TSINGHUA NEWSLETTER

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清華大学2025年毕业典礼
Tsinghua University Commencement Ceremony 2025

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Tsinghua University Commencement Ceremony 2025

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Xi, Putin witness exchange of cooperation agreement between Tsinghua University and Russian institutions

In the presence of Chinese President Xi Jinping and Russian President Vladimir Putin, Qiu Yong, Secretary of the CPC Tsinghua University Committee, exchanged a cooperation agreement with Anatoly Torkunov, Rector of Moscow State Institute of International Relations (MGIMO University), and Kirill Dmitriev, CEO of the Russian Direct Investment Fund (RDIF), at the Kremlin in Moscow on May 8.

According to the agreement, Tsinghua University will deepen cooperation with MGIMO University and RDIF in the fields of education, science and technology, and talent cultivation, promoting collaborative development between the two countries in academia, industry, and research.

Through the establishment of joint degree programs, the three parties will strengthen collaborative research, enhance faculty and student exchanges, and carry out talent exchange and training initiatives to accelerate the cultivation of high-level professionals aligned with the needs of the China-Russia comprehensive strategic partnership of coordination for a new era. These efforts aim to enhance the cross-border cooperation and practical capabilities of professionals. In response to the shared development priorities of both countries in science and technology, energy, agriculture, infrastructure, and the digital economy, the collaboration will promote integrated innovation across academia, industry, and research, contributing wisdom and strength to address global challenges and advance human development.

At the invitation of Russian President Vladimir Putin, President Xi Jinping arrived on Wednesday to pay a state visit to Russia and attend the celebrations marking the 80th anniversary of the Victory in the Soviet Union's Great Patriotic War. The two heads of state witnessed the exchange of more than 20 bilateral cooperation documents.

Tsinghua inaugurates four residential colleges, explores talent cultivation pathways for the future

On May 30, the inauguration ceremony for Tsinghua University's four residential colleges—Wuqiong College, Zijing College, Ziqiang College, and Shuimu College— and the appointment ceremony for the college deans were held in the Main Building.

The establishment of Tsinghua colleges is a momentous initiative for Tsinghua University. The initiative seeks to further stimulate the University's vitality through comprehensive reforms and address major national strategic needs and socio-economic development demands.

It also aims to deeply integrate traditional engineering disciplines with artificial intelligence, enhance the quality and efficiency of independent talent cultivation, and pioneer new frameworks for holistic education.

Qiu Yong, secretary of the CPC Tsinghua University Committee, attended the ceremony and delivered a speech, while Li Luming, president of the University, announced the official establishment of the four residential colleges and the appointments

of their deans. Peng Gang, vice-president of the University, presided over the ceremony.

During the ceremony, Qiu, Li, and Peng unveiled plaques for the four residential colleges alongside Dean Zheng Li of Wuqiong College, Dean Zhang Li of Zijing College, Dean Yao Qiang of Ziqiang College, and Dean Feng Peng of Shuimu College. Qiu and Li presented appointment letters to the four new deans.

Qiu said that teaching and nurturing talent is a long-term endeavor, and Tsinghua University is committed to being an active reformer and practitioner of innovation. Since 2014, the University has been exploring the development of Tsinghua residential colleges. In 2020, it established five colleges to accelerate the process.

The establishment of the four new colleges will accelerate the development of a Tsinghua residential college education system. Through continuously developing innovative educational concepts, theories, and practices, this initiative aims to cultivate strategic national talent and

Deans of the inaugurated residential colleges are appointed.

high-demand specialists, bolster the University's contribution to high-quality development, and elevate its standing as a world-class institution through service to the nation's progress.

The entire University must further consolidate consensus and mobilize its collective strength, staying on the right course and seeking to break new ground, and further deepening comprehensive reforms, he added. It is essential to advance the Tsinghua residential college system, enhance coordination across all educational resources, and form a collaborative educational framework between colleges and academic departments.

These efforts will continuously translate disciplinary strengths into excellence in talent cultivation, establishing a new paradigm for holistic education that integrates virtue and intellect.

In his announcement, Li stressed the imperative to prioritize the fundamental mission of holistic education, reaffirming the consensus that "first-class undergraduate education constitutes both the foundation and hallmark of a first-class university."

Li stated that the University will leverage its comprehensive disciplinary strengths to advance the development of an undergraduate teaching

The inaugurated residential college plaques are unveiled.

system grounded in general education and the integration of broad and specialized education. The initiative aims to develop and perfect the Tsinghua residential college system, cultivating top-tier innovators with solid theoretical foundations and exceptional practical capabilities for the nation.

Zheng, Zhang, Yao, and Feng, the four deans, each delivered a speech, introducing the talent cultivation goals, models, and characteristics of their respective colleges.

Wuqiong College focuses on core innovations and applications of artificial intelligence, aiming to cultivate a new generation of AI leaders with scientific spirit, humanistic cultivation, and global competitiveness.

Zijing College integrates artistic and creative elements into broad-based science and engineering education, developing international engineering innovation leaders with cross-cultural coordination skills and interdisciplinary practical capabilities.

Ziqiang College aims to build a new "Intelligent+" engineering education system, leveraging multidisciplinary strengths to nurture innovation leaders for the smart energy sector.

Shuimu College, characterized by the model of "AI-driven Engineering + Management," aims to meet long-term societal needs and major engineering demands to cultivate future engineering leaders.

Heads of relevant departments and administrative offices attended the event.

An inauguration ceremony for Tsinghua University's four residential colleges is held on May 30.

Related news

In recent years, Tsinghua University has continuously deepened its educational and teaching reforms, steadily advancing the development of a Tsinghua residential college system. In 2014, Tsinghua established its first undergraduate residential college, Xinya College, marking the exploratory phase of Tsinghua colleges' development.

In 2020, the university fully implemented the national "Strengthening Foundation Plan" by establishing five colleges, namely Zhili, Rixin, Weiyang, Tanwei, and Xingjian, signifying the rapid development phase of the Tsinghua residential colleges. Subsequently, the University established Qiuzhen College, Weixian College, Xiuzhong College, Dushi College, and Zhishan College. In 2022, a university-level working group for college development was formed to further enhance top-level design and stimulate the enthusiasm and initiative of departments to participate in Tsinghua residential college development.

For more than a decade, Tsinghua colleges have developed new educational concepts and methods, with educating people as the sole purpose.

They have practiced the talent cultivation philosophy of "broad foundation, deep integration, and interdisciplinary emphasis" by breaking down disciplinary barriers and integrating educational resources across departments. It has encouraged students to engage in scientific research at an early stage.

Following the educational principle of teaching students according to their aptitude, they have implemented personalized training programs under mentor guidance, which help guide students to establish a correct growth perspective and combine individual growth with collective growth.

They have advocated a culture of "the great fish leads, the small follows,", fully implementing the advisor system, shortening the distance between teachers and students, and creating a warm educational environment. This approach aims to cultivate proactive learning and growth, fostering independent thinking and research abilities.

The inauguration of these four colleges will further expand and improve the professional setup and educational system of Tsinghua colleges.

Wuqiong College, with the philosophy of "intelligent literacy, mathematical foundation, problem orientation, and collaborative evolution," will break down disciplinary barriers, allowing AI to spark transformative innovations across fields such as science, engineering, humanities, and medicine. By closely collaborating with relevant university departments and industries, the aim is to cultivate AI leaders with the most innovative capabilities in the most AI-driven way.

Zijing College is characterized by internationalization, creative engineering thinking, and scenario-based small-class teaching, which allows students to choose their own development path within a curriculum system that integrates design science, construction engineering, manufacturing engineering, and information science technology, forming a personalized knowledge system. It will enroll undergraduate students both domestically and internationally.

Ziqiang College focuses on "smart energy," integrating six emerging directions such as smart grids, with classic disciplines like electrical engineering, further broadening student development paths.

Shuimu College, characterized by the model of "AI-driven Engineering + Management," emphasizes "interest-driven, self-selected topics, one-person-one-plan," customizes students' academic training plans based on future-oriented research topics, and relies on major engineering practices and high-level laboratory research to guide students in accomplishing unprecedented endeavors.

Tsinghua University to date has 15 residential colleges responsible for undergraduate education. It is estimated that nearly 60% of the 2025 cohort will enter the residential colleges.

Tsinghua establishes School of Education and hosts academic symposium on Major Relationships in Building a Leading Country in Education

On April 21st, Tsinghua University established its School of Education, coinciding with the upcoming 114th anniversary of the university. This milestone underscores Tsinghua's renewed commitment to advancing the development of building a leading country in education, fostering high-caliber talent, and strengthening its educational disciplines. Concurrently, the academic symposium on major relationships in building a leading country in education was held.

Attendees included Qiu Yong, secretary of the CPC Tsinghua University Committee; Zhu Zhiwen, President of the China Society of Education; Guan Peijun, Vice President of the China

Association of Higher Education; renowned educator Gu Mingyuan; and other prominent figures. Guo Yong, Deputy Secretary of the CPC Tsinghua University Committee, presided over the ceremony.

In his speech, Qiu Yong highlighted that in an era marked by profound global shifts and rapid technological advancements, the establishment of the School of Education directly responds to the urgent need to build a leading country in education. The school aims to nurture world-class educators and visionary leaders who possess a deep sense of national responsibility, global perspective, professional expertise, and innovative thinking. It aims to become a global

hub for pioneering educational research and intellectual leadership, contributing to high-quality educational development. Qiu Yong emphasized that education today bears greater responsibilities: exploring innovative ideas rooted in China's rich cultural heritage, addressing key systemic challenges, and providing theoretical foundations to elevate higher education, improve pedagogical excellence, and respond to global, temporal, and educational imperatives. He urged the School of Education to expand its vision, seize opportunities, and foster bold innovation to achieve new milestones in building a leading country in education and advance national rejuvenation.

Zhu Zhiwen pointed out in his speech that Tsinghua University has always been committed to serving national development, national rejuvenation, and the advancement of humanity. He regards the founding of the School of Education as a significant step in implementing the central government's education strategy and accelerating high-quality education development. Zhu called on the school to fulfill its mission of cultivating future educators, driving theoretical innovation, and emerging as a global leader for educational excellence.

Guan Peijun highlighted the timely launch of the School of Education and the symposium, aligning with the national strategy of building a leading country in education. He expressed confidence that

the school would advance China's autonomous educational knowledge system through academic innovation, uphold talent cultivation as its core mission, and contribute Tsinghua's wisdom to strategic research, policy development, and international exchanges.

The symposium featured keynote speeches by prominent scholars including Gu Mingyuan; Xie Wehe, Distinguished Professor of Arts, Humanities, and Social Sciences at Tsinghua University; Liu Haifeng, Senior Professor of Liberal Arts at Zhejiang University; Yuan Zhenguo, Director of Faculty of Education at East China Normal University; Wu Daguang, Professor of Institute of Education at Xiamen University; Zhu Xudong, Dean of Faculty of Education at Beijing Normal University; Cheng Tianjun, Vice President of Nanjing Normal University; Zhou Guangli, Dean of School of Education at Renmin University; Jiang Kai, Dean of the Graduate School of Education at Peking University; and Shi Zhongying, Professor of School of Education at Tsinghua University. Participants engaged in substantive discussions on advancing educational disciplines, talent development, theoretical innovation, faculty building, and digital transformation to serve national education goals.

More than 100 attendees, including representatives from government agencies, peer universities, senior education experts, institutional leaders, faculty, and students, participated in the event.

Tsinghua University holds Tsinghua AI Agent Hospital Inauguration and 2025 Tsinghua Medicine Townhall Meeting

On the morning of April 26, Tsinghua University held an inauguration ceremony for Tsinghua AI Agent Hospital and the 2025 Tsinghua Medicine Townhall Meeting at the Main Building Reception Hall. Tsinghua President Li Luming and Vice President Wang Hongwei attended the event.

President Li Luming reviewed the progress of Tsinghua University's medical programs over the past year, emphasizing the University's strong commitment to the development of medical disciplines. He highlighted Tsinghua's strength in fundamental research in Artificial intelligence, which has already led to a series of high-level innovations at the intersection of AI and medicine. The establishment of the Tsinghua AI Agent Hospital represents a new initiative by Tsinghua to leverage its strengths in science and engineering to empower the advancement of medicine.

President Li encouraged Tsinghua Medicine to remain committed to fostering virtue and talent, cultivating a new generation of medical innovators with both a strong medical foundation and AI literacy. He also called for deeper integration across disciplines, particularly between engineering and medicine, as well as closer ties between clinical

practice and technology. Finally, he urged Tsinghua Medicine to align its work with cutting-edge global trends and national strategic needs, driving medical advancement and contributing to the protection of public health.

During the ceremony, Li Luming, Wang Hongwei, Vice Provost and Senior Vice-Chancellor of Tsinghua Medicine Wong Tien Yin, Dean of the Institute for AI Industry Research (AIR) Zhang Ya-Qin, Executive Dean of AIR Liu Yang, and Director of the Department of General Practice and Health Medicine at Beijing Tsinghua Changgung Hospital Prof Wang Zhong jointly unveiled the Tsinghua AI Agent Hospital. Wong Tien Yin and Zhang Ya-Qin each delivered keynote speeches outlining the hospital's strategy and future outlook.

The development of the Tsinghua AI Agent Hospital will proceed in phases. In the initial stage, the hospital system will be built leveraging the university's comprehensive AI infrastructure and interdisciplinary strengths in engineering and medicine. It will undergo pilot operations at Beijing Tsinghua Changgung Hospital and the Beijing Tsinghua Changgung Internet Hospital, starting with departments such as General Practice,

Ophthalmology, Radiological Diagnostics, and Respiratory Medicine.

Looking ahead, the hospital aims to create a closed-loop ecosystem of "AI + Healthcare + Education + Research," enhancing the efficient expansion and equitable distribution of high-quality medical resources. The ultimate goal is to provide more people with affordable, sustainable, and high-quality medical services.

Wong Tien Yin noted that the AI Agent Hospital is designed to transcend the traditional "Hospital + AI" model. Accordingly, AI agent functions are embedded at the foundational design level, driven by clinical service needs. This approach will assist doctors in making precise decisions, improve healthcare efficiency and patient satisfaction, lower hospital operating costs, and help address the shortage of primary care physicians. In the long term, the hospital plans to operate as a physical AI-enabled hospital, promoting a revolutionary transformation of healthcare models. It will also serve as a key platform for medical education at Tsinghua, nurturing a new generation of "AI-collaborative physicians."

Zhang Ya-Qin emphasized that Artificial Intelligence is a key driver of the Fourth Industrial Revolution, and AI+Healthcare is a crucial interdisciplinary field with significant research and application value. In November 2024, Tsinghua launched the internal test version of the "Zijing AI Doctor," a system based on a "closed-loop" medical virtual world that accelerates the evolution of AI doctors, laying a solid foundation for the research and application of intelligent agents in

Unveiling Ceremony of Tsinghua AI Agent Hospital Hospital

healthcare. Building on this core technology, the AI Agent Hospital will fully leverage Tsinghua's interdisciplinary strengths to continuously pioneer new models of innovative healthcare.

The event also featured the launch ceremony for the Tsinghua University Academic Clinical Program (ACP). Wang Hongwei and Wong Tien Yin presented appointment letters to the first two ACP teams: Radiological Sciences ACP and General Practice ACP.

Prof Li Guoxin, Medical Director of Beijing Tsinghua Changgung Hospital, elaborated on the concept and framework of ACP.

The Tsinghua University Academic Clinical Program is committed to establishing a collaborative academic framework through interdisciplinary collaboration and integration of resources from Tsinghua affiliated hospitals, Tsinghua Medicine schools, and other schools of Tsinghua University, as well as international partners. By establishing a long-term interdisciplinary collaboration mechanism driven by clinical needs and following the "X + Medicine" model, the ACP seeks to foster open sharing and stronger synergy across clinical care, education, and research domains, thereby elevating the standard of academic medicine. In addition, it seeks to inject new momentum into discipline development and talent development to support the goals of the "Healthy China 2030" strategy.

Faculty and staff of Tsinghua Medicine participated in the meeting both online and offline.

Meeting in progress

The graduation ceremony venue

Tsinghua holds Commencement Ceremony for Undergraduate Students

Tsinghua University hosted its 2025 Undergraduate Commencement Ceremony on the morning of June 21. Leaders of the University attended the ceremony.

Tsinghua University Vice President and Provost Peng Gang presided over the ceremony and announced the decision on undergraduate graduation and the conferral of bachelor's degrees.

Secretary of the CPC Tsinghua University Committee, Qiu Yong, announced the commendation of outstanding classes and excellent graduates, and encouraged the graduates to cultivate a character of courage and resilience, foster an optimistic and open-minded outlook, develop a pragmatic and enterprising spirit, and strive with tenacity and determination. He called on them to live up to their mission and continue reaching new heights in life on the journey toward building a strong nation and realizing national rejuvenation.

Li Luming, Tsinghua President and Chairman of the Academic Degrees Evaluation Committee, delivered a speech entitled "Learning from the past, embarking on a new journey with wisdom. "

On behalf of the university, Li extended congratulations to the graduating students who have successfully completed their undergraduate studies, as well as to their families and friends. He also expressed gratitude to the teachers who have nurtured the students with great care. He encouraged the graduates to be proactive innovators and responsible doers, to embrace the era of rapidly emerging and widely empowering new technologies—represented by artificial intelligence—with open arms, to shape the future with a spirit of innovation, and to stay grounded with a humanistic outlook. With patriotism, a sense of responsibility, and the capabilities to strengthen the country, he called on them to shine in their youth on the vast stage of advancing the Chinese path to modernization.

Qiu Yong announces the commendation of outstanding classes and excellent graduates, and conveys expectations and well-wishes to the students.

Li Luming delivers a speech.

Zhang Jianhui, an alumnus who graduated from the Department of Electrical Engineering and currently Chairman of Beijing HyperStrong Technology Co., LTD., delivered a speech as the alumni representative. He shared his life journey of serving the nation through technology, overcoming countless challenges, and cultivating a true "craftsman' s spirit". He encouraged everyone to be people of integrity and "systematic thinkers", and to make "long-termism" a guiding belief.

Dang Jie, from Zhili College, spoke as the representative of the graduating students. Using "striving for growth" as her key theme, she shared reflections on her four years at Tsinghua— how she pushed beyond her limits through challenges, expanded her horizons, and grew in step with the times.

The university leaders presented badges of honor to the excellent graduate representatives.

The graduation ceremony was broadcast live in both Chinese and English on the Rain Classroom platform, allowing graduates who were not physically present on campus and their family members to attend online.

Following the conclusion of the ceremony, university leaders proceeded to the Gymnasium to continue with the Degree Conferment Ceremony.

Peng Gang presides over the ceremony.

Zhang Jianhui delivers a speech.

Dang Jian speaks at the ceremony.

University leaders present badges of honor to the excellent graduate representatives.

Qiu Yong confers degree certificates to the graduates.

Li Luming confers degree certificates to the graduates.

The Degree Conferment Ceremony venue

Tsinghua holds Commencement Ceremony for Graduate Students

Tsinghua University hosted its commencement ceremony to honor the graduate class of 2025 on June 22.

Leaders of the University attended the ceremony. Tsinghua Vice President Jiang Peixue presided over the ceremony.

Secretary of the CPC Tsinghua University Committee Qiu Yong announced the decision to commend the excellent PhD and Master's graduates, expressing his expectations and well-wishes for the students. He encouraged the graduates to uphold integrity, stay on the right course and seek to break new ground, and remain committed to serving the people and contributing to society. He urged them to refine their work ethic, strengthen their character, shoulder the responsibilities of the times, and make their mark in advancing Chinese modernization on all fronts.

The University leaders presented badges of honor to the excellent graduate representatives.

Tsinghua President Li Luming delivered a speech titled "Break Through Self-Imposed Limits, Embrace a Broader Vision". On behalf of the University, he extended his congratulations to the graduates who had successfully completed their postgraduate studies, as well as to their families and friends, and expressed sincere gratitude to the dedicated teachers who had nurtured them. He urged the graduates to be builders who pursue knowledge and put it into practice without forgetting their original aspirations; to be trailblazers who tackle tough challenges and dare to innovate; and to be strivers who rise above personal interests and shoulder responsibilities with courage. He called on them to carry forward the University motto—Self-discipline and Social Commitment—and to

The Graduation Ceremony venue

Qiu Yong announces the commendation of excellent PhD and Master's graduates, and conveys expectations and well-wishes to the students.

Li Luming delivers a speech.

University leaders present badges of honor to the excellent graduate representatives.

maintain the sharpness and sense of duty to "break through" as well as the courage and perseverance to "stand firm". He encouraged them to strive unremittingly for the betterment of the nation, the people, and all humanity.

Yang Guangjun, an alumnus from the Department of Electronic Engineering and a division-level engineer as well as Deputy Director of the Design Department at Shanghai Huahong Grace Semiconductor Manufacturing Corporation, spoke

on behalf of the alumni. He shared his experience in tackling the challenges of independently designing memory chips and encouraged students to cultivate a deep sense of patriotism, build physical and mental resilience, and have the courage to pursue what is "difficult but right".

Feng Chenlong, a graduate student from the Department of Energy and Power Engineering, delivered a speech on behalf of the graduates.As he is about to embark on a journey to the western China, he reflected on his decade at Tsinghua University and expressed his aspiration to work diligently and serve the people wholeheartedly.

The graduation ceremony was broadcast live in both Chinese and English on the "Rain Classroom" platform, allowing graduates who were not physically present on campus and their family members to attend online.

Following the conclusion of the ceremony, university leaders proceeded to the Gymnasium to continue with the Degree Conferment Ceremony.

Jiang Peixue presides over the ceremony.

Qiu Yong confers degree certificates to the graduates.

Li Luming confers degree certificates to the graduates.

Yang Guangjun delivers a speech.

Feng Chenlong speaks at the ceremony.

The Degree Conferment Ceremony venue

GLOBAL ENGAGEMENT

TSINGHUA NEWSLETTER

Tsinghua University co-hosts 2025 World Digital Health Forum

The 2025 World Digital Health Forum, held on March 28th, was jointly hosted by the Chinese Academy of Engineering and Tsinghua University. This year, the forum's opening remarks were delivered by Li Xiaohong, president of the Chinese Academy of Engineering; Sui Zhenjiang, member of the Party Leadership Group of the Beijing Municipal Government; Zeng Rong, vice president of Tsinghua University; and Dong Jiahong, chair of the Forum Presidium and dean of the School of Clinical Medicine (Beijing Tsinghua Changgung Hospital), Tsinghua University.

An affiliate of the 2025 Zhongguancun Forum Annual Conference, the 2025 World Digital Health Forum was organized around the theme of "Innovation in digitalized intelligence: Vitalization of a new framework for healthcare." The focus of the event was the in-depth exploration of innovative ways in which digital and intelligent technologies can be utilized to harness the full potential of healthcare, cultivate interdisciplinary talent in smart health, and foster new industries and models. Other aims included expediting digital health industrialization, contributing to the development of a new productive force in healthcare, fueling high-quality economic and social growth, and enhancing global health governance.

In his speech, Li Xiaohong emphasized the three key areas in which the Chinese Academy of Engineering intends to accelerate the integration of digital technologies with biological and health sciences for the enhancement of human health and well-being: Use of AI as a catalyst for creating new momentum for intelligent healthcare, prioritizing the use of technology in public welfare as a means to strengthen universal health coverage, and promoting open collaboration in building a global health community.

Sui Zhenjiang highlighted that Beijing will seize strategic opportunities in AI to deepen its integration with the pharmaceutical and healthcare industries. The city will focus on AI-driven paradigm innovation, with the aim of achieving breakthroughs in key technologies. Efforts will also be made in expanding the applications of medical devices, telemedicine, and smart healthcare system development for the elderly and in the establishment of a comprehensive service system for lifelong healthcare. Moreover, Beijing will strengthen industrial support mechanisms and build a collaborative innovation ecosystem, fully empowering the transformation and upgrading of the healthcare and pharmaceutical industries.

Zeng Rong stated that in recent years, Tsinghua University has been making continuous efforts in the field of medicine. Progress has been made in brain-computer interfaces, AI-driven drug discovery, and talent development. Looking ahead, Tsinghua

Li Xiaohong delivers a speech.

Sui Zhenjiang delivers a speech.

Zeng Rong delivers a speech.

Dong Jiahong delivers a speech.

Respective speakers of the keynote session.

Release of the "Tsinghua Urban Health Index."

Release of the "Blue Book on Digital Intelligence Healthcare Technology Innovation and Industrial Development of China."

University will continue to leverage its strengths in conducting interdisciplinary research, taking technological innovation as the lead, and promoting the integration of medical education, research, and clinical practice, contributing to the Healthy China strategy and the advancement of global health.

Dong Jiahong proposed three innovative paradigms: "A New Voyage in Smart Healthcare," "A New Frontier in Health Governance," and "A New Approach to Talent Cultivation". He emphasized the importance of creating a cross-border talent training network and mutually recognized digital healthcare standards under the Belt and Road Initiative given that generative AI and digital intelligence technologies are reshaping the cognitive framework of medicine.

The keynote session was hosted by Wong Tien Yin, co-chair of the conference and senior vice-chancellor of Tsinghua Medicine. Experts and renowned scholars delivered keynote speeches on a range of topics including medical artificial intelligence, chronic disease management, imaging AI, radiology AI, intelligent surgical equipment, and intelligent medical agents.

The forum also featured a frontier dialogue on the role of China's digital technology in health governance across the Belt and Road Initiative and a roundtable discussion on the prospects of healthcare transformation in the era of general AI.

During the forum, Tsinghua University released the "Tsinghua Urban Health Index," establishing

a nationwide health assessment system that is in alignment with international standards. Additionally, the Chinese Academy of Engineering and Tsinghua University jointly released the "Blue Book on Digital Intelligence Healthcare Technology Innovation and Industrial Development of China," which systematically outlines key technological breakthroughs and pathways for industrial transformation. The "Beijing Medical and Health

Trusted Data Space" was also officially inaugurated, aiming to unlock the value of medical data, driving pharmaceutical research and development, and fostering innovation in AI applications. Meanwhile, the successful launch of the "BAAI OpenComplex-2" will further enhance AI-driven drug discovery and support the innovative development of Beijing's biopharmaceutical industry.

Panelist of the frontier dialogue segment.

Panelists of the roundtable discussion segment.

Forum participants assemble for a group photo.

Tsinghua University Confers Honorary Doctorate on Nobel Laureate Professor Brian Kobilka

Jiang Peixue delivers a speech

Professor Kobilka delivers a speech

Distinguished physiologist and recipient of the 2012 Nobel Prize in Chemistry Professor Brian Kobilka was recently awarded an honorary doctorate by Tsinghua University. Kobilka is also a member of the National Academy of Sciences (US), fellow of the American Academy of Arts and Sciences, and professor of Molecular and Cellular Physiology at Stanford University. Tsinghua Vice President Jiang Peixue presented Professor Kobilka with the honorary degree.

In his address, Jiang emphasized that Professor

Kobilka is a globally renowned scholar in the field of life sciences who has supported Tsinghua University's development for many years. He noted that the University is currently advancing its 2030 global strategy and expressed hope that Professor Kobilka will continue to support the development of life sciences and related disciplines at Tsinghua, helping the University attract world-class academic resources and elevate the discipline of structural biology to new heights.

Professor Kobilka said he was honored to receive the honorary doctorate, acknowledging Tsinghua University as one of the world's most prestigious institutions with outstanding achievements in life sciences. Additionally, he conveyed his interest in working with Tsinghua scholars in future academic exchanges.

On the same day, Professor Kobilka delivered an academic lecture titled "G Protein Coupled Receptors: Challenges and New Approaches to Drug Discovery" to an audience of over 300 students and faculty members from Tsinghua and partner institutions.

Jiang Peixue presents Professor Kobilka with the honorary degree

Tsinghua University hosts Fifth Global Forum on Development of Computer Science

Chen Yuan delivering a welcome speech

Andrew Chi-Chih Yao delivering online remarks

Bai Benfeng delivering a speech

The Fifth Global Forum on the Development of Computer Science (GFDCS) was held in a hybrid online and offline format at Tsinghua University on April 12th.

Chen Yuan, Vice Chairman of the 12th National Committee of the Chinese People's Political Consultative Conference; Andrew Chi-Chih Yao, Dean of Tsinghua University's College of AI, Dean of Tsinghua University's Institute for Interdisciplinary Information Studies and Turing Award laureate; and Bai Benfeng, Deputy Secretary of the CPC Tsinghua University Committee and Vice President, delivered opening remarks.

Under the theme of "The Development of Computer Science in the AI Era," the forum invited Turing Award laureate Jack Dongarra from the University of Tennessee, Samuel Madden, Chair of the Computer Science Department at MIT; H. V. Jagadish, Director of the Social Data and AI Research Institute at the University of Michigan; Luke Ong, Vice President of Research and Dean of the School of Computing and Data Science at Nanyang Technological University, and heads of computer science departments from Peking University and Harbin Institute of Technology, among other participating universities. The forum was co-chaired by Yin Xia, Director of the Department of Computer Science at Tsinghua

University, and Li Guoliang, Deputy Director of the Department of Computer Science at Tsinghua University.

Chen Yuan stated that building a cooperative platform for friendly exchanges in global computer science, conducting dialogue and cooperation on major issues in computer science, and learning from each other to embrace diverse ideas embodies our shared commitment to shaping the future of computer science and contributing to the common prosperity of human society. He hoped that this forum could further consolidate consensus on the development of computer science, explore new paths for computer science to empower the high-quality development of universities, explore innovative models for autonomous talent training, and promote interdisciplinary and cutting-edge innovation.

In his opening remarks, Andrew Chi-Chih Yao stated that AI is no longer just a distant vision, but rather a paradigm-shifting force that will redefine industries, societies, and even human potential. We have witnessed the relentless progress of computer science, since the 1960's, laying the foundation for artificial intelligence. Interdisciplinary collaboration and integration between computer science and many other disciplines, such as biology, medicine, engineering, and humanities, have not only brought

about major technological breakthroughs but also unprecedented challenges, calling on us to pool the strengths of various fields in order to jointly address them. He expressed his hopes for forum attendees to fully discuss important topics such as how artificial intelligence is reshaping scientific discovery, creating industry-changing innovations, and redefining human-machine collaboration.

On behalf of the University, Bai Benfeng welcomed the guests and briefly reviewed the consensus reached at the previous forum. He stated that the aim of the GFDCS is to bring together deans and department heads of computer science from renowned universities worldwide to address fundamental issues in computer science, enhance talent development, and promote the advancement of the computer science discipline. In the new era where traditional disciplines are being reshaped by the rise of AI technology, he hoped that experts and scholars would use the forum to deeply explore the development trends of computer science and the direction of interdisciplinary integration with a new sense of urgency, form a new consensus on the development of computer science worldwide,

Samuel Madden, H. V. Jagadish, and Luke Ong delivering keynote speeches (from left to right)

jointly enhance discipline development, and promote social progress.

In the first half of the forum, Samuel Madden, H. V. Jagadish, and Luke Ong delivered keynote speeches on topics such as the progress of computer science and artificial intelligence at MIT, computer science ethics in the era of artificial intelligence, and computing and data science in the era of artificial intelligence.

Group Photo of Attendees

Experts and scholars participating in a morning panel discussion.

Experts and scholars participating in an afternoon panel discussion

Following the speeches, Andrew Chi-Chih Yao, Jack Dongarra, and the three keynote speakers held a morning panel discussion to explore the topic "The Development of Computer Science in the AI Era."

In the second half of the forum, Pierre Senellart, Director of the Graduate Program in Computer Science at PSL University; Ji Ping, Director of the Graduate School and Executive Officer of the Doctoral Program in Computer Science at the City University of New York and John Jay College, and Li Qing, Head of the Department of Computer Science at the Hong Kong Polytechnic University, delivered keynote speeches on topics such as the qualitative assessment of academic careers in computer science, a universally accessible educational ecosystem, and a knowledge graph-based framework for student curriculum guidance and career planning.

Following the speeches, Li Xiangyang, Executive Dean of the School of Computer Science and Technology at the University of Science and Technology of China; Wang Cong, Head of the Department of Computer Science at the City University of Hong Kong, and the three keynote speakers held an afternoon panel discussion to explore the topic "Talent Development in the AI Era."

The Global Forum on the Development of Computer Science is an international forum for high-level development of the computer science discipline hosted by Tsinghua University. Since its inception in 2018, the forum has been committed to exploring the fundamental nature of computer science and promoting its global development, earning widespread recognition from the international computer science community.

Pierre Senellart, Ji Ping, and Li Qing delivering keynote speeches (from left to right)

Yin Xia hosting the morning session

Li Guoliang hosting the afternoon session

Tsinghua President Li Luming visits Singapore and Japan for multisector cooperation and exchange

From April 13 to 19, Tsinghua President Li Luming led a delegation to visit Singapore and Japan, where they engaged in discussions with local educational institutions and enterprises on further deepening cultural exchanges and higher education cooperation, as well as advancing talent development.

On April 14, Li Luming met separately with A*STAR Chief Executive Officer Beh Kian Teik, SingHealth Group Chief Executive Officer Ng Wai Hoe, and Nanyang Technological University President Ho Teck Hua. They had in-depth discussions on strengthening cooperation in life sciences and other research fields with A*STAR, including enhancing personnel exchanges, as well as collaborating with SingHealth on AI-powered healthcare and jointly creating industry benchmarks in the field of smart healthcare. At Nanyang Technological University, the two sides conducted in-depth discussions on strengthening joint research collaboration mechanisms and cultivating top innovative talents.

On April 15, Li Luming delivered a keynote speech at the Think Asia Forum on contributing Asian wisdom to global governance.

During his visit to Singapore, Li Luming met Tsinghua alumni living and working in Singapore,

encouraging them to contribute to building a bridge of friendship between China and Singapore.

On April 16, Li Luming met with Teiji Tominaga, President of Tohoku University, and Naoto Ohtake, President of Institute of Science Tokyo, and signed a Memorandum of Understanding with Institute of Science Tokyo, engaging in exchanges focused on promoting talent cultivation, faculty and student exchange, and collaborative research and innovation among universities. At the Institute of Science Tokyo, Li Luming also had talks with Tsinghua students participating in the exchange programs.

From April 17 to 19, Li Luming met with Toshiaki Higashihara, Director and Executive Chairman of Hitachi Group, Eisaku Ito, President and CEO of Mitsubishi Heavy Industries, Ltd., and Yoshiki Takada, President and Chief Executive Officer of SMC Corporation. Li held successive talks on topics such as injecting innovative momentum into scientific research, talent cultivation, and sustainable social development in collaboration with Hitachi; deepening cooperation with Mitsubishi in areas including energy and carbon neutrality, logistics, and infrastructure development; and working with SMC to jointly promote the transformation and upgrading of global manufacturing.

During his visit to Japan, Li Luming also attended the 2025 Board Meeting and Presidents Forum of the Asian Universities Alliance, where he met with University of Tokyo President Teruo Fujii. The two reached consensus on increasing the support of seed funding programs and further expanding collaborative initiatives. He then took part in the "Resilience and Vitality: Strategic Choices for Sino-Japanese Cooperation in the International Economic and Technological Wave" forum—jointly organized by Tsinghua University and Nomura Research Institute and hosted by the Executive Education Center of Tsinghua's School of Economics and Management—delivering the closing address.

Heads of relevant schools, departments, and administrative offices within the University participated in the related activities.

Li Luming talks with Tsinghua students participating in the exchange programs at the Institute of Science Tokyo.

Qiu Yong visits Russia, deepens cooperation in education, science and technology

During President Xi Jinping's state visit to Russia and his attendance at the celebration marking the 80th anniversary of the Victory in the Soviet Union's Great Patriotic War, Qiu Yong, Secretary of the CPC Tsinghua University Committee, visited Russia. The visit aimed to leverage the leading role of higher education, and promote Tsinghua University's deeper cooperation with Russia in the fields of education, science and technology, and talent cultivation, and contribute Tsinghua's strength to advancing the China-Russia comprehensive strategic partnership of coordination for a new era.

In the presence of Chinese President Xi Jinping and Russian President Vladimir Putin, Qiu Yong exchanged a cooperation agreement with Anatoly Torkunov, Rector of Moscow State Institute of International Relations (MGIMO University), and Kirill Dmitriev, CEO of the Russian Direct Investment Fund (RDIF), at the Kremlin in Moscow on May 8.

The three parties will establish joint degree programs, strengthen collaborative research, enhance faculty and student exchanges, and carry out talent exchange and training initiatives to accelerate the cultivation of high-level professionals aligned with the needs of the China-Russia comprehensive strategic partnership of coordination for a new era. In response to the shared development priorities of both countries in science and technology, energy, agriculture, infrastructure, and the digital economy, the collaboration will also promote coordinated development across academia, industry, and research.

On May 9, Qiu Yong visited Mendeleev University of Chemical Technology, where he held discussions with the university's Rector, Evgeny Vladimirovich Rumyantsev, and met with representatives of Chinese students studying there. Earlier, the two universities had signed a memorandum of understanding on cooperation.

In his remarks, Qiu Yong emphasized that Tsinghua University attaches great importance to international exchanges and cooperation and remains committed to advancing high-level educational openness. He expressed hope
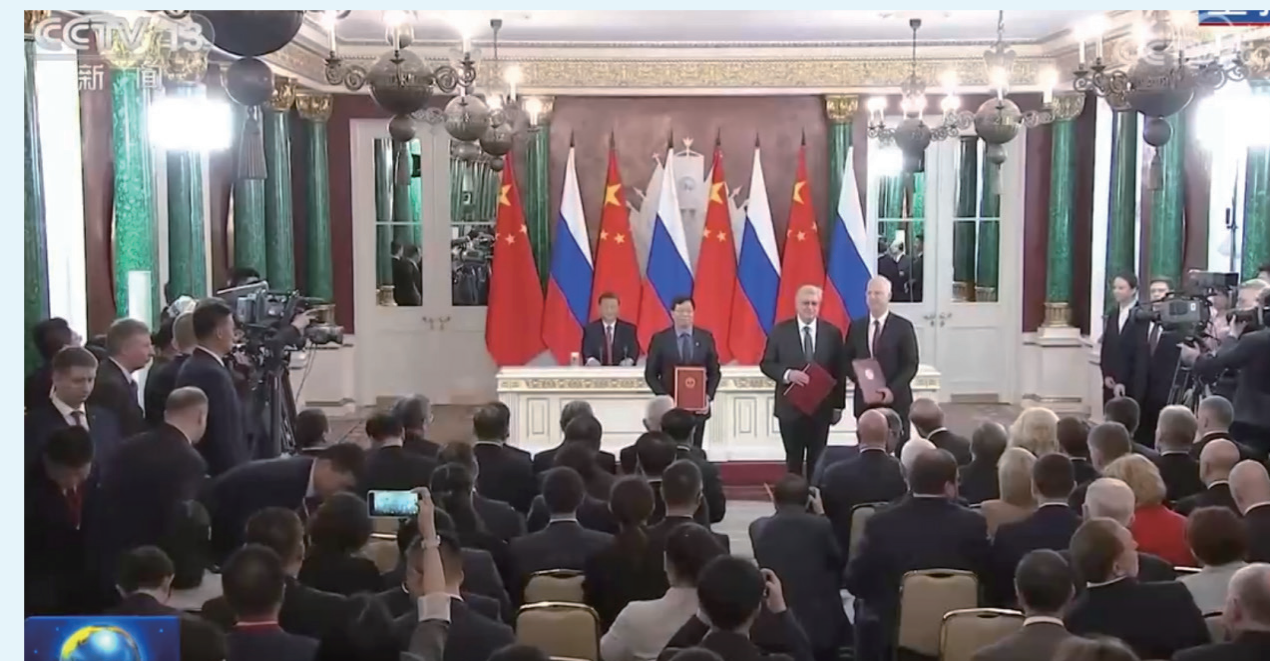
Qiu Yong exchanges an agreement with Anatoly Torkunov and Kirill Dmitriev.

Qiu Yong visits Mendeleev University of Chemical Technology.

that the pragmatic collaboration between the two universities would generate more positive "chemical reactions," injecting new momentum into the steady and long-term development of China-Russia relations.

Rumyantsev introduced relevant programs of Mendeleev University of Chemical Technology. He hopes to spark more collaborative breakthroughs with Tsinghua in areas such as joint talent cultivation and scientific research.

That afternoon, Qiu Yong met with Herman Gref, CEO and Chairman of the Executive Board of Sber. The two sides discussed how to better leverage the dual engines of innovation from universities and enterprises, deepen and expand cooperation in areas such as artificial intelligence and digital finance, and promote integrated innovation across academia, industry, and research in both countries. Following the meeting, Qiu Yong and Herman Gref

signed a Memorandum of Understanding on behalf of their respective institutions.

On May 10, Qiu Yong visited the National Research University Higher School of Economics (HSE University), where he exchanged a cooperation agreement with the university's Rector, Nikita Anisimov. Qiu Yong stated that China and Russia are embracing new historical opportunities for cooperation across various fields, and universities should play an increasingly important role in this process. He expressed Tsinghua University's willingness to work with HSE University and other relevant Russian institutions to further expand channels of collaboration and jointly promote fruitful higher education cooperation within multilateral platforms such as BRICS.

Anisimov congratulated Tsinghua on its remarkable achievements and expressed hope that more outstanding students and scholars from HSE University would have opportunities to study and engage in exchanges in China.

During the visit, Qiu Yong also met with representatives of Tsinghua University alumni in Russia.

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

Qiu Yong and Herman Gref sign a Memorandum of Understanding.

Qiu Yong exchanges a cooperation agreement with Nikita Anisimov.

2025 Tsinghua PBCSF Global Finance Forum held

The 2025 Tsinghua PBCSF Global Finance Forum was held in Shenzhen on May 17, drawing global leaders and experts to address pressing economic and financial challenges.

The opening ceremony saw the attendance of distinguished figures, including Zhou Xiaochuan, Vice Chairman of the 12th National Committee of the CPPCC and former Governor of the People's Bank of China. Guo Yong, Deputy Secretary of the Tsinghua University Party Committee, and Jiao Jie, Dean of the PBC School of Finance at Tsinghua University, delivered inaugural addresses. Keynote insights were shared by Marek Belka, former Prime Minister of Poland, and Michael Spence, the 2001 Nobel Laureate in Economics. The opening ceremony was hosted by Zhang Xiaoyan, Associate Dean of the Tsinghua PBCSF.

Held under the theme "A Shared Future: Building an Open and Inclusive Economic and Financial System", the two-day forum features 13 thematic panel discussions and two closed-door sessions. Nearly 100 high-profile policymakers, industry leaders, and academic experts from across the globe convene in Shenzhen to debate critical topics such as the evolving international monetary system, global trade dynamics, risks of economic fragmentation, and opportunities within the Guangdong-Hong Kong-Macao Greater Bay Area. These dialogues seek to chart innovative pathways and drive actionable strategies for sustainable global financial growth.

The forum emphasizes aligning with contemporary trends, harnessing intellectual rigor to bolster the vision of a robust financial ecosystem. Through pragmatic discourse, participants addressed systemic challenges, reinforced economic resilience, and explored collaborative frameworks to advance a shared global future. A key focus was how to foster inclusiveness and openness in financial systems to bridge divides and promote equitable development.

Since its inception in 2014, the Tsinghua PBCSF Global Finance Forum has become a cornerstone of China's academic and financial discourse, marking its 11th edition this year. Renowned as one of the premier platforms for high-level dialogue, it continues to unite policymakers, scholars, and business leaders worldwide, synergizing expertise for transformative solutions for tomorrow's economic landscape.

The Second Workshop on AI Capacity Building held

The opening ceremony of the Second Workshop on AI Capacity Building, hosted by the Ministry of Foreign Affairs, organized by Tsinghua University, and co-organized by Beijing Municipality, was held at Tsinghua University recently. Ma Zhaoxu, Vice Foreign Minister; Chola Mwalebo, Co-chair of the Group of Friends for International Cooperation on AI Capacity-Building and Zambia's Permanent Representative to the United Nations; Qiu Yong, Secretary of the CPC Tsinghua University Committee; and Ma Jun, Vice Mayor of Beijing, attended the opening ceremony and delivered remarks. Amandeep Singh Gill, United Nations Under-Secretary-General, delivered a video address. Yang Bin, Vice Chairperson of Tsinghua University Council, presided over the ceremony. Representatives from nearly 40 countries and regional organizations gathered at Tsinghua University to embark on a six-day program of exchanges and learning.

Ma Zhaoxu said President Xi Jinping proposed the Global AI Governance Initiative, contributing China's solution and wisdom for the question of the times and charting the course for global AI governance, which carries great historical and practical relevance. All countries should uphold the vision of a community with a shared future for mankind, adhere to innovation and openness, fairness and inclusiveness, and collaborative governance, deliver on the Global AI Governance Initiative, and make AI an international public good for all.

Ma Zhaoxu pointed out that China is an active advocate, promoter, and pioneer of AI capacity building. It has prioritized the follow-up implementation of the United Nations (UN) General Assembly resolution on enhancing international cooperation on AI capacity building, announced the AI Capacity-Building Action Plan for Good and for All, and set up the Group of Friends for International Cooperation on AI Capacity-Building. Ma Zhaoxu expressed his anticipation that all parties will further build consensus, promote cooperation, and achieve common development.

Chola Milambo said, China has played a leading role in helping the Global South enhance its AI capacity-building, and the workshop is extremely significant for following through on the Global Digital Compact and the UN General Assembly resolution.

The opening ceremony of the workshop

Qiu Yong first introduced Tsinghua University's achievements in the field of artificial intelligence. He stated that with the rapid evolution of AI technology, developing countries are presented with opportunities as well as challenges. Promoting the fair and inclusive development of AI is a shared responsibility of the international community. Tsinghua will insist on open cooperation, uphold the philosophy of humanistic care, and work with global partners to advance AI talent development, accelerate AI technological innovation, and empower practical applications, ensuring that AI truly benefits all humanity.

Amandeep Singh Gill delivered a video speech, emphasizing that the AI resolution adopted by the UN General Assembly with China's promotion is of milestone significance. He expressed the hope that the workshop will contribute to advancing global AI governance and international cooperation on AI.

Ma Jun stated that Beijing will serve as a vital link, working together to build a comprehensive and multi-layered artificial intelligence cooperation network. This initiative aims to accelerate the transformation of locally developed, secure, reliable, convenient, and efficient AI technologies, products, and services from Global South countries into the AI development capabilities of various nations. This collaboration will ultimately contribute to writing a new chapter in global inclusive development.

Li Chijiang, Deputy Director-General of the Department of Arms Control of the Ministry of Foreign Affairs; Liu Weihua, Deputy Director-General of Beijing Municipal Science and Technology Commission , Administrative Commission of Zhongguancun Science Park; and relevant officials from Tsinghua's School of Public Policy and Man,gement and International Office attended the opening ceremony.

Following the ceremony, Xue Lan, a Distinguished Professor of Arts. Humanities and Social Sciences at Tsinghua University and Director of the Institute for AI International Governance, delivered a keynote lecture.

RESEARCH

TSINGHUA NEWSLETTER

Chen Zhucheng's team captures dynamic conformations of ISWI during active nucleosome sliding, reveals mechanism of chromatin remodeling

Nucleosomes, which consist of DNA wrapped around histone octamers, are the fundamental building blocks of chromatin. Chromatin remodelers utilize energy from ATP hydrolysis to reposition nucleosomes, thereby regulating chromatin structure and gene activity. Chromatin remodelers are divided into four major subfamilies: SWI/SNF, ISWI, CHD, and INO80, each having distinct biological functions. Among them, SWI/SNF enzymes facilitate the formation of open chromatin, widely involved in gene regulation. ISWI senses linker DNA length and drives formation of compact chromatin. Different chromatin remodelers share highly conserved ATP-dependent motor domains, which are central to chromatin remodeling activity. Excessive remodeling must be inhibited to prevent inappropriate disruption of chromatin structure. The mechanisms by which chromatin remodelers overcome histone-DNA interactions to slide nucleosomes are yet to be fully resolved.

On April 4, *Science* magazine published a study, entitled "**Structural insights into chromatin remodeling by ISWI during active ATP hydrolysis**", by Professor Zhucheng Chen's team at Tsinghua University School of Life Sciences. Presumably because of the conditions of non-hydrolyzable nucleotides, only three chromatin remodeling states (Apo, ADP, and ADP-BeF$_x$) were captured. This new study employed ATP to sustain DNA translocation, allowing the motor to undergo all possible conformational changes during the remodeling cycle. The researchers designed experiments by varying the ATP concentrations to enrich different conformational states, and used cryo-electron microscopy (cryo-EM) to determine transient structures of ISWI bound to nucleosomes. Nine high-resolution structures were resolved, including ATP, ADP, ADP*, ADP$^+$, ADP*$^+$,

Apo, Apo*, ADPS, and ADPB. Based on these structures, the authors propose a comprehensive chromatin remodeling model, which provides mechanistic insights into DNA translocation and linker DNA sensing.
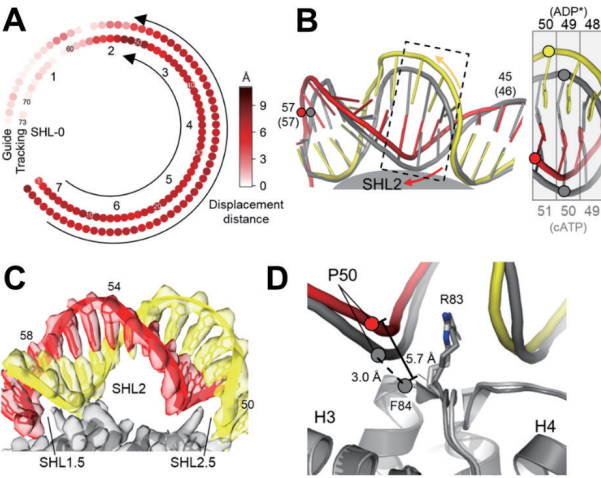
Figure 1. Structure of the ADP state with a 1 bp DNA bulge.*

(A) Heatmap of DNA phosphate backbone displacement. Relative to the ATP state, both DNA strands in ADP* shift inward (arrow direction), and a 1-bp DNA bulge is stored at SHL2

(B) Structural comparison of SHL2 DNA in ATP (gray) and ADP* (colored) states.

(C) Cryo-EM density map of the DNA bulge in the ADP* state.

(D) Analysis of local histone-DNA interactions. ATP state (gray); ADP* state (colored). In ADP*, histone-DNA interactions are disrupted.

The researchers discovered that ISWI induces a full 1-bp DNA bulge at SHL2 inside the nucleosome (Figure 1). Here, the chemical energy from ATP hydrolysis is converted into the energy of DNA deformation. This conformation, termed ADP*, differs from the canonical ADP state, which exhibits a 1/2-bp DNA distortion. In the ADP* state, the motor induces both DNA strands to shift inwards from the entry side, storing the 1 bp bulge at SHL2 and disrupting the local histone-DNA interactions. These observations contradict two popular models of DNA translocation. The identification of the ADP* state resolves a long-standing question in chromatin remodeling, revealing the mechanism of DNA translocation.

The study also identified multiple regulatory conformations of ISWI: ADP$^+$, ADP*$^+$, ADP^S, and ADP^B. The motors in the regulatory conformations preferentially engage the nucleosome at the side with a shorter linker DNA. ADP$^+$ and ADP*$^+$ feature positive regulatory elements: RYA (arginine-tyrosine anchor) and PosC (Figure 2A–C), which promote the remodeling activity. In the ADP^B state, the positive regulation is lost, and a newly formed Brake element induces an abnormally open conformation, and thus inactivates ISWI. The Brake element is essential for the linker DNA sensitivity of ISWI (Figure 2D–E). Together, these findings elucidate the machinery of linker DNA sensing of ISWI.
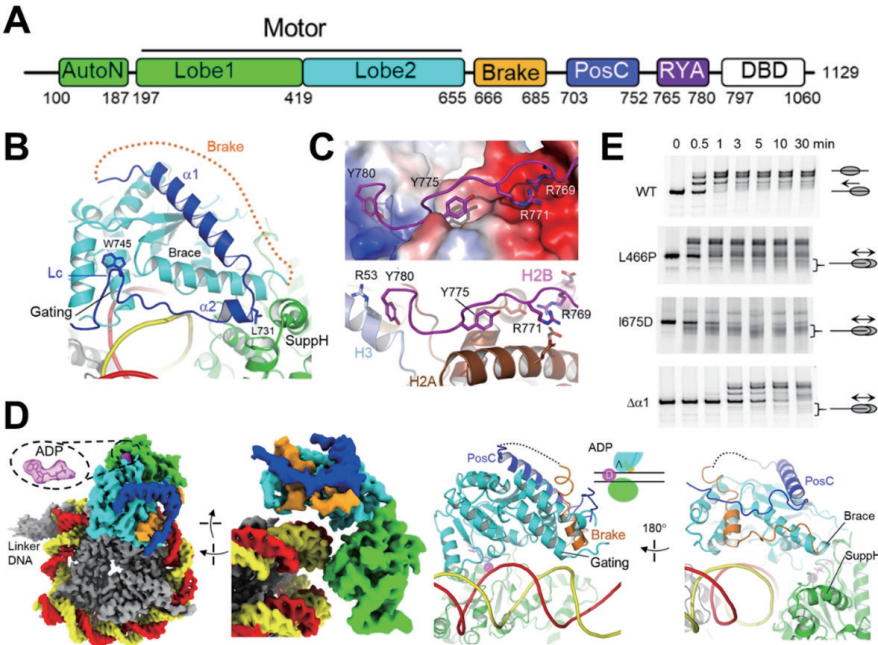

Figure 2. Regulatory conformations of ISWI.

(A) Domain of ISWI.

(B) PosC (dark blue) in ADP*.

(C) RYA in ADP*, with histone surface electrostatic potential shown.

(D) ADPB structure with Brake (orange).

(E) Nucleosome sliding (centering) assay. Wild-type (WT) ISWI senses linker DNA length, sliding nucleosomes to a more centered position (slower gel band). Brake mutants disrupt linker DNA sensing, yielding faster gel bands.

Integrating all nine conformations, the authors proposed a multi-state chromatin remodeling model, which comprises a core translocation cycle and peripheral regulatory states (Figure 3). The core remodeling cycle arbitrarily initiates with ATP hydrolysis and inorganic phosphate release, driving a conformational transition from the ATP state to the ADP state, and induces a 1/2-bp DNA distortion at SHL2. The motor tilts further into ADP*, generating a 1-bp bulge and breaking local DNA-histone contact. ADP releases the Apo* state, and next ATP binding triggers motor closure, propelling the 1-bp DNA bulge propagating toward the exit side.

During the remodeling cycle, DNA deformation in the ADP and ADP* states establish high-energy configurations, representing a critical regulatory node of the remodeling reaction. The motor is stabilized in the ADP^+ and ADP^{*+} conformations through RYA and PosC, or collapses into the inactive ADP^S and ADP^B states. The ADP^S structure represents a 'slipping' state where the energy from ATP hydrolysis does not drive DNA translocation. Short linker DNA diminishes DBD anchorage, inducing the Brake helix formation that locks the motor in an inactive ADP^B state. The authors argue that the core remodeling cycle represents a universal mechanism of DNA translocation conserved across chromatin remodelers, while the peripheral regulatory layers are ISWI-specific.

Professor Zhucheng Chen led the study, with PhD candidate Youyang Sia and postdoctoral fellow Han Pan as co-first authors. Postdoctoral fellow Kangjing Chen also contributed to this work. This study was supported by grants from the National Natural Science Foundation of China, the National Key Research and Development Program, and institutional funding through the Tsinghua University Branch of the China National Center for Protein Sciences (Beijing) and Beijing Frontier Research Center for Biological Structure Tsinghua–Peking Joint Center for Life Sciences.
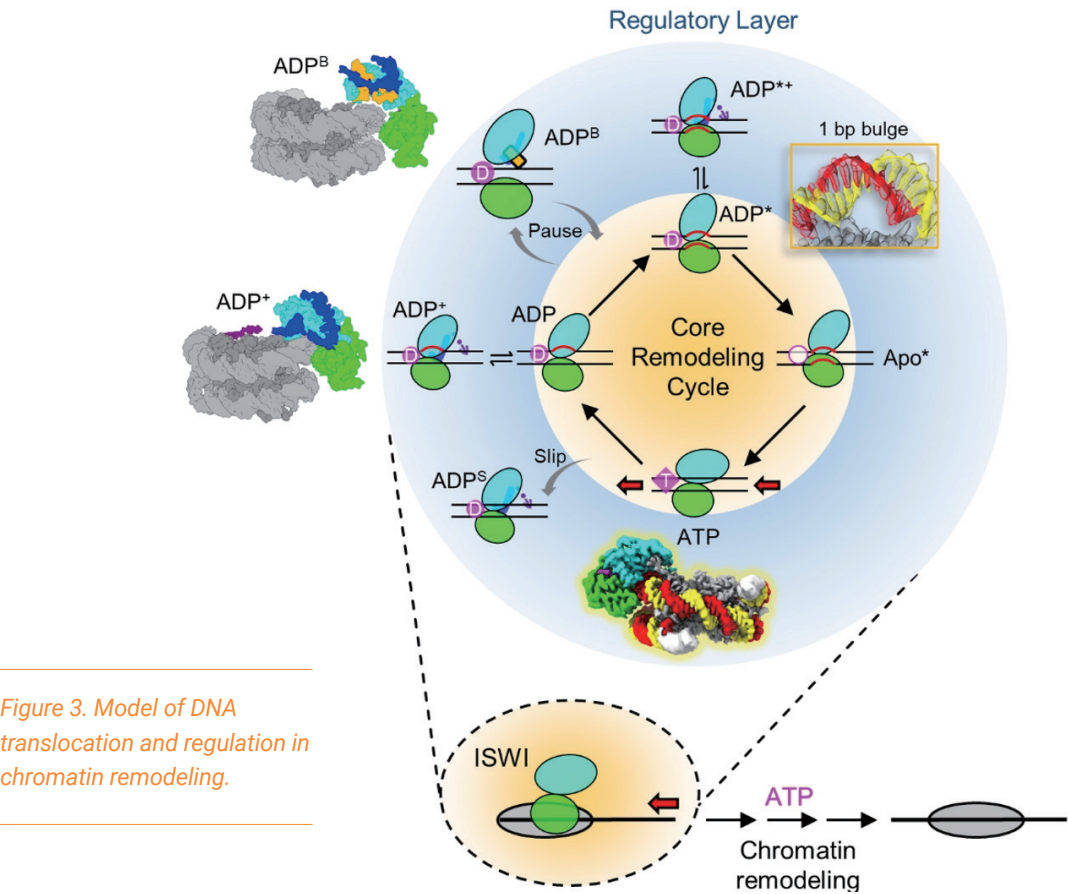
Figure 3. Model of DNA translocation and regulation in chromatin remodeling.

Zheng Bo's team makes inroads in global climate change research
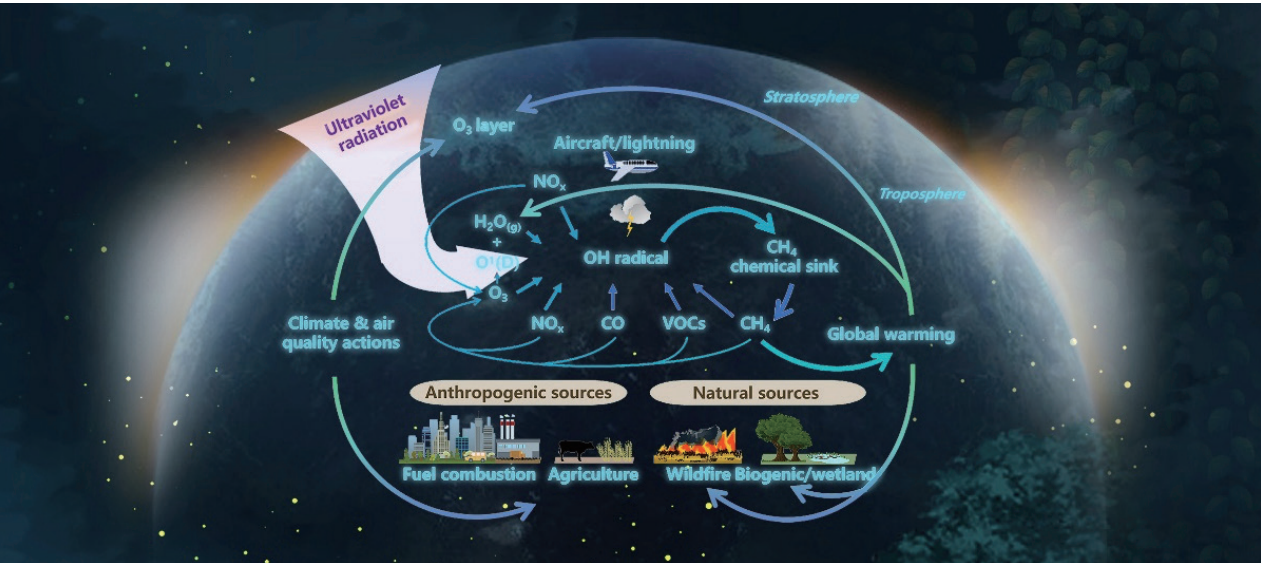
On May 28, 2025, Associate Professor Zheng Bo from the Institute of Environment and Ecology at Tsinghua Shenzhen International Graduate School (Tsinghua SIGS), leading an international research team comprising scholars from China, France, and Germany, published a study titled "Air pollution modulates trends and variability of the global methane budget" in *Nature*. The research systematically reveals how air pollution influences the global methane (CH_4) budget by modulating atmospheric hydroxyl radical (OH) concentrations, providing a new theoretical foundation for addressing global climate change and synergistically advancing pollution reduction and carbon mitigation.

Addressing the Major Challenge in Global Climate Change Research

Since the 21st century, climate change has evolved from an environmental issue to a critical factor affecting global security, economy, and societal stability. As the second-largest greenhouse gas after carbon dioxide (CO_2), CH_4 concentrations significantly impact the climate system. In recent years, the rapid rise in global CH_4 levels has drawn attention to its source-sink dynamics and regulatory mechanisms. The global CH_4 budget is not only influenced by natural emissions and anthropogenic activities but also involves complex interactions with air pollution.

Global atmospheric CH_4 concentrations have surged since 2007. Beyond natural and anthropogenic CH_4 emissions from wetlands, energy production, agriculture, and waste management, atmospheric oxidation processes, particularly the removal of CH_4 by OH, are also key regulators of its concentration. OH is the primary oxidant in the atmosphere and accounts for approximately 90% of CH_4 chemical consumption. However, long-term quantification of how air pollutants influence global OH levels and CH_4 budgets over decadal scales remains limited. Conventional studies often solely rely on observation datasets or atmospheric model simulations, which struggle to fully capture the complex dynamic interactions between air pollutants, OH concentrations, and CH4 sinks.
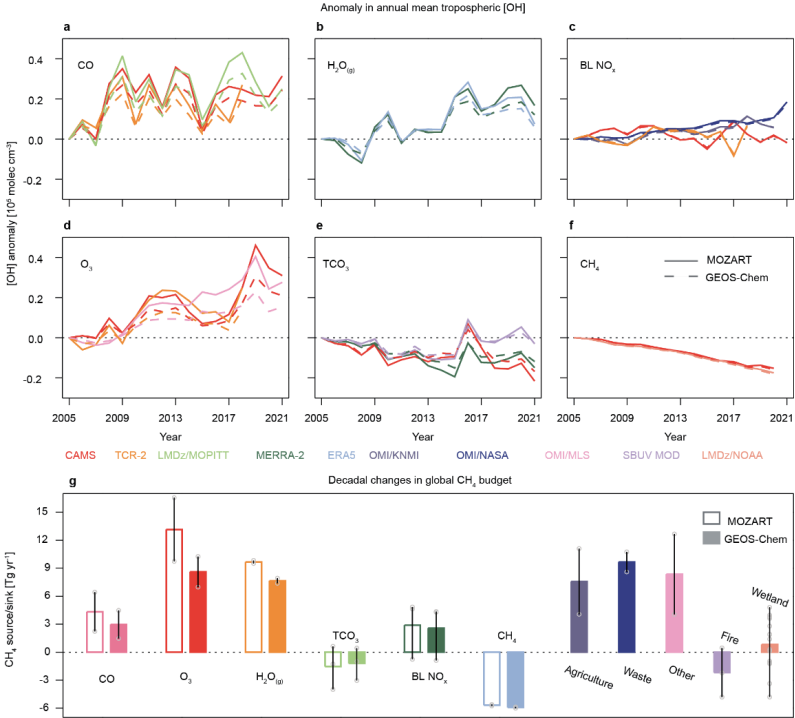
Fig. 2 Contributions of individual OH precursors to global CH4 sink changes during unusual years

Deciphering the Complex Interactions Between Air Pollution and CH_4 Budget

This study innovatively developed an integrated research framework coupling atmospheric observations with process-based models to quantify the impacts of major air pollutants on CH_4 chemical sink. Utilizing advanced atmospheric chemistry models, multi-source atmospheric composition observations, reanalysis data, and sensitivity experiments of chemical box models, the team constructed response functions of OH to precursor concentration changes. They systematically analyzed the spatio-temporal variations of key OH precursors—including carbon monoxide (CO), ozone(O_3), water vapor ($H_2O(g)$), nitrogen oxides (NOx), and total column ozone (TCO_3)—from 2005 to 2021, and their systemic effects on global OH concentrations and CH_4 budgets(Fig.1). This approach not only accounts for long-term global scale trends but also addresses spatio-temporal heterogeneity, offering a novel insight into air pollution-CH_4 budget interactions.

The study found that from 2005 to 2021, enhanced tropospheric ozone, increased water vapour, and decreased carbon monoxide levels collectively contributed to a significant increase in global mean OH concentrations of 0.2% to 0.4%. (Fig. 1a-d). These changes collectively enhanced the global CH_4 sink by 1.3-2.0 Tg/yr², substantially buffering the atmospheric CH_4 growth rate. Notably, this sink enhancement was concentrated in tropical regions and exhibited pronounced hemispheric asymmetry. In mid-to-high latitudes of the Northern Hemisphere, OH and CH_4 sink variations were more influenced by anthropogenic activities. Such global-regional synergistic analysis provides scientific support for targeted air quality and climate policies.

The research also highlighted that during extreme events, such as the super El Niño event in 2015–2016 and the COVID-19 lockdown in 2020–2021, drastic air pollutant fluctuations caused significant impacts on OH and CH_4 sink in a short time. For instance, during the El Niño event, tropical wildfires spiked CO concentrations, depleting the OH, weakening the CH_4 sink, and elevating atmospheric CH_4 levels (Fig. 2b).
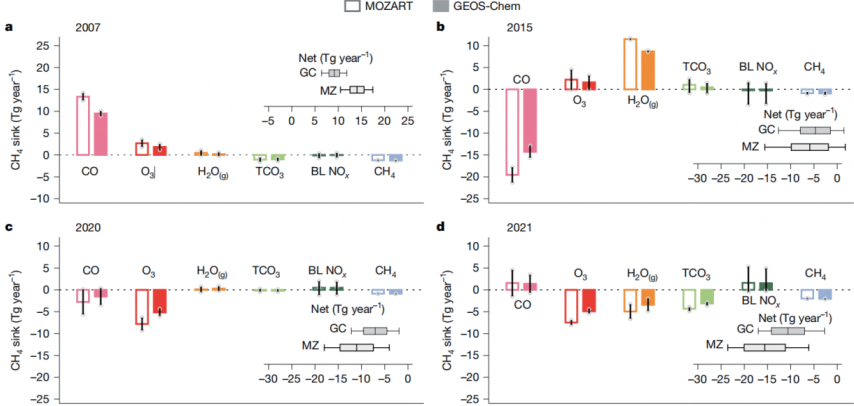
During the COVID-19 lockdown, reduced human activities lowered O_3 concentrations, decreasing OH levels and CH_4 sink (Fig. 2c-d). This partially offset the slowed CH_4 growth caused by reduced anthropogenic CH_4 emissions, stimulating the global CH_4 concentration rise.

Navigating Strategic Pathways for Global Climate Change Mitigation

The study reveals the need to integrate the synergies between global air pollution and CH_4 budget when implementing air quality and climate policies. For example, while reducing O_3 pollution improves air quality, it may lower OH concentrations, weaken CH_4 oxidation sink, and inadvertently elevate CH_4 levels. Future strategies must systematically assess the impacts of air pollutant reductions on CH_4 budgets to achieve co-benefits for air quality and climate targets. This requires considering interactions between emission sources and sinks in pollution and carbon mitigation policies.

The research also provides a novel tool for monitoring and evaluating global OH concentrations and their effects on CH_4 sink. By regularly updating input driver data, the developed model system can track spatiotemporal OH variations, enabling dynamic studies of its regulatory role in the global CH_4 budget. This advancement holds practical significance for formulating science-based climate policies.
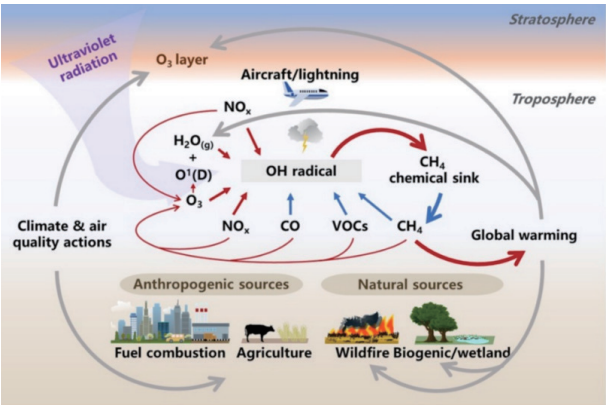
Fig. 3 Complex interactions between air pollution and OH and CH4 budget

Professor Di Long's team reveals global dominance of seasonality in shaping lake-surface-extent dynamics

Professor Di Long's team from the Department of Hydraulic Engineering at Tsinghua University recently showcased their impactful research on the remote sensing of global surface water. The team successfully developed a deep-learning method for the spatiotemporal fusion of multi-source satellite data at a global scale, enabling continuous monthly monitoring of approximately 1.4 million lakes worldwide at a 30-meter spatial resolution. The study revealed that seasonality plays a dominant role in shaping global lake-surface-extent dynamics. Furthermore, the geographical pattern of this seasonality dominance aligns with global population distribution, indicating a strong linkage between human activities and seasonal hydrological processes in lakes.
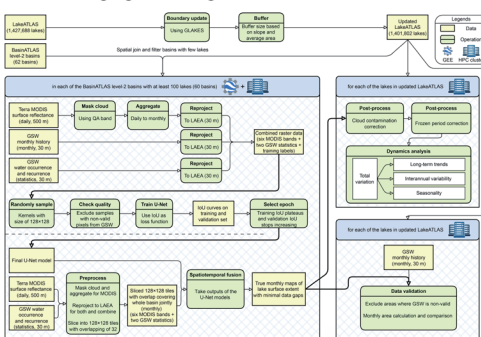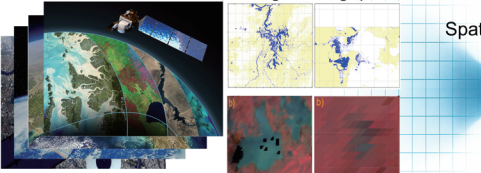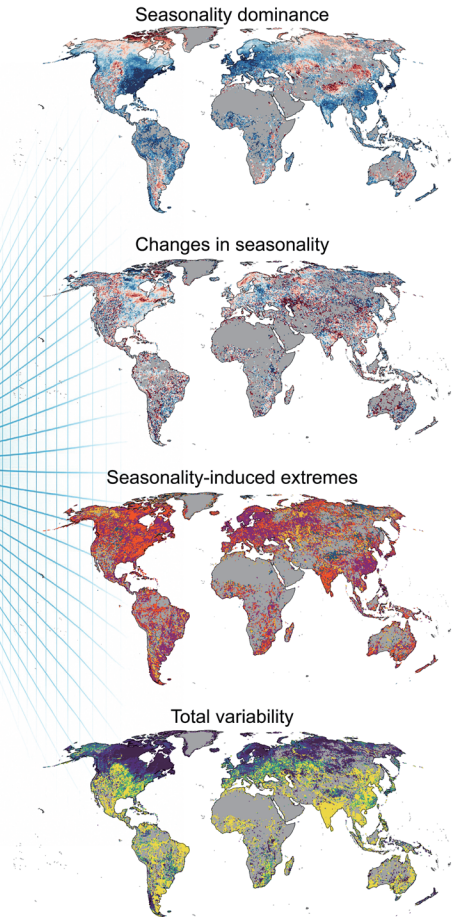
Lakes are key components of the global hydrological cycle and ecosystems, profoundly influencing the carbon cycle, greenhouse gas emissions, and water resource availability. Lake surface extent changes over different time scales, including long-term trends, interannual variability, and seasonal changes. Although long-term trends have been extensively studied, systematic characterization of seasonal lake dynamics has been limited. Existing leading datasets, such as the Global Surface Water (GSW) dataset published in *Nature* by the European Commission's Joint Research Centre in 2016, have provided a valuable foundation for global lake studies. Nonetheless, they may have some limitations in fully representing spatiotemporal continuity and capturing fine-scale seasonal dynamics.

Professor Long's team developed a deep-learning-based spatiotemporal fusion framework to overcome these challenges. The framework integrates the advantages of MODIS's frequent observations and GSW's detailed spatial information. Using advanced computing resources, the team created the most comprehensive global lake surface dataset to date, featuring high spatiotemporal continuity (Fig. 1). The resulting dataset achieved high accuracy (user's accuracy of 93% and producer's accuracy of 96%) and notably reduced the missing data rate from 34% (in GSW) to 1.2%. This substantial improvement makes lake dynamics data more accessible and usable, facilitating stronger and more credible scientific research.

The study found that seasonality is the dominant factor driving lake-surface-extent dynamics in 59% of lakes that cover approximately 66% of total lake area globally (Fig. 2). Moreover, this seasonal pattern closely aligns with global population distribution—over 90% of the world's population resides in basins where more than half of the lakes are dominated by seasonality. This finding underscores the global-scale relationship between human activities and seasonal hydrological cycles, highlighting the increasing influence of seasonality-induced extremes and human regulation. Additionally, the research reveals that seasonal extreme events can rapidly intensify or reverse long-term trends in lake surface extent, threatening the adaptability of lake ecosystems and water security. These results provide a scientific basis for more accurate estimation of lake-related greenhouse gas emissions, protecting habitats, and developing effective strategies for managing extreme hydrological events.

These findings represent a major advancement in scientific understanding and significantly enhance the practical integration of remote-sensing big data with artificial intelligence. By overcoming the longstanding challenge of balancing spatial resolution with temporal frequency in remote sensing hydrology, this research transforms global lake monitoring from annual static observations to precise and dynamic analyses.

The study, titled "Global dominance of seasonality in shaping lake-surface-extent dynamics", was published in *Nature* on May 28.
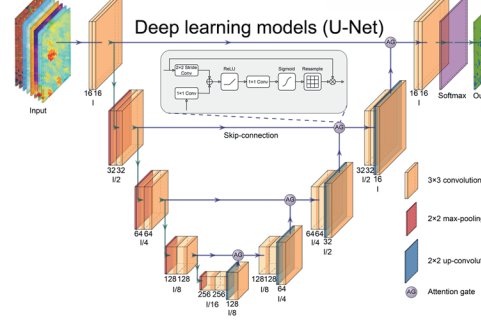
Fig. 1: Continuous and high-resolution monitoring of approximately 1.4 million global lakes achieved through deep-learning-based spatiotemporal fusion of multi-source satellite data
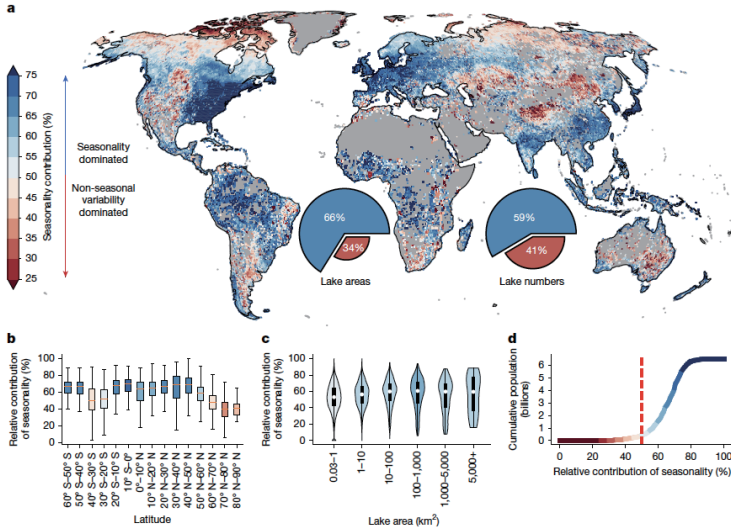

Fig. 2: Seasonality dominates lake-surface-extent dynamics of approximately 1.4 million lakes worldwide

TSINGHUA COMMUNITY

TSINGHUA NEWSLETTER

Tsinghua team wins first place at ASPLOS 2025 / EuroSys 2025 contest

A team from the Storage Research Group at Tsinghua University's Department of Computer Science and Technology won first place at the ASPLOS 2025 / EuroSys 2025 contest on an optimized Neuron Kernel Interface (NKI) Implementation of Llama 3.2 1B (Inference). The competition was held during the 30th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS) and the 20th ACM European Conference on Computer Systems (EuroSys) from March 30 to April 3 in Rotterdam, Netherlands.

The winning team is composed of Ph.D. students Shiwei Gao, Ruwen Fan, and their colleagues, supervised by Prof. Jiwu Shu and Youyou Lu from the Department of Computer Science and Technology. The team distinguished themselves among competitors from renowned institutions, including Cornell University, New York University, the University of Wisconsin-Madison, King Abdullah University of Science and Technology, Yonsei University, Peking University, and Shanghai Jiao Tong University.

The contest challenged teams to develop the fastest inference implementation of the Llama 3.2 1B model using Amazon Web Services' Neuron Kernel Interface (NKI) on a single Trainium1 (trn1) chip. Leveraging the AWS-provided NKI framework, the Tsinghua team implemented techniques such as computation tiling, instruction merging, and operator fusion, achieving a remarkable 1.1x performance improvement over Amazon's baseline implementation.

ASPLOS and EuroSys, both hosted by the Association for Computing Machinery (ACM) with over two decades of history, are premier conferences in computer architecture and systems.

Tsinghua's LHCb, ATLAS, and CMS teams share 2025 Breakthrough Prize in Fundamental Physics

The Breakthrough Prize Foundation announced the winners of the 2025 Breakthrough Prizes in Los Angeles, USA on April 5. Among the winners jointly awarded the 2025 Breakthrough Prize in Fundamental Physics were researchers from the Center for High Energy Physics at Tsinghua University participating in the LHCb, ATLAS, and CMS experiments. A total of 13,508 researchers from more than 70 countries are recognized for testing the modern theory of particle physics – the Standard Model – and other theories describing physics that might lie beyond it to high precision. This includes precisely measuring properties of the Higgs boson and elucidating the mechanism by which the Higgs field gives mass to elementary particles; probing extremely rare particle interactions, and exotic states of matter that existed in the first moments of the universe; discovering new hadrons and measuring subtle differences between matter and antimatter particles; and setting strong bounds on possibilities for new physics beyond the Standard Model, including dark matter, supersymmetry, and hidden extra dimensions. The winners represent four experimental collaborations at CERN's Large Hadron Collider (LHC) – ATLAS, CMS, ALICE and LHCb (Fig. 1).

Within these experiments, ATLAS and CMS are general-purpose experiments pursue the full program of exploration offered by the LHC's high-energy and high-intensity proton and ion beams. They synchronously announced the discovery of the Higgs boson in 2012 and continue to investigate its

Fig. 1. The 2025 Breakthrough Prize in Fundamental Physics is awarded to thousands of researchers representing four experimental collaborations – ATLAS, CMS, ALICE and LHCb.

properties. ALICE studies the quark-gluon plasma, a state of extremely hot and dense matter that existed in the first microseconds after the Big Bang. In addition, LHCb explores minute differences between matter and antimatter, violations of fundamental symmetries, and the complex spectra of composite particles ("hadrons") made of heavy and light quarks. By performing these extraordinarily precise and delicate tests, the LHC experiments have pushed the boundaries of fundamental physics to unprecedented limits.

Tsinghua University joined the LHCb experiment in 2000, ATLAS in 2014, and CMS in 2017 respectively, contributing significantly to the detector construction, maintenance, operation, and upgrades. Key contributions include the LHCb experiment's outer tracker, trigger electronics, next-generation

scintillating fiber tracker, and electromagnetic calorimeter; the ATLAS experiment's inner tracker; and the CMS experiment's GEM detector, High-Granularity calorimeter, and MIP timing detector.

In recent years, the LHC has discovered 77 new hadrons, marking a new chapter in hadron physics. Tsinghua teams co-discovered 15 of these (nearly 20%). The LHCb team from the Department of Engineering Physics co-discovered the first pentaquark, the first double-charmed baryon, and multiple tetraquark and pentaquark states. The CMS team from the Department of Physics co-discovered the fully-charmed tetraquark X(6600) and its triplet family, while the ATLAS team from the Department of Physics found the evidence of a new decay mode for the X(6900) tetraquark.

Additionally, Tsinghua's LHCb team contributed to the recent discovery of baryon CP violation. The ATLAS team explored Higgs decays involving flavor-changing neutral currents (e.g., H tt), the CP properties of the Higgs boson. The CMS team participated in measuring the H 4l decay, with members receiving the CMS Collaboration's 2021 Annual Award.

The award is shared by over 10,000 researchers in total, including approximately 80 current and former Tsinghua researchers. Current Tsinghua-affiliated laureates include:

LHCb Team (alphabetical order; * denotes faculty):

Xinchen Dai, Chenzhi Dongm, Guanghua Gong*, Xiaofan Hu, Youen Kang, Anfeng Li, Zhengchen Lian, Ge Ma, Fanjie Meng, Xiaofan Pan, Ning Qin, Yuxiang Song, Yinghua Tan, Da Yu Tou, Jianqiao Wang, Liangjun Xu, Ming Zeng*, Liming Zhang*, Yuge Zhang, Zhicai Zhang*, Xutao Zheng, Xianglei Zhu*.

ATLAS Team (alphabetical order; * denotes faculty):

Xin Chen*, Hui Li, Shaogang Peng, Yan Zhou.

CMS Team (alphabetical order; * denotes faculty):

Jinjing Gu, Zhen Hu*, Zhengchen Liang, Jinfeng Liu, Xining Wang, Yi Wang*, Hongwei Wen.

The Center for High Energy Physics at Tsinghua University is an academic center established by the university to conduct research in high-energy physics. It is primarily engaged in theoretical and experimental studies of particle physics and high-energy nuclear physics, as well as fostering academic exchanges both domestically and internationally.
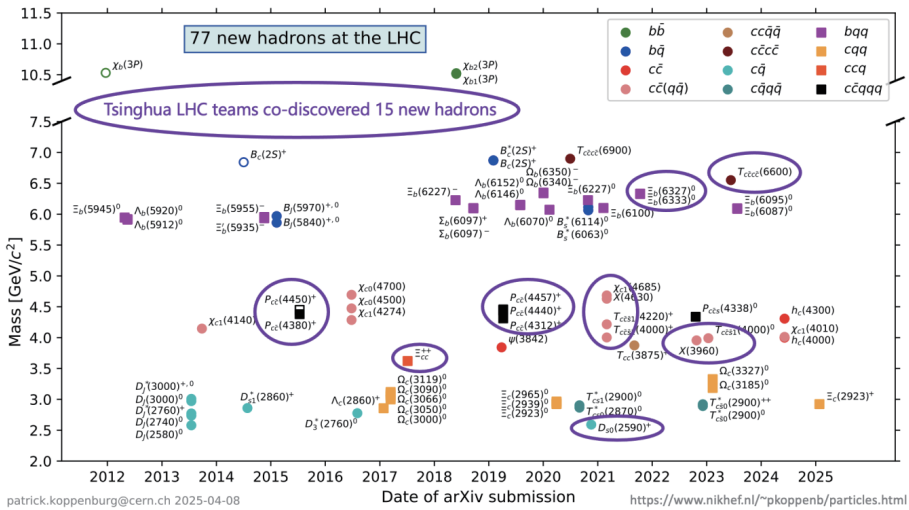
Fig. 2. 77 new hadrons have been discovered at the LHC, with 69 observed by the LHCb experiment and the remaining 8 by the ATLAS and CMS experiments. The LHCb team from the Department of Engineering Physics at Tsinghua University co-discovered 14 new hadrons, while the CMS team from the Department of Physics at Tsinghua University co-discovered one new hadron.

Tsinghua Professor Wang Xiaoyun receives 2025 L'Oréal-UNESCO For Women in Science International Award

On May 26, UNESCO officially announced the five international laureates of the 2025 L'Oréal-UNESCO For Women in Science International Awards, recognizing their pioneering contributions to physical sciences, mathematics, and computer science. Among them is Professor Wang Xiaoyun, who holds the Chen-Ning Yang Professorship at Tsinghua's Institute for Advanced Study and is also a member of the Chinese Academy of Sciences.

Set up in 1998, the L'Oréal-UNESCO For Women in Science International Awards honor five outstanding women scientists every year from the following five regions of the world: Africa and the Arab States, Asia and the Pacific, Europe, Latin America and the Caribbean, and North America.

Wang Xiaoyun, second from right, talks with her students.

Wang is rewarded for her significant contribution to cryptography and cryptographic mathematics, critical for secure data communication and storage, according to the UNESCO announcement.

Her breakthrough work showed essential flaws in hash functions, which are widely used in communication protocols and led to the invention of the new hash function standards. Today, these standards are used for bank cards, computer passwords, and e-commerce.

The visibility of her revolutionary work has encouraged many female students to pursue a research career in mathematics and network security.

Wang is the ninth Chinese scientist to receive this award since its inception, and the third Chinese female scientist to be honored in the past four years.

The other four award winners this year are Professor Priscilla Baker from the Department of Chemistry at the University of the Western Cape in South Africa; Professor Claudia Felser, Director and Scientific Member of the Max Planck Institute for Chemical Physics of Solids in Germany; Professor María Teresa Dova from the Department of Physics at the Faculty of Exact Sciences, National University of La Plata in Argentina; and Distinguished Professor Emerita Barbara Finlayson-Pitts from the Department of Chemistry at the University of California, Irvine in the United States.

The laureates were selected from a pool of 466 nominees through a rigorous evaluation process conducted by an independent jury. The winning researchers will be honored at a ceremony on June 12 at the UNESCO Headquarters in Paris.

Tsinghua's Student Cluster Team claims championship at ISC25

The Tsinghua University Student Cluster Team emerged victorious at the ISC 2025 Student Cluster Competition after securing the overall championship and the Highest LINPACK Benchmark Score award. This marks Tsinghua's 19th win across the three major international student supercomputing competitions and their 8th championship in the ISC competition since its inception in 2012. The competition was held at the Congress Center Hamburg, Germany.

The ISC25 competition challenged teams to build and optimize computer clusters under a 6-kilowatt power constraint. The tasks included running benchmark programs such as LINPACK, HPCG, and IO500, as well as scientific applications like the earthquake simulation software SeisSol, the post-training of large language model Llama, the computational fluid dynamics software code_saturne, and a molecular dynamics simulation application LAMMPS, which is a secret application announced on-site.

Facing technical challenges and jet lag, the Tsinghua team demonstrated exceptional system expertise, teamwork, and adaptability. They strategically configured a 4-node, 12-GPU cluster, achieving a record-breaking 340 TFLOPS (teraflops) in the LINPACK benchmark, securing first place in that category and setting a new competition record.

The ISC25 competition, co-organized by the HPC-AI Advisory Council and ISC Group, stands as one of the world's top three student supercomputing contests alongside SC and ASC, featuring 10 teams from 10 countries or regions in the in-person finals.

The Tsinghua team consisted of six undergraduate students: Yuqing Yang, Shuangyu Li, Jiaxin Lv from the Department of Computer Science and Technology, and Kai Yang, Chaopeng Jia, and Yang Zhang from Zhili College. An additional three students Zhangqiao Yue, Shi Chengyu, and Yucheng Wang participated in the training. The team was instructed by Wentao Han, Yuyang Jin, and Professor Jidong Zhai, with technical support from doctoral students Runqing Zhang, Jingbo Shan, and Shengqi Chen from the Institute of High-Performance Computing.

DIVERSE CAMPUS

TSINGHUA NEWSLETTER

2025 Tsinghua University Campus Marathon Held

Tsinghua University Campus Marathon was held on April 20. Over 3,000 faculty, students, and alumni ran together in the gentle spring breeze, experiencing Tsinghua's sports culture and carrying forward the spirit of Tsinghua athletics.

The Tsinghua University Campus Marathon has been successfully held ten times since its inception in 2015.

Tsinghua's 43rd "Challenge Cup" Exhibition: A Spotlight on Innovation
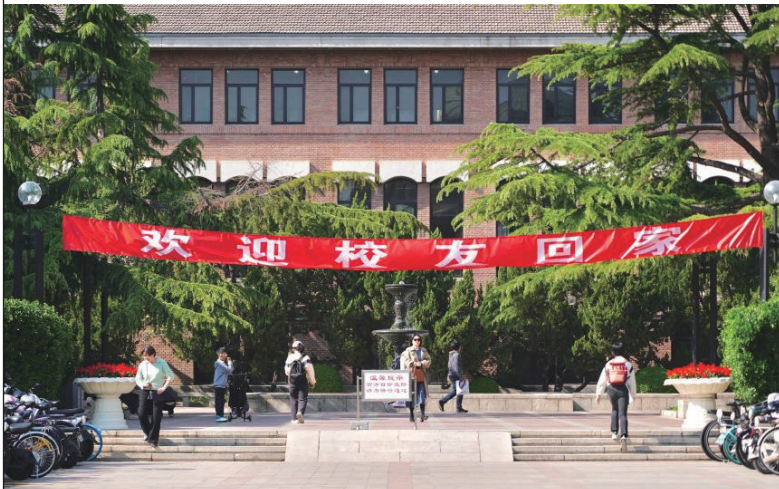
From April 26 to 27, the 43rd "Challenge Cup" Student Extracurricular Academic Science and Technology Exhibition took place at Tsinghua University, showcasing innovative works by Tsinghua students in a range of cutting-edge fields.
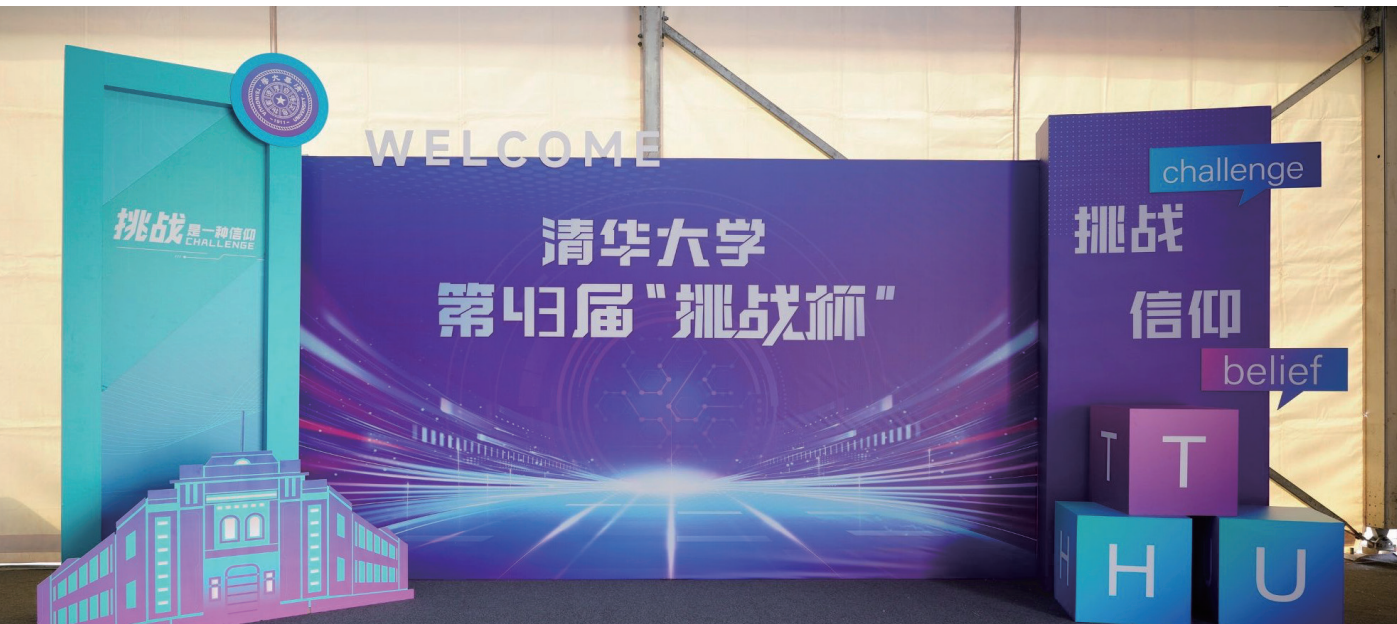
Photos Courtesy of Hu Liang, Wen Yanlong, and Xia Yi

114th Anniversary of Tsinghua

Tsinghua University hosted alumni from around the world for a weekend of reunions and festivities on April 27. The event featured various exhibitions, performances, and activities organized by different departments of the University.

Where cultures meet:
A 2025 Global Village recap

Last weekend, we welcomed the long-awaited annual Global Village! Nearly 8000 participants gathered in the Zijing Sports Field, and the atmosphere was filled with excitement and enthusiasm! With the theme of "Echoes of the World," participants were able to embrace diversity and build bonds across cultures.

This festival has become one of Tsinghua's largest and most popular cross-cultural events since its launch in 2009. Each year, it attracts over 3,000 Chinese and international faculty, students, and guests to celebrate global civilizations and build friendships.

This year's Global Village featured 3 main sectors,

which included Exhibition Booths, the Main Stage, and Interactive Booths, each delivering a one-of-a-kind visitor experience.

The Main Stage covered lively performances ranging from hitting the 24 Festive Drums performance to Indonesia's blend of modern and traditional dance to deeply resonating music. "From Colombia, with Love" definitely brought the audience to experience the Colombian enthusiasm. Additionally, the Korean martial arts performance showcased strength yet with a smooth flow. Every performance created a mesmerizing scene for all who participated, further reflecting this year's theme, "Echoes of the World", embracing cultural diversity.

Photos Courtesy of Huo Yuandong, Zhang Wenyu, Hu Liang, Fei Hanlu, Du Kunlin, Zhang Wenyu, and Wen Yanlong

60 different exhibition booths, 36 nations were brought together, each bringing a sense of home from where they come from, introducing the rich diversity present on campus.

The Indonesian booth had a variety of specialties ranging from Soto Ayam (soup) to Pisang Ijo (dessert), sweet to savory, you name it! However, instead of just a stationary booth, there was a portable one - Gerobak, a moving cart you will see on every Indonesian Street. Craving for something sweet? The German booth has got you covered! With gummy bears and chocolate, visitors got a chance to relive childhood happiness.

Other than Asian Delights, dances were also a hit in the shared space of Uzbekistan, Kazakhstan, Kyrgyzstan! The groove attracted engagement from audiences, whether you're a pro or a newbie the sense of cross culture took over and livened up the atmosphere! In for some challenge? The Nigerian booth introduced "Ayo Olopon," a board game that tests strategizing skills and quick thinking.

Last but not least, the China Avenue! From intangible cultural heritage crafts to calming musical instruments, everyone had a chance to experience the Chinese culture! Performances like the Lion Dance have definitely added a one-of-a-kind experience to the event!

"Where cultures meet, friendships thrive." Come explore the world in Tsinghua's Global Village—where every handshake, every smile, and every bite bridges continents.

Tsinghua wins 16th consecutive title in track and field

The 63rd Beijing University Students Track and Field Games, recently held at Beijing Information Science & Technology University, witnessed four days of fierce competition among 87 universities.

The Tsinghua University Track and Field team secured championships in the men's, women's, and team total score categories, with a remarkable total of 493 points-24 gold, 18 silver and nine bronze medals. Their consistent excellence secured their 16th consecutive title. In addition, they were awarded the Sportsmanship Award.

The annual competition, also the largest student sports event in Beijing, has been held for 63 years, with Tsinghua securing the team championship on 42 occasions.
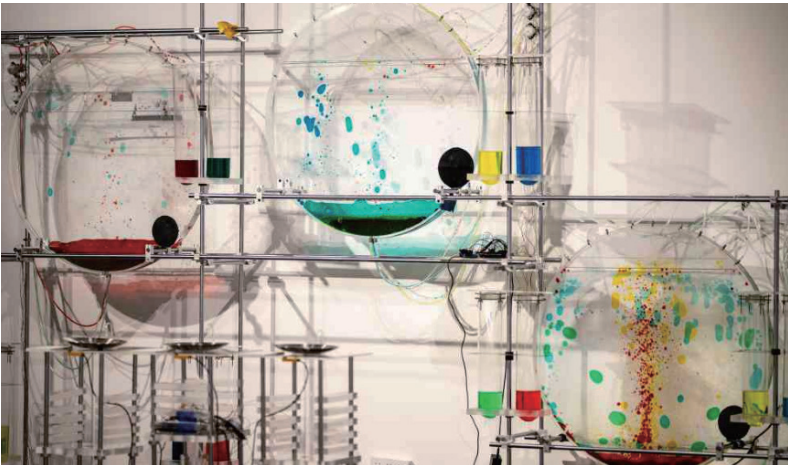
2025 Graduation Exhibition of the Academy of Arts & Design held

The Class of 2025 Graduation Exhibition of the Academy of Arts & Design, Tsinghua University, is being held at the Tsinghua University Art Museum this summer. The exhibition showcases the works of over 170 postgraduate students and more than 260 undergraduates.
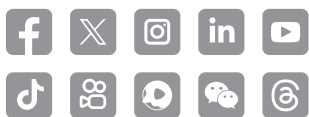
For the first time, the graduation works are being presented in a national first-class museum, fully open to the public. The postgraduate exhibition ran from May 24 to June 1, while the undergraduate exhibition is taking place from June 7 to 19.

清華大学
Tsinghua University