



Newsletter

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National Science and Technology Workers' Day 2022

CAST holds a symposium to celebrate National Science and Technology Workers' Day

On May 30, 2022, the China Association for Science and Technology (CAST) held a symposium during the celebration of the 6th National Science and Technology Workers' Day.

Wan Gang, Vice Chairman of the National Committee of the Chinese People's Political Consultative Conference (CPPCC) and President of CAST, attended the symposium and delivered a speech. He paid tribute to Chinese science and technology workers and applauded their

efforts and contributions in combating the COVID-19 pandemic as well as in promoting economic development, social stability, and national security. He also expressed hope that they would continue to use "innovation" as an engine for development, "science and technology" as a powerful tool to overcome difficulties, and scale new heights through independent innovation.

CAST launches new book series on China's carbon peak and carbon neutrality goals in celebration of National Science and Technology Workers' Day

On May 30, 2022, as part of the celebrations for the National Sci-

ence and Technology Workers' Day 2022, the China Association for Science and Technology (CAST) officially launched a new book series themed around China's carbon peaking and neutrality goals.

The series, with a foreword by Wan Gang, Vice Chairman of the National Committee of the CPPCC and President of CAST, spans a wide range of key areas in global climate change, energy, transportation, steel and non-ferrous metals, petrochemicals and chemicals, construction and building materials, carbon sinks, and carbon neutrality.

The series draws on the wisdom of Chinese academicians, experts, and science and technology work-

ers to present the latest achievements in research on “carbon peaking and neutrality”. The innovative, systematic, and lucid style adopted by the series would provide a fun read for those interested in these strategic key issues. The whole series is expected to come out by the end of 2023.

CAST joins *China Daily* to issue a special supplement to pay tribute to Chinese science and technology workers

On May 30, 2022, the China Association for Science and Technology (CAST) joined *China Daily* to launch a specially designed eight-page supplement titled “Ten Years in Retrospect: Salute Notable Pioneers in

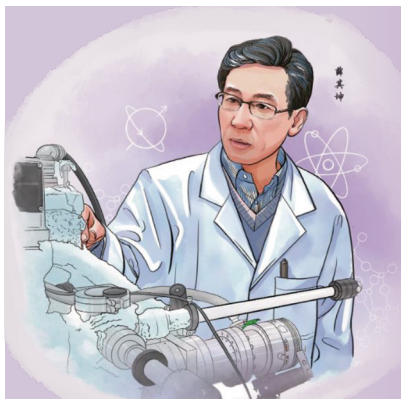
Science and Technology” to mark the 6th National Science and Technology Workers’ Day. The English version of the supplement was launched online simultaneously.

The supplement reviewed breakthroughs and achievements China has made in science and technology in recent years. Through a set of figures and charts, it traced the progress CAST has achieved in advancing scientific development, promoting science popularization, and building think tanks over the past decade.

The supplement also profiled nine noted Chinese scientists and engineers: Xue Qikun, Cai Tao, Bao Xinhe, Liang Jianying, Li Deren, Li Yu,

Tu Youyou, Wang Yingjun, and Zhu Tao. All of them are academicians. Each has pushed global scientific frontiers, kindled economic growth, fulfilled the country’s crucial needs, or safeguarded public health. Together, they represent a diverse and inclusive group portrait of China’s scientific and engineering community.

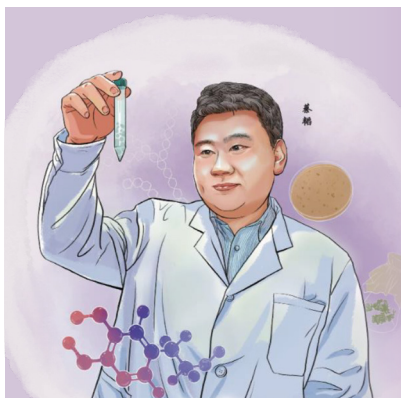
To learn more, please read the supplement on the back of this newsletter.



Xue Qikun

A world-renowned experimental physicist in condensed matter physics, superconductors and topological insulators. He is an academicien of the Chinese Academy of Sciences and a fellow of the American Physical Society.

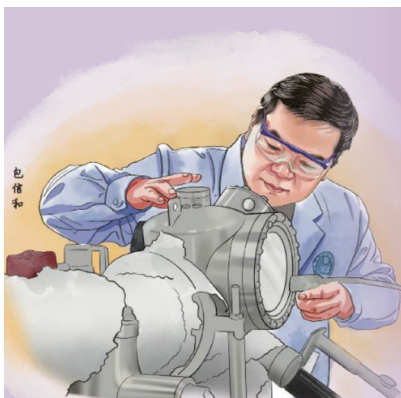
Xue received the first prize of the 2018 State Natural Science Award for his discovery of the quantum anomalous Hall effect in a lab experiment. He became the first Chinese citizen to win the Fritz London Memorial Prize in 2020.



Cai Tao

An associate research fellow at the Tianjin Institute of Industrial Biotechnology of the Chinese Academy of Sciences. In 2021, a team consisting of Cai and the institute's director Ma Yanhe became the first in the world to artificially synthesize starch from carbon dioxide in a lab experiment.

The new technique was published in the journal Science and would revolutionize agriculture if proven to be economically viable at the industrial level.



Bao Xinhe

A world-renowned chemical physicist who specializes in basic research on catalysts and its creation, process and industrial applications. He is an academicien at the Chinese Academy of Sciences, the Academy of Sciences for the Developing World and an honorary fellow of the Royal Society of Chemistry in the United Kingdom.

He received the first prize of the 2020 State Natural Science Award, China's highest academic accolade for basic sciences, for his groundbreaking work on "nanoconfined catalysis".



Liang Jianying

The vice-president and chief engineer of China Railway Rolling Stock Corporation Qingdao Sifang, the company behind the Hexie and Fuxing bullet trains, which have propelled China to the position of a global powerhouse in high-speed trains.

Liang and her team received the Special Prize of the 2015 National Science and Technology Progress Award for developing the Beijing-Shanghai high-speed railway network.



Li Deren

A world-renowned scientist in photogrammetry and remote sensing. He is an academicien of the Chinese Academy of Sciences and the Chinese Academy of Engineering, and an honorary member of the International Society for Photogrammetry and Remote Sensing.

He has won numerous prestigious awards, including the first prize of the 2020 State Scientific and Technological Progress Award and the ISPRS Brock Gold Medal Award for his outstanding contributions to photogrammetry. He has supervised over 200 doctoral students, and is one of the key contributors that transformed China into a global geomatics powerhouse.



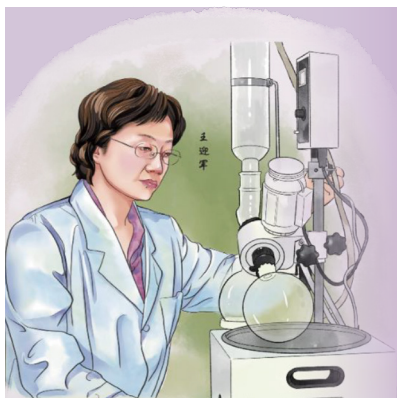
Li Yu

A world-renowned mycologist who specializes in engineering and industrialization of fungi science and edible fungi. He is an academicien of the Chinese Academy of Engineering and the president of the International Society of Medicinal Mushrooms. His research has made substantial contribution to China's poverty alleviation effort, lifting hundreds of villages out of absolute poverty. In 2021, he received the honorary title of National Poverty Alleviation Models for his success in poverty eradication.



Tu Youyou

A Chinese pharmaceutical chemist whose discovery of the malaria drug artemisinin has saved millions of lives across the globe. She received the 2015 Nobel Prize in physiology or medicine, becoming the first Chinese to win this award. She is also the recipient of the 2016 National Science and Technology Progress Award, China's highest honor for a scientist, and the Medal of the Republic, China's highest state honor.



Wang Yingjun

An academician of the Chinese Academy of Engineering and the director of the National Engineering Research Center for Tissue Restoration and Reconstruction.

She is a noted biomedical material expert who has developed original breakthroughs and products in bone, teeth, tissue engineering and regenerative medical materials.



Zhu Tao

A vaccine expert and the chief scientist at CanSino Biologics. He is a member of the National Committee of the Chinese People's Political Consultative Conference, China's highest political advisory body.

Zhu is one of the key scientists behind Convidecia, a single-dose adenovirus-based viral vector vaccine for COVID-19, which has been listed by the WHO for emergency use.

CAST

Zhang Yuzhuo attends the press conference series “China in the Past Decade”



The “China in the Past Decade” press conference series.

On the morning of June 6, 2022, Zhang Yuzhuo, Executive Vice President and Chief Executive Secretary of the Secretariat of CAST, briefed the media on China’s progress in science and technology alongside Wang Zhigang, Minister of Science and Technology of China, Hou Jianguo, President of the Chinese Academy of Sciences (CAS), Li Xiaohong, President of the Chinese Academy of Engineering (CAE), and Li Jinghai, Director of the National Natural Science Foundation of China (NSFC). The press conference was part of a series of events organized by the Publicity Department of the Communist Party of China (CPC) Central Committee under the theme “China in the Past Decade.”

Zhang Yuzhuo said at the press conference that

the science literacy rate of Chinese people had increased to 10.56% in 2020, almost double the number of 2015. In the past decade, China has seen rapid growth of modern science and technology museums featuring distinct themes, with offline visitors surpassing 850 million. The number of offline museums has risen from 118 in 2012 to the current 408, and 1,112 popular-science sites have been built in China’s rural middle schools.

Over 30,000 science and technology members vote for the CAST scientific and engineering challenges of 2022

The China Association for Science and Technology (CAST)

recently organized Chinese science and technology communities to vote for China's top ten scientific, engineering, and industrial challenges in 2022.

The initiative received an enthusiastic response from 115 national societies, alliances and unions, universities, research institutions, and leading technology companies as well as from 75 overseas organizations and experts. A total of 642 entries were submitted in the field of frontier science, engineering technology, and industrial technology.

Voting channels were open from April 28 to May 20. When it closed, a total of 91,672 votes were cast by 30,245 named science and technology workers, a

new record.

Based on preliminary statistics, this year's favorites were concentrated in the fields of agricultural science and technology (including food technology), information technology, earth science (including deep earth and deep sea), and life and health (including medicine).

All entries were categorized to represent scientific advancements, technological innovation, and industrial development. CAST organized an evaluation committee to select 10 from each category.

UN STI Forum 2022 side event “Open Science Promoted Quality Graduate Education in Global South” held online



7th UN STI Forum side event “Open Science Promoted Quality Graduate Education in Global South” held online

On May 4, 2022, the 7th UN STI Forum Side Event entitled “Open Science Promoted Quality Graduate Education in Global South”. The side



The six speakers held lively discussions online at the forum.

event was the first of a series of events jointly organized by the CAST UN Consultative Committee on Open Science and Global Partnerships (CCOS/CAST) and the Chinese Women Scientists Association. Academician Yang Wei, Honorary Member of CAST, Chair of CCOS, and Treasurer of the World Academy of Sciences (TWAS), chaired the forum.

Focusing on “Quality Education (SDG4)” and “Gender Equality (SDG5)” and other UN Sustainable Development Goals (SDGs), the six speakers each presented on topics ranging from “Pilot programs: Graduate education under South-to-South collaboration,” “Open science promoted (online and hybrid) quality education,” “Digital inclusiveness for countries in Global South,” and “Gender equality in graduate education and professional cultivation.” They also held in-depth discussions on ways to develop high-quality graduate education in the Global South. The side event drew participa-

tion from over 3,300 people worldwide via live-streaming platforms.

Chinese team wins first place in the 22nd Asian Physics Olympiad (APhO-2022)

China won first place at the 22nd Asian Physics Olympiad (APhO – 2022), which concluded on May 31, 2022. The eight Chinese team members took home seven gold and one silver medal, securing the team’s first place in the group score.

The Asian Physics Olympiad (APhO) is the most influential physics competition for pre-university students from Asian and Oceanian countries. It aims to promote exchanges and

cooperation in physics education among Asian countries and regions, enhance connection and understanding, and inspire talented young people to achieve excellence. China has organized teams to compete in the annual event since its inception in 2000. The Children and Youth Science Center (CYSC) of the China Association for Science and Technology (CAST) and the Chinese Physical Society (CPS) jointly selected outstanding Chinese middle school students who have a keen interest in physics to compete with their Asian peers to nurture intelligence and make friends.



China's team ranks first at the 22nd Asian Physics Olympiad

Local associations for science and technology

Work mobilization meeting for innovation and entrepreneurship competition and promotion held online

On May 17, 2022, the work mobilization meeting for the 2022 China (Changsha) Overseas Talent Innovation and Entrepreneurship Competition & International Promotion for Innovation China was held online.

The meeting voted to hold the launch ceremony of the competition on the sidelines of the CAST 24th Annual Conference. Following a preliminary round and a finals round, the grand final will be held in Hunan Province's capital city of Changsha at the end of the year. The International Promotion for the Innovation China tour will also kick off in 10 cities in Hunan Province during this period.



The 2022 China (Changsha) Overseas Talent Innovation and Entrepreneurship Competition & International Promotion for the Innovation China work mobilization meeting

Fujian Association for Science and Technology holds a preparatory meeting for the 2022 Cross-Straits Science and Technology Experts Forum

On May 18, 2022, the Fujian Association for Science and Technology held a preparatory meeting for the 2022 Cross-Straits Science and Technology Ex-

perts Forum, which is set to be held in Fujian from June to September, in hybrid mode, under the theme “New Era for Cross-Straits Relations, New Integration of Science and Technology.”

The forum will focus on serving Fujian’s digital economy, marine economy, green economy, and tourism economy and building a community of health

for all. In addition to the main venue, the forum will set up 10 side venues. It is expected to draw more than 2,000 experts and scholars from across the Taiwan Strait in the fields of digital science, marine science, ecology, energy, and health to participate and exchange ideas.

The 9th Guangdong Youth Science and Tech-

nology Tangram Puzzle Competition officially launched in Guangzhou



Guangzhou Chaotian Primary School receives free Tangram puzzles



Students at Guangzhou Chaotian Primary School learning to solve tangram puzzles.

On June 2, 2022, the Guangdong Association for Science and Technology joined the Guangdong Provincial Committee for the Wellbeing of the Youth, the Guangdong Provincial As-

sociation of Optics and Optoelectronics, and the Guangdong Service Center of the National Tangram Puzzle Competition to officially launch the 9th Guangdong Youth Science and Technology Tangram Puzzle Competition at a special ceremony at Guangzhou Chaotian Primary School in Yuexiu District.

On behalf of the organizers, Liang Hui, executive director of the Guangdong Provincial Committee for the Wellbeing of the Youth and director of the organizing committee of the event, delivered a speech at the launch ceremony. Wang Yuxue, director of the Guangdong Provincial Education System Committee for the Wellbeing of the Youth, joined Chen

Jielun, secretary-general of the Guangdong Foundation of Promoting Science and Technology (GFPST), to present free tangram puzzles to Chaotian Primary School.

Primary school students in Guangdong, Hong Kong, and Macao will later be trained to create tangram designs for the competition to deepen their understanding of the region and inspire them to participate in the construction of the Guangdong-Hong Kong-Macao Greater Bay Area.

National societies

2022 IEEE 5th International Electrical and Energy Conference (CIEEC 2022) held

From May 27 to 29, 2022, the 2022 IEEE 5th International Electrical and Energy Conference (CIEEC 2022) was held in Nanjing in hybrid mode. Yang Qingxin, President of the China Electrotechnical Society (CES), joined the Executive Vice-Chair of the IEEE China Council and other leaders in attending the conference and delivering speeches. The conference drew 2,212 registered participants and was joined by 150 people attending on-site in addition to 12,035 watching the live-streamed event online.

The conference received a total of 1,163 papers from around the world and accepted 891 papers and 51 abstracts following strict evaluations by more than 300 pro-

fessors and industry experts. Between the opening and closing ceremonies, the two-and-a-half-day event featured a plenary keynote speaker session, several themed workshops, a young scholars' forum, an industrial forum, and 70 parallel sessions representing 19 disciplines in electrical engineering and energy science and technology.

CAST Consultative Committee on UN Information Technology (CCIT) crowned Champion of WSIS Prizes 2021

On June 1, 2022, the UN World Summit on the Information Society (WSIS) Prizes Award Ceremony was held in Geneva, Switzerland. The Champion project in the e-Science Cat-

egory was awarded to “COVID-19 Knowledge and Data Hub,” a project jointly carried out by the CAST Consultative Committee on UN Information Technology (CCIT), the CAST Consultative Committee on Life Sciences and Human Health (CCLH), and the Institute of Geographical Sciences and Natural Resources Research (IGSNRR) of the Chinese Academy of Sciences (CAS) over a total of 1,270 submissions.

The project was supported by more than 100 experts and scholars from 14 teams across China. They used digital technologies such as big data and artificial intelligence to build a COVID-19 journal article database from more than 170 journals for the World Health Organization. The initiative showcased China’s scientific and technological contributions to the global fight against the COVID-19 pandemic and the new successes of China’s diplomatic efforts.



On behalf of CCIT, Zhang Wenjian, Assistant Secretary-General of the World Meteorological Organization (WMO), received the award certificate from Zhao Houlin, Secretary-General of the International Telecommunication Union (ITU), at the ceremony.

Jiang Tianzai, Executive Director of the Chinese Neuroscience Society (CNS) is elected President of the Organization for Human Brain Mapping (OHBM)

On June 2, 2022, the Organization for Human Brain Mapping (OHBM) officially announced that Jiang Tianzai, Executive Director of the Chinese Neuroscience Society (CNS) and chair of CNS’s Consciousness and Disorders of Consciousness Sub-Committee, had been elected OHBM Council Chair.

The Organization for Human Brain Mapping (OHBM) is an international organization dedicated to advancing understanding of the anatomical and func-

tional organization of the human brain using neuroimaging. A primary function of the organization is to provide educational forums for the exchange of up-to-the-minute and groundbreaking research across neuroimaging methods and applications. OHBM also works to bring scientists from various backgrounds together to discuss challenges facing brain science research and to provide more educational opportunities for young scholars and students.

China releases list of top 10 scientific and technological advances in ecology and environment in 2021

On June 5, 2022, World Environment Day, the CAST Alli-

ance for Ecological and Environmental Sciences and Industry (the “Alliance”) held an online press conference in Beijing to announce China’s top ten scientific and technological advances in ecology and environment in 2021.

Zhang Yuanhang, Chair of the Alliance, Director of the Alliance’s Academic Exchange Committee, and an academician with the Chinese Academy of Engineering (CAE), briefed the media on methods used to compile the list before unveiling China’s top ten scientific and technological advances in ecology and environment in 2021. Afterward, representatives of each selected project summarized their research. The list included:

China’s hyperspectral satellite remote sensing technology of trace gases and its application

Air pollution full-component exposure features and its health effect mechanism

Key R&D technologies for novel functional engineered nanomaterials and their environmental applications

A study on the forces behind spatial and temporal variations of air pollution

Key technologies and standards used in biodiversity monitoring network in China

Efficient control technologies used in ammonia emissions in agriculture and animal husbandry

Satellite remote sensing carbon accounting system and China's carbon satellite global high precision carbon products

Chemical principles of rapid formation of sulfate in atmospheric heavy pollution

Key technologies used in sludge treatment and disposal and their applications

How China's arid regions regulate their ecological structure and functions in response to environmental gradients

The CAST Alliance for Ecological and Environmental Sciences and Industry was formed in September 2018 by 11 national societies in the fields of environment, meteorology, geology, ge-

ography, ocean, ecology, water conservancy, renewable energy, agriculture, forestry, and soil in collaboration with several innovative leading companies and well-known institutions. Since 2019, it has organized the recommendation and selection of China's annual top ten scientific and technological advances in ecology and environment.

S&T News

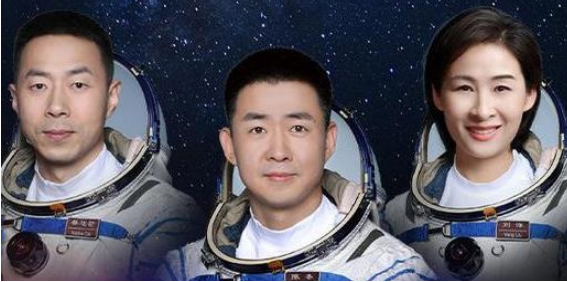
China launches the Shenzhou-14 crewed spacecraft and sends three astronauts to the core module of China's space station

On June 5, 2022, a Long March-2F Y14

carrier rocket lifted the Shenzhou-14 crewed spacecraft off at 10:44 local time from the Jiuquan Satellite Launch Center in China's northwestern Gobi Desert. About 577 seconds after lift-off, the spacecraft separated from the carrier rocket and entered the predetermined orbit. The crew reported being in good condition, making the launch a complete success.

At 17:42 local time, the Shenzhou-14 spacecraft successfully docked with the nadir, or Earth-facing port of the Tianhe core module, with the entire process taking about 7 hours. The crew then entered the orbital module from the return module. At 20:50, all three astronauts entered the core module of the Tiangong space station.

The three astronauts will stay in orbit for six months and help maintain the function of the space station. They will conduct spacewalks, use Tianhe's robotic arm to reposition its new modules, and carry out a series of space science and technology experiments.



The three Chinese astronauts aboard the Shenzhou-14 spacecraft

China aims to build a climate-resilient society by 2035

China's Ministry of Ecology and Environment and 16 other departments recently released the National Adaptation Strategy for Climate Change 2035 ("Adaptation Strategy 2035"). The Strategy provides a comprehensive plan for China's adaptation to climate change by 2035.

The Adaptation Strategy 2035 specifies that by 2035, China will follow the principles of active and scientific adaptation and prevention as well as joint governance of different sectors to design and implement climate adaptive measures. It aims to raise China's climate monitoring and early warning systems to international advanced

levels by 2035, build a nationwide system to monitor and assess climate change-related risks, develop effective prevention and response to major climate-related disasters, and arrange coordinated technical systems and standards. These measures will substantially improve China's capabilities to prevent and control natural disasters and develop China as a "climate-resilient society" by 2035.

Chinese scientists make breakthrough discovery in the field of two-dimensional ferroelectric materials

Professor Ji Wei and his team at the Physics Department of the Renmin University of China recently made

an important breakthrough in low-dimensional polarized materials in collaboration with teams led by Professor Shu Ping Lau at Hong Kong Polytechnic University and Professor Manish Chhowalla at Cambridge University. With theoretical calculations and experimental measurements, they discovered out-of-plane (OOP) ferroelectricity and piezoelectricity in the untwisted two-dimensional heterobilayers that were only 6 atomic layers thick for the first time. The findings expanded the family of ferroelectric materials, deepened understanding of the physical properties of two-dimensional ferroelectric materials, and demonstrated their information storage potential. The research was published in the

world's preeminent journal *Science* on May 27, 2022, under the title "Ferroelectricity in Untwisted Heterobilayers of Transition Metal Dichalcogenides."

In October 2020, through theoretical and empirical methods, Ji Wei and his partners also discovered the world's first single-molecule electret called Gd@C82 by compressing its physical size to the extreme single-molecule level of 1 nm (one billionth of a meter) 100 years after the electret was synthesized by humans.

Shanghai Astronomical Observatory makes breakthrough discovery of first repetitive fast radio burst

using the "Sky Eye"

Professor Yu Wenfei and his team at the Shanghai Astronomical Observatory (SHAO) of the Chinese Academy of Sciences (CAS) recently made a breakthrough discovery in locating a Fast Radio Burst (FRB) and its radio counterpart in collaboration with international partners. Using China's Five-hundred-meter Aperture Spherical radio Telescope (FAST), also known as the "Sky Eye," they discovered an FRB (FRB 20190520B as they call it), which became the second out of the 500 FRBs identified so far to have a bright and dense Persistent Radio Source (PRS). It shows a more extreme near-source

electromagnetic environment than the first but has no UV or X-ray short-time burst counterparts.

The findings show a possible link among the activeness of

repeated fast radio bursts, local extreme electromagnetic environment, and the high luminosity of PRS. The research also provides important clues for astronomers to solve frontier scientific

inquiries such as the origin and evolution of fast radio bursts. It was published in the prestigious journal *Nature* on June 9, 2022.

CAST is the largest non-governmental organization of scientific and technological professionals in the world. Through its 211 member societies and local branches all over the country, CAST maintains close ties with millions of Chinese scientists, engineers, and other professionals working in fields of science and technology.

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