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New Quality Productive Forces

Commercial Spaceflight Embraces Rapid Growth

By WANG Xiaoxia

China plans to pull out all the stops to modernize its industrial systems and develop new quality productive forces, by fostering creative growth engines in fields such as biomanufacturing, commercial spaceflight, and the low-altitude economy.

In recent years, China's commercial spaceflight has shifted into a period of rapid development, and its market volume has exceeded one trillion RMB, becoming an important complement to China's space industry and injecting new momentum into the development of new quality productive forces.

Rapid development

On January 11, a Gravity-1 carrier rocket was launched from waters off the coast of Haiyang, Shandong, sending three satellites into a planned orbit. In the process, the rocket, developed by the commercial aerospace enterprise Orienspace, became the world's largest solid-fuel carrier rocket and China's most powerful commercial launch vehicle to date.

The successful launch of Gravity-1 indicates the rapid development of China's commercial spaceflight. According to the *Blue Book of China's Aerospace Science and Technology Activities (2023)*, a total of 26 commercial launches were completed in 2023, accounting for 39 percent of the annual launches, with a success rate of 96 percent.

China's commercial space program is creating a new industrial system and market system. A number of private companies have entered the fields of rocket launch, satellite production and manufacturing, and satellite application services. This has resulted in several leading enterprises demonstrating skill and capacity in rocket and satellite development, constellation deployment, and data services.

Technological innovation

Under a more flexible market mechanism, commercial spaceflight continues to promote the progress of space technology, and a number of technological breakthroughs have emerged.

In 2023, 41 satellites developed by Changguang Satellite were successfully launched, setting a record for the largest number of satellites launched in a single mission in China.

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WEEKLY REVIEW

China's Top 10 Archaeological Discoveries in 2023

The National Cultural Heritage Administration on March 22 announced the list of the top 10 archaeological discoveries of 2023 from 22 nominated sites. The sites cover a broad space, from the Qinghai-Xizang Plateau to the South China Sea, and the earliest could date back to the Paleolithic Age.

Sino-Indonesian Expedition Sets Java Trench Record

The joint scientific expedition conducted by the Chinese Academy of Sciences and Indonesia's National Research and Innovation Agency successfully dived 7,178 meters into the Java Trench in the Indian Ocean, setting the deepest dive record for Indonesia. The joint expedition ran from February 23 to March 23, using China-developed manned deep-sea submersible Fendouzhe.

5G Base Stations Reach 3.5 Million in China

By the end of February, China had built more than 3.5 million 5G base stations, with 851 million 5G mobile phone users, according to the latest data from the Ministry of Industry and Information Technology.

Mysterious Plant Hormone Exporter Identified

Researchers from University of Science and Technology of China have discovered the first brassinosteroid (BR) exporter. BR hormones play a key role in regulating plant development and physiology, including adaptation to environmental stresses. The study was published in *Science* on March 22.



The Boao Forum for Asia (BFA) Annual Conference 2024 is held from March 26 to 29 in Boao, south China's Hainan province, focusing on how the international community can work together to deal with common challenges and shoulder their responsibilities. (PHOTO: XINHUA)

Editor's Pick

Electric Vehicle: An Irreversible Trend

By YU Haoyuan

China's 2024 government work report highlights the significant increase in exports of the "new trio" — referring to electric vehicles (EVs), lithium-ion batteries, and photovoltaic products — which collectively saw a 30 percent rise. Among these, the exports of China's new energy vehicle (NEV) sector soared by 77.6 percent in 2023, reaching 1.2 million units, ranking first in the world for the ninth consecutive year.

Development of EVs — past and present

China's remarkable EV achievement stems from its planning over the past two decades.

In 2007, in alignment with global efforts to combat climate change and achieve carbon neutrality, China imple-

mented the New Energy Vehicle Production Access Management Rules.

In 2018, China removed foreign ownership restrictions on special-purpose vehicles and NEVs. Foreign EV producers then could directly build factories in China without establishing joint ventures with Chinese companies. This move saw U.S. carmaker Tesla launching its mega factory project in Shanghai, while Volkswagen Group China set ambitious goals to produce more than half of the group's global objective of 22 million EVs in China by 2028.

Simultaneously, China witnessed the emergence of domestic NEV startups, with Nio becoming the first Chinese EV company to list shares on the New York Stock Exchange. Today, Chinese-made cars not only dominate the domestic EV market, but are also exported in

growing numbers, with NEV manufacturer BYD ranking among the world's top 10 car companies by sales. Other notable players like Li Auto, Xpeng, and LYNK are also industry leaders.

Technical advantages in EV performance

EV core technologies, including power batteries, electric motors, electronic control systems, and semiconductor chips, have seen significant advancements driven by domestic demand.

The country's EV companies have rapidly upgraded their battery technologies, with major suppliers like CATL introducing innovative solutions that include sodium-ion batteries and super-fast charging LFP batteries. BYD's blade battery and its subsequent enhancements further exemplify this progress.

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Joint Efforts to Build World's Largest Radio Telescope

By BI Weizi

China was right there in the early conversations about what the future of radio astronomy might look like, and has played a critical role in creating the world's largest and most advanced radio telescope - the Square Kilometer Array (SKA).

Philip Diamond, director general of the SKA Observatory (SKAO), told *Science and Technology Daily* this during the 11th SKAO Council Meeting.

The SKA is a next-generation radio astronomy-driven facility of big data received via thousands of small antennae spreading over 3,000 km to simulate a single giant radio telescope with a total collecting area of approximately one

square kilometer.

It will revolutionize our understanding of the universe and the laws of fundamental physics and answer some of the most fundamental scientific questions, including detecting the epoch of reionization and testing gravity with pulsars.

China's commitment to SKAO

"China is a founding member of the SKAO and contributes eight percent of the budget," Diamond said. China also has significant construction contracts to supply the SKA and is fully participating in the science, engineering and management activities of the organization, he added.

The first mid-frequency dish antenna, designed for the SKA and assem-

bled in Shijiazhuang in north China, has already been sent to South Africa, and the second is on its way, marking a milestone in the SKA construction phase.

Made up of 66 individual panels, the structure stands more than six stories tall and weighs more than 50 tons. With a fully assembled dish in hand, engineers will be able to investigate and resolve issues when the next three dishes are shipped to South Africa and installed on site.

"I visited the factory in Shijiazhuang a few days ago. It's very impressive," Diamond said. "It's an example that the other countries can learn from."

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Boao Forum Addresses Common Challenges

International Cooperation

By Staff Reporters

The Boao Forum for Asia (BFA) kicked off its annual conference in Boao, Hainan province on March 26.

Themed "Asia and the World: Common Challenges, Shared Responsibilities," the four-day event centered around five main topics, namely, world economy, scientific and technological innovation, social development, international cooperation, and jointly meeting challenges.

The forum highlighted China's role in global economic growth. "Asia will continue to remain the largest contributor to global economic growth (this year)," BFA secretary general Li Baodong told a news conference in Boao. China's economy enjoys strong resilience and great potential, becoming a major pillar of sustainable global development.

The weighted real GDP growth rate of Asia in 2024 is expected to be 4.5 percent, given the emerging macro policy effectiveness of China and other major economies to boost demand and economic growth, according to a flagship report from the Boao Forum for Asia Annual Conference 2024.

Artificial Intelligence (AI) was also a hot topic. Max Yuan, chairman of Xiao-i Corporation emphasized the importance of integrating AI into our daily lives, as it has become ubiquitous in all aspects of society.

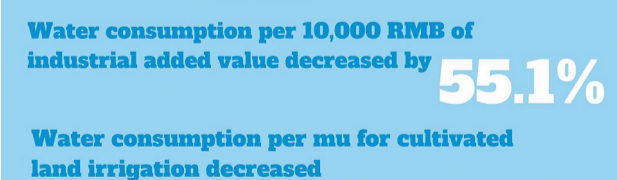
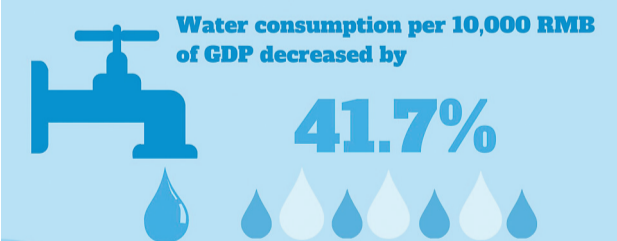
Kyoung Mu Lee, professor at Seoul National University, said that the point at which AI becomes more intelligent than humans will arrive faster than most people think.

This year's BFA drew representatives from more countries and regions than last year's edition. Some 2,000 participants from more than 60 countries and regions attended the annual conference, underscoring the rising influence of the BFA.

The challenges facing the world today are complex, and only by jointly meeting them, shouldering the responsibilities and strengthening cooperation can the world continue to move on the track of peace and prosperity, said Li.

New Graphic

China's Water Efficiency Continues to Improve (From 2014 to 2023)



Source: Ministry of Water Resources
Designed by YAO Yilu / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER



Guideline to Boost Regional Environment Management



Policy

By ZHONG Jianli

In the latest move to protect the ecological environment, China recently unveiled a guideline on strengthening region-specific environmental management.

Jointly issued by the general offices of the Communist Party of China Central Committee and the State Council, the guideline has two targets: by 2025, a

region-specific ecological environmental management system will be basically established; by 2035, the system will be fully established and function smoothly across the country.

The region-specific environmental management system aims to implement differentiated and precise management based on regional ecological functions and enhance the environmental quality. It calls for strict adherence to ecological protection red lines and resource utilization ceilings, while scientifically guiding various developmental and conservation activities.

Three zoning areas have been classified based on air, water, ecology, soil and the ocean: priority protection units, key protection units and general protection units.

To facilitate the implementation of important national strategies, differentiated zoning and management will be promoted in crucial river and basin areas, such as the Yangtze River Economic Belt and the Yellow River Basin.

To advance green and low-carbon development, the guideline proposes that in the key protection units, green, low-carbon transformation and upgrad-

ing of traditional industries such as petrochemicals, steel, and building materials should be strengthened; in priority protection units, models and paths should be explored for developing ecological products, and the capacity of carbon sinks should be enhanced.

For key regions such as the ecological barrier areas of the Qinghai-Xizang Plateau, the northern sand control belt, and coastal areas, specific units will be identified to address prominent environmental issues.

The guideline emphasizes the importance of enhancing information sharing in region-specific environmental management. This includes promoting information sharing and coordination at the national, provincial and other levels.

Innovative technologies such as next-generation information technology and AI will be integrated with environmental management to improve online government services and intelligent decision-making capabilities, thereby enhancing service efficiency.

The document also specifies the need to strengthen supervision and assessment. Relevant departments should use regulatory platforms and technological means such as big data, satellite remote sensing, and unmanned aerial vehicles to conduct dynamic monitoring, on-site inspections of environmental issues and discovery of hidden risks, and enforce the law upon their discovery.



The Qutang Gorge on the Yangtze River in Fengjie county, Chongqing municipality. (PHOTO: XINHUA)

Light: Science & Applications

Thriving with International Scientists

By CAO Jianlin



Cao Jianlin. (COURTESY PHOTO)

The editorial philosophy of *Light: Science & Applications (Light)*, launched in March 2012, is explicitly defined: creating a top-tier comprehensive journal across the full spectrum of optics research, including basic, applied and engineering results in all areas of optics and photonics. The goal is to enlighten and contribute to the well-being of global optics researchers, engineers, students and the industry.

The journal is co-hosted by the Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences (CAS) and Chinese Optical Society, and co-published by Springer Nature. Its impact has been among that of the world's top three optics journals for the past nine consecutive years.

Light has evolved into a "Light" brand for scientific communication and collaboration, as well as industry integration. It has incubated the Light Doctoral League, China's Top 10 Social Impact Events in Optics, Rising Stars of Light, and many other academic platforms.

The secret to the success of *Light* is the mutual trust between our editorial staff and high-level researchers.

For example, in 2014, Prof. Cui Tiejun from Southeast University in Nanjing, Jiangsu province, first proposed the idea of digitally coding metamaterials. This new representation of metamaterials — still in its preliminary stage — was not widely accepted by the community at the beginning, but *Light* was attracted to its possibility of connecting the physical-digital-artificial worlds, and published it through an expedited green track. *Light* continued to publicize this field by highlighting its follow-up breakthroughs, which helped the field attract wide attention and recognition worldwide.

This paper later became the major representative work for Prof. Cui to win the second prize of China's National Natural Science Award, be elected a member of CAS, and conduct a Basic Science Center project of the National Natural Science Foundation of China. The paper has been among the most cited optics papers in the past decade, has been cited more than 2,500 times in Google Scholar so far, and shows enormous potential for real applications.

Another example is a research paper by Prof. Aydogan Ozcan, Chancellor's Professor of the University of California, Los Angeles. In 2017, we invited him to publish his research paper "Phase recovery and holographic image reconstruction using deep learning in neural networks" in *Light*. This work has been cited more than 900 times in less than six years, making it one of Ozcan's highest-cited papers. In 2022, he was awarded the "Joseph Fraunhofer Award/Robert M. Burley Prize" for his contributions to computational optical imaging and other

optical engineering fields.

The trust between *Light* and optics scientists originates from our intimate communication, ranging from technical discussions about manuscripts to co-planning special issues and events, from discussions about the future layout of the optics discipline to conversations about the history and heritage of optics, meticulously attending to every aspect.

We work and live together with scientists, sharing a common language, and facing joys and challenges together. Over the past decade, our editorial staff spared no effort to travel around the world to reach out. The wide distribution of the *Light* editorial board members and *Light* global offices in renowned universities and research institutions is compelling evidence of our commitment.

Building up close communication and mutual trust with scientists is a perennial task of scientific, technical and medical (STM) journals. *Light* has luckily made a good debut.

With its achievements, *Light* has gained recognition in its home China. It was selected as a leading journal by the "National Outstanding STM Journals", and received the "National Publishing Award" (the highest honor in China's publishing industry), "National Top 100 Journals" and other honors.

Today, *Light* is shouldering the expectations of hundreds of thousands of readers, which in turn enables our branded events to receive widespread acclaim. With such visibility, *Light* has been selected as the golden partner of UNESCO's International Year of Light and International Day of Light. Meanwhile, the editorial office of *Light* receives numerous visits from universities, institutions and industries.

Looking back at 2023, our editorial staff visited 53 cities across 12 countries to promote *Light* and its brand. Looking into the next decade, we aspire to remain in tune with the thoughts of scientists and extend our influence even further.

The author is a former vice minister of science and technology of China, and the founding editor-in-chief and honorary editor-in-chief of Light: Science & Applications.

The mission of *Light: Science & Applications* is exactly as the name implies — to shine a light on the path ahead. Throughout its journey, *Light* has upheld its unique academic appreciation function, striving to lead scientific research rather than be a follower. Its goal is to establish a brand-new communication platform for researchers engaged in the integration of science, technology and engineering.

The key to scientific progress lies in breaking away from the past. In 2014, researchers first proposed a new approach of using digital encoding to represent metamaterials. It was a divergence from the inherent concept and faced resistance during peer review. However, the *Light* team recognized the transformative impact of

this achievement on the information field and industrial layout, and were the first to publish the research. Subsequently, *Light* made significant contributions to nurturing this frontier area and gained widespread recognition.

Light has always adhered to scientific values and explored the essence of scientific research. It dares to publish innovative achievements that challenge the orthodox ideas in terms of basic principles, fundamental ideas, and theoretical frameworks. This has broadened the horizon for researchers in optics worldwide.

— Shi Bei

Researcher at the National Science Library of the Chinese Academy of Sciences.

Global Conference to Co-draw 6G Blueprint for Future

By Staff Reporters

The Global 6G Conference 2024, themed "Better Together, Better Future," sponsored by FuTURE Mobile Communication Forum and Purple Mountain Laboratories, will be held in Nanjing, Jiangsu province, from April 16 to 18. The conference will gather global insights into 6G technology and business.

With the International Telecommunication Union (ITU) recently releasing the Framework and Overall Objectives of the Future Development of IMT for 2030 and Beyond, 6G R&D has entered the next stage of development. Aiming to align with the ITU's roadmap, the conference will discuss the future blueprint of 6G technologies and business

and promote global consensus before the launch of 6G standards.

As an international event covering a wide range of 6G fields and comprehensive content, the Global 6G Conference is not only a grand event for cutting-edge sci-tech communication, but also a bridge to enhancing international cooperation.

This year's conference agenda encompasses eight key frontiers: the integration of communications and AI, wireless integrated sensing and communication, space-air-ground integrated communication, 6G network architecture and key technology, technology trust and security, high-frequency wireless transmission and devices, potential business and applications, and innovation in

new energy and materials.

The advisory committee and chairs of the conference boast a lineup of renowned scholars, including academicians from the Chinese Academy of Sciences, Chinese Academy of Engineering, members of the U.S. National Academy of Engineering, fellows of the Royal Academy of Engineering, members of the German National Academy of Science and Engineering, and fellows of the Academy of Engineering, Singapore.

The conference will be co-organized by prominent international institutions, including 6G Flagship (Finland), the Fifth Generation Mobile Communications Promotion Forum (Japan), Future Communications Programme (Singapore), China Communications Standards

Association, and China Institute of Communications.

Scientists and engineers from China, the U.S., UK, Germany, Sweden, Japan, South Korea, Singapore, the UAE, India and other countries and regions will speak in-person or online, sharing their insights into the trajectory of 6G technology development.

Last year, the conference issued a document, "Global Promotion Initiative for 6G International Cooperation and Development," making two key recommendations for further global cooperation.

One suggestion is to establish a communication platform for unifying research endeavors. The other is to explore new paradigms for global open cooperation.

Sci-tech Innovation Energizes Mining City in Hubei

Case Study

By Staff Reporters

Daye, a typical resource-based city in central China's Hubei province, is employing sci-tech innovation to accelerate the high-quality development of its economy.

To break away from the dependence on mineral resources, Daye is adjusting its industrial structure, utilizing advanced sci-tech to develop emerging sustainable

industries such as machinery manufacturing, new materials and life health.

Centering on the aluminum profile industry, Daye is building, strengthening and supplementing an industrial cluster which includes a number of leading aluminum profile enterprises, and a group of supporting small and medium-sized enterprises.

The city is also developing high-tech "little giant" enterprises to upgrade its traditional industries, such as the mining engineering equipment.

Different categories and models of

energy-saving and environmentally-friendly mining products have been developed. The vision for the future is to switch from traditional fuel-powered equipment to pure electric versions, and control underground operations from the office through intelligent unmanned remote control products.

"Through technological transformation and upgrading, as well as building industrial clusters and chains, we have driven the traditional industries of steel, cement and others to high-end and intelligent development, while also promot-

ing the growth of industrial clusters in areas such as healthcare, electronic information, and energy conservation and environmental protection," said Dong Yang, director of the Science and Technology Bureau of Daye.

Having carved out a new path for the transformation of its resource-dependent economy through technological progress, Daye recently released its 2024 action plan for innovation-driven development. The plan will continue to boost technological innovation and cultivate new drivers of growth.

Commercial Spaceflight Embraces Rapid Growth

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In addition, GalaxySpace built and launched a plate-shaped communications satellite called Lingxi 03, which is the country's first satellite equipped with a flexible solar array, while the Zhuque-2 rocket, developed by LandSpace, became the world's first methane-fueled rocket to reach Earth's orbit.

To meet subsequent needs of the market, China is developing 4-meter and 5-meter class reusable rockets, which are planned to make their maiden

flights in 2025 and 2026 respectively, said the China Aerospace Science and Technology Corporation recently.

Strategic emerging industry

With the strong support of technological innovation, commercial aerospace continues with a process of industrial upgrade as it accelerates to be a new quality productive force.

For example, Changguang Satellite has continuously optimized the satellite design and manufacturing technology to reduce the weight of Jilin-1 satellite

from 400 kg level to 20 kg level. While ensuring satellite performance, the development cost has also been reduced to five percent of the original, laying the foundation for the rapid construction of commercial satellites constellation.

The Lijian-1 and Lijian-2 carrier rockets adopt a new development and manufacture mode. The modular design can largely reduce costs and enables the rapid delivery of rockets. The flexible solar array equipped on satellite Lingxi 03 also laid a solid foundation

for the development of related industries in the future.

For commercial spaceflight, a global industry with strategic importance, international cooperation and competition are inevitable. China has signed more than 150 space cooperation documents with over 50 countries and international organizations. Meanwhile, Chinese companies have carried out cooperation projects on the China Space Station platform and under the framework of the Belt and Road Initiative, in the fields of space scientific exploration and satellite data services.

INSIGHTS

New Opportunities for Sino-Oceania Cooperation

Voice of the World

By TANG Zhexiao

Chinese Foreign Minister Wang Yi paid a visit to New Zealand and Australia from March 17 to 21 for the first time since 2017.

As this year marks the 10th anniversary of the establishment of China-New Zealand and China-Australia comprehensive strategic partnerships, the visit is seen as a signal of elevating China's relationship with the two main Oceanian countries and building an open world economy.

Greater growth in coming decade

In talks with New Zealand's Deputy Prime Minister and Minister of Foreign Affairs Winston Peters, Wang said that China is willing to work with the New Zealand government to build new growth engines such as infrastructure, green transitioning, digital economy, technological innovation, and climate response.

The *NZ Herald* said it was a "perfectly timed visit" and comes "at just the right moment," while Al Jazeera reported "It's seen as an important test of trade and diplomatic ties between the nations."

China is willing to hold talks on reducing barriers to investment in the service sector and build new drivers of economic growth with New Zealand in the digital economy and through technological innovation, AP News reported.

The removal of China's last remaining tariffs on New Zealand dairy products at the start of 2024 may provide



The inauguration and ribbon-cutting ceremony of a China-Australia Friendship Bridge at Sydney's Chinese Garden of Friendship to mark the sister relationship between China's Guangdong province and Australia's New South Wales. (PHOTO: VCG)

hope for improvement this year, according to the *NZ Herald*.

China has been New Zealand's biggest two-way trading partner since 2017. New Zealand was the first WTO member to finalise its bilateral accession negotiation with China, and the first Western developed country to join the Belt and Road Initiative.

In the face of increasing trade barriers and uncertainties in the world, the upgraded China-New Zealand Free Trade Agreement is of great exemplary significance, said New Zealand's Minister for Trade Todd McClay when meeting with Wang, adding that the two

sides should work together to uphold the principle of free trade and resist all kinds of protectionism and unilateral practice.

Dialogue leads to understanding

After Australia's Minister for Foreign Affairs Penny Wong's proposal "set out a new journey" during her visit to China in 2022 amid joint efforts of both sides, China-Australia relations have thawed, and exchanges and cooperation in various fields have gradually resumed.

Hailing the renewed "stability" between Beijing and Canberra, Wong said it was crucial to recognize, "How much

progress we have made in a short period of time," according to AFP.

China and Australia have highly complementary economies and huge potential for cooperation.

Last year, bilateral trade bucked the overall downward trend, with nearly 80 percent of Australia's foreign trade surplus coming from trade with China.

Australia Broadcasting News reported Wang Yi held a roundtable meeting in Canberra. David Olsson, national president of Australia China Business Council, said the roundtable provided a significant opportunity for industry. "It also enables the Australian business community to share their perspectives and insights on the future direction of the relationship," he said.

Not only does it lead to understanding, but the dialogue will also benefit both of our nations, said Australia's Prime Minister Anthony Albanese, according to Reuters.

Since last year, the trade restrictions on a range of products and commodities including barley, wine, coal and lobsters have been steadily lifted. Albanese said he expected the wine market to open back up, describing it as "win-win" for both countries.

The Australian delegates who sat in discussion with Wang on his visit, said they were in support of the two sides actively exploring new opportunities for cooperation in green development, scientific and technological innovation and other areas, as well as jointly addressing climate change and other global challenges, so as to increase the stability of the world through solid Australia-China relations.

Comment

China-Europe Railway Express, the Path to Prosperity

Edited by QI Liming

A few years ago, American think tank Center for Strategic and International Studies (CSIS) released an article *The Rise of China-Europe Railways*, in which it listed many challenges that the China-Europe Railway Express (CRE) had faced. However, the CRE has become the "main artery" of high-quality joint construction of the Belt and Road Initiative, facilitating connectivity. The CRE is now hailed as the "iron camel caravan" that connects the Eurasian continent. It is also a "stabilizer," ensuring the security of international supply chains in a turbulent world.

As of 2023, this freight train had made 85,000 trips, connecting China to more than 100 cities in 11 Asian countries and over 200 cities in 25 European countries. In 2023, the CREs transportation cost between China and Europe was only 20 percent of air freight. The transport time is about 25 percent of the sea freight voyage, and the CRE trade volume exceeded 75 USD billion.

Spanish website Conqueror Freight Network mentioned in February that for numerous shipping companies, the CRE has emerged as a more dependable alternative to sea transport. This is attributed to the CRE's advantages in terms of speed and cost-efficiency. Rather than following a single fixed route, the CRE operates through a network of railways that traverse both continents.

The CRE operates along three ma-

ior corridors, each catering to specific geographical regions and facilitating the transportation of goods between China and Europe. These three routes collectively form a comprehensive network that reflects the diverse geographical and economic landscapes of China, ensuring efficient and tailored transportation of goods to various European destinations. Notably, in the first half of 2023, the maximum load capacity of a single China-Europe freight train was increased from 2,500 to 3,000 tonnes.

In 2018, CSIS said that in a broader trade context, the CRE presents a new offering that has not yet grown from niche to mainstream. If railways double their current share of trade by value, taking on 2.5 percent of China-Europe trade by volume, that would be a major development for those involved in rail.

In the past decade, the proportion of China's imports and exports value carried by CRE has increased from 0.3 percent to six percent. Chinese household goods and electronic products are popular in Europe, while European red wine, olive oil and rose oil have been warmly welcomed in the Chinese market.

Fu Cong, head of the Chinese Mission to the European Union, said on the Euractiv website that under the complex and turbulent geopolitical situation, especially since the outbreak of the Red Sea crisis, the CRE has stood out as a land-based alternative that provides rapid, stable, and reliable solutions to the massive flow of goods between both sides.



A CRE train loaded with machinery, vehicles and spare parts waits to depart in Chongqing, southwestern China. (PHOTO: XINHUA)

EU's AI Act Worthy of Attention

Opinion

By TANG Zhexiao

The European Union's parliament on March 13 approved the Artificial Intelligence Act, which is dubbed the world's first comprehensive AI law.

Born in 2021, the AI Act takes a risk-based approach: the riskier the system, the tougher the requirements.

It defines four levels of risk for AI systems, ranging from unacceptable, high, limited, to minimal.

"All AI systems considered a clear

threat to the safety, livelihoods and rights of people will be banned, from social scoring by governments to toys using voice assistance that encourage dangerous behavior," according to the AI Act.

Not everyone is in favor of the "historic" AI Act. Some companies worry that the act may limit technological innovation and business development, and hurt them via additional constraints, while some believe the act does not go far enough to fully address the challenges and risks posed by AI.

According to TradingView, a social media network, the French and German governments are against some of

the strictest ideas for regulating generative AI, arguing that the rules would hurt European startups like France's Mistral AI and Germany's Aleph Alpha GmbH.

The adoption of the act means that if AI companies want to enter the European market, they must first make sure that their products and technologies meet the standards and requirements.

For small and medium-sized enterprises, as well as startups, it means a lot more work is needed.

Marianne Tordeux Bitker, public affairs chief at France Digitale, described this as having "a bittersweet taste."

While the law only applies in the EU, it is expected to have a global impact, said *The Wall Street Journal*, adding the act could also be used as a model for other jurisdictions' AI regulations, which will contribute to a ripple effect.

The act is set to be enforced in May. As MEP Dragos Tudorache told BBC News: "The AI act is not the end of the journey but the starting point for new governance built around technology."

People expect such regulations could balance the safe development and technological innovation of AI sector.

Electric Vehicle: An Irreversible Trend

From page 1

In the global power battery market, Chinese brands have secured dominant positions, with CATL and BYD leading the rankings in 2023.

The two companies together posted 371.1 GWh, over 50 percent share of the world EV battery market.

Chinese companies are also competing in electric motor technologies. BYD and Guangzhou Automobile Group (GAC) have claimed that some of their car products can accelerate from zero to 62 mph in less than 3 seconds.

Moreover, China's automotive chip technology is catching up with established players worldwide.

The adoption of intelligent driver-assistive technology is also gaining momentum, with Chinese systems like Huawei ADS 2.0 and Xpeng XNGP showcasing urban driving capabilities without relying on high-precision maps.

Technologies such as the emergence of 800V charging and CIB (Cell Integrated Body) technology represent China's significant innovations.

The rapid iteration of products and technologies is gradually shifting China's NEVs from mere recipients of standard technology to pioneers in the field.

The future main arena of EVs

EVs are the future of passenger cars, a sentiment agreed on by industry leaders from companies like GAC, BYD and Mercedes at the latest China EV100 Forum, who recognize that the trend towards electrification is irreversible.

China has emerged as the primary technology arena for EVs.

According to an article published on the *Harvard Business Review*, one significant factor driving this phenomenon is the extensive collaboration among domestic automotive companies and those

from abroad to reinforce their core technology efforts.

The article underscores Geely as an example, emphasizing its strategic partnerships, including with Baidu, and acquisitions such as Drivetrain Systems International, an Australian automatic transmission manufacturer, and renowned automakers like Volvo and Lotus.

These maneuvers have enabled the company to swiftly and effectively orchestrate complementary assets around its core focus, which now encompasses everything from low-orbit satellites to smart hardware for collecting and monitoring data that could potentially enhance EV battery performance.

This collaboration has led to strategic partnerships, acquisitions, and investments. Last July, the Volkswagen Group announced a \$700 million investment for a 4.99 percent stake in Xpeng.

The two companies have embarked on a long-term strategic partnership to produce new EVs in China. Audi also signed a Memorandum of Understanding with SAIC to jointly develop new electric models.

Furthermore, Chinese companies are accelerating their global expansion, establishing factories overseas and gaining recognition for their products. Brands such as AVATR, HAVAL, BYD, and ZEEKR have achieved success in various countries.

German auto expert Kupferschmidt noted that China has achieved mastery over much of the value chain, spanning from raw materials to battery technology.

Looking ahead, Ouyang Minggao, academician at the Chinese Academy of Sciences, advocated for a continued focus on electrification, intelligence, low carbonization and globalization to drive industry advancements.

'Queqiao 2' Paves Way for Future Lunar Missions

By Staff Reporters

China launched a relay satellite into the lunar orbit on March 20, to pave the way for the country's prospective trailblazing expeditions to the moon.

The satellite Queqiao 2 (or Magpie Bridge 2) was carried atop a Long March 8 carrier rocket that blasted off at the Wenchang Space Launch Center in south China's Hainan Province.

The launch is only the first step in this mission, as Queqiao 2 also needs to carry out a series of important actions such as a mid-course trajectory correction and a braking operation.

After it enters an elliptical frozen orbit around the moon, it also needs to conduct communication tests with the Chang'e 4 probe that is on the lunar surface and the Chang'e 6, which is waiting for launch at the Wenchang center.

This will ensure that Queqiao 2 es-

ablishes a ground-to-moon relay communication link, according to Ge Ping, one of the senior officials at the China National Space Administration which oversees the lunar program.

Queqiao 2 has more technological innovations, stronger functions, more complex interfaces, higher degree of development, and a longer mission period. In addition, Queqiao 2 carries some scientific payloads and will carry out scientific exploration.

The fourth phase of the Chang'e lunar exploration project was approved for implementation in December 2021, which consists of four missions, Chang'e 4, Chang'e 6, Chang'e 7 and Chang'e 8.

Launched in December 2018, Chang'e 4 achieved the world's first soft landing on the moon's far side. Chang'e 6 will be launched in the first half of 2024. Chang'e 7 and Chang'e 8 will build basic lunar scientific research stations and carry out lunar environmental exploration and other tasks.

Unveiling Nature's Wonders

Dialogue

By LONG Yun & BI Weizi

Nature is a vast and intricate masterpiece that is full of wonders to be explored. In a recent interview with *Science and Technology Daily*, American Professor of Plant Ecology Uromi Manage Goodale from Xi'an Jiaotong-Liverpool University (XJTU), painted a vivid portrait of the nature's gifts.

Curiosity unleashed
When recalling the starting point of her academic journey, Goodale said, "It was my father who unleashed my curiosity about plants. When I was a young child, I remembered my father told me that just like children need water, plants also need water."

Throughout her career, Goodale has been propelled by pivotal moments that deepened her connection to the natural world and botanical science. She reminisced about the profound influence of her former advisor, Professor Graeme P. Berlyn, who ignited her passion for understanding the inner workings of plants.

In 2012, Goodale encountered an opportunity to conduct research in China. "When I heard about this opportunity, I was very excited," she said, adding that she had a childhood fascination with Chinese culture and history. The Chinese Academy of Sciences, which her mentors at Yale called "one of the best scientific institutions in the world," solidified her decision to embark on this new chapter.

Today, Goodale's research at XJTU encompasses diverse topics within plant ecology, with a particular emphasis on



Professor Uromi Manage Goodale. (COURTESY PHOTO)

seed biology, ecology, and conservation. Through her work, she seeks to reveal the secrets of seeds, shedding light on their crucial role in sustaining ecosystems and safeguarding biodiversity.

Profound influence
Her studies in plant ecology and seed physiology is more than fulfilling her academic curiosity. It is also a vital endeavor with far-reaching implications for tackling pressing environmental issues. "Temperature and water essential for seeds to grow are the two main factors that are changed due to global climate change," she emphasized.

Her work illuminates the intricate relationship between climate change and plant regeneration. Through studying how plants respond to shifts in temperature and water availability, she unveils the mechanisms that drive changes in plant communities and ecosystems. From droughts to heavy rains, plants are profoundly impacted by alterations in

climatic patterns, leading to cascading effects on biodiversity and ecosystem health.

In her research group, Goodale focuses on key plant species, such as orchids, which play crucial roles in ecosystems worldwide. These species face numerous threats, including habitat loss and over-harvesting, which place them at risk of extinction. "Focusing on how they're growing and how the seeds of the species can be conserved can help us conserve some of these species," said Goodale.

Through techniques like low-temperature seed banking, Goodale aims to safeguard endangered plant species for future generations. She seeks to ensure the resilience of ecosystems in the face of environmental challenges by understanding the relationships among plants, pollinators and fungi.

A facilitator of learning
Goodale said she is committed to

science outreach activities in order to ensure scientific knowledge reaches beyond the academic community. "Such activities should be a cornerstone in any scientific researcher's career because we need to make sure not only the experts and the scientific community, but the general public at large can also have an understanding of what our findings are," she said.

Furthermore, she takes pride in her role as a "facilitator of learning," rather than merely being a teacher. "A loving learning environment where our students are comfortable to ask questions and explore, that is what I aspire to do as a facilitator of learning," she said.

She also actively engages in popularizing science to inspire young minds and foster a deeper appreciation for scientific inquiry. She believes that science is not just about doing research, but also training students to ask questions and critically evaluate situations in order to come up with innovative solutions that can make our world a better place.

At the same time, she cherishes her role of educating the next generation on tackling global environmental issues, particularly climate change.

In her free time, Goodale is adept at balancing her work and life. Her passion for languages and art has enriched her experience in China. "I find Chinese to be a very fascinating language with the four different tones," she said.

Through her linguistic pursuits, Goodale has forged connections and gained insights into Chinese life, further integrating herself into the fabric of the country. "If you can talk to people, you get to know the place better, and you learn to live a fuller life," she said.

Letter to the Editor

Exploring Xi'an Through Belgian Eyes

By Cleo Zoe Lauwers

Three months ago, my boyfriend and I arrived in Xi'an, each with a 21 kg suitcase. I had found it difficult to pack my entire life in a medium-sized suitcase, but one thing I was sure of, the suitcase should contain chocolate. As a true Belgian, I need my daily fix of chocolate, and I am afraid of having to go even one day without it. That brings me to a fun fact about Belgium, famous for its high-quality chocolates.

Cities in China are huge. In Belgium, we lived in Ghent, the third largest city there. That sounds impressive, but Ghent has only 265,000 inhabitants. It is so small compared to Xi'an! As many other inhabitants of Ghent, I was used to doing everything by bike or on foot. Here, however, the distances are much longer. Biking or going on foot is less of an option, unless you're in excellent shape. I had to get used to taking the metro, the bus or a taxi.

That being said, I'm absolutely amazed by the different means of transportation in Xi'an. There's easy access to bikes, the metro, buses, taxis and so on. In Belgium, public transportation is not available everywhere, even if it is, it is rarely on time.

Meeting up with a friend in Belgium should be planned in advance, two weeks beforehand preferably, and the exact time has to be specified. I've noticed people in Xi'an just say, "Want to hang out tonight? See you then!" I've learned to be more relaxed with these things, and to my surprise, the best moments are often those unplanned.

"Food is life" here, so my students told me. Lunch time in Belgium is one hour if you are lucky, 30 minutes for most people. We gulp down our food in order to get back to the business of our day as soon as possible. So coming to Xi'an and seeing people enjoy food so much, taking the time to sit down and have a hot meal, is like a breath of fresh air.

On top of that, food in Belgium is not prepared with many spices. We use salt and pepper, that's about it. Here, food is so rich in flavor. For me, someone who likes well-seasoned food, it is heaven on earth. I do miss French fries though, which are, another fun fact, actually Belgian.

I love my home country, but I must say, China is starting to grow on me.

The author is a Belgian teacher at the Xi'an International Studies University.

Optimizing Services for Foreigners

Service Info

By Staff Reporters

China will further facilitate the work, study, and investment activities of foreign nationals in the country, as well as visa facilitation for foreign business personnel and their families, said the National Immigration Administration (NIA) during a recent press conference.

The NIA has been providing services from various aspects including policies, mechanisms and procedures.

According to Jia Tongbin, an NIA official, foreign nationals who have continuously held work-type residence permits for more than one year and those working in well-known enterprises or research institutions may now apply for

residence permits valid for up to five years. Additionally, those meeting specific conditions may be granted permanent residency in China.

Moreover, the NIA is promoting additional measures. For instance, foreign nationals applying for residence documents for investment, entrepreneurship, work, or study in China are now exempt from having to leave their passports for verification. Instead, they can present their passports at the issuance window at the agreed-upon time to collect their residence permit, leaving them time for dealing with passport-related work during this period.

Jia also stated that the NIA will collaborate with relevant departments to introduce more proactive, open and effective immigration policies and measures, contributing to China's high-level openness.

Joint Efforts to Build World's Largest Radio Telescope

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According to Wu Xuefeng, deputy director of the Purple Mountain Observatory, the Chinese Academy of Sciences, China's commitment to the SKAO is systematic and comprehensive.

The Chinese industry and academia have participated in the design and development work of several international SKA design consortia, including the SKA mid-frequency array SKA-Mid. China is also deeply involved in the development of the SKA's core equipment, such as the central signal processing system, the time signal transmission system.

In addition, the Chinese scientific research community attaches great importance to the cultivation of SKAO-related talents. Several graduate students and postdoctoral fellows have been selected to work at the SKA's world-class academic institutions for future SKAO project construction and scientific operation.

International collaboration key for astronomy

Science is fundamentally collaborative on an international scale, especially astronomy, said Diamond.

The SKA is being built by scientists and engineers from 20 countries, and

will eventually include some 200 parabolic dishes in South Africa and more than 131,000 tree-like antennas in Australia. Eight other African countries, including Ghana and Kenya, are also hosting some of the system's components.

Launched in Rome in March 2019, with 14 consortium members, the SKAO will be a global observatory, operating two telescopes on three continents on behalf of its member states and partners.

Diamond believes that the power of collaboration made the SKA possible. "I don't think any single country would have succeeded in building the SKA," he said.

After the 11th SKAO Council meeting in Nanjing, there's another international SKA meeting in Shanghai, where experts will look at how scientists and astronomers can use SKA data. "China could not be more welcoming to the radio astronomy community," Diamond said.

According to him, the SKA will be the world's largest radio telescope when it is completed in 2028. It will be 50 times more sensitive than any other existing radio instrument, enabling scientists to study the universe in much greater detail through the dust and gas that block optical observations.

Dried Fruit: Good or Bad?

Science Outreach

By Staff Reporters



PHOTO: VCG

People's opinions diverge greatly when it comes to dried fruit — some believe that it is unhealthy and contains too much sugar, while others think that it's a reliable source of micro-nutrients.

According to Fan Zhihong, director of the Chinese Nutrition Society, dried fruit can boost fiber and nutrient intake and contain large amounts of antioxidants. But dried fruit is also a high-carb food, containing sugar and many calories that can cause problems if eaten too much.

Fruits are eaten not only to get vitamin C, but also to get minerals such as potassium and magnesium, as well as various phytonutrients such as carotenoids, anthocyanins, flavonoids, and phenolic acids. Many of these nutrients can still be preserved in dried fruits.

Different ways of food preserva-

tion have been practiced since ancient times in one way or another according to local and cultural traditions. Due to the absence of refrigerators, dehydration methods that reduce the amount of water in fruits to prevent bacteria, yeast or fungi from growing on them are used to prevent food from spoilage. Sun drying, tray (air) drying, freeze drying, and vacuum microwave drying are commonly used with their unique benefits and disadvantages.

Freeze drying is a unique method of drying that eliminates all moisture and affects food flavor less than traditional dehydration, such as sun drying and air drying. This process works by freezing the material in a vacuum chamber at a low temperature, then reducing the pressure and adding heat to neutralize the frozen water in the material, said Fan. In contrast to alterna-

tive drying techniques, this procedure, although more expensive, retains the shape and color of fruit and provides a great rehydration property.

More importantly, with freeze drying, water-soluble vitamins, such as vitamin B and vitamin C, anthocyanins, flavonoids, chlorogenic acid and other water-soluble healthful compounds can be preserved; since no frying is involved, there is no loss of carotenoids and vitamin K. In addition, no artificial preservative is added because harmful microorganisms have a difficult time growing in such a dry environment.

However, it should be remembered that dried fruit is more concentrated in sugar than whole fruit, said Fan. For people with diabetes, it is best to consult a dietitian to find out how to include dried fruit in their meal plan, she added.

White Tea: Taste of Nature and Health

Traditional Eastern Wisdom

By ZONG Shihan

White tea is one of the healthiest types of tea in China. It is sourced from the tender buds of tea leaves, which are covered with a layer of white fluff after drying, thus giving the tea its name.

Compared with other types of tea, the processing technique of white tea is relatively simple. Freshly picked tea leaf buds are exposed to weak sunlight or placed inside a well-lit and ventilated room to wither naturally. When the tea leaves are 70-80 percent naturally dried, they are then dried slowly over a gentle heat.

Its simple manufacturing process makes its benefits stand out. Because it doesn't go through excessive processing, white tea retains many natural ingredients such as tea polyphenols, amino acids, vitamins and minerals, all of which have health benefits such as being antioxidant, antibacterial, and immune-boosting.

White tea has an exceptional storage value. The taste of white tea in the first year of production is close to that of green tea. After two or three years, the chemical structure of the tea slowly changes, bringing a more mellow aroma. The tea can also help with anti-inflammation, heat relief and liver nourishment.

Upon reaching five to six years of

age, white tea is considered vintage. Over time, its aroma matures and the color of the tea turns amber, becoming

almost transparent. In addition, the health benefits are becoming increasingly prominent.



A tea farmer dries white tea leaves at a tea factory in Fujian province. (PHOTO: XINHUA)