TSINGHUA NEWSLETTER

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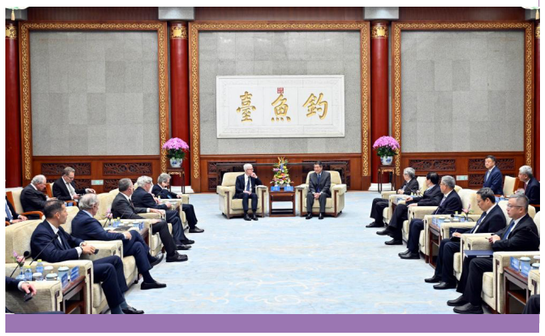

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Chinese vice premier meets Tsinghua University advisors

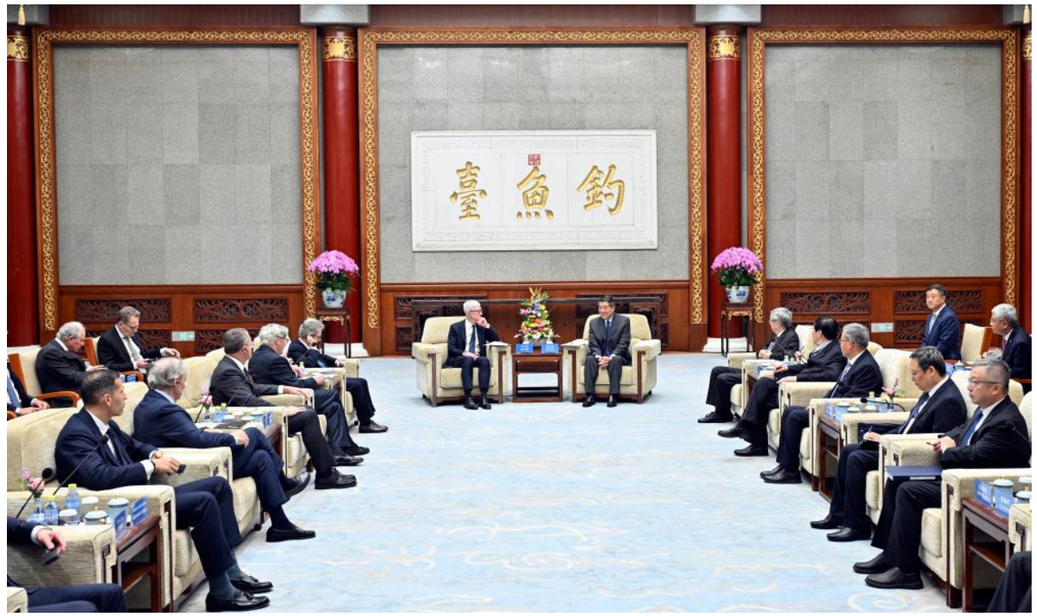
Chinese Vice Premier He Lifeng met with representatives of the advisory board of the Tsinghua University School of Economics and Management (Tsinghua SEM) in Beijing on Thursday.

He, also a member of the Political Bureau of the Communist Party of China Central Committee, said China is deepening the building of a unified national market and firmly promoting high-standard opening up to achieve stable economic growth, noting that the country is willing to deepen mutually beneficial cooperation with countries worldwide to share opportunities for high-quality development and realize mutual gains.

He also expressed hope that the advisors will continue to play a bridging role and actively support China's economic development as well as international exchanges and cooperation.

The representatives, including Tim Cook, Apple CEO and chair of the advisory board, expressed strong confidence in China's development prospects and a commitment to further engage in the Chinese market and expand investment and cooperation in China.

The advisory board of the Tsinghua SEM was founded in October 2000. Comprised of global business executives, business school deans and renowned scholars, the board aims to help make Tsinghua SEM a world-class school in terms of economics and management by improving its teaching and research capabilities.



Chinese Vice Premier He Lifeng, also a member of the Political Bureau of the Communist Party of China Central Committee, meets with representatives of the advisory board of the Tsinghua University School of Economics and Management (Tsinghua SEM) at the Diaoyutai State Guesthouse in Beijing, capital of China, Oct. 16, 2025.

Honoring the life and legacy of Professor Chen Ning Yang

Professor Chen Ning Yang, a world-renowned physicist, Nobel Laureate in Physics, Academician of the Chinese Academy of Sciences, Professor at Tsinghua University, and Honorary Director of the Institute for Advanced Study at Tsinghua University, passed away in Beijing on October 18 due to illness at the age of 103.

Professor Yang was born in Hefei, Anhui Province, in 1922 and moved to Tsinghua with his parents in 1929. In 1938, he enrolled at the National Southwest Associated University. He entered the Tsinghua Graduate School in 1942 and received his Master of Science degree in 1944. In 1945, he went to the United States and studied at the University of Chicago. After earning his Ph.D. in 1948, he remained at the University to pursue his career. In 1949, he joined the Institute for Advanced Study in Princeton, New Jersey, becoming a permanent member of the Institute in 1952 and a professor in 1955. In 1966, he became the Albert Einstein Professor at the State University of New York at Stony Brook, where he founded the Institute for Theoretical Physics (now named the C.N. Yang Institute for Theoretical Physics) and worked there until 1999. Starting in 1986, he served as Distinguished Professor-at-large at the Chinese University of Hong Kong. From 1997, he served as Honorary Director of the newly established Center for Advanced Study at Tsinghua University (now named the Institute for Advanced Study), and became a professor at Tsinghua University in 1999.

Professor Yang is one of the greatest physicists of the 20th century, having made revolutionary contributions to the development of modern physics. The Yang-Mills Gauge Theory, which he proposed with Robert Mills, laid the foundation for the subsequent Standard Model of particle physics. It is regarded as one of the cornerstones of modern physics alongside Maxwell's equations and Einstein's theory of general relativity.
His collaboration with Tsung-Dao Lee on the groundbreaking concept of parity non-conservation in weak interactions earned them the 1957 Nobel Prize in Physics, making them the first two Chinese Nobel Prize winners. He discovered the pivotal equation for one-dimensional quantum many-body problems, the Yang-Baxter equation, which opened up new directions in research in statistical physics, quantum groups, and related fields of physics and mathematics. He achieved numerous breakthroughs in particle physics, quantum field theory, statistical physics, and condensed matter physics, profoundly shaping the development of these disciplines. Professor Yang was elected member or foreign member of over ten national and regional academies of sciences, received honorary doctorates from more than twenty prestigious universities worldwide, and was honored with numerous awards, including the U. S. National Medal of Science, the Benjamin Franklin Medal, the Lars Onsager Prize, the King Faisal International Prize for Science, the China International Science and Technology Cooperation Award, and the Qiu Shi Lifetime Achievement Award.

Professor Yang was deeply devoted to his homeland, making remarkable contributions to China's scientific and educational developments. His visit to China in 1971 sparked a wave of visits by overseas scholars, earning him recognition as the pioneer in building the bridge of academic exchange between China and the United States. He later proposed the restoration and strengthening of basic scientific research to China's central leadership. He also raised funds to establish the "Committee on Educational Exchange with China", which has continuously sponsored nearly 100 Chinese scholars for advanced studies in the United States. These scholars later became the backbone of China's scientific and technological development. He undertook extensive work to promote China's scientific and technological exchange and progress, offering advice and exerting significant influence on major Chinese scientific projects and the formulation of science and education policies. After returning to Tsinghua University, he took on developing the Institute for Advanced Study as his new mission. He poured immense effort into advancing fundamental disciplines like physics and cultivating talents at Tsinghua, making tremendous contributions that greatly impacted the reform and development of Chinese higher education.

Professor Yang's life was an immortal legend in exploring the unknown and a profound embodiment of his love for his homeland. "Better to be genuine than clever; better to be simple than ornate" reflected both his academic attitude and his life stance. As his cherished verse says:

"A piece of literature

Is meant for the millennium

But its ups and downs are known

Already in the author's heart."

His life stands as a timeless chapter in human history—one that shines not only for China but for the global community of thinkers and innovators.

Professor Chen Ning Yang's legacy will live on forever.

Tsinghua shines at Beijing Science and Technology Awards

At the Beijing Municipal Science and Technology Awards Conference, convened by the Beijing municipal government on November 7, Tsinghua University, as the leading institution, claimed nine first prizes and 11 second prizes. Additionally, three of its faculty members were honored with the 2024 Zhongguancun Award for Outstanding Youth. The number of first prizes led by Tsinghua University ranked first among all award-applying institutions.

A total of 15 first prizes and 42 second prizes were conferred for the Natural Science Award, six first prizes and 18 second prizes for the Technological Invention Award, and 29 first prizes and 83 second prizes for the Science and Technology Progress Award. Additionally, 26 young scientists were honored with the Zhongguancun Award for Outstanding Youth.

Ten Tsinghua faculty members elected as academicians

On November 21, the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE) announced the results of their 2025 academician election. Eight faculty members from Tsinghua University were elected to the CAS, including Professor Feng Xiqiao from the School of Aerospace Engineering, Professor Liu Yunhao from the Department of Automation, Professor Sun Hongbin from the Department of Electrical Engineering, Professor Sun Hongbo from the Department of Precision Instrument, Professor Li Jun from the Department of Chemistry, Professor Zhang Qiang from the Department of Earth System Science, Professor Lin Yuanhua from the School of Materials Science and Engineering, and Professor Luo Guangsheng from the Department of Chemical Engineering.

Professor Caucher Birkar from the Yau Mathematical Sciences Center was elected as a foreign academician of the CAS.

Professor Li Junhua from the School of Environment was elected to the CAE.

In addition, according to incomplete statistics, seven Tsinghua alumni were elected as academicians of the CAS and the CAE, and two alumni were elected as foreign academicians of the CAE.

Tsinghua University releases comprehensive guiding principles for AI use in education

As generative artificial intelligence accelerates its way into classrooms and laboratories, a quiet yet profound transformation is unfolding across universities worldwide. Students are turning to AI to support their learning and spark new ideas, even as they confront concerns about "mental inertia" and the outsourcing of cognitive effort. Faculty members, meanwhile, are exploring new avenues for AI-empowered instruction while grappling with questions of boundaries and ethics.

Recently, Tsinghua University released the ***Tsinghua University Guiding Principles for the Application of Artificial Intelligence in Education*** **("the Guiding Principles")**, the institution's first comprehensive, university-wide framework that sets systematic, multi-level guidance and norms for the use of AI across campus.

Five Core Principles: Defining the Red Lines—and the Pathways Forward—for AI in Education

The Guiding Principles are structured into three parts—"General Provisions," "Teaching and Learning," and, "Theses, Dissertations and Practical Achievements." Together, they offer a top-level framework supported by detailed, scenario-based guidelines that cover the core contexts of teaching and academic research.

The "General Provisions" outline Tsinghua's stance of being "proactive yet prudent" in its approach to AI and establish five core principles: principal responsibility, compliance and integrity, data security, prudence and critical thinking, and fairness and inclusiveness. These principles affirm that AI must remain an auxiliary tool and that teachers and students continue to be the primary agents in teaching and learning. The framework calls for proper disclosure of AI use and prohibits academic misconduct; forbids the use of sensitive, classified, or unauthorized data when training or operating AI models; urges vigilance toward AI "hallucinations" and stresses multi-source verification to guard against the cognitive complacency that can result from overreliance on AI; and underscores the importance of identifying and mitigating algorithmic bias and the digital divide to ensure that technology can be used for public good.

The "Teaching and Learning" section advises instructors to determine how AI should be used according to the goals of each course, clearly explain the Guiding Principles to students at the start of the semester, and remain responsible for the AI-generated teaching materials. The section also encourages teachers to guide students toward a critical and well-rounded understanding of AI, helping them develop essential competencies. Students, in turn, are encouraged to explore AI as auxiliary aids within the boundaries set by each course, but they are strictly prohibited from copying or mechanically paraphrasing AI-generated text, code, or other output as academic submissions.

For graduate students, the section on "Theses, Dissertations and Practical Achievements" highlights that AI may not replace the academic training and intellectual labor that students are expected to complete independently. The use of AI for ghostwriting, plagiarism, fabrication, or other forms of misconduct is strictly forbidden. Supervisors are required to provide clear guidance on AI use and maintain full-process oversight to ensure both the integrity of academic training and the originality of students' work.

According to Wang Shuaiguo, Director of the Online Education Center and primary drafter of the document, the Guiding Principles also reserve ample space for future development. Beyond current teaching and research scenarios, the framework is designed to support future extensions into academic research, administrative services, and other emerging applications. "We hope this will not become a document that restricts innovation," he said. "It should be a living system—one that continues to grow as the technology evolves."

Two Years in the Making: Responding to Frontline Needs in Teaching and Learning

The development of the Guiding Principles reflects Tsinghua University's close observation of AI's growing presence in education, its extensive research, and the gradual formation of shared consensus.

"Technology often matures earlier than the risks it brings become visible," noted Professor Li Manli of the School of Education. She emphasized that universities need time to fully explore and discern the opportunities and challenges that AI brings to real teaching and learning contexts.

Since 2023, a wave of innovations has taken shape across Tsinghua's campus -- including AI-empowered courses, disciplinary knowledge engines, agent instructors, and the all-in-one campus companion Qing Xiaoda. These developments have also brought new questions: whether AI-assisted assignments should be treated as academic misconduct, how responsibility should be defined when AI is used to grade coursework, and where the boundaries lie when graduate students rely on AI to process data or generate code.

"These real issues had to be addressed." Work began immediately. A research team led by Professor Li conducted a global survey of AI education guidelines, systematically analyzing 70 documents released by 25 universities across the United States, Europe, and the Asia-Pacific region.

In the summer of 2024, the University launched the drafting of the Guiding Principles, led jointly by the Undergraduate Academic Affairs Office, the Graduate School, the School of Education, and several departments and academic units.

At the same time, the University officially initiated a broad internal consultation process. From March to May 2025, the project team interviewed more than one hundred students and frontline instructors from disciplines spanning the humanities, sciences, engineering, and medicine. Many expressed the hope that the University would clarify the boundaries of academic integrity and offer clear guidance on AI usage.

"Different disciplines and different habits of AI use naturally led to different viewpoints. Every discussion was intense," recalled Wang. "But it was through these exchanges that we gradually reached consensus."

Feedback from teachers and students was directly woven into the Guiding Principles. Multiple rounds of review by the Teaching Committee and the Degree Evaluation Committee further ensured the document's scientific rigor and practical feasibility.

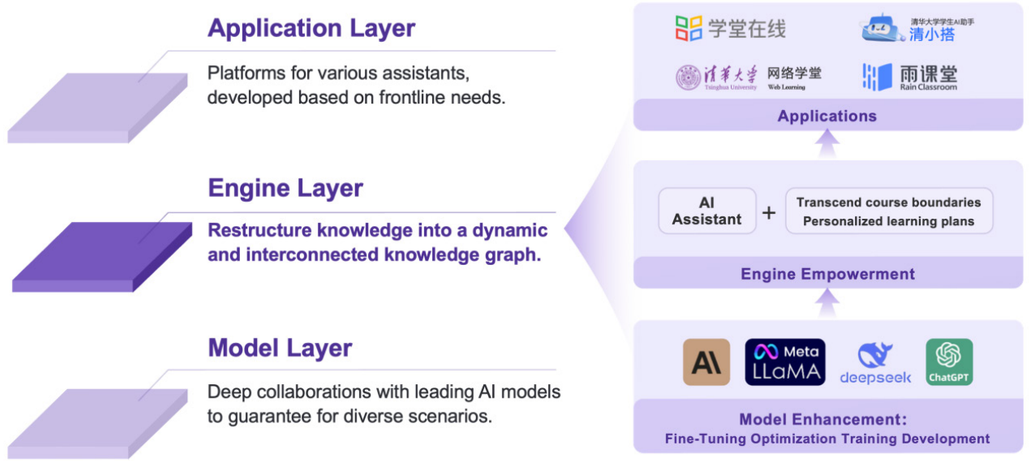
"Through parallel tracks of pilot experimentation and research-driven inquiry, Tsinghua has taken a measured approach to the new challenges of the AI era." In Li's view, the Guiding Principles represent a pragmatic effort to find the broadest common ground between "active embrace" and "prudent use."

The Future Is Here: Building a Sustainable Ecosystem for AI in Education

The release of the Guiding Principles marks a new stage in Tsinghua University's exploration of AI–education integration—one that moves from "technology advancement" to "institutional support." This shift is rooted in the University's sustained and systematic groundwork in AI-enabled teaching over recent years.

As early as 2023, Tsinghua launched its first pilot programs for AI-empowered courses. After more than two years of development, over 390 courses now incorporate AI deeply into teaching practice, spanning ten functional areas that include AI learning companions, AI teaching companions, and AI assistants for lesson preparation. These pilots have generated a rich pool of practical experience.

A key technical backbone in this process has been the University's self-developed three-layer decoupled architecture. By flexibly connecting multiple mainstream AI models at the foundational layer, building precise discipline-specific knowledge engines in the middle layer, and supporting diverse teaching applications at the top layer, the architecture reduces dependence on any single model and provides a scalable solution



Building a disciplinary knowledge engine to transcend the boundaries of curricula and classrooms.

The three-layer decoupled architecture

for integrating AI into instruction in a scientific and efficient manner.

At the same time, Tsinghua has built a multi-level AI general education ecosystem encompassing general education courses, minor programs, and certificate pathways to enhance students' AI literacy systematically. The University's all-in-one learning companion, ***Qing Xiaoda***, functions as an always-available growth assistant, offering personalized support throughout the entire learning journey.

Importantly, the Guiding Principles are designed not to constrain innovation; rather, they aim to enable it. The General Provisions explicitly state that the University encourages and supports faculty and students to pursue innovative applications of AI in teaching and learning and will recognize and promote exemplary practices. In this sense, the Guiding Principles not only establish "red lines" but also illuminate "green lights" for responsible, meaningful experimentation.

Looking ahead, Tsinghua will continue to advance the implementation and evolution of the Guiding Principles through the AI literacy platform, teaching workshops, and interdisciplinary discussions.

"What we confront is not merely the question of how to employ a particular tool, but rather a fundamental redefinition of the very nature of education in the age of artificial intelligence." With the Guiding Principles now in place, Tsinghua aims to guide its community toward responsible, informed AI use to foster a positive, healthy, and sustainable ecosystem for educational innovation—preparing the next generation of talents to harness intelligent technologies and innovate alongside them.

Tsinghua University inaugurates Institute for Embodied Intelligence and Robotics

The inauguration ceremony

The inauguration ceremony for the Tsinghua University Embodied Institute for Intelligence and Robotics was held on November 30.

In his address, Tsinghua University President Li Luming reviewed Tsinghua University's development in the field of embodied intelligence and robotics. He noted that generations of Tsinghua individuals have made relentless efforts and courageous explorations, laying a solid foundation for the future development of this field. The establishment of the Institute for Embodied Intelligence and Robotics is a major initiative by the University to proactively serve national strategic needs, leverage its multidisciplinary strengths and talent advantages, further refine its artificial intelligence layout, and carry out forward-looking, strategic, and systematic scientific research in an organized way.

Li hopes that the Institute will fully draw on Tsinghua's multidisciplinary strengths, actively explore new paradigms of interdisciplinary innovation, forge new pathways for industry–academia–research integration, uphold the principle of win-win cooperation, remain committed to the philosophy of "Pushing Frontiers, Grounding Applications, and Nurturing Talent," and grow into an important center for scientific innovation and the cultivation of top-tier innovative talent. Li looks forward to the Institute, striving for excellence, with the support of all parties, working boldly to open new frontiers in embodied intelligence, continuously fostering new drivers of high-quality development, and contributing Tsinghua's strength to the building of a strong nation and the great rejuvenation of the Chinese nation.

Tsinghua University Vice President Wu Huaqiang read the decision to establish the Institute for Tsinghua University Embodied Intelligence and Robotics.

Following the unveiling, Li presented letters of appointment to the Institute's Dean and Deputy Dean.

Zhang Tao, dean of the Institute for Embodied Intelligence and Robotics of Tsinghua University and head of the Department of Automation, outlined the Institute's development status and overall plan.

More than 150 representatives from academia, enterprises and industry, as well as finance and investment sectors attended the event.

The Institute for Embodied Intelligence and Robotics of Tsinghua University is affiliated with the University's Research Institute and jointly developed by the Department of Automation, Department of Mechanical Engineering, Department of Electronic Engineering, and Department of Computer Science and Technology. The Institute will bring together leading teams from both within and outside the University to conduct collaborative research, focusing on achieving "0 to 1" original innovation in the full-stack technology of "Robust Body + Intelligent Brain." Simultaneously, leveraging Beijing's industrial ecosystem resources, it will construct a full-chain transformation hub encompassing "technology R&D - pilot verification - scenario application" to accelerate the implementation of technological achievements. The Institute aims to build a globally influential talent hub and source of innovation, creating a virtuous cycle where "high-level research platform construction drives technological innovation, and technological innovation in turn feeds high-quality education." It will strengthen Tsinghua University's role as a core pivot within the national "Robotics Plus" strategy, provide a core driving force for China to seize the track in embodied intelligence and robotics and cultivate new quality productive forces, and help the nation gain strategic initiative in the new round of scientific and technological revolution and industrial transformation.

The inauguration of the Institute for Tsinghua University's Embodied Intelligence and Robotics

AI Open Alliance launched to pool resources for innovation and application

The Artificial Intelligence Open Alliance was inaugurated in Guangzhou, Guangdong province, marking a significant step to pool resources for AI innovation and application.

The alliance, initiated by 17 leading universities and eight top-tier tech enterprises and research institutions, was formed under the guidance of the Ministry of Education's department of science, technology, and informatization.

The 17 founding universities include Tsinghua University, Peking University, Shanghai Jiao Tong University, Zhejiang University, and Beijing University of Posts and Telecommunications. The alliance's secretariat is based at Tsinghua University.

Designed as an international, open, and nonprofit strategic collaboration platform, the alliance aims to undertake major national AI research tasks, build an independent and controllable AI infrastructure system, cultivate high-level AI talent, promote AI application in education and other fields, and develop an open-source AI technology community.

To advance these goals, the alliance will focus on transforming education and teaching models, building a new talent cultivation system, organizing cutting-edge technology research, developing autonomous infrastructure, and promoting international exchanges.

Five specialized committees have been established, led respectively by Tsinghua University, Peking University, Shanghai Jiao Tong University, The Chinese University of Hong Kong, and The Hong Kong University of Science and Technology, covering AI in education, AI in research, fundamental AI engineering, AI ethics and governance, and international AI cooperation.

Li Luming, president of Tsinghua University and chair of the alliance, said forming the alliance is a significant move to serve national strategic needs and secure a leading position in AI development.

He said the alliance will build integrated application innovation, coordinated technology infrastructure, and linked governance and exchange systems.

GLOBAL ENGAGEMENT

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Tsinghua SEM holds 2025 Advisory Board Meeting

Tsinghua University School of Economics and Management (Tsinghua SEM) held its 2025 Advisory Board Meeting on October 17. It was the board's 26th annual meeting since its establishment. A total of 23 board members attended the meeting.

Chinese Vice Premier He Lifeng met with representatives of the advisory board of Tsinghua SEM in Beijing on Thursday.

He, also a member of the Political Bureau of the Communist Party of China Central Committee, said China is deepening the building of a unified national market and firmly promoting high-standard opening up to achieve stable economic growth, noting that the country is willing to deepen mutually beneficial cooperation with countries worldwide to share opportunities for high-quality development and realize mutual gains.

He also expressed hope that the advisors will continue to play a bridging role and actively support China's economic development as well as international exchanges and cooperation.

The representatives, including Tim Cook, Apple CEO and chair of the advisory board, expressed strong confidence in China's development prospects and a commitment to further engage in the Chinese market and expand investment and cooperation in China.

Wang Qishan, China's former vice president and the honorary chairman of the advisory board, met with the representatives and hosted a banquet at the Diaoyutai State Guesthouse on the evening of October 16.

Three specially-invited experts including Zhou Xiaochuan, vice chairman of the 12th National Committee of the Chinese People's Political Consultative Conference (CPPCC) and former governor of the People's Bank of China; Lou Jiwei, standing committee member of the 13th National Committee of the CPPCC and former finance minister; Guo Shuqing, a member of the 14th Standing Committee of the National People's Congress (NPC) and vice chair of NPC Financial and Economic Affairs Committee; Xu Shouben, deputy secretary-general of the State Council; Ren Youqun, vice education minister; Li Luming, president of Tsinghua University and vice chairman of Tsinghua SEM's Advisory Board, along with directors from related bureaus and departments under the Ministry of Foreign Affairs and the Ministry of Education attended the activity.

Tsinghua SEM holds its 2025 Advisory Board Meeting

The Advisory Board meeting was chaired by Tim Cook. He welcomed the new honorary board member, four new members and thanked all board members, including three departed members for their contributions and support.

In his speech, Li Luming first conveyed the heartfelt greetings and gratitude from Zhu Rongji, the first Dean of Tsinghua SEM and the Founding Honorary Chairman of the advisory board, to all members and specially-invited experts for their kind assistance. On behalf of the University, he also thanked the committee members for their long-term care and support. He introduced the University's implementation of its Global Strategy and the integration of AI into education to better support students. He stated that the University would remain committed to high-level opening-up and resolutely strive to becoming a leading world-class university. He also expressed the expectation of working together with all committee members to contribute to the high-quality development of higher education.

Bai Chong-En reported to the advisory board on the progress of the school's work over the past year, including opportunities, challenges, reflections and methods. The advisory board members engaged in discussion and idea exchange afterwards.

A new session titled "Discussions on the Chinese Economy" was introduced at the meeting. A specially-invited guest Yang Weimin, member of the Standing Committee of the 13th National Committee of the CPPCC and vice minister in the former Office of the Central Leading Group on Financial and Economic Affairs, delivered a keynote speech on the structural features of China's current economic performance and the key tasks outlined in the 15th Five-Year Plan. Bai Chong-En chaired a roundtable discussion. Guo Shuqing, Yi Gang, chair of China Society for Finance and Banking and former governor of the People's Bank of China and Yang Weimin exchanged views on the current economic situation and prospects, and interacted with board members.

Six board members gave lectures in the Tsinghua SEM classrooms and interacted with faculty and students during the meeting.

Tsinghua SEM Advisory Board members pose for a group photo.

Second International Academic Forum on "Paleography and Chinese Civilization" opens

On the morning of October 18th, the opening ceremony of the Second International Academic Forum on "Paleography and Chinese Civilization" was held at Tsinghua University. Qiu Yong, Secretary of the CPC Tsinghua University Committee; Liu Peijun, Director-General of the Department of Language Information Management under the Ministry of Education; Wu Zhenwu, President of the Chinese Society of Paleography and former Vice President of Jilin University; and Dirk Meyer, Fellow of The Queen's College, Oxford University, and Director of the Centre for Manuscript and Text Culture, attended and delivered speeches at the opening ceremony, presided over by Wu Huaqiang, Tsinghua Vice President.

Qiu Yong stated that Tsinghua University has been thoroughly implementing Xi Jinping Thought on Culture, actively promoting the creative transformation and innovative development of China's excellent traditional culture, and has achieved a series of major academic achievements in the study of paleography, while continuously advancing the interdisciplinary integration of artificial intelligence technology with this field. He expressed confidence that this forum will further deepen and expand international academic exchange and collaboration in the study of paleography, fostering mutual learning between Chinese civilization and world civilizations. The University will continue to explore the contemporary value of China's fine traditional culture, strengthen international cooperation, contribute wisdom to building up China's cultural strength, and inject more vitality into the progress of human civilization.

The opening ceremony

Liu Peijun stated that the Ministry of Education and the State Language Affairs Commission lead the implementation of the "Paleography and Chinese Civilization Inheritance and Development Program," which aims to inherit and promote China's excellent traditional culture and deeply explore the historical thought and cultural values contained within it. Tsinghua University, as the lead unit of the collaborative platform, provides crucial support for the Paleography Program. The Research and Conservation Center for Unearthed Texts plays a key role in the documentation of excavated documents and in research on cutting-edge issues. Academic achievements nurtured by different civilizational backgrounds and academic traditions effectively promote the global reach of China's excellent traditional culture and foster the common progress of global humanities scholarship.

Wu Zhenwu noted that whether through traditional research or with the support of new technologies, the development of ancient Chinese characters and unearthed document studies is promising. The interpretation of Chinese civilization and world civilizations will undoubtedly benefit significantly from Chinese paleography.

Dirk Meyer emphasized that the study of ancient civilizations is a shared celebration of humanity and looked forward to fruitful discussions among global scholars at the forum.

Professors Edward L. Shaughnessy (University of Chicago), Michael Friedrich (University of Hamburg), Chen Wei (Wuhan University), and Scott Cook (National University of Singapore) delivered keynote speeches. The forum was hosted by Tsinghua University and organized by the Research and Conservation Center for Unearthed Texts and the Secretariat of the Paleography Program, and featured five parallel sessions: "Oracle Bones," "Bronze Inscriptions," "Warring States Characters," "Qin-Han Characters," and "Characters and Civilization." Over 180 scholars from more than 80 universities and research institutions across 14 countries and regions, including China, the US, Russia, and the UK, attended.

Since its establishment in 2008, the Research and Conservation Center for Unearthed Texts, Tsinghua University, has been selected as a key research base for humanities and social sciences under China's Ministry of Education and a leading unit in national collaborative innovation centers. To date, the center has published 14 volumes of the *Tsinghua University Collection of Warring States Bamboo Manuscripts*, part 1 of the *Collation and Interpretation of the Tsinghua University Collection of Warring States Bamboo Manuscripts* (Volumes 1-4), and the *Studies and English Translations of the Tsinghua University Collection of Warring States Bamboo Manuscripts* (Volumes 1, 2, 3, 6), and other related works.

4th Tsinghua Higher Education Forum held

The 4th Tsinghua Higher Education Forum in Conjunction with 2025 Asian Universities Alliance Academic Conference recently opened at the Tsinghua Southeast Asia Center. The forum, centered on the critical theme: "The Future of Internationalization in Higher Education: Markets, Geopolitics, and Epistemic Justice," convened over 150 experts, scholars, and researchers from global educational institutions.

The opening ceremony featured remarks from several distinguished guests. Speakers included Guo Yong, deputy secretary of the CPC Tsinghua University Committee; Getachew Engida, former UNESCO deputy director-general; Ir. I Nengah Sujaya, vice rector for academic affairs at Udayana University; and Cherie Nursalim, co-Chair of the Southeast Asia Center, Tsinghua University. Additionally, Stella Christie, vice minister of Higher Education, Science, and Technology of the Republic of Indonesia, delivered special video remarks.

In his address, Guo Yong emphasized that in the face of complex circumstances intertwined with globalization and geopolitics, higher education internationalization urgently requires the establishment of new models, forms, and consensus. He affirmed Tsinghua University's dedication to implementing its global strategy, actively advancing the development of its overseas bases, expanding access to quality international educational resources, and building a robust global partnership system for education and scientific research.

Getachew Engida highlighted that while internationalization brings opportunities for collaboration, it is also confronted by numerous challenges rooted in inequality. He stressed that future endeavors must be dedicated to establishing equitable partnerships. Ir. I Nengah Sujaya shared the internationalization practices of universities in the region, focusing specifically on Udayana University's experiences. Cherie Nursalim presented the Center as a case study, illustrating a concrete exploration of new concepts in internationalization. In her video message, Vice Minister Stella Christie underscored the role of higher education as a key driver of economic growth.

Focusing on the future of higher education internationalization, the forum featured keynote reports delivered by three distinguished scholars: Professor Emeritus Cheng Kaiming from The University of Hong Kong, William Kirby, chairman of the Harvard China Fund, and Simon Marginson, founding director of the Centre for Global Higher Education (CGHE) at the University of Oxford.

A subsequent roundtable discussion gathered leading experts—including Xie Weihe, Distinguished Professor of Humanities and Social Sciences at Tsinghua University; Liu Haifeng, Distinguished Professor of Humanities and Social Sciences at Zhejiang University; William Kirby; Shi Zhongying, dean of the School of Education at Tsinghua University; and Yang Rui, dean of the Faculty of Education at The University of Hong Kong—for an in-depth dialogue on the prospects for Sino-U.S. higher education cooperation.

Established in 2022, the Tsinghua Higher Education Forum continues to serve as a global observatory and think tank dedicated to addressing transformative trends in higher education worldwide.

5th World Health Forum focuses on "Climate Change and Health"

The 5th World Health Forum, hosted by Tsinghua University, commenced in Beijing on November 1. Ban Ki-moon, chairman of Boao for Asia and former secretary-general of the United Nations; Li Luming, president of Tsinghua University; Shen Hongbing, vice-minister of the National Health Commission and administrator of the National Administration of Disease Prevention and Control; Xiong Shaoyuan, deputy administrator of China Meteorological Administration; Saia Ma'u Piukala, WHO regional director for the Western Pacific; Amakobe Sande, UNICEF representative to China and Margaret Chan, founding dean of Vanke School of Public Health at Tsinghua University and former director-general of the World Health Organization (WHO), attended the opening ceremony. Yang Bin, vice chancellor of Tsinghua University Council, presided over the opening ceremony.

With the theme "Climate Change and Health: Responsibility, Governance and a Shared Future for Mankind," this year's forum brought together nearly 400 experts, scholars, representatives of international organizations and youth delegates from 22 countries and regions to jointly explore new paths and cooperation models for global health governance in the context of climate change.

Opening Ceremony guests assemble for a group photo

Ban Ki-moon pointed out that ten years ago, countries around the world made a historic commitment in Paris. Today, climate change has become one of the most serious public health emergencies. He hoped that the international community would attach great importance to it and make climate action a top priority in public health.

Li Luming welcomed forum attendees on behalf of Tsinghua University. He said that the University has thoroughly implemented the decisions and plans of the CPC Central Committee and has given full play to its strengths and taken active actions in addressing climate change and promoting health and well-being. The World Health Forum has become an important platform for promoting cooperation in global health governance and sustainable development. He looked forward to working with all sectors of society to cultivate talents, strengthen scientific and technological innovation, deepen international cooperation, and jointly safeguard a better future for human health and sustainable development.

Shen Hongbing said that the Chinese government attaches great importance to the coordinated development of climate and health, continuously promoting an integrated layout of "mitigation–adaptation–resilience" to form a governance system of "four-in-one" with policies, actions, standards, and evaluation. The National Health Commission and the National Disease Control and Prevention Administration will continue to improve top-level design and strengthen scientific research and international cooperation.

Xiong Shaoyuan said that the China Meteorological Administration is improving the climate and health governance mechanism through refined early-warning services, cross-sectoral coordination and international cooperation, actively promoting the integration of health meteorological services with multiple fields, and contributing China's solutions to building a community of shared future for human health.

Saia Ma'u Piukala shared the concept that "climate equals health," pointing out that climate change is not a distant threat but a present reality.

Amakobe Sande said that she hopes all countries will accelerate actions and strengthen the construction of climate-resilient public health systems to protect children's survival and development in the climate crisis.

Margaret Chan noted that the Vanke School of Public Health of Tsinghua University will continue to support decision-making through scientific research, cultivate leadership through innovative education, and gather global wisdom through open cooperation.

The two-day forum focuses on topics such as global health governance under climate change, scientific evidence chain and risk assessment, educational cooperation and academic innovation, youth and climate action, and includes three plenary sessions and one youth forum.

Tsinghua Global Youth Summit on Net-Zero Future highlights youth leadership in climate governance

The Fifth Global Youth Summit on Net-Zero Future, hosted by the Global Alliance of Universities on Climate (GAUC), recently took place at Tsinghua University. The summit brought together young leaders, scholars, and practitioners from around the world to exchange insights on climate governance, innovative solutions, and youth contributions to global climate action ahead of COP30 in Belém, Brazil.

Welcoming remarks were delivered by Professor Shi Zongkai, Vice Chair of Tsinghua University's University Council, who highlighted the crucial role of youth in climate action. He reaffirmed Tsinghua's commitment to fostering global partnerships and strengthening higher education's contribution to climate governance.

In a video address, Ms. Laurence Tubiana, President and CEO of the European Climate Foundation and COP30 European Special Envoy, reflected on the enduring significance of the Paris Agreement and commended youth for driving the transition toward a net-zero future.

Prof. Peter Hennicke, former Director of the Wuppertal Institute, delivered a keynote speech and explored systemic pathways toward net-zero emissions, circular economy, and well-being. He called on youth to learn from global best practices and act with optimism.

Alice Ho, GAUC Chief Youth Officer, introduced the Alliance's "Climate x" Campaign, which has engaged youth in 79 countries and impacted over five million people. She also highlighted the Global Youth Climate Week initiative, which since 2022 has held over 100 events in 20+ countries, showcasing youth-led innovative actions in education, clean energy, fashion, health, and disaster response.

The summit featured "Youth Climate Talks" and intergenerational dialogues. Young delegates shared experiences from COP29 and other initiatives, while industry experts from BMW Group, and EcoVoyage shared practical insights on sustainable business practices, circular economy, and youth empowerment. Participants underscored the importance of taking initiative, fostering collaboration, and developing critical skills in addressing climate challenges.

Panel discussions focused on green transition, youth empowerment, and practical strategies for sustainability. Academics and practitioners from Tsinghua University, GIZ, Airbus (China), and Beijing Eco-Hub stressed international cooperation, policy awareness, and the integration of academic knowledge with real-world action to achieve meaningful impact.

The summit concluded with a call to action. Speakers urged participants to turn insights into actions, carry forward the lessons learned, and lead by example to advance a sustainable, net-zero future.

Tsinghua University hosts 2025 Modern Governance Forum

Tsinghua University hosted the 2025 Modern Governance Forum on November 16, focusing on "Global and Public Governance in an Era of Transformation." The event was supported by the Chinese Public Administration Society and organized by Tsinghua University School of Public Policy and Management (SPPM). Guo Yong, deputy secretary of the CPC Tsinghua University Committee, attended the opening ceremony and delivered a welcome speech. Li Baorong, president of the Chinese Society of Public Administration, also attended the ceremony and gave a speech. Xue Lan, distinguished professor of Arts, Humanities and Social Sciences and dean of the Schwarzman College at Tsinghua University, presided over the opening ceremony.

In his address, Guo Yong stated that amidst the profound transformations unfolding across the world, universities should shoulder the historical mission of advancing research and practice in global public governance, and drive systemic innovation in the global governance system. In recent years, Tsinghua University has been committed to constructing an independent knowledge system in Chinese public administration, contributing Chinese wisdom to global public governance. He expressed his anticipation that this forum would inspire new ideas and foster new consensus to address governance challenges in this era of transformation.

Venue of the forum

Speakers of the forum assemble for a group photo

Li Baorong stated that formulating and implementing five-year plans is a hallmark of the CPC's governance. From the First Five-Year Plan (1953-1957) to the upcoming 15th Five-Year Plan (2026-2030), the planning system has progressed in a stepwise manner, breaking down long-term strategies into executable phased tasks. The scientific formulation and effective implementation of these plans have benefited from strategic resolve, institutional adjustments, and the forging of consensus across society. He expressed his expectation that the academic community would deepen relevant research and make greater academic contributions to advancing the Chinese path to modernization.

During the keynote speech session, relevant experts and scholars delivered presentations on topics such as the global challenges of public governance, global governance in the current era, and cultivating governance talents for a world in transformation.

The four parallel forums were conducted under the themes of "Geopolitical Shifts and the Governance of Global Economy," "Governance Digital Transformation and Global Digital Equity," "Socio-Economic Fluctuation and the Governance of Social Resilience," and "Global Flux and the Restructuring of World Governance," respectively.

Some members and guests of the Global Advisory Board of SPPM, along with part of the faculty and students from SPPM, participated in the event.

Tsinghua SPPM holds 2025 Global Advisory Board Meeting

Tsinghua University School of Public Policy and Management (Tsinghua SPPM) convened its 2025 Global Advisory Board (GAB) Meeting on November 15. Focusing on the theme "Public Governance Towards 2030", the GAB Meeting comprised an opening ceremony and closed-door meeting, adopting a hybrid online and offline format.

Qiu Yong, secretary of the CPC Tsinghua University Committee participated as a GAB member and gave welcome remarks. Luis Vassy, president of Sciences Po, also attended and delivered a keynote speech as a newly-joined GAB member.

Qiu Yong, on behalf of Tsinghua University, expressed sincere gratitude to all the GAB members. He noted that over the 25 years since its establishment, SPPM has remained rooted in China while embracing a global vision. The School has made positive contributions to nurturing high-level public management professionals, constructing an independent knowledge system, and advancing the modernization of China's governance system and governance capacity. Since its inception, the GAB has leveraged its members' extensive expertise to provide a range of forward-looking, strategic advice, playing a pivotal role in supporting SPPM's development. Looking ahead, he stated that SPPM should strive to develop new theories drawn from the dynamic practice of China's reform and development, explore new paradigms

Tsinghua University School of Public Policy and Management (Tsinghua SPPM) convened its 2025 Global Advisory Board (GAB) Meeting on November 15

for governance transformation in the AI era, and propose new solutions in the historical process of improving global governance. He expressed his hope that all GAB members would continue to offer valuable insights and contribute their wisdom and strength to building of a community with a shared future for mankind and creating a better world.

Peng Zongchao, professor of Tsinghua SPPM and secretary of the CPC Tsinghua SPPM Committee, presided over the opening ceremony. The subsequent closed-door discussion was led by Wu Hongbo, former special representative of the Chinese Government on European Affairs, former UN under-secretary-general and former president of the Chinese International Public Relations Association. Zhu Xufeng, professor and dean of Tsinghua SPPM, presented the school's 25th anniversary overview and development strategy.

The attending GAB members and guests highly affirmed the achievements of SPPM over the past 25 years. They also engaged in discussions around topics such as global governance, artificial intelligence, talent cultivation, and the establishment of an independent knowledge system, jointly offering strategic guidance and insightful suggestions for the high-quality development of SPPM during the 15th Five-Year Plan (2026-2030) period. They emphasized the need to strengthen the discipline construction of public policy and management by focusing on digitalization, green development, integration, and internationalization. They also expressed hope that SPPM would continue striving to become a world-class institution, contributing to the development of global public policy and management disciplines and institutions, as well as global sustainable development.

Relevant officials from Tsinghua University, leaders from Tsinghua SPPM, along with faculty and student representatives, were also in attendance.

2025 Tsinghua International Conference on Art & Design Education held in Milan

Participants gather for a group photo during the opening ceremony

The 2025 Tsinghua International Conference on Art & Design Education (ICADE 2025), hosted by Tsinghua University and organized by the Academy of Arts & Design, Tsinghua University, the Tsinghua Arts and Design Institute in Milan, and the China-Italy Design Innovation Hub, was recently held in Milan, Italy.

Under the theme Future Context: A New Paradigm for Art and Design Education, the conference

brought together over one hundred participants, including deans, professors, scholars, and industry representatives from both domestic and foreign art and design institutions. The conference featured eight keynote speeches, two leaders' roundtables, four thematic forums, two parallel seminars, and a series of international art and design workshops. Participants engaged in deep cross-disciplinary and cross-cultural dialogue, shared insights spanning from theory to practice, and collectively explored the evolution and transformation of art and design languages in the AI era—reflecting on how to reconstruct educational paradigms within this emerging context.

Conference participants during the RE-ACTOR International Art & Design Workshops

At the opening ceremony, remarks were delivered by Qin Chuan, Party Secretary of the Academy of Arts & Design, Tsinghua University; Anna Barbara, dean of POLI.design, Politecnico di Milano; Dalia Gallico, executive vice president of the World Olymp'Arts Council; Lorenzo Imbesi, president of CUMULUS; and Wu Jian, head of Haier Innovation Design Center. A letter of congratulation was sent by Wu Qiong, dean of the Academy of Arts & Design, Tsinghua University. The ceremony was hosted by Shi Danqing, vice dean of the Academy of Arts & Design, Tsinghua University.

The morning keynote sessions featured presentations by Anna Barbara, Rebecca Wright, dean of S School, Central Saint Martins, University of the Arts London; Rachel Dickson, deputy director of The Glasgow School of Art; and Qin Chuan. In the afternoon session, keynotes were delivered by Francesco Zurlo, head of the School of Design at Politecnico di Milano; Yang Dongjiang, chair of the Academic Committee of the Academy of Arts & Design, Tsinghua University; Kun-Pyo LEE, dean of The Hong Kong Polytechnic University School of Design; and John Ochsendorf, founding director of the MIT Morningside Academy for Design.

During the roundtable discussions, participants exchanged perspectives on two central themes: The Future Mission of Design: Interdisciplinary Education and Global Challenges; and, The Coordinates of Institutions within the Contemporary Context.

The second day of conference featured the thematic forums and parallel seminars within diverse disciplinary and industrial contexts. Experts and scholars from fields including spatial environments, fashion design, industrial design, information design, and intelligent manufacturing engaged in dialogues around the following topics: Rhetorical Translation: Aesthetic Resonance Across Cultures; Dual Subjects: Human-Machine Collaboration and Interdisciplinary Integration; Sensorial Verbs: Designing Through Bodily Experience; and, Plural Space: The Narrative Tension of Multi-dimensional Experience.

Concurrently, the RE-ACTOR International Art & Design Workshops took place, focusing on the theme AI Protocols for New Space: Embodied Experiences and Ritual Habitats. Speakers delivered specialized presentations exploring this concept in depth.

Qiu Yong visits Ethiopia, promotes educational cooperation

On November 25 local time, Qiu Yong, secretary of the CPC Tsinghua University Committee, visited Ethiopia to attend the Forum on Science & Technology Cooperation and Sustainable Development in the Global South. During the visit, Tsinghua University signed memorandums of understanding with Addis Ababa University and Mekelle University, contributing Tsinghua's strength to advancing the All-Weather Strategic Partnership between China and Ethiopia.

On the morning of November 25, the Forum on Science & Technology Cooperation and Sustainable Development in the Global South—hosted by Tsinghua University's Institute for Carbon Neutrality and the Department of Earth System Science—convened in Addis Ababa.

The event featured remarks from Qiu Yong; Kindeya Gebrehiwot, state minister of Ethiopia's Ministry of Education; Lelise Neme, director general of the Ethiopian Environmental Protection Authority; and Getachew Engida, co-director of the China-Africa Leadership Development Institute, Tsinghua University, and former deputy director-general of UNESCO.

Experts and scholars from both China and Ethiopia engaged in in-depth discussions on strengthening China–Africa cooperation across multiple fields to advance sustainable development.

Qiu Yong stated that this year marks the 55th anniversary of diplomatic relations between China and Ethiopia. As two major countries of the

At the forum venue

Tsinghua University and Mekelle University sign a memorandum of cooperation

Global South, China and Ethiopia enjoy a deep foundation of cooperation and broad prospects for future collaboration.

He emphasized that Tsinghua University has long valued exchanges with African countries and has continuously advanced cooperation in academic research, talent cultivation, and people-to-people engagement. Looking ahead, Tsinghua is ready to work with Ethiopia and other African nations to seize the historic opportunities brought by the development of artificial intelligence, further strengthen joint scientific research, expand faculty and student exchanges, and deepen collaboration in public health, clean energy, climate change, sustainable development and other key areas.

He added that by working together, both sides can better address common challenges facing humanity and deliver greater benefits to the two countries and their peoples.

The African guests emphasized the significance of China–Africa cooperation, highlighting its profound and lasting impact. They expressed confidence that partnerships with Chinese universities, particularly Tsinghua University, will strongly advance scientific innovation and green energy development across Ethiopia and wider Africa. Such collaborations are crucial for promoting sustainable development and building a shared future for humanity and nature.

At the forum, Qiu Yong and Fana Hagos Berhane, president of Mekelle University, signed a memorandum of cooperation. The two universities will strengthen collaboration in areas such as talent cultivation and joint research.

On the afternoon of Nov 25, Qiu Yong visited Addis Ababa University and signed a memorandum of cooperation with President Samuel Kifle.

Qiu Yong underscored Tsinghua University's strong commitment to international engagement and high-level opening-up in education. He expressed his hope to enhance collaboration with Addis

Tsinghua University and Addis Ababa University sign a memorandum of cooperation

Ababa University in talent cultivation, joint research, platform development, and academic exchanges. By working together to promote industry-academia-research integration, the two institutions can inject new vitality into the longstanding friendship between China and Ethiopia.

Samuel Kifle introduced key initiatives at his university and expressed his hope to deepen engagement with Tsinghua University by launching joint training programs and research projects.

During his visit to Ethiopia, Qiu Yong met with Jiang Feng, head of the Chinese Mission to the African Union. Their discussions explored the potential for universities to play a greater role in supporting China–Africa cooperation and achieving more fruitful outcomes.

Heads of relevant departments and offices of Tsinghua attended the related activities.

Qiu Yong visits Kenya, strengthens educational partnerships

Tsinghua University and University of Nairobi sign a cooperation agreement

Qiu Yong, secretary of the CPC Tsinghua University Committee, visited Kenya from November 26 to 28 local time, implementing the important consensus reached by the heads of state of the two nations. The visit focused on advancing high-quality Belt and Road cooperation, deepening educational and scientific collaboration as well as cultural exchanges between Tsinghua University and Kenya, and contributing Tsinghua's strength to building a China-Kenya community with a shared future in the new era.

On November 28, Qiu Yong visited the University of Nairobi, where he met with Chancellor Patrick Verkooijen and Acting Vice Chancellor Margaret Jesang' Hutchinson. The two sides held discussions and signed a cooperation agreement between the universities.

Qiu Yong noted that the University of Nairobi is an important partner of Tsinghua University and a founding member of the Global MOOC and Online Education Alliance initiated by Tsinghua.

He expressed hopes that the two universities will continue to expand faculty and student exchanges, deepen cultural interaction, and broaden educational and research collaboration in areas such as artificial intelligence, climate change, public health, and hospital management, setting a model for China–Africa higher education cooperation.

Verkooijen and Hutchinson introduced the University of Nairobi's history and distinctive strengths, expressing their hope to learn from Tsinghua's successful development experience and to foster deeper collaboration that will generate more "chemical reactions" between the two institutions.

On the same day, Qiu Yong delivered a speech titled "Universities in the Age of AI: Reflections, Responsibilities and Actions" at the University of Nairobi auditorium. More than 300 representatives from various sectors, including faculty and students from China and Kenya, attended the event. Experts and scholars from both Tsinghua University and the University of Nairobi also engaged in

Qiu addresses the audience at the University of Nairobi

Qiu and Mrema ; Qiu and Rossbach exchange a Letter of Intent for cooperation

discussions centered on the theme of the speech in panel discussion.

Qiu Yong emphasized that education is an undertaking built on inheritance, and universities possess enduring resilience. In the era of artificial intelligence, he noted, universities should actively advance AI-empowered teaching, innovation, and application of research outcomes, while also strengthening studies on governance and standards to help reduce disparities in AI competence. Accordingly, universities will better promote mutual learning among civilizations and safeguard humanity's spiritual home.

He highlighted that Tsinghua University is among the earliest institutions in China to engage in AI education and research, and that the University has established a comprehensive layout in the AI field. Looking ahead, Qiu Yong stated that Tsinghua is ready to work hand in hand with Kenya and other African partners, upholding openness and cooperation, jointly addressing the challenges and opportunities of the AI era, and contributing more practical outcomes to support China–Africa efforts toward modernization.

On November 27, Qiu Yong held separate meetings with Elizabeth Maruma Mrema, Deputy Executive Director of the United Nations Environment Programme (UNEP), and Anacláudia Rossbach, Executive Director of the United Nations Human Settlements Programme (UN-Habitat). Their discussions focused on deepening collaboration between Tsinghua University and international organizations to advance Africa's green and sustainable development. Qiu Yong and Rossbach also exchanged a Letter of Intent for cooperation between Tsinghua University and UN-Habitat.

On November 26, Qiu Yong visited the Karen Base, the East and Southern Africa Regional Headquarters of the Power Construction Corporation of China (POWERCHINA) for an inspection. Together with Chen Guanfu, Member of the Standing Committee of the POWERCHINA's CPC Committee and Deputy General Manager of the Power Construction Corporation of China, he jointly unveiled the Tsinghua University Africa Center.

The Tsinghua University Africa Center, formerly the Tsinghua University China-Africa Leadership Development Institute, was established in 2018 with the support of UNESCO and is affiliated with the University's Vanke School of Public Health. The newly established Tsinghua University Africa Center will be located at the Karen Base of POWERCHINA in Kenya.

As an important part of Tsinghua University's global strategy, the Center is dedicated to serving as Tsinghua's hub for engagement and exchanges in Africa. The Center will advance cooperation between Tsinghua and African countries in talent development, academic research, scientific and technological innovation, and people-to-people exchanges. It aims to provide strong support for building an all-weather China-Africa community with a shared future for the new era and for contributing to the achievement of the United Nations 2030 Sustainable Development Goals.

During the visit, Qiu Yong held discussions with Guo Haiyan, Chinese ambassador to Kenya, on advancing high-quality China–Kenya educational cooperation, and visited representatives of Tsinghua alumni in Africa.

Relevant department and faculty heads from Tsinghua participated in the respective activities.

Unveiling of the Tsinghua University Africa Center

2025 Global MOOC and Online Education Conference held in Mexico

The 2025 Global MOOC and Online Education Conference, themed "Breaking Boundaries and Reshaping Futures: Open and Intelligent Global Education," was held at the National Autonomous University of Mexico (UNAM) from December 2 to 4, local time. The opening ceremony was attended by Li Luming, president of Tsinghua University and chair of the board of the Global MOOC and Online Education Alliance; Patricia Dávila Aranda, general secretary of National Autonomous University of Mexico; and Asha Kanwar, chair of the UNESCO IITE Governing Board. Stefania Giannini, UNESCO assistant director-general for education, delivered a video address to the conference.

The meeting brought together 180 participants from 76 leading institutions, including Tsinghua University, Peking University, Cornell University, and the University of Auckland, among others. These representatives hailed from renowned universities, online education platforms, international organizations, and government agencies across 34 countries and regions worldwide. Li Luming extended a warm welcome and thanked distinguished guests in attendance. He reviewed the Alliance's work over the past year across four key areas: Quality, Equity, Community, and Wisdom, and announced the official inclusion of Vietnam National University, Hanoi, and the Federal University of Rio de Janeiro, as new members of the Global MOOC and Online Education Alliance. In his keynote address titled "Dissolving Boundaries: Educational Innovation for a Future Learning Ecosystem," he provided an in-depth analysis of the practical pathways for universities in the AI era to break down disciplinary barriers, overcome temporal and spatial constraints, and redefine institutional roles. He introduced

The 2025 Global MOOC and Online Education Conference, held at the National Autonomous University of Mexico (UNAM) from Dec 2 to 4, local time.

Tsinghua University's explorations in building an "AI-native" educational model and advancing the transformation of educational paradigms. Furthermore, he called upon universities worldwide to join forces in leveraging intelligent technologies to transcend the boundaries of time, space, disciplines, and traditional teacher-student roles, thereby collaboratively shaping a more inclusive and resilient future learning ecosystem.

Giannini highly commended the Global MOOC and Online Education Alliance for its contributions to promoting equity and inclusive development in global education. She called upon the international community to strengthen cooperation to ensure that the outcomes of educational transformation benefit every learner.

Dávila expressed her hope that universities worldwide would seize the opportunity presented by this conference to work together in building a more inclusive, intelligent, and human-centered educational ecosystem.

The Alliance releases the Mexico City Declaration.

Infinite Possibilities: Report on the Digital Development of Global Higher Education (2025) and The Digital Development Index of Global Higher Education (2025) are released.

Li Luming, Dávila, Kanwar, and Anabel de la Rosa Gómez, coordinator of coordination of Open University and digital education of National Autonomous University of Mexico, jointly released the *Infinite Possibilities: Report on the Digital Development of Global Higher Education (2025)* and *The Digital Development Index of Global Higher Education (2025)*.

The conference also featured the release of the *Mexico City Declaration* and proposed the new concept of "Intelligent MOOCs" for the first time globally. In addition, it debuted a series of Intelligent MOOCs, including Tsinghua University's Chemical Engineering Thermodynamics.

The event featured four plenary sessions, a Special Global Workshop titled "AI for Futures," and a dedicated Intelligent Higher Education Exhibition, showcasing innovative AI-empowered teaching outcomes across multiple dimensions.

The Board Meeting of the Global MOOC and Online Education Alliance was held concurrently. Peng Gang, vice president and provost of Tsinghua University and chair of Executive Committee of the Global MOOC and Online Education Alliance, attended the meeting and delivered a speech. During the meeting, the Board approved the resolution confirming Vietnam National University, Hanoi, as the host of the 2026 Global MOOC and Online Education Conference.

Members of the Global MOOC and Online Education Alliance Board Meeting gather for a group photo.

International AI Cooperation and Governance Forum 2025 held at the University of Melbourne

The International AI Cooperation and Governance Forum 2025 was recently held at the University of Melbourne, bringing together leading scholars, policymakers, industry executives, and representatives from various international organizations to discuss the role of global collaboration in shaping a safer, more inclusive AI future.

Co-hosted by Tsinghua University, the University of Melbourne, the National University of Singapore (NUS), and the Hong Kong University of Science and Technology (HKUST), this year's theme was "Inclusive AI: Who Builds, Who Benefits?"

The opening ceremony was chaired by Professor Jeannie Paterson, co-founding director of the Centre for Artificial Intelligence and Digital Ethics (CAIDE) at the University of Melbourne. Opening remarks were delivered by Jean Todt, the UN secretary-general's special envoy for road safety; Tshilidzi Marwala, rector of the United Nations University (UNU) and UN under-secretary-general; and Yang Bin, vice chancellor of Tsinghua University Council.

Jean Todt outlined the current global road safety situation and introduced applications of AI technologies in areas such as risk detection and traffic management. Yang Bin highlighted ongoing efforts in AI education, research and international cooperation. Tshilidzi Marwala discussed the growing need for collaboration in AI ethics

Group photo of forum participants

Roundtable discussion session

and governance and noted the importance of continued academic and policy exchange.

The plenary session, chaired by Professor Xue Lan, dean of Institute for AI International Governance of Tsinghua University (I-AIIG), featured leading voices, including Stuart Russell (UC Berkeley), Gong Ke (Haihe Laboratory of Information Technology Application Innovation), Jeannie Marie Paterson (University of Melbourne), Simon Chesterman (NUS), and Celine Yunya Song (HKUST).

Speakers introduced recent progress in national and regional AI strategies, developments in governance tools, and ongoing research initiatives. Topics discussed included regulatory approaches for high-risk systems, the development of integrated governance mechanisms, and the need for continued international dialogue.

The two-day forum featured a plenary session and seven thematic panels. Nearly 100 experts from China, Australia, Singapore, the United States, the United Kingdom, and New Zealand participated in the event, alongside representatives from the UN, leading universities, and major technology companies.

Li Luming visits Mexico and Brazil

Tsinghua University President Li Luming visited Mexico and Brazil from December 2 to 6 (local time). In Mexico, he attended the 2025 Global MOOC and Online Education Conference. During the visit, he held meetings with representatives from leading local universities and officials from Chinese diplomatic missions, with the aim of deepening cultural exchanges and strengthening cooperation in higher education between China and the two countries.

During his visit to Mexico on December 3, Li Luming attended the opening ceremony of the 2025 Global MOOC and Online Education Conference at the National Autonomous University of Mexico. He delivered a keynote speech titled "Dissolving Boundaries: Educational Innovation for a Future Learning Ecosystem". He also met with Chinese Ambassador to Mexico, Chen Daojiang, to discuss ways to further deepen China–Mexico cooperation in higher education.

On December 4, during his visit to Brazil, Li Luming met with Maysa Furlan, Rector of São Paulo State University, and signed a Memorandum of Understanding between the two institutions. Li introduced Tsinghua University's latest achievements and development plans in scientific research, talent cultivation, and international cooperation. He emphasized Tsinghua's strong commitment to deepening partnerships with Brazilian universities and research institutions, proposing to expand collaboration areas, explore innovative cooperation mechanisms, and

Li Luming attends the opening ceremony of the 2025 Global MOOC and Online Education Conference and delivers a keynote speech.

strengthen joint research and talent development—particularly in addressing global issues such as carbon neutrality and energy transition. These efforts, he noted, aim to contribute to tackling climate change and advancing sustainable development.

Furlan highlighted São Paulo State University's longstanding strengths in fields such as bioenergy and public health, expressing readiness to promote substantive cooperation in relevant fields. She stated that the university looks forward to the partnership yielding fruitful results in the near future.

Li Luming met with Roberto Medronho, Rector of the Federal University of Rio de Janeiro on December 5. Li outlined Tsinghua University's recent progress in advancing its global strategy and promoting high-level openness in education. He congratulated the Federal University of Rio de Janeiro on officially joining the Global MOOC and Online Education Alliance as a new member, and expressed Tsinghua's readiness to use this milestone to further deepen practical cooperation in talent development, scientific research, and online education. Such collaboration, he noted, will help expand the sharing of high-quality educational resources and support the high-quality development of higher education in both countries.

Tsinghua University and São Paulo State University sign a Memorandum of Understanding

Li Luming visits the Federal University of Rio de Janeiro

Medronho reviewed the longstanding and fruitful collaboration between the two universities and expressed his full support for expanding and deepening the bilateral partnership. He affirmed that both sides will work together to advance talent cultivation and research innovation, injecting new momentum into China–Brazil educational exchanges and supporting the economic and social development of both nations.

On December 6, Li Luming held separate meetings with Antonio Claudio Nobrega, Rector of Fluminense Federal University, and Anderson Antonio Pedroso, Rector of Pontifical Catholic University of Rio de Janeiro. During the meetings, he signed a Memorandum of Understanding with Fluminense Federal University and witnessed the signing of a Cooperation Agreement between Tsinghua Shenzhen International Graduate School and the Pontifical Catholic University of Rio de Janeiro.

Li Luming reviewed the achievements of collaboration between Tsinghua University and Brazilian universities and held in-depth discussions with representatives from both institutions on talent cultivation, scientific and technological innovation, international cooperation, AI-empowered educational transformation, and expanding faculty and student exchanges. The visit further advanced the vision for friendly cooperation outlined during last year's meeting between the leaders of China and Brazil, injecting new momentum into cultural exchanges and higher education collaboration between the two countries.

Tsinghua University and Fluminense Federal University sign a Memorandum of Understanding

During the visit, Li Luming also met with Tian Min, Chinese Consul General in Rio de Janeiro, to discuss strengthening China–Brazil educational collaboration and talent exchanges. Together, they witnessed the inauguration of the Tsinghua Envision Center for Sustainable Development (Brazil). Li also visited the laboratory of the Tsinghua-UFRJ China-Brazil Center for Climate Change and Energy Technology Innovation at the Federal University of Rio de Janeiro, visited the headquarter of State Grid Brazil Holding S.A., and met with Tsinghua alumni working in Brazil.

Tsinghua Shenzhen International Graduate School and Pontifical Catholic University of Rio de Janeiro sign a Cooperation Agreement

Qiu Yong visits France and Greece

From December 14 to 18 (local time), Qiu Yong, Secretary of the CPC Tsinghua University Committee, visited France and Greece to advance educational and scientific cooperation as well as people-to-people exchanges between Tsinghua University and leading European universities and institutions. This visit contributed Tsinghua's strength to the development of the China–EU comprehensive strategic partnership.

During his visit to France, Qiu Yong met with Khaled El-Enany, Director-General of the United Nations Educational, Scientific and Cultural Organization (UNESCO), on the morning of December 15.

Qiu Yong briefed El-Enany on Tsinghua University's latest progress in international cooperation and expressed the University's willingness to deepen collaboration with UNESCO in areas including artificial intelligence, online education, cultural heritage protection, and youth capacity building, with a view to contributing to global sustainable development.

El-Enany looks forward to bilateral cooperation in areas such as innovation in AI-driven educational innovation and digital cultural heritage preservation. He also expects to support the development of developing countries, including Small Island Developing States, through measures like special visiting scholar programs and joint research funds.

On the afternoon of December 15, Qiu Yong visited Sciences Po and held talks with its President, Luis Vassy.

Qiu Yong meets with Khaled El-Enany.

Qiu Yong Visits UNESCO.

Tsinghua University and Sciences Po sign a letter of intent for cooperation.

Qiu Yong noted that Sciences Po is an important partner of Tsinghua University and expressed the hope that the two institutions would further deepen cooperation in scientific research and talent cultivation, particularly in areas such as artificial intelligence and public governance, as well as climate change and sustainable development. He emphasized that strengthened collaboration would contribute to China–France people-to-people exchanges and mutual learning between civilizations.

Vassy expressed his expectation that the two universities would jointly design joint training programs, advance research collaboration, and foster young talent, with the aim of delivering practical solutions for global sustainable development.

During the visit, the Tsinghua University Institute of Climate Change and Sustainable Development and the Sciences Po Paris Climate School signed a letter of intent on cooperation.

During his stay in France, Qiu Yong met with Deng Li, Chinese ambassador to France, to exchange views on advancing China–France cooperation in education.

During his visit to Greece, Qiu Yong met with Gerasimos Siasos, Rector of the National and Kapodistrian University of Athens (NKUA), on the afternoon of December 16.

Qiu Yong outlined Tsinghua University's global strategy and its implementation, expressing the hope that the two universities would work together to promote the integrated development of science and technology with culture, as well as classical civilization and modern science.

Siasos stated that the NKUA is willing to strengthen cooperation with Tsinghua in areas such as museum planning and development, as well as exchanges in engineering and the humanities.

Tsinghua University and the National and Kapodistrian University of Athens sign a memorandum of understanding on cooperation.

Following the meeting, Qiu Yong and Siasos signed a memorandum of understanding on cooperation between the two universities.

On the morning of December 17, Qiu Yong visited the National Technical University of Athens and held discussions with its Rector, Ioannis K. Chatjigeorgiou, on further expanding cooperation in areas such as artificial intelligence, energy transition, humanities research, and digital cultural heritage.

During the visit, the two universities signed a student exchange agreement.

On the afternoon of December 17, Qiu Yong visited the Athens University of Economics and Business (AUEB) and held discussions with its Rector, Vassilis Vasdekis, on strengthening pragmatic cooperation in areas such as talent cultivation, joint research, and financial technology.

Following the talks, Qiu Yong and Vasdekis signed a memorandum of understanding on cooperation between the two universities.

On the evening of December 17, Qiu Yong was invited to engage with representatives from Greece's political, business, and academic communities and delivered a keynote address. The address was titled "Cultural Inheritance and Mutual Learning Among Civilizations in the Era of Artificial Intelligence".

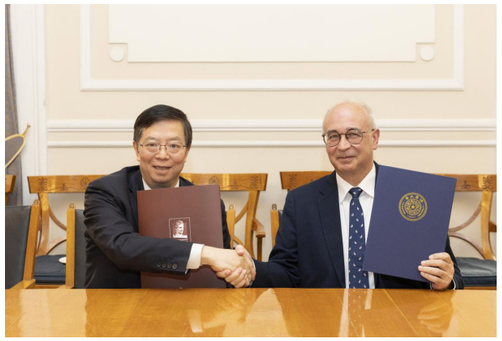
The event was attended by Giannis Kefalogiannis, Minister of Climate Crisis and Civil Protection of the Hellenic Republic; Evangelos Angelakos, former Mayor of Oinousses, Honorary Chairman of Angelakos S.A.; Vasileios Vasdekis, Rector of Athens University of Economics and Business; Ioannis K. Chatjigeorgiou, Rector of the National Technical University of Athens; Sophia Papaioannou, Vice-Rector of the National and Kapodistrian University of Athens; and Ren Fujun, CEO of the Southeast European Region of Huawei, among others.

Tsinghua University delegation visit the National Technical University of Athens.

During the exchange session, Tsinghua University and the National and Kapodistrian University of Athens signed a letter of intent for cooperation. The two sides will carry out joint research and talent cultivation in areas including early detection and prevention of forest fires, as well as the application of digital technologies to cultural heritage preservation.

During the visit, Qiu Yong met separately with George Papandreou, former Greek Prime Minister and Dimitris Avramopoulos, a member of parliament in Greece, and visited the Port of Piraeus operated by the China COSCO SHIPPING Corporation Limited.

Relevant heads of academic departments and administrative offices at Tsinghua University accompanied the visit and took part in related activities.



Tsinghua University and the Athens University of Economics and Business sign a memorandum of understanding on cooperation.

Signing of a letter of intent for cooperation

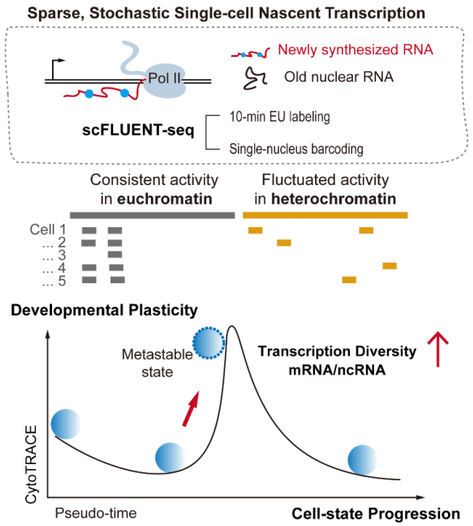
RESEARCH

TSINGHUA NEWSLETTER

Advances made by Shen Xiaohua's Lab in genome decoding

The genome serves as life's blueprint, yet how much of it is actually used by a single cell has remained unclear. Professor Shen Xiaohua's team at the School of Basic Medical Sciences, Tsinghua University, has made advancements in genome decoding. The researchers developed a high-throughput single-cell nascent transcriptome technology (scFLUENT-seq), which, for the first time, quantifies genome usage at the single-cell level. The study reveals the sparsity and heterogeneity of nascent transcription, offering fresh insights into the diversity of cell fates. The work, entitled Single-cell nascent transcription reveals sparse genome usage and plasticity, was published online in *Cell* on September 26, 2025 (DOI: https://doi.org/10.1016/j.cell.2025.09.003).

Using scFLUENT-seq, Shen's team measured genome usage in individual cells. They discovered that even in highly transcriptionally active mouse embryonic stem cells, only about 3% of the genome is transcribed at any given time—though this is more than 50-fold higher than in terminally differentiated splenic lymphocytes. When data from all cells are combined, nascent transcription covers nearly 80% of the genome. This striking contrast underscores the extreme sparsity, randomness, and heterogeneity of transcription at the single-cell level—patterns that are largely obscured in bulk analyses.



The study also shows that transcription in noncoding regions is more stochastic than in protein-coding genes. Distal noncoding transcription units in heterochromatic regions, although sparse, exhibit regulatory properties shaped by their chromatin environment. The team introduced the concept of "nascent transcriptional diversity" to describe transient and unstable cellular states. Such cells, indistinguishable in steady-state transcriptomes, simultaneously transcribe more protein-coding genes and noncoding units at the nascent level, reflecting heightened fate plasticity.

This research not only establishes precise single-cell measurement of nascent transcription but also addresses two central theoretical questions: the transcriptional activity of noncoding "dark matter" and the inherently probabilistic nature of life regulation. By quantitatively uncovering the sparsity and heterogeneity of nascent transcription, the study moves beyond the limitations of steady-state transcriptomics and provides a new framework for rethinking genome regulation and cell fate.

The first author of the study is Ma Shaoqian, a Ph.D. student (Class of 2021) at the School of Basic Medical Sciences, Tsinghua University. The corresponding authors are Professor Shen Xiaohua and Ma Shaoqian. This work was supported by the National Natural Science Foundation of China Excellence Research Group Program, National Natural Science Foundation of China grants, and the National Key Research and Development Program of China.

About the Shen Lab

The Shen Lab studies how the noncoding genome, chromatin, and nuclear architecture shape gene regulation and cell fate. By combining biology, physics, and quantitative modeling, we aim to uncover the fundamental rules of life at the interface of molecules and cells. We welcome motivated students and postdocs—especially those with mathematical, physical, or engineering backgrounds—to join us (xshenlab.com) in exploring life's most fundamental questions.

Nature showcases Tsinghua's integration of AI into education

Nature, the world's leading scientific journal, has highlighted Tsinghua University's systemic approach and thoughtful reflections on integrating artificial intelligence into education. The feature article, titled ***Universities are embracing AI: will students get smarter or stop thinking?*** appears on *Nature*'s website and is published in the October 23rd print edition (Vol 646).

Penned by senior *Nature* editor Helen Pearson, the article delves into the complex landscape of AI adoption across global higher education, examining the opportunities and anxieties surrounding tools like ChatGPT. The report draws on insights from several world-leading institutions, including Harvard University, Massachusetts Institute of Technology (MIT), University of Sydney, and Tsinghua University, placing Tsinghua's efforts at the heart of this critical global conversation.

Nature highlights Tsinghua University with extensive coverage, beginning its exploration with Tsinghua's innovative use of Xiaoda, an AI agent provided to incoming students via their admission letters to navigate campus life.

Based on interviews with Shuaiguo Wang, Director of Online Education Center at Tsinghua University, the article details the university's proactive and systemic strategy for integrating AI into teaching. It showcases Tsinghua's unique "three-layer decoupled architecture," designed to ensure flexibility, accuracy, and pedagogical soundness. This architecture leverages multiple AI models, incorporates "Disciplinary Knowledge Engines" to correct hallucinations, and supports diverse student-facing platforms. The report also notes the significant impact of this Tsinghua-led initiative, stating it has already been adopted by hundreds of universities across China.

Crucially, the *Nature* feature goes beyond showcasing innovation, spotlighting Tsinghua's commitment to rigorous scientific scrutiny regarding AI's impact on learning. The article candidly shares preliminary, unpublished findings from ongoing studies led by Wang, which suggest AI tutoring might boost immediate test scores but potentially impair long-term retention, leading to a "false sense of understanding." These findings form a meaningful dialogue with related research from Harvard University—suggesting that AI can enhance learning when used in the right way—and from MIT—showing that students who rely too heavily on AI may fail to develop essential skills such as critical thinking. It underscores the thoughtful and evidence-based approach Tsinghua is taking.

This in-depth coverage in *Nature*, a journal renowned for its independence and scientific rigor, offers significant international recognition of Tsinghua University's forward-thinking strategy, systematic implementation, and profound reflections in the domain of AI-empowered education. It signals that Tsinghua's exploration in this field is providing valuable "Tsinghua Experience" and insights for the global higher education community navigating the complexities of the AI era.

From pioneering MOOCs in China to ensuring educational continuity during the pandemic via comprehensive online teaching, and now to actively shaping the future of AI-empowered education, Tsinghua University remains committed to leveraging cutting-edge technology to drive pedagogical reform.

Read the full Nature feature here: https://www.nature.com/articles/d41586-025-03340-w

2025 Lancet Countdown China Report offers valuable lessons for urban resilient and low-carbon development

New Lancet Countdown China report reveals eight of 13 climate-health risk indicators at historic peaks; Beijing launch showcases scalable approaches for resilient and low-carbon urban development.

As eight of 13 critical climate-health risk indicators hit record highs in China, the 2025 Lancet Countdown China Report offers valuable lessons for urban resilient and low-carbon development, launched on October 31 at Tsinghua University.

Wu Huaqiang, vice president of Tsinghua University, Sandro Demaio, head of Environmental Health for the Asia-Pacific Region at the World Health Organization, Helena Wang, senior executive editor for Asia of the Lancet, and Gong Peng, vice president of the University of Hong Kong and global co-chair of the Lancet Countdown, attended and addressed the event, chaired by Luo Yong, professor and chair of the Department of Earth System Science at Tsinghua University, and co-chair of the Lancet Countdown Asia Center.

In his speech, Wu Huaqiang mentioned that the report offers a Chinese perspective and Chinese solutions for global climate and health governance, serving as a testament to Tsinghua University's fulfillment of its international responsibilities through the power of scientific research.

Gong Peng stated that this report will provide critical support for city-level climate actions and generate extensive influence across multiple dimensions.

Sandro Demaio remarked that the Lancet Countdown China Report stands as both a testament to scientific excellence and a call to collective responsibility, to protect the health of people and the planet we share.

Helena Wang noted that the China Report released today serves as a forward-looking call to action, inviting all of us to work together to transform scientific insights into concrete measures that protect every life and every community.

Marking World Cities Day under the theme "Empowering Cities for Synergistic Action", the report provides unprecedented city-level analysis, exposing a critical gap between national/provincial assessments and the unique risks facing individual cities. "While climate red alerts are flashing everywhere, we must fight public desensitization and provide cities with targeted solutions," said Professor Cai Wenjia, Director of the Lancet Countdown Asia Centre at Tsinghua University. "Our analysis shows health-focused climate action isn't an economic brake – it's actually an accelerator for growth."

Key findings with regional implications include:

• Asians now experience an average of 20 heatwave days per year (2022-2024), with climate change responsible for 16 of these days

• Public risk fatigue is emerging as climate warnings become constant, threatening response effectiveness

• Each city faces its own distinct climate-health crisis – national averages mask critical local vulnerabilities

• Scientific research doesn't match cities' most urgent needs, with cost-effective solutions remaining scarce

• Health-centered climate action accelerates rather than hinders economic growth

The report identifies cities as both the epicenter of climate health risks and the engine of solutions, outlining five priority actions from developing people-centered early warning systems to embedding health in smart city planning.

The launch featured experts from Singapore, India, Australia and China discussing practical urban solutions. The event also highlighted new financing pathways. The Asian Infrastructure Investment Bank outlined its focus on health- and nature-positive infrastructure, while the Asian Venture Philanthropy Network introduced its Climate x Health Lighthouse Fund—Asia's first philanthropic fund scaling adaptation innovation.

The full report is available at: https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(25)00230-0/fulltext

Tsinghua scientists engineer disease-resistant crops

A modification to plant proteins helps them recognize and attack pathogens such as viruses.

Crop diseases are a huge drain on our food supply. The soybean mosaic disease, for example, is a highly destructive infection that leads to billions of dollars in losses on soybean yields every year around the world.

For decades, farmers have tried to battle crop diseases with pesticides, but these agrochemicals often can harm non-target animals and microorganisms, disrupt ecosystems, and contaminate soil and water sources. Worst still, many pathogens or pests adapt and develop resistance to chemicals, reducing their effectiveness.

Plant biologists at Tsinghua University are taking a different approach to bolster plant defenses against disease. In a recent study published in ***Nature***, researchers led by Yule Liu, have enhanced the immune systems of plants by reengineering proteins to act as more vigilant sentinels.

These modified proteins can improve the plant's capacity to recognize invading intruders and trigger the its immune defenses. "Our approach targets the root of disease susceptibility: the plant's ability to detect pathogens," says Liu.

Vigilant sentinels

Central to this breakthrough is an 'alarm protein' found within plant cells, known as 'nucleotide-binding domain and leucine-rich-repeat immune receptors', or NLRs.

NLRs can detect specific pathogen-or pest-derived molecules introduced into plant cells by bacteria, fungi, viruses or insects. These receptors then become activated and initiate a cascade of immune responses against the foreign pathogens, such as killing off the infected cells to prevent the spread of infection.

"It is like a guard sounding an alarm during an invasion," Liu explains.

However, some pathogens have evolved to evade detection by avoiding the production of the molecules that would normally activate NLRs. Moreover, NLRs cannot stay activated all the time, as that would cause excessive damage to healthy plant tissue. This mirrors the human immune system, where hyperactivity can lead to autoimmune disorders, such as Crohn's disease.

In 2017, while examining the functional mechanism of NLRs, Liu's team reported that an activated NLR will stop working if one of its terminal regions was blocked. "Reports from other labs suggested this was a common issue," recalls Liu.

Rather than viewing it as a flaw, the team saw potential. They hypothesized that if they could design a custom-built blocker that only a pathogen can remove, and attach it to an active NLR, they could effectively create a molecular trap.

In its blocked state, the NLR would remain dormant. But upon invasion, the pathogen could remove the blocker, automatically unleashing the NLR and triggering the plant's immune defenses. The team dubbed this innovation 'controllable autoactive NLRs', or 'controllable aNLR' for short.

Sustaining immunity

To achieve broad-spectrum resistance against multiple pathogens, the blocker on aNLRs would be attached with short peptide sequences that can be cut by enzymes produced by a wide range of pathogens.

The researchers first focused on potyviruses, a large viral family that accounts for about 30% of all known plant viruses, including the soybean mosaic virus. They identified a conserved protease called NIa — a type of enzyme that plays a crucial role in breaking down polyproteins into smaller, active mature proteins — which is essential to the infection process of all potyvirus species. Moreover, the NIa cleavage sites from more than 100 potyviruses are highly conserved. The researchers then engineered a blocker peptide

sequence containing the conserved cleavage site, and attached it to the beginning (N-terminus) of the aNLR.

Through this strategy, the tools that viruses use for infecting cells are repurposed as 'molecular scissors' that activate the aNLRs. "This in turn sounds the alarm for the plant's immune system to launch a defense," explains Liu.

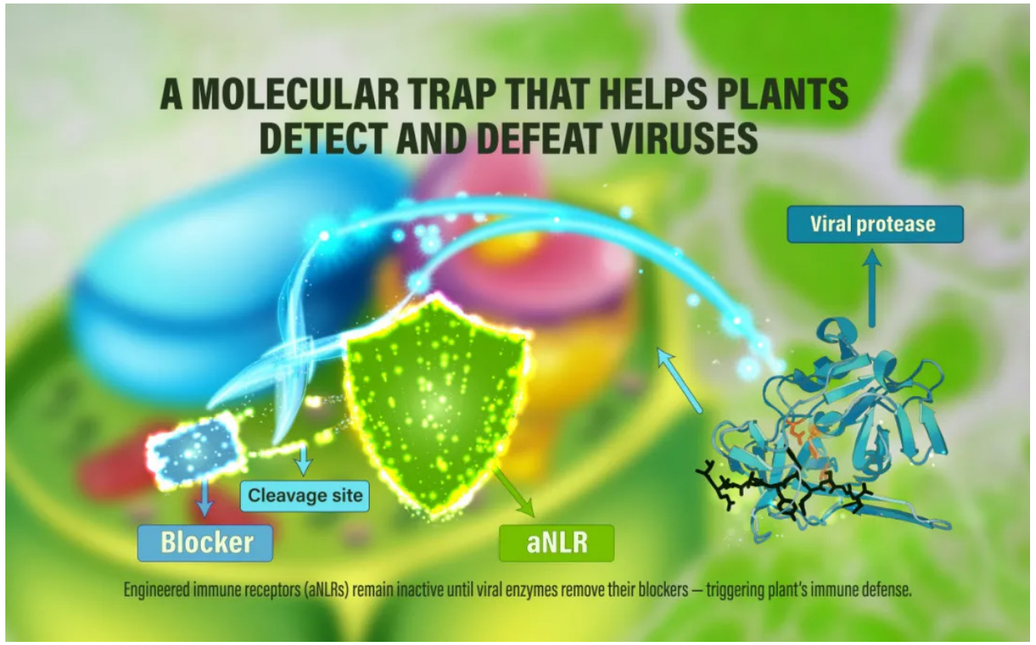
The resulting plant immunity is expected to be long-lasting and difficult for viruses to develop resistance to, because the enzymes involved are critical for the pathogens to infect the plant and unlikely to be lost through mutation.

To test this approach, the researchers used a common model plant, *Nicotiana benthamiana*. After designing the aNLRs, they introduced them into the plants using standard genetic engineering techniques, enabling the plants to produce the modified receptors themselves.

In a trial spanning five different viruses — including the potato virus Y (PVY), turnip mosaic virus, pepper mottle virus, chili veinal mottle virus, and the plum pox virus — between 70% and 100% of plants that carried the engineered aNLRs did not get systemic infections, compared to zero resistance in the control group. The engineered plants even maintained their resistance when the researchers tried to infect them with all five viruses simultaneously.

"We were initially surprised by the robustness of resistance, that one engineered aNLR could protect against multiple potyviruses," Liu says.

However, the engineered plants did not show similar resistance against the tobacco etch virus (TEV), succumbing to systemic infections. The team then created another aNLR with two cleavage sites, each responsive to different viral enzymes. They managed to raise the complete resistance rate against TEV to 55% while maintaining 100% complete resistance against PVY. Further research would be needed to improve the rate, explains Liu.



Engineered immune receptors (aNLRs) stay silent until viral enzymes act like 'molecular scissors' to remove their blockers, triggering a powerful immune response against viruses.

Thriving crops

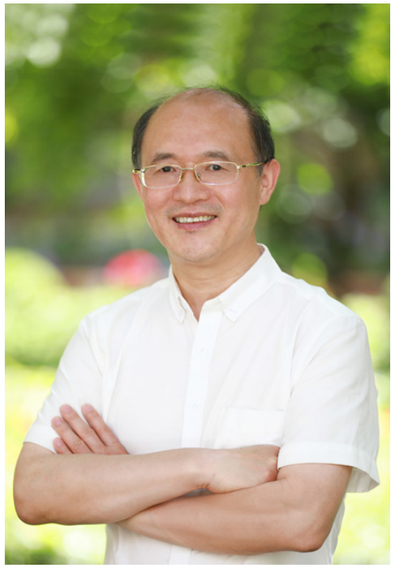
To evaluate the effectiveness of their strategy in a real-world crop, the researchers engineered soybean plants and exposed them to the soybean mosaic virus. Compared to unmodified plants — which all succumbed to the virus — the soybean plants carrying aNLRs were able to withstand the virus and continued growing normally, showing no viral symptoms and no detectable viral RNA.

So far, the researchers have not observed abnormalities or other side effects in the growth of genetically modified soybean plants, but field trials are still needed to assess long-term impacts, Liu says. The team also aims to employ CRISPR genetic editing techniques to modify native NLR genes directly in crops without introducing foreign genetic material. This approach would help allay concerns associated with transgenic crops, Liu says.

Beyond viral targets, the researchers are working to design aNLRs with blockers that bacteria, oomycetes, fungi, nematodes and piercing-sucking pests could remove. A major focus of this effort is to identify enzymes that these microbes commonly produce during infection. "By engineering immune receptors, we equip crops with 'built-in armor' that reduces yield loss and promotes ecological sustainability," Liu says.

Liu is a professor at the School of Life Sciences at Tsinghua University. He is widely recognized for his research in plant molecular biology and immunity, particularly in understanding how plants defend themselves against viruses and other pathogens.

Liu is also leading research to advance understanding of innate plant defense mechanisms beyond NLR-mediated immunity. One area of interest is the airborne defense mechanism, where plants emit volatile organic compounds in response to aphid attack. These airborne cues serve as early warnings to neighboring plants, prompting them to produce other compounds to counter the aphids and the viruses that they transmit.



A profile photo of Prof. Liu Yule.

Ultimately, Liu hopes that his team's research would create crops that can withstand diseases on their own. "Our goal is to see these disease-resistant crops thrive in fields, protecting harvests and securing food for future generations," Liu says.

Solid-state battery breakthrough at Tsinghua

Recently, a research team led by Professor Kang Feiyu, Professor He Yanbing, Associate Professor Lv Wei, and Assistant Professor Hou Tingzheng from the Institute of Materials Research at Tsinghua Shenzhen International Graduate School (Tsinghua SIGS), in collaboration with Professor Yang Quanhong's team from Tianjin University, has made new progress in the field of solid-state lithium metal batteries.

They innovatively proposed the design concept of a ductile inorganic-rich solid-electrolyte interphase (SEI). Their paper, titled "*A ductile solid electrolyte interphase for solid-state batteries*," was published online in *Nature*. This marks the fourth Nature paper published by Tsinghua SIGS this year.

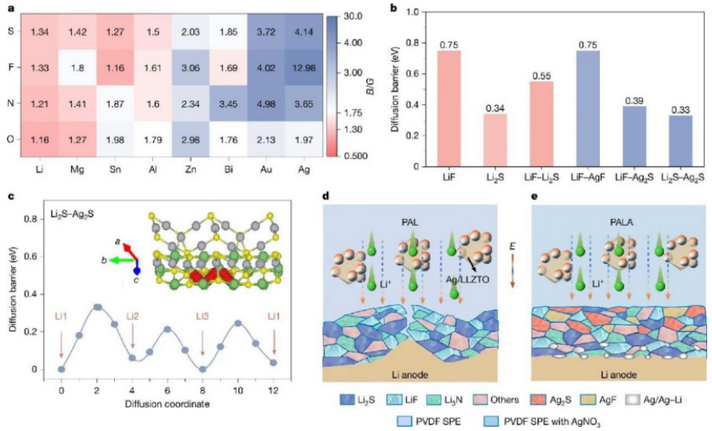
Solid-state lithium (Li) metal batteries are among the most promising candidates for both electric vehicles and large-scale energy storage systems. However, the uncontrolled growth of Li dendrites under practical conditions (high areal capacities and high current densities) severely hinders their commercial applications. Although extensive research has significantly improved the ionic conductivity of solid electrolytes, solid-state batteries are still prone to issues such as interfacial cracking under demanding conditions like high current densities and low-temperature charging and discharging.

Previous studies have generally concluded that lithium fluoride (LiF)-rich lithiophobic SEIs show a high Young's modulus. However, the lithiophobic nature and inherent brittleness of traditional inorganic components lead to much larger Li^+ nucleation barriers and difficulty in maintaining integrity during Li^+ deposition and stripping at high current densities and areal capacities, ultimately causing severe Li dendrite growth, side reactions and interfacial cracking—a problem that remains effectively unresolved to this day.

The research team developed the ductile inorganic-rich SEI that integrates exceptional mechanical properties, efficient lithium-ion transport kinetics, and multi-layer lithiophilic/lithiophobic characteristics, significantly enhancing the cycling stability of solid-state batteries under high current densities and low-temperature conditions.

The research team pursued innovation at the fundamental level of SEI structure and modeling, abandoning the conventional "strength-only" structural model and design philosophy for SEI. Instead, they prioritized "ductility" as the core criterion for screening new SEI components. Using the Pugh's criterion (B/G ratio ≥ 1.75 indicates ductility, where B is bulk modulus and G is shear modulus) as the ductility benchmark, they conducted an AI-accelerated theoretical screening of a series of potential inorganic materials. This process revealed that materials such as silver sulfide and silver fluoride not only exhibit excellent plastic deformation capability but also significantly reduce the diffusion energy barrier for lithium ions.

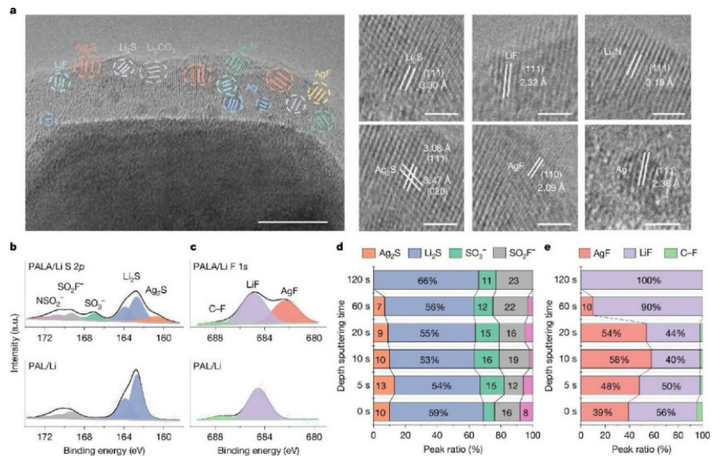
Building upon the screening of target components for the ductile SEI, the research team designed an composite solid-state electrolyte containing



Design of the ductile SEI and its function in solid-state battery operation.

$AgNO_3$ additive and Ag/$Li_{6.75}La_3Zr_{1.5}Ta_{0.5}O_{12}$ (LLZTO) filler. This system enables in situ replacement reactions during solid-state battery operation, converting brittle Li_2S/LiF components into ductile Ag_2S/AgF phases to construct a multi-layer SEI with a "soft exterior and rigid interior" structure. In this architecture, the outer ductile Ag_2S/AgF layer dissipates interfacial stress, the intermediate layer rich in conventional SEI components maintains high modulus, while the inner lithiophilic layer guides uniform lithium metal deposition. This multi-layer SEI design functions like customized "ductile armor" for the lithium metal anode, simultaneously ensuring structural integrity under low-temperature and high-current-density conditions while enabling efficient ion transport and suppressing side reactions.

At the same time, the Ag-decorated LLZTO mixed ion-electron conductor ceramic filler (Ag/LLZTO) significantly enhances the bulk dielectric properties of the composite solid electrolyte, establishing efficient lithium-ion transport pathways that facilitate rapid and homogeneous lithium deposition. Experimental results demonstrated exceptional electrochemical performance enabled by this ductile SEI: symmetrical lithium cell with such an SEI has a long cycle life of over 4,500 hours at room temperature when the cycling current density and areal capacity are increased to 15 mA cm^{-2} and 15 mAh cm^{-2} respectively. The ductile SEI also works over 7,000 hours at -30 °C, even under practical conditions 5 mA cm^{-2} and 5 mAh cm^{-2}. When paired with $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$ cathodes in full cells, the system also exhibits remarkable



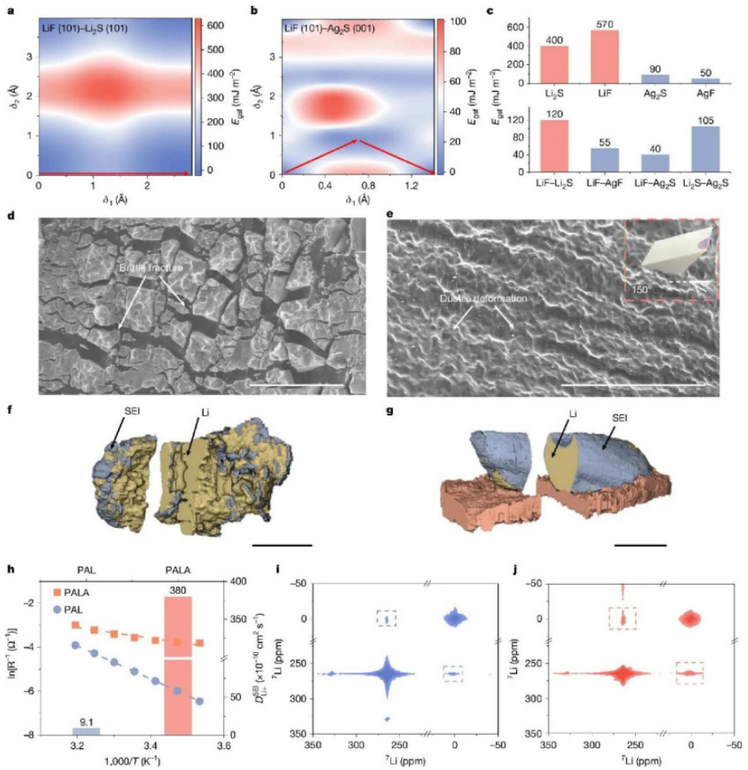
Structure and component analysis of the ductile inorganic-rich SEI.

high-rate (20 C) and low-temperature (-30˚C) electrochemical performance.

This work broke through the traditional design philosophy of the SEI, which primarily emphasizes hardness, and innovatively introduced ductility as a key characteristic indicator. It proposed a precise pathway from the design of solid electrolyte components to the ideal construction of interfaces, offering a novel strategy to address interfacial cracking issues in solid-state batteries. Additionally, it provided an important theoretical foundation for the design of new types of interfacial layers, holding significant practical value for the development of practical solid-state batteries.

The corresponding authors of the paper are Kang Feiyu, He Yanbing, Lv Wei, Hou Tingzheng, and Yang Quanhong. The co-first authors are Mi Jinshuo (Ph.D. Class of 2025), Yang Jun (Master's student enrolled in 2023), Chen Likun (Ph.D. Class of 2024) and Cui Wenting (Ph.D. candidate enrolled in 2022), all from Tsinghua Shenzhen International Graduate School. Other contributors include Associate Professor Gan Lin and Associate Professor Liu Ming from Tsinghua SIGS, Assistant Professor Han Bing from the Eastern Institute of Technology, Ningbo, and Associate Professor Huang Yanfei from Shenzhen University. The research received support from several national and Shenzhen municipal research projects.

Full article:
https://www.nature.com/articles/s41586-025-09675-8



Superior deformability and mechanical stability of the ductile inorganic-rich SEI.

Tsinghua team unlocks multicolor lanthanide electroluminescence

Recently, a research team led by Associate Professor Han Sanyang from Tsinghua Shenzhen International Graduate School (Tsinghua SIGS), in collaboration with Professor Xu Hui and Professor Han Chunmiao from Heilongjiang University, as well as Professor Liu Xiaogang from the National University of Singapore, has achieved significant progress in the field of rare earth electroluminescence.

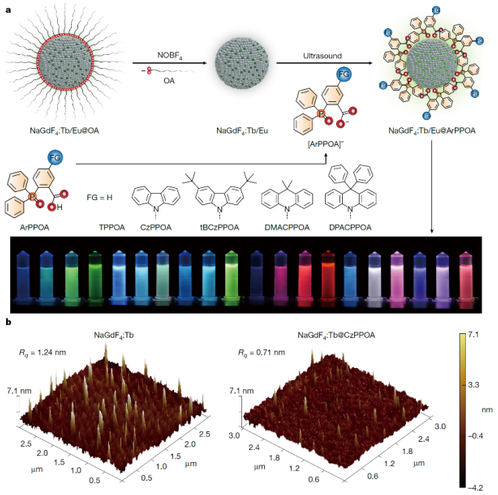
They proposed an innovative organic–inorganic hybridization strategy to overcome the long-standing challenge of charge injection into insulating lanthanide nanocrystals. Their paper, titled *Electro-generated excitons for tunable lanthanide electroluminescence*, was published online in *Nature* and marks the fifth *Nature* paper published by Tsinghua SIGS this year.

Electroluminescence (EL), the direct conversion of electrical energy into light, serves not only as the cornerstone of modern display and lighting technologies but also as a key enabler for advancements in biophotonics, quantum information, and laser technology. In recent years, materials like organic molecules and quantum dots have led to major gains in the efficiency and color purity of light-emitting systems. Still, conventional luminescent materials and devices struggle with limited color tuning, inflexible design, and poor long-term stability.

Lanthanide-doped nanocrystals (Ln-NCs) are inherently promising candidates for EL materials due to their rich energy level structure, narrow emission lines, and high device stability. They possess multiple narrow emission lines, high stability, and a rich energy level structure that allows broad color tuning without changing the device design. Yet their insulating nature has long prevented efficient electrical excitation, hindering both research and real-world use in EL devices.

To overcome the fundamental challenges of electro-generated exciton generation, transport, and injection in lanthanide-doped nanocrystal EL, the research team hybridized Ln-NCs with organic semiconductor molecules by precisely tailoring the energy level alignment within the organic-inorganic hybrid system. This approach successfully enabled efficient spin-state conversion of electro-generated excitons and interfacial energy injection

Co-corresponding author Han Sanyang (left) with his student and co-first author Zhang Peng



System design of phosphine oxide–lanthanide fluoride nanocrystal emitters.

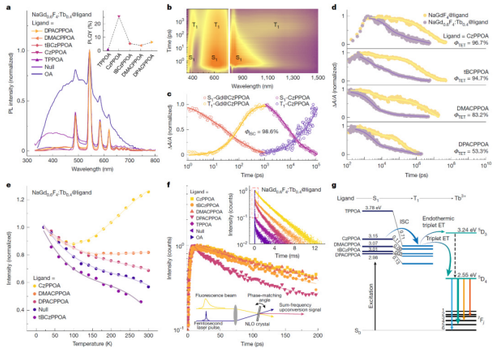
at the insulating nanocrystal. Consequently, they achieved EL across the visible and even near-infrared (NIR) spectral regions without modifying the device structure.

In the study, the research team designed a series of carboxylic acid derivatives of aryl phosphine oxides. These molecules firmly anchor onto the surface of ~4 nm NCs via their carboxyl groups. Under an electric field, these functionalized organic ligands first capture electrons and holes, forming electro-generated excitons at the NC interface. Subsequently, through a ligand-to-NC energy transfer process, the energy is funneled to the lanthanide ions within the NCs. By carefully tuning the lanthanide composition and molecular energy levels, they achieved pure, characteristic lanthanide ion emission with controllable multicolor output.

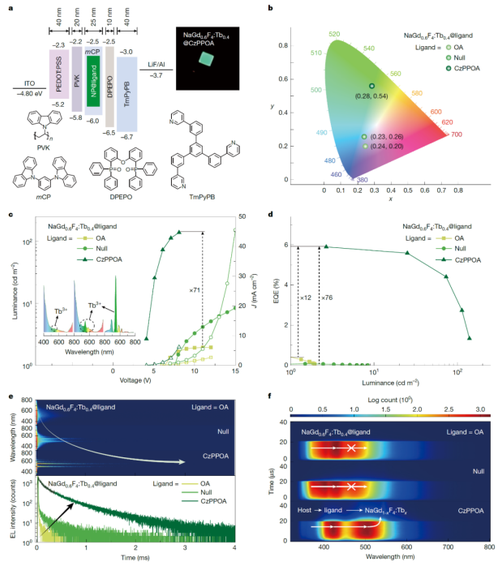
To elucidate the photophysical processes at the Ln-NC/organic molecule hybrid interface, the team employed various transient and temperature-dependent spectroscopic techniques. They observed a lanthanide-nanocrystal-induced acceleration of intersystem crossing (ISC) in the organic molecules (<1 ns), with an ISC efficiency reaching 98.6%. Notably, carbazole-modified phosphine oxide (CzPPOA) exhibited the most efficient triplet energy transfer (TET) efficiency to the lanthanide ions, achieving 96.7%. Further investigation revealed that this rapid TET benefits from well-matched energy levels facilitating endothermic TET and a significant suppression of interfacial non-radiative losses. The clarification of this ultrafast mechanism helps establish design principles and optimization directions for triplet exciton injection into insulating nanocrystals.

Leveraging the efficient carrier transportation and exciton transfer properties of the Ln-NC-molecule hybrids, the team fabricated multilayer EL devices based on NaGd0.6F4:Tb0.4@CzPPOA. These devices demonstrated a current efficiency of 9.99 cd A^{-1} and a power efficiency of 7.66 lm W^{-1}. The external quantum efficiency (EQE) reached 5.9%, representing a 76-fold enhancement compared to devices using non-functionalized insulating NCs, with an exciton utilization efficiency of 88%. These device performance metrics confirm that the ligand-functionalized Ln-NC-organic hybrid system enables effective exciton capture and energy injection, thereby overcoming the long-standing bottleneck of inefficient EL from insulating nanocrystals.

Owing to the richness and environmental robustness of lanthanide 4f energy levels, a single ligand type holds the potential to sensitize various lanthanide ions, enabling controllable and tunable emission colors. By adjusting the doping components and concentrations of lanthanide ions within the NCs, the team successfully tuned



Photophysical properties of NaGd1-xF4:Tbx@ ArPPOA nanohybrids



EL performance of NaGd0.6F4:Tb0.4@ligand devices.

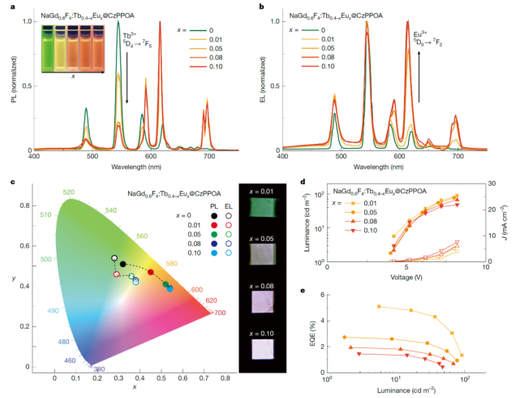
spectral tunability, and high energy efficiency. More importantly, these results highlight the potential of this ligand-functionalized nanocrystal platform for multi-spectral electroluminescence, particularly in applications such as high-resolution, wide-color-gamut displays and near-infrared technologies.

The corresponding authors are Professors Liu Xiaogang from the National University of Singapore, Professors Xu Hui and Han Chunmiao from Heilongjiang University, and Professor Han Sanyang from Tsinghua Shenzhen International Graduate School. The co-first authors are Tan Jing (Master's student, Heilongjiang University), Zhang Peng (Ph.D. candidate, Tsinghua SIGS), and Song Xiaoqing (Master's student, Heilongjiang University). Other contributors include Professor Zhang Jing and Associate Professor Duan Chunbo from Heilongjiang University, Professor Wang Feng from the City University of Hong Kong, and Professor Zhang Zhilong from South China University of Technology.

Read more:
https://www.nature.com/articles/s41586-025-09717-1

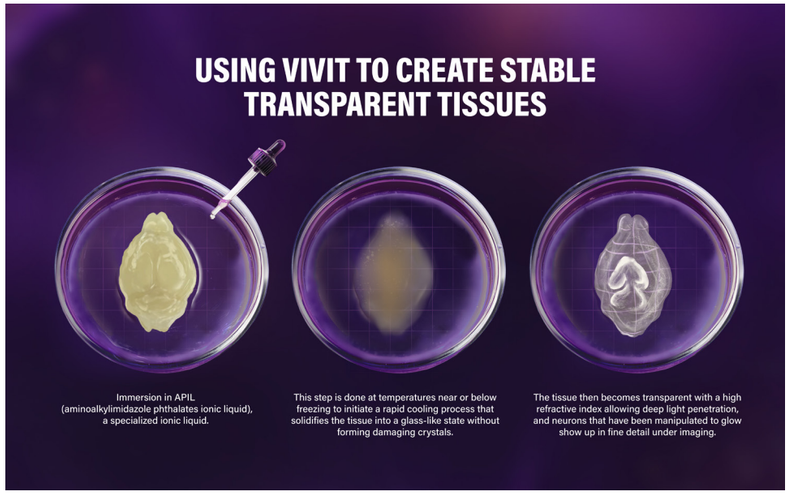
the emission color under both photoexcitation and electrical excitation, all while maintaining an identical EL device structure. Simple doping with Eu^{3+} and Nd^{3+} ions resulted in a shift of the EL emission from green to warm white light and even to NIR light, with only minor variations in device efficiency (e.g., for 1% Eu^{3+} doping: current efficiency of 8.48 cd A^{-1}, power efficiency of 6.34 lm W^{-1}, EQE of 5.09%). This multicolor tuning strategy is difficult to achieve with traditional organic or quantum dot EL devices, offering a novel pathway for future economically viable and versatile multicolor displays and special-band EL devices.

This study demonstrates highly efficient electroluminescence from lanthanide nanocrystals achieved through a ligand engineering approach. By leveraging the optoelectronic synergy of organic semiconductor ligands, the research team established a multifunctional strategy that goes beyond conventional surface passivation. The engineered ligands facilitate the confinement of charges and excitons within the nano-hybrid system, effectively allocating exciton energy to the lanthanide emitter ions. These characteristics yield electroluminescence with exceptional color purity,



Emission characteristics of dually doped NaGd0.6F4:Tb0.4-xEux @CzPPOA nanocrystals.

Breakthrough in distortion-free tissue transparency reveals neurons in 3D



A new method for making tissues see-through without changing their structure is making it possible to image the details of neurons in 3D.

A new technique makes tissue samples see-through without deforming them — offering unprecedented insights into neurons in their natural state.

Microscopes have long been the biologist's window into the body's inner workings. But preparing tissue for imaging — whether by slicing it thinly or using chemicals to make it transparent — often deforms delicate structures and limits the accuracy of observations. Now, a new method offers clarity without compromise.

Researchers at Tsinghua University have developed a method for making biological tissue transparent without the usual side effects. Unlike traditional techniques that can shrink or swell samples, this approach maintains their original structure. Published recently in Cell, the new technique enables high-resolution, 3D imaging of entire organs with remarkable clarity1.

"It could significantly advance our understanding of biological systems, particularly delicate structures in the brain," explains Kexin Yuan, an associate professor at the School of Biomedical Engineering at Tsinghua and co-author of the study. He adds that the technique could potentially revolutionize drug discovery by helping to visualized a drug's mechanisms in situ, as well as improve the diagnosis of diseases by allowing clinicians to examine pathological tissues in greater detail.

A new path to transparency

Traditional tissue-clearing techniques — which render biological samples transparent for imaging — typically rely on organic solvents or aqueous solutions. These agents deform tissues through swelling or shrinkage and often interfere with fluorescence, the glow emitted by dyed or engineered cells that makes structures visible.

A new method, known as VIVIT (vitreous ionic-liquid-solvent-based volumetric inspection of trans-scale biostructure), overcomes these challenges. It relies on a specialized ionic liquid (APIL) that preserves structural integrity during tissue clearing.

APIL is an ionic liquid that supports a rapid cooling process known as vitrification, which solidifies liquid into a glass-like state. When tissue samples are immersed in APIL under near-freezing conditions, the solution induces this state without forming ice crystals. This prevents the structural damage typically caused by freezing and preserves tissues in a finely organized, clear condition suitable for high-resolution imaging.

APIL's refractive index also reduces light scattering, enabling deep light penetration that aids visibility. And its compatibility with water-based samples eliminates the need for dehydration, a common step in some other clearing methods.

In addition, the researchers discovered that VIVIT enhances the fluorescence intensity of the dyes and proteins used for cell labeling, an effect not observed with conventional clearing agents. "We were very surprised to discover this," Yuan says.

Mapping the brain in 3D

To demonstrate VIVIT's capabilities, the team applied the method to mouse brain tissue. Using light-sheet microscopy, they captured images of an entire brain made optically transparent.

Genetically modified neurons emit a yellow fluorescent glow, revealing a delicate network of axons — slender projections that transmit signals between neurons.

For higher-resolution imaging, the researchers then sliced the brain into thinner sections and imaged them using spinning disk and super-resolution confocal microscopy. These slices were digitally reconstructed into a 3D model based on earlier scans, enabling the team to trace individual neurons from input to output regions.

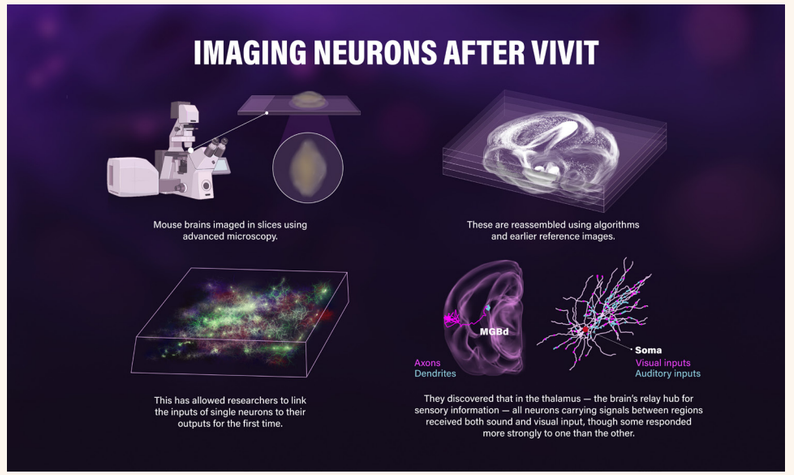
Their analysis showed that distinct types of neurons in the thalamus specialize in different senses — some processing auditory signals, others visual — and relay them to separate brain areas.

"It's the first time a neuron's full trajectory has been mapped in 3D, from synaptic input to axonal output," Yuan says.

A new 3D imaging era

The researchers also applied VIVIT to human brain tissue samples, uncovering more details about inhibitory control mechanisms that prevent neurons from firing excessively a process implicated in conditions such as epilepsy.

Yuan explains that the technique's ability to preserve tissue integrity while enabling deep, multiscale imaging could revolutionize fields ranging from spatial transcriptomics and proteomics, which allow scientists to study how cells and other components interact, to clinical diagnostics. It could also deeply change therapeutic development, by helping to identify new therapeutic targets and evaluate pre-clinical



A new distortion-free method for making tissues see-through for imaging is already leading to insights into how neurons process visual and auditory information.

drug efficiency. “It may help these disciplines finally step into a truly three-dimensional era,” he says.

Yuan’s team plans to integrate artificial intelligence with VIVIT to automate image analysis and enhance diagnostic potential. Such advances may ultimately extend VIVIT’s impact from neuroscience research to advances that help doctors analyze tissue samples and medical images to detect and monitor disease, and supports precision and personalized medicine.

“Once we combine our method with AI, we could do a lot,” he says.

Kexin Yuan, an associate professor at Tsinghua University, advances biomedical imaging and tissue-clearing techniques for neuroscience research.

Next-generation lithium battery punches well above its weight

An ultra-energy-dense battery incorporates an innovative fluorine-rich polymer electrolyte to achieve safer and more efficient energy storage.

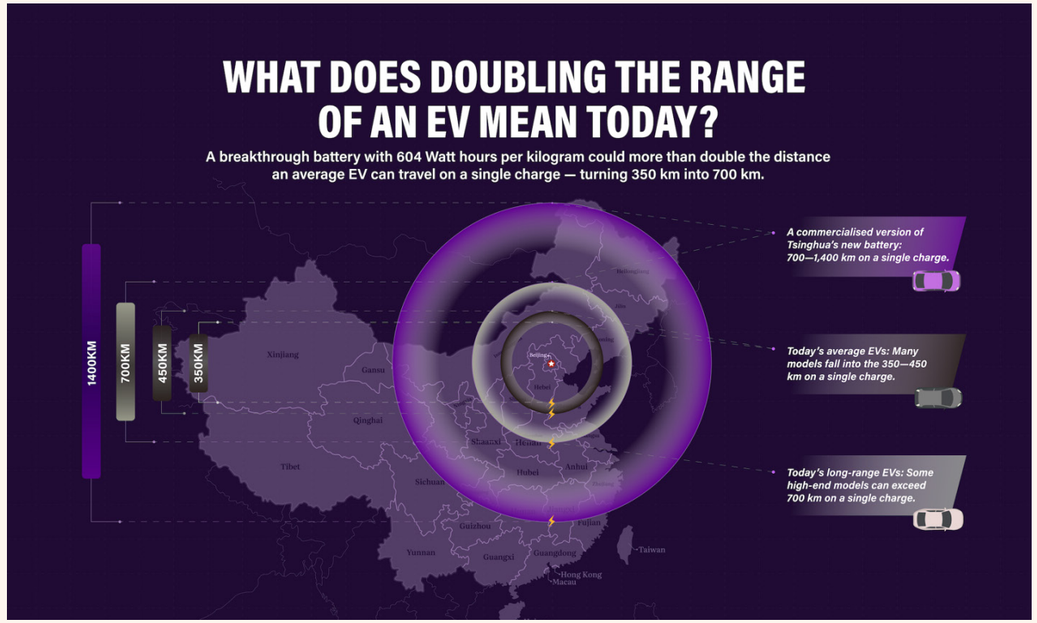
The range of electric vehicles (EVs) could potentially double if the latest advance in high-performance batteries detailed by Tsinghua researchers reaches the market1.

They reported in Nature that a quasi-solid-state lithium battery developed at Tsinghua University in 2025 has achieved more than twice the energy storage capacity of a conventional lithium-ion cell, weight for weight. This means that one of these new EV batteries that weighed the same as a conventional battery, could allow cars to travel twice as far.

The new battery safely withstood extreme stress testing while fully charged, outperforming conventional batteries, adds research leader, Qiang Zhang. He says that EVs, e-bikes, electric airplanes and portable electronics could all benefit from the performance and safety gains that battery’s innovative polymer electrolyte has enabled.

Liquid luck

Electrolytes form the core of any battery, keeping the anode and cathode safely separated while balancing and facilitating rapid ion flow between them, which completes the circuit, allowing continuous electron flow and energy delivery.



A breakthrough battery technology doubles typical energy densities and survives extreme heat and puncture, promising safer, longer-range electric vehicles (EVs).

Regular lithium-ion batteries typically use a liquid electrolyte, which have some drawbacks: they have a limited safe range of voltages within which a battery’s electrodes and electrolyte can function; can form unstable interfaces with the anode and cathode; and they are flammable — limiting safety, longevity and performance.

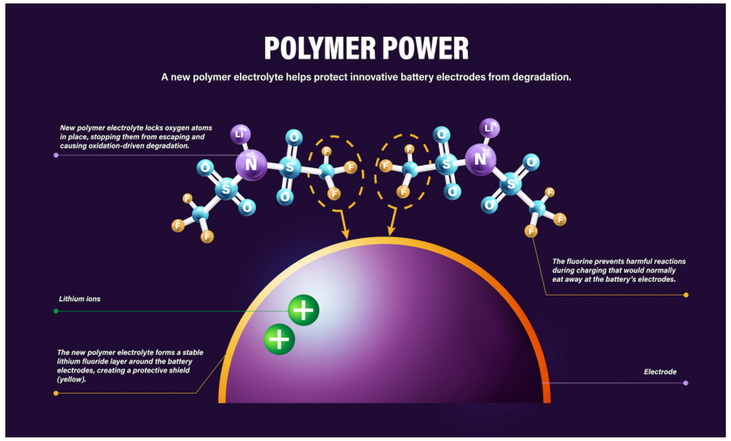
Designer polymer electrolytes could overcome many of these limitations, Zhang and his team have shown. They developed a tough, fluorine-rich polymer electrolyte, tailor-made for a high voltage experimental battery design that combines a lithium-rich manganese-based layered oxide (LRMO) cathode within an ‘anode-free’ battery design.

An anode-free battery has no traditional anode, the conductive material that allows electrical current to leave a battery. Instead, it starts with a bare metal strip, and during charging, lithium from the cathode, where the electrical current enters, coats the metal strip to form an anode able to interact with ions safely in a lithium-ion battery. This makes the battery lighter and more energy-dense, but harder to manage.

Commercial polymer electrolytes such as polyethylene oxide (PEO) are incompatible with this promising battery technology, Zhang explains. “PEO and related electrolytes decompose at the high voltages these batteries reach,” he says.

PEO decomposition at the electrolyte-cathode interface can result in damaging, irreversible oxygen loss from the battery. “So, we tried replacing some of the polymer’s oxygen atoms with fluorine,” Zhang says.

The team designed their polymer electrolyte to balance stability with performance, explains team member. Chen-Zi Zhao. “The oxygen-based segments of the polymer that we retained facilitated rapid lithium-ion transport, while the fluoride segments that we added stabilized the high voltage interface between polymer and cathode,” she says.



Fluorine-rich polymer electrolytes enable lighter, safer, high-voltage batteries, boosting energy density.

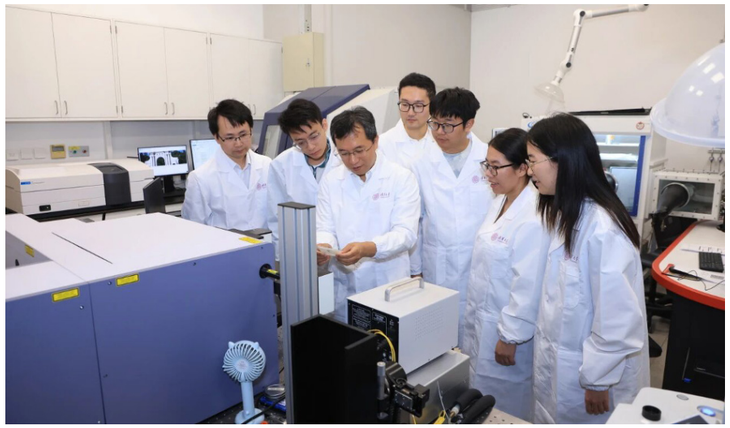
Investigating the nature of this stabilizing effect, the team showed that a thin protective coating rich in lithium fluoride had formed over the LRMO cathode surface. Some fluorine also became directly incorporated into the cathode's outer layers. "Together, these layers provided a very stable shell coating the cathode, and we observed no oxygen loss," Zhang says.

Trial by fire

The battery's energy density reached 604 watt hours per kilogram, more than double that of conventional lithium-ion batteries. Demonstrating its safety, the fully charged battery survived heat treatment at 120C for six hours, and having a nail driven through it, without catching fire.

The results are expected to generate broad interest, Zhao says. And energy densities of 800 watt hour per kilogram or higher could be reachable, she says, which would be ideal for demanding applications, such as electric airplanes.

Zhang's next task is to further stabilize the electrolyte's interface with the lithium anode, to maximize the battery's long-term performance. "We hope to optimize our electrolyte design to get a stable interface at both the anode and cathode from a single polymer," he says.



Professor Qiang Zhang and his team from the Department of Chemical Engineering at Tsinghua have pioneered a next-generation lithium battery using a fluorine-rich polymer electrolyte.

TSINGHUA COMMUNITY

TSINGHUA NEWSLETTER

Tsinghua's Long Di awarded by AGU for contributions to hydrologic sciences

The American Geophysical Union (AGU) has recently announced its 2025 Honors Recipients. Professor Long Di from the Department of Hydraulic Engineering, Tsinghua University, has been selected to receive the Polubarinova-Kochina Hydrologic Sciences Mid-Career Award in recognition of his significant contributions to hydrologic science and his sustained academic leadership.

This prestigious honor follows Professor Long's receipt of the AGU Hydrologic Sciences Early Career Award in 2019, marking another major international recognition of his long-term dedication and achievements in the field of hydrology.

Professor Long serves as a faculty member in the Department of Hydraulic Engineering at Tsinghua University, editor of Water Resources Research, and deputy director of the Key Laboratory of Hydrosphere Sciences of the Ministry of Water Resources. His research focuses on remote sensing hydrology, encompassing the development of theoretical frameworks and methodologies for retrieving groundwater storage variations from satellite gravimetry, multi-source remote sensing of surface water extent, level, discharge, storage, and ice thickness, as well as cryosphere monitoring and hydrological prediction in data-scarce regions.

Over the past decade, Professor Long has led pioneering studies that have deepened scientific understanding of global water cycle changes under climate and human influences. His research has also advanced the practical application of satellite-based data in water resource management, supporting decision-making for national and local agencies.

Professor Long's research achievements have been recognized by numerous national and international honors, including the First Prize of the Dayu Water Science and Technology Award, the First Prize of the Surveying and Mapping Science and Technology Award, the First Prize for National Teaching Achievement in Water-Related Disciplines, the China Youth Science and Technology Award, and the AGU Hydrologic Sciences Early Career Award.

Professor Long Di

Founded in 1919, the American Geophysical Union (AGU) is one of the world's largest and most influential scientific organizations in the Earth and space sciences. The Polubarinova-Kochina Hydrologic Sciences Mid-Career Award honors scientists who, within 11 to 20 years after earning their Ph.D., have made outstanding research contributions that have significantly advanced the field of hydrology. The award also recognizes excellence in interdisciplinary innovation, education and mentorship, and societal impact.

Chen Lai elected Member of the International Institute of Philosophy

Chen Lai

At the 2025 annual meeting of the International Institute of Philosophy (IIP), held recently in Morocco, Professor Chen Lai from the Department of Philosophy, School of Humanities at Tsinghua University, was elected as a member of the Institute.

Chen Lai, born in Beijing in 1952, is a Distinguished Professor of Arts, Humanities and Social Sciences at Tsinghua University and Director of Tsinghua Academy of Chinese Learning. His research focuses primarily on Chinese philosophy.

Professor Chen serves as a member of the Academic Degrees Committee of the State Council, the China Central Institute for Culture and History (by appointment of the Premier of the State Council), and the Social Science Committee of the Ministry of Education. He is also Vice Chair of the International Confucian Association and Chair of the China Zhu Xi Studies Association. Chen has published more than forty monographs and received numerous honors, including the First Prize of the Ministry of Education's Outstanding Achievements Award in Humanities and Social Sciences, the Confucius Cultural Award, and the Global Chinese Lifetime Achievement Award in Chinese Learning.

The International Institute of Philosophy (IIP) was founded in 1937 in Paris. It is one of the world's most prestigious academic and honorary institutions in the field of philosophy. The Institute currently has around 100 members from different countries, divided into titular, emeritus (those over the age of 80), and honorary members. Following the recent election, Tsinghua University now has two members of the Institute — Professors Liu Fenrong and Chen Lai.

Tsinghua BIM Group wins student research award at 2025 buildingSMART International Summit

Award certificate (left) and the award ceremony

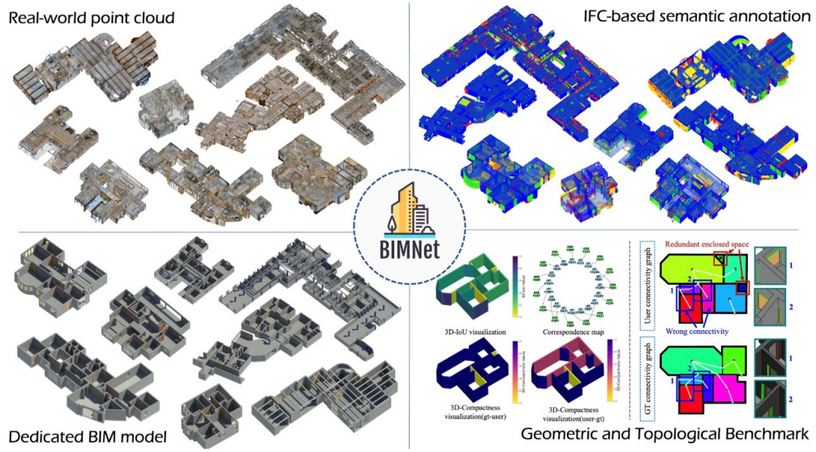
The BIM research group from Tsinghua University's School of Software recently won the Student Research Award at the 2025 buildingSMART International Summit in Berlin, Germany. Their project, BIMNet, offers an openBIM-based dataset and benchmark for scan-to-BIM processes.

The project was supervised by Professor Gu Ming from the School of Software and Assistant Researcher Gao Ge from the Beijing National Research Center for Information Science and Technology. The main contributors were students Liu Yudong, Huang Han, Ke Ziyi, Li Shengtao, and Zhang Xiaowei.

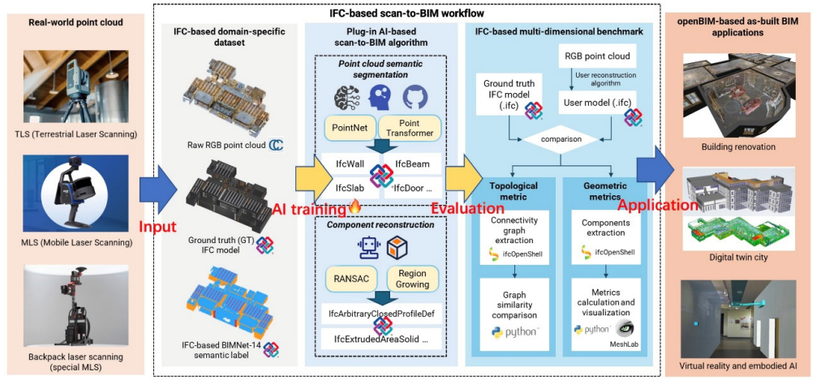
The buildingSMART open BIM Awards Program is an international BIM competition initiated and organized by buildingSMART, a globally recognized authority in the field of BIM.

In 2025, 129 projects worldwide were submitted for the award, among which 47 projects passed the preliminary selection. After rounds of international expert review and final presentations, BIMNet was the only project to win in the student research category.

A large-scale Scan-to-BIM dataset was developed, based on which BIMNet can reconstruct BIM



The BIMNet dataset



Application ecosystem of BIMNet

models automatically from point clouds, encompassing both real-world point cloud data and manually modeled BIM data. It also proposes a multi-dimensional benchmark system and a standardized BIM workflow. This result provides the missing foundational support for Scan-to-BIM, facilitates AI model training, evaluation, and application in the architecture and engineering fields, and advances the intelligent and digital transformation of the Architecture, Engineering, and Construction (AEC) industry.

Tsinghua clinches victory at 2025 China International College Students' Innovation Competition

The award ceremony

The final round of the China International College Students' Innovation Competition (2025) was held at Zhengzhou University from October 13 to 15.

The "ManiMinds" team from Tsinghua University stood out among 4,720 finalist projects worldwide, winning the championship with their project titled "Next-Generation General Model and Intelligent Agent Ecosystem Based on Brain-like Architecture".

This marks the second time a team from Tsinghua University has won the competition, following their first championship in 2019. It is also the first time in the competition's history that an undergraduate team has claimed the overall title.

The "ManiMinds" team aims to achieve Artificial General Intelligence (AGI) as its long-term goal. By integrating reinforcement learning (RL), evolutionary algorithms, and brain-inspired architecture research, the team is developing a next-generation AI model framework to overcome the limitations of traditional architectures in areas such as logical reasoning.

Their work significantly reduces the "hallucination" issues of conventional large language models in complex tasks and strives to build an autonomous, controllable AI foundation model with general intelligence and deep reasoning capabilities.

In 2025 the team unveiled a deep logical-reasoning model called "HRM". The model achieved near-perfect scores on highly challenging mathematics and Sudoku tests and, on multiple international benchmarks — including the ARC general AI evaluation — outperformed mainstream models such as DeepSeek R1 and OpenAI o3, despite those models having parameter counts nearly 10,000 times larger.

At present, the team is advancing the application of its technology across a range of fields, including robotic control, quantitative finance, healthcare, and climate prediction.

This year's competition attracted 6.19 million projects and 24.43 million participants from 5,673 universities and colleges across 161 countries and regions.

A total of seven teams from Tsinghua University advanced to the final round, winning six gold medals and one silver, marking the best performance in the University's history at the event.

Since the competition's launch in 2015, teams from Tsinghua University have advanced to the championship round five times across eleven editions, earning two championships and three runner-up titles, consistently maintaining their position as a national leader among Chinese universities.

Tsinghua University adheres to the principle of "promoting teaching, learning, and innovation through competition". The University has been dedicated to thorough organization and broad participation, encouraging students to gain knowledge in innovation and entrepreneurship through competitions, and using hands-on innovation practices to drive the deep, high-quality development of practical education.

Since the launch of this year's competition in May, a total of 82 teams from the University have registered to participate. Through on-campus contests, training camps, and specialized coaching, the university has provided students with comprehensive support, including competition simulations, resource connections, and pitch refinement.

By actively engaging in the competition, Tsinghua has fostered a strong culture of innovation and entrepreneurship while gaining valuable experience for the future cultivation of innovative talent and the translation of research achievements.

The winning team from Tsinghua University

Awards of Tsinghua University teams

· The "ManiMinds" team, led by Wang Guan, won the championship with their project "Next-Generation General Model and Intelligent Agent Ecosystem Based on Brain-like Architecture".

· The "MINI CRAFT" team, led by Ye Yuxuan, won the gold medal with their project "AI + General Microfluidics Platform".

· The "cPilot" team, led by Wang Guanbo, won the Gold Award for their project "Next-Generation Fully Autonomous Decision-Making and Operational Local PC Agent".

· The "Qingbo Aerospace Operations" team, led by Zeng Yiqiang, won the Gold Award for their project "Full-Cycle Intelligent Aerospace Operations and Maintenance Management".

· The "PhotonCore" team, led by Yang Qisheng, won the Gold Award for their project "Full-Spectrum Optoelectronic Fusion Computing Chip".

· The "Xinyuan Zhiye" team, led by Chen Yaopeng, won the Gold Award for their project "Chemical Robotics Platform for Secondary Battery Electrolyte Design".

· The "Qihua Technology" team, led by Zhou Zibo, won the Silver Award for their project "Green Solution for Intelligent Temperature Control in Computing Infrastructure".

Tsinghua's Pervasive Human-Computer Interaction Laboratory earns Distinguished Paper Award

On October 15, a collaborative study conducted by Tsinghua University's Pervasive Human-Computer Interaction Laboratory, Sichuan University's West China Hospital Rehabilitation Medicine Center, and Sichuan University's Institute of Rehabilitation Medicine, titled "UbiPhysio: Support Daily Functioning, Fitness, and Rehabilitation with Action Understanding and Feedback in Natural Language," received the Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) Distinguished Paper Award at the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2025).

From the 208 papers published in Volume 8 of IMWUT over the past year, only eight papers were selected for this prestigious recognition, representing an acceptance rate of just 3.85%. The IMWUT Distinguished Paper Award is presented annually at the UbiComp conference to recognize exceptional contributions to the field of ubiquitous and pervasive computing.

According to the award committee, “UbiPhysio represents a versatile framework for at-home rehabilitation, combining biomechanical movement modeling with instruction-tuned LLMs. Co-designed with physiotherapists and validated on 100+ users, it delivers expert feedback, generalizes across IMU and vision-based data, and lays the groundwork for scalable, accessible remote care.”

The paper’s first author, Dr. Chongyang Wang, conducted the research as a postdoctoral researcher at the Pervasive Human-Computer Interaction Laboratory of Tsinghua University's Department of Computer Science and Technology and currently serves as Research Assistant Professor at the Institute of Rehabilitation Medicine, West China Hospital, Sichuan University, where he leads the Rehab AI Lab. Corresponding authors include Associate Professor Chun Yu from Tsinghua University’s Pervasive HCI Lab, Professor Chengqi He, and Associate Professor Siyi Zhu from Sichuan University’s West China Hospital Rehabilitation Medicine Center. Additional co-authors include Yuan Feng, a master’s graduate from Sichuan University’s West China Hospital; Lingxiao Zhong, an undergraduate alumnus of Tsinghua University; Chi Zhang, an undergraduate from Tsinghua’s Department of Computer Science and Technology; Siqi Zheng, a graduate student at Tsinghua’s Global Innovation Exchange (GIX); Assistant Professor Chen Liang from the Hong Kong University of Science and Technology (Guangzhou); Associate Researcher Yuntao Wang; and Professor Yuanchun Shi from Tsinghua’s Pervasive Human-Computer Interaction Laboratory.

Tsinghua triumphs at 19th "Challenge Cup"

Tsinghua University wins the Excellence Cup.

The 19th "Challenge Cup" National College Student Extracurricular Academic and Technological Works Competition concluded at Nanjing University on November 3. The team from Tsinghua University achieved a remarkable feat by entering six projects in the finals and winning five top prizes and one first prize. In the special Leaderboard Challenge competition, four projects claimed the Champion title, while seven projects secured top prizes. In addition, Tsinghua University was awarded the Excellence Cup for the eighth time, maintaining its record for the most championships in the competition’s history.

This year's "Challenge Cup" attracted over three million students from more than 2,700 universities nationwide. The competition comprised 10 academic categories, including Mechanics and Control, Information Technology, Mathematics and Physics, Life Sciences, Energy and Chemical Engineering, Economics, Politics, Culture, Society, and Ecological Civilization Development.

Tsinghua University places great importance on the educational value of the "Challenge Cup" competition, viewing it as a key platform for cultivating top innovative talent. Leveraging its student science and technology innovation system, the University mobilized faculty advisors, experts, scholars, and student leaders to actively prepare for the event, providing participants with comprehensive guidance and support throughout the process.

A group photo of the Tsinghua team

Tsinghua University's I-AIIG secures first UNESCO-Uzbekistan Beruniy Prize for Scientific Research on the Ethics of Artificial Intelligence

Xue Lan accepts the medal and certificate on behalf of I-AIIG.

On the evening of November 6 (local time), the award ceremony for the First UNESCO-Uzbekistan Beruniy Prize for Scientific Research on the Ethics of Artificial Intelligence was held in Samarkand, Uzbekistan. The Institute for AI International Governance of Tsinghua University (I-AIIG) was named the first research institution laureate on the winners' list.

Audrey Azoulay, Director-General of UNESCO, presented the prize with Gayane Uemerova, Chairperson of the Uzbekistan Art and Culture and Development Foundation. Xue Lan, Dean of I-AIIG, along with Vice Deans Liang Zheng and Xiao Qian, attended the ceremony as invitees.

Ms. Azoulay emphasized in her speech that in a world transformed by the rapid rise of new technologies — whether artificial intelligence, robotics, biotechnology, or now neurotechnology — we need an ethical compass. Not as a brake, but as a guiding star, to ensure that innovation is always directed toward the common good.

Ms. Uemerova pointed out that Biruniy's legacy is more than his discoveries, it was about his relentless curiosity, his respect for other cultures and the relentless pursuit of knowledge. AI offers us the opportunity to advance science and medicine, but as ever some of the practitioners have warned about using it without ethics.

In his acceptance speech, Professor Xue emphasized that the true power to shape the future lies not in AI technology, but in our own hands. The social impact of AI, he noted, depends entirely on the design principles, governance models, and application approaches that we ourselves employ. He called on the international community to strengthen dialogue and cooperation to build a shared framework of responsibility for AI governance.

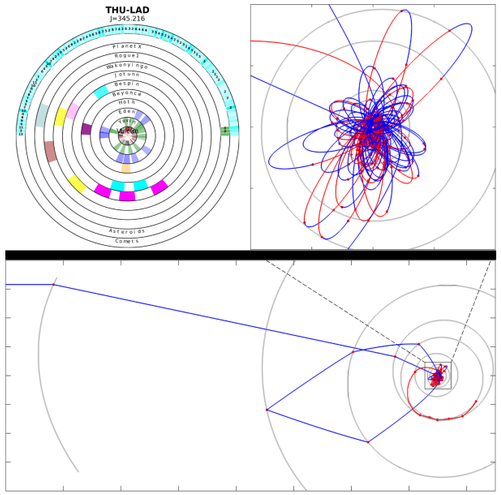
"The inaugural award being presented to a Chinese academic institution is a significant recognition of China's advances in AI technology and governance. It underscores our country's growing contributions and international influence in the field of AI ethics," said a Ministry of Education official.

The event concluded with a thought-leadership panel titled "Harnessing Frontier Technologies for the Benefit of All," which delved into the ethics and impacts of AI, as well as its integration into national and regional systems.

The UNESCO-Uzbekistan Beruniy Prize recognizes individuals, institutions, or organizations that have made significant contributions to the field of AI ethics research and applications. Established at the initiative of the Government of Uzbekistan, the prize is awarded biennially to three laureates worldwide. Since its establishment, I-AIIG has been engaged in AI governance practices, promoting global collaboration and win-win outcomes and spearheading the development of AI governance frameworks and multilateral cooperation mechanisms.

Panel Discussion

Tsinghua team wins 13th Global Trajectory Optimisation Competition



Tsinghua team's final results (the statistical chart in the upper left is sourced from the competition website)

The team from School of Aerospace Engineering of Tsinghua University recently won the championship with their outstanding score in the 13th Global Trajectory Optimisation Competition (GTOC). The team also won the right to host the 14th edition of the competition.

This edition of competition attracted 101 teams from all over the world to participate. The theme of this competition is " Humanity's First Robotic Exploration of a Hypothetical Exoplanetary System". Participants are required to design the flight trajectory of spacecraft with maximal scientific value, flying over the 310 planets, dwarf planets, asteroids, and comets orbiting the star Altaira as many and widely as possible. Meanwhile, the spacecraft is limited to performing only orbital maneuvers using planetary gravity assists and solar sail pressure. The problem involves the challenging problem of multi-target trajectory optimization with advanced propulsion methods.

The Tsinghua team was composed of members from the research group leading by Prof. Baoyin Hexi, including Prof. Jiang Fanghua (Team Leader), Dr. Zhang Nan (Coach), and students Song Jialong (Captain), Tao Yuming, Li Rundao, Zhou Yi, Qin Yiyang, Kinthong Lee, and Wu Yixuan.

To tackle the complex problem related to the hybrid propulsion of solar sail propulsion and multiple planetary gravity assists, the team developed on the spot a novel intelligent trajectory design framework. This framework was used to efficiently search for the optimal solution among hundreds of millions of possible flight trajectories, ultimately working out an extreme exploration trajectory that flew over 150 celestial bodies. The solution trajectory received the highest score after the quantitative evaluation, ranking first in both the number of celestial bodies visited and the total scientific return.

The GTOC was initiated by the European Space Agency (ESA) in 2005. This is a high-level, professional, and international event, regarded as the most top-level competition in the field of space mission design, and often referred to as the "Olympics of space mission design". The competition is held every one to two years and lasts for four weeks. It aims to invite the world's most outstanding astrodynamics experts and mathematicians to challenge the "nearly impossible" complex task optimization design problems in space exploration. The team from Tsinghua University had already won the championship in the 11th edition of the competition in 2021.

Team members assemble for a group photo.

Renowned biomedical scientist Hu Ye joins Tsinghua University

Li Luming presents the letter of appointment to Hu Ye.

On December 12, Tsinghua University held the appointment ceremony for Professor Hu Ye. Dr. Hu, an internationally renowned expert in biomedical engineering, was appointed as the Zhaoyi Chair Professor. Li Luming, president of Tsinghua University, Wang Zhizhen, former vice chairman of the National Committee of the Chinese People's Political Consultative Conference and academician of the Chinese Academy of Sciences, He Wei, general manager of GigaDevice Semiconductor Inc., and other guests attended the ceremony. Wang Hongwei, vice president of Tsinghua University, presided over the ceremony.

On behalf of Tsinghua University, Li Luming welcomed Professor Hu Ye for joining the University upon his full-time appointment to the University. He stated that Tsinghua attaches great importance to the construction of its faculty, vigorously implements the core strategy of strengthening the University through talents, and actively recruits leading scholars from around the world.

Dr. Hu's distinguished record in scientific research, teaching, and talent cultivation, together with his longstanding ties to Tsinghua, make him a valuable addition to the University's academic community.

President Li expressed confidence that Dr. Hu's appointment will bring new momentum to Tsinghua's efforts in talent cultivation, scientific innovation, industry-university-research integration, and international exchanges and cooperation. He will further advance interdisciplinary integration of medicine and engineering, strengthen the development of the School of Biomedical Engineering to achieve new achievements and reach new heights, and contribute to Tsinghua's broader goal of building a world-class university.

Dr. Hu expressed gratitude to Tsinghua University as well as colleagues and friends for their care and support. He described his decision to return to the motherland and join Tsinghua as both a major professional milestone and a deeply

personal commitment. In the future, he will focus on advancing research in areas such as the precise diagnosis of infectious diseases, take an active role in cultivating the next generation of top-notch innovative talents for the country, pursue acientific excellence alongside the faculty and students of the School of Biomedical Engineering, and contribute to China's pursuit of high-level scientific and technological self-reliance.

Qi Hai, executive vice-chancellor of Tsinghua Medicine, stated that Professor Hu Ye's appointment is expected to significantly advance technological iteration in China's biomedical engineering field and the University's talent cultivation efforts. He Wei is confident that after being appointed as Zhaoyi Chair Professor, Professor Hu Ye will achieve breakthroughs at the forefront of science and technology and mentor a new generation of innovative talents. Wang Zhizhen emphasized the great significance of top talents returning to China after completing their studies, hoping that Dr. Hu will deliver impactful results in cutting-edge fields such as clinical diagnosis and actively contribute to the Healthy China strategy.

Representatives from relevant departments of Beijing Municipal Government, enterprises and public institutions in the field of biomedical engineering, as well as Tsinghua's relevant schools and departments, attended the ceremony.

Professor Hu Ye is an internationally renowned expert in biomedical engineering and a Fellow of the American Institute for Medical and Biological Engineering (AIMBE). His research interests cover engineered multi-omics, nanomedicine, mechanism-based biomarker discovery, and the development of detection methods combining machine learning with material optimization. He has achieved internationally leading research results especially in the field of tuberculosis blood diagnosis. In terms of talent cultivation, Dr. Hu has rich experience and has nurtured a group of outstanding talents who have emerged in academic circles.

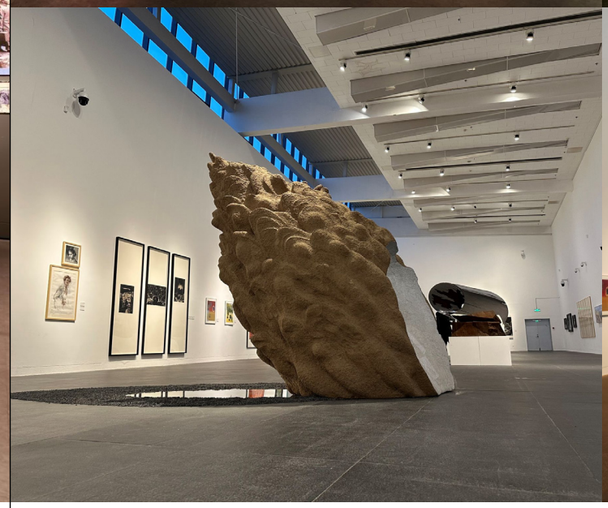
The venue of the appointment ceremony

DIVERSE CAMPUS

TSINGHUA NEWSLETTER

2025 Faculty Art Show underway at Tsinghua

The 2025 Faculty Art Show opened on November 10 at the Art Museum of Tsinghua University's Academy of Arts & Design. Hosted by the Academy and jointly organized by the Department of Painting, Department of Sculpture, and Department of Art History, the exhibition will run through November 24. Featuring cross-disciplinary works by faculty members from multiple fields, the show opens up new possibilities for deeper integration between art and technology.



Stage of cultures: Tsinghua Gala Night 2026

On December 19, the stage curtains unveiled the 2026 Tsinghua University International Students and Scholars' Gala Night at the New Tsinghua Xuetang. Once again, this annual tradition continues to highlight the rich cultural diversity at Tsinghua. The breathtaking performances encompassed more than 240 performers and volunteers across 27 different countries.

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