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CAST Newsletter

Headlines

◎ Chinese President Xi Jinping sends a congratulatory letter to TWAS 16th General Conference

◎ *EurAsia Info* CEO reflects on the 20th National Congress of the Communist Party of China

◎ 2022 World Young Scientist Forum discusses new innovations in data intelligence-empowered healthcare technology

◎ 2022 Glass Language International Contemporary Glass Art Exhibition opens in Beijing

◎ 5th WLA Forum opens in Shanghai

◎ China's Mengtian Laboratory Module successfully launched into space

Article Highlights

Chinese President Xi Jinping sends a congratulatory letter to TWAS 16th General Conference

On November 21, 2022, Chinese President Xi Jinping sent a congratulatory letter to the 16th General Conference of the World Academy of Sciences for the advancement of science in developing countries (TWAS).

Photo credit: CAST

In the letter, President Xi Jinping said that China attaches great importance to the development of basic science and is willing to work with other countries in the world, including developing countries, to further enhance the openness, trust, and cooperation of the international scientific community, and benefit people of all countries through the prosperous development of science. China is willing to work with all countries to contribute to advancing the Global Development Initiative, implementing the UN 2030 Agenda for Sustainable Development, and building a global community of shared future.

The event, hosted by TWAS and organized by Zhejiang University in collaboration with China Association for Science and Technology (CAST) and the Chinese Academy of Sciences (CAS), opened in Hangzhou, Zhejiang Province on November 21 under the theme "Basic Sciences for Evidence-based Decision-making and Sustainable Development in the Global South".

(Source: Xinhua News Agency)

EurAsia Info CEO reflects on the 20th National Congress of the Communist Party of China

On October 16, 2022, the 20th National Congress of the Communist Party of China (CPC) opened at the Great Hall of the People in Beijing. Zhu Ailian was among those granted media access to the event. The CEO of EurAsia Info, the Switzerland-based

Chinese-English bilingual news magazine, shared her takeaways after watching the report delivered by General Secretary Xi Jinping at the congress.

The 20th CPC National Congress gives the world new confidence in China

Zhu viewed the 20th CPC National Congress as a milestone event that not only provides answers on China's sustained prosperity, but also gives the world new confidence in China's development. "I was impressed by the fact that General Secretary Xi made reference to the importance of 'people' more than 100 times in his report," said Zhu.

She credited the CPC's governing success to the support it receives from over 1.4 billion Chinese people. "This country is its people," said Xi. "The people are the country." CPC is deeply rooted in China. Without the CPC, China would not be the same as it is today, nor would it ever achieve its great rejuvenation.

"I think the convening of the 20th CPC National Congress has made Chinese people more confident and prouder of the country's achievements and more united around the CPC's missions and visions for the country," Zhu said.

China has achieved extraordinary growth in the past decade

"Over the past decade, the international community has seen China fulfill its responsibilities as a major country and how efficiently China gets things done," said Zhu. "More and more countries are interested in China's governance model and the practices adopted by the CPC to grow the economy, improve the people's livelihood, and root out corruption."

Zhu pointed out that as China became more integrated in globalization, the country became an important part of the global supply chain and a significant contributor to global economic growth. However, over the same period, the world has also seen profound changes, risks, and uncertainties. Many countries have gone into stagnation or decline, or face social unrest, wars, and political crises…

"As the international situation gets more complex amid new risks and challenges, China has still been able to maintain a stable pace of economic and social development. This proves that the political system and governance model that the CPC has adopted work for China," said Zhu.

China will write a new chapter of development in the new era

"The international community has shown

strong interest in the Belt and Road Initiative and the Global Development Initiative proposed by China," said Zhu on China's future direction. "If we take a macro and historical perspective, these initiatives are not only creating new avenues of growth, but also providing reference for countries going through various degrees of economic transition. I see that many developing countries today are keen on developing deeper and wider cooperation with China."

"We are very confident in China's future," she added. "China has remained open and friendly, as is expected of a major country. China has continued and will continue its foreign policy of maintaining world peace and common development and will remain firm in its commitment to building a global community of shared future. We have every reason to believe that after the Congress, China will become a more stable and prosperous nation. The peaceful development of China will benefit all people around the world. Chinese people will write a new chapter of development in the new era."

(Source: cn.chinadaily.com.cn)

CAST Events

2022 World Young Scientist Forum discusses new innovations in data intelligence-empowered healthcare technology

Opening ceremony of the WYSS 2022 International Forum on Comprehensive Health Care
(Photo credit: Official website of the 2022 World Young Scientist Summit)

On November 12, 2022, the 2022 World Young Scientist Summit (WYSS) opened in Wenzhou, Zhejiang Province. Jointly initiated and hosted by China Association for Science and Technology (CAST) and Zhejiang Provincial People's Government, the Summit organized multiple plenary events, includ-

ing the WYSS 2022 International Forum on Comprehensive Health Care held at Wenzhou Medical University under the theme "Changes and Opportunities in the Healthcare Industry in the Era of Artificial Intelligence". The participants of the forum held in-depth discussions on the opportunities and challenges in applying artificial intelligence, big data, the Internet of Things, and internet technologies to new drug research and development, medical health, and comprehensive healthcare industry.

(Source: *Science and Technology Daily*)

Artificial intelligence brings both opportunities and challenges to healthcare industry

At the Dialogue of the WYSS 2020 International Forum on Comprehensive Health Care, Li Xiaokun, a member of the Chinese Academy of Engineering (CAE) and President of Wenzhou Medical University, pointed out that AI technology will empower the prevention and treatment of chronic diseases. With AI's strengths in rapid data transmission, information integration, and efficient statistical analysis of a large number of samples, medical research will better reflect reality, unlock deeper mysteries of life, and boost human defense against diseases.

Dialogue held at the WYSS 2022 International Forum on Comprehensive Health Care (Photo credit: Science and Technology Daily)

Zheng Yuguo, also a CAE member, discussed opportunities brought by AI to drug manufacturing. He said that artificial intelligence will accelerate the integration of green manufacturing and intelligent manufacturing, improve the quality of health products, reduce production costs, and benefit the public.

With the rapid development of data, algorithms, and computing power, researchers will collect more data and make drug research and development more digital. This means AI will be used extensively in drug research and development. Hua Fengmao, chairman of China Finance Strategies Investment Holdings Limited (CFS), believed that artificial intelligence will significantly shorten the development cycle of innovative drugs and help make more efficient and

quality innovative drugs.

(Sources: *Science and Technology Daily/The Paper*)

WYSS 2022 International Forum on Comprehensive Health Care launches China's first national engineering research center on cell growth factors

The WYSS 2022 International Forum on Comprehensive Health Care culminated in the launch of the National Engineering Research Center for Cell Growth Factor Drugs and Protein Preparations. The center, a collaboration between Wenzhou Medical University and local governments, universities, research institutes and industry players, will build four key technology platforms for cell growth factor drug screening and molecular improvement, cell growth factor and protein drug process preparation, cell growth factor and protein drug preparation engineering, cell growth factor and protein drug quality standards, and new drug evaluation. It will also work with China Gene Medicine Valley, a biopharmaceutical research center, to build a large-scale engineering verification and industrialization demonstration base.

(Sources: *The Paper*/Official website of China's Ministry of Science and Technology)

Launching ceremony of the National Engineering Research Center for Cell Growth Factor Drugs and Protein Preparations
(Photo credit: news.sohu.com)

2022 Glass Language International Contemporary Glass Art Exhibition opens in Beijing

On November 5-20, 2022, the 2022 Glass Language International Contemporary Glass Art Exhibition was held at the China Hall of Science and Technology and Beijing World Art Museum.

The exhibition presented a complete history of glass art through a diverse range of forms and designs. Viewers also got to experience cultural exchange between the East and the West first-hand and see evidence of human civilization in glass art.

Glass is widely used in everyday life, everywhere from daily functional objects to art decorations and building materials. This exhibition aims to raise public understanding of the aesthetic qualities of glass art and to chal-

lenge them to reimagine usage of the material.

2022 is designated by the United Nations as the International Year of Glass, the first time the UN names a year with a single material. Themed "Celebrating the past, present and future of glass for a sustainable, equitable and better tomorrow", a series of events have been held to celebrate the essential role glass has in society.

2022 Glass Language International Contemporary Glass Art Exhibition

5th WLA Forum opens in Shanghai

Opening ceremony of the 5th WLA Forum

On November 6, 2022, the 5th WLA Forum, one of the world's largest science and technology gatherings, opened in Shanghai under the theme "Science Forward: Create a Bright Future." The inaugural WLA Prize was awarded to two scientists at the opening ceremony.

Roger Kornberg, chairman of the WLA and a laureate of the Nobel Prize in Chemistry in 2006, spoke at the opening ceremony.

(Sources: Xinhua News Agency/CAST national societies/Academy of Arts & Design of Tsinghua University)

Recommended Case

Chinese Preventive Medicine Association works with international partners to advance global health governance

◎ Chinese Preventive Medicine Association (CPMA)

The Chinese Preventive Medicine Association (CPMA) is an organi-

zation led by China's National Health Commission (NHC) seeking to promote clear communication on public health issues.

Since 1998, CPMA has been a member of the World Federation of Public Health Associations (WFPHA) and has served on the Governing Council since 2000. To lead by example, CPMA has been working closely with international partners to advance global health governance.

CPMA has been an active partner in international health conferences. Alongside WFPHA and other stakeholders, CPMA has been working to share China's COVID-19 response and experience by hosting international conferences on COVID-19 and the Workshop on Prevention and Control of Infectious Diseases in BRI Countries. From 2016 to 2020, CMPA successfully hosted five Chinese satellite sessions of the International AIDS Conference, the World Health Assembly, Options for the Control of Influenza, and the European Congress on Tropical Medicine and International Health.

At the regional level, CPMA has served as the APRLO (regional office for Asia-Pacific) of WFPHA since 2010 and renewed the memorandum of understanding with WFPHA in 2012 and 2016. It has led coordination work and pushed for more regional exchange and cooperation through the hosting member state work conferences and the Asia-Pacific Conference on Public Health (APCPH).

CPMA also acts quickly to promote and publish research on topics of global public health concern. Progress made on this front include the publication of *Guidance for Corona Virus Disease 2019: Prevention, Control*, Diagnosis and Management (English edition), the release of a video series detailing China's research efforts on fighting COVID-19 and the set-up of a COVID-19 data system, the publication of *Risk Assessment*, *Prevention, and Control Guidelines of Infectious Diseases in BRI Countries*, and the compilation of *Infectious Diseases Risk Assessment, Prevention and Control in BRI Countries* (English edition).

CMPA has recommended Chinese public health experts to serve in international organizations. In the 43 international organizations it has worked with since 2020, 11 Chinese members have been elected to executive councils and four as the president of relevant organizations.

(Source: CAST recommended cases)

Trending News

China's Mengtian Laboratory Module successfully launched into space

On October 31, 2022, at 15:37 Beijing Time, the Mengtian Laboratory Module was launched atop a Long March 5B Y4 heavy-lift rocket from Wenchang Space Launch Site in Hainan Province, China. It successfully separated from the rocket and entered the predetermined orbit, marking the complete success of the launch and a new milestone of China's manned space program.

Photo credit: China Manned Space Agency

Mengtian is the third component of China's Tiangong space station. It is the second laboratory module launched after Wentian to extend Tiangong's Tianhe core module. Weighing 23 tons at take-off, it included a working cabin, a payload cabin, a resource cabin, and a cargo airlock cabin. Mengtian will be mainly used for a range of science experiments. It will also provide support for astronauts to assemble and manage different modules of the space station and allow automatic entry and exit of cargo supplies.

(Sources: *People's Daily*/Xinhua News Agency)

Chinese scientists become first to successfully map the holistic evolution of charge transfer to photocatalyst surface sites

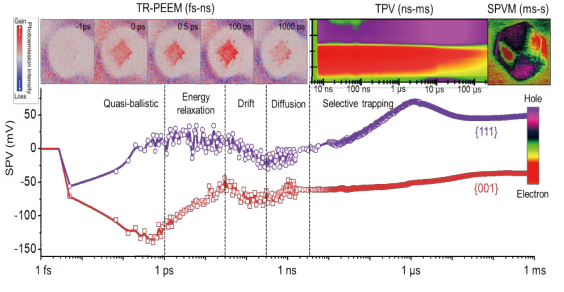

Photo credit: Xinhua News Agency/Dalian Institute of Chemical Physics under the Chinese Academy of Sciences

On October 12, 2022, Chinese researchers published mapping of the spatiotemporal evolution of charge transfers in photocatalyst particles in Nature, signaling new progress achieved in raising photocatalytic efficiency, the "holy grail" of clean energy research.

Using a variety of technologies connected at the spatiotemporal scale, Li Can, a member of the Chinese Academy of Sciences (CAS), Fan Fengtao,

and other scientists from the Dalian Institute of Chemical Physics (DICP) under CAS carried out a universal space detection of the photogenerated charge transfer of photocatalyst nanoparticles and revealed a holistic picture of their complex charge-transport mechanisms. The mapping they recorded was the first of its kind in the field.

"This is a big breakthrough in basic research," wrote Li Can. "The revealed mechanisms could help advance applications of photocatalytic solar energy conversion devices and provide clean and green energy for industrial and residential use."

(Source: Xinhua News Agency)

Chinese scientists publish new discoveries on how humans evolved from fish

The rise of jawed vertebrates was a critical step in the evolution of vertebrates, but exactly when, where, and how this happened has long baffled the science community. Without key fossil evidence, it has been impossible to build a detailed reconstruction of their morphology.

On September 29, 2022, the British science journal Nature published four papers as part of a cover story by Zhu Min, a member of the Chinese Academy of Sciences (CAS), and his team from the Institute of Vertebrate Paleontology and Paleoanthropology (IVPP) under CAS. The fossils they discovered revealed a previously unseen diversification of jawed vertebrates in the early Silurian period and provided detailed insights into the whole-body morphology of the jawed vertebrates of this period.

(Sources: China Science Communication/Official WeChat account "kexuedayuan")

Photo credit: Official WeChat account "kexuedayuan"

Explainer

With the successful launch of the Mengtian Laboratory Module on October 31, 2022, China has

commenced the final stage of construction of the Tiangong space station. Here are 3 things to know about Mengtian.

The Long March-5B Y4 carrier rocket carrying Mengtian blasting off from Wenchang Space Launch Site.
Photo credit: *People's Daily*/China Manned Space Agency

1. What is the difference between Mengtian and Wentian?

Close-up view of a modular experiment cabinet.
Photo credit: China Manned Space Agency

Tiangong is China's first permanent space station. Once constructed, it will mark a significant accomplishment of China's manned space program which started in 1992. Tiangong can provide a microgravity environment and is free from interference from most of the earth's atmosphere, making it a unique space laboratory for research. It will serve as a home for astronauts to live in space.

Tiangong has three key components: the "Tianhe" core module and two laboratory modules named "Wentian" and "Mengtian." As the control center of Tiangong, Tianhe contains living quarters for crew members, while Wentian and Mengtian, installed with 25 large experiment cabinets, provide venues for complex space science experiments that benefit people on Earth. Wentian and Mengtian, however, serve different purposes. Wentian, equipped with the same astronaut living facilities

as the Tianhe core module, will act as a backup for management and control of the space station. It has a life support system, can assist astronauts in spacewalks, and will primarily host life science and biological experiments.

In contrast, Mengtian will support a range of physics experiments in microgravity. It is equipped with an external experimental platform, a small robotic arm, and an experimental payload airlock cabin that allows large equipment to move outside the module to study effects of cosmic radiation and space physics. It mainly serves as a microgravity science laboratory. Its unique payload arrangement platform will help put satellites in orbit near the space station.

Mengtian laboratory module before leaving its assembly building.
Photo credit: China Central Television

2. How is Mengtian launched and how will it rendezvous and dock with Tiangong?

Mengtian is about 17.9 meters tall, 4.2 meters in diameter, and weighs around 20 tons. It was lifted into orbit by a Long March 5B heavy-lift rocket, China's most powerful launcher to date. Unlike its immediate predecessor, the Long March 5, which contains an 11.5-meter-long core two-stage rocket, the Long March 5B rocket removes the two-stage rocket altogether and uses a larger and longer fairing (20.5 meters long and 5.2 meters in diameter), making it particularly suitable to send large modules into space. It had also been used in the launch of Tianhe in May 2022 and Wentian in July of this year.

Mengtian must rendezvous and dock with the Tiangong space station within a carefully controlled time frame. This involves launching Mengtian at a predefined time to make sure it maintains a fixed distance from Tiangong after entering the planned orbit and bringing both Mengtian and Tiangong, both massive, into precise alignment while they are moving and subject to orbital mechanics. After docking with Tianhe, Mengtian, with the help

of its robotic arm, will adjust its docking port and rotate 90 degrees to achieve a symmetrical distribution with Wentian.

3. How long will it take for the Tiangong space station to be totally complete?

How the completed Tiangong space station will look in space
Photo Credit: China Manned Space Agency

With the successful launch of Mengtian, all important modules of the Tiangong space station are in place. For it to become fully operational, however, the following steps will be critical in the coming months.

Step 1: Mengtian will be relocated to its permanent position and the three modules, Tianhe, Wentian and Mengtian, will form a basic T-shape configuration.

Step 2: The astronauts currently aboard the Tianhe core module will run a thorough test on Mengtian and exit Tianhe to assemble the external equipment.
Step 3: A new cargo supply spacecraft will be sent to deliver experimental equipment, research materials, life supplies, and more fuel.

Step 4: Three new astronauts will be sent into space to take over operation of the Tiangong space station.

Chinese astronauts Cai Xuzhe, Chen Dong, and Liu Yang (from left to right).
Photo Credit: China Manned Space Agency

The three Chinese astronauts currently living on Tiangong, Chen Dong, Liu Yang, and Cai Xuzhe, will be the first crew members to float into the station's new module. They are also the first trio of second-generation astronauts working together as a team in the history of China's manned space program. Once they complete final assembly work, they will be joined by three new astronauts sent by the Shenzhou-15

spacecraft. By then, the Tiangong space station will reach its maximum weight and volume by accommodating six astronauts at once.

With all the essential modules in place, the Tiangong space station will soon take shape and be ready to embark on exciting space exploration.

(Source: China Science Communication's official WeChat account)