En. They received a certificate of appreciation from the Premier, highlighting NCU students' proactive involvement in local communities and their commitment to social responsibility in the immediate aftermath of the disaster.

Vice President for Student Affairs Chen emphasized that students' willingness to step forward at critical moments is rooted in the university's long-standing efforts to cultivate altruism through service-learning courses and student-initiated learning. She also highlighted the strong support of NCU President Hsiao, Shu-San for student civic engagement, as well as the immediate backing of NCU EMBA alumni, who contributed resources and actions alongside students, creating a virtuous cycle of goodwill.

This recognition by the Executive Yuan not only affirms NCU students' tangible contributions to post-disaster recovery, but also underscores the core mission of a research university: to nurture talent grounded in humanistic values, empowering students to connect professional learning with social responsibility and to respond meaningfully to real-world challenges.





National Central University

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