

Popularizing Science Helps Address Social, Global Issues

By CHEN Chunyou & LIU Yin

Since the 18th National Congress of the Communist Party of China, great strides have been made in popularizing science in the country. Currently, China has shifted to a stage of high-quality development, and boasts many advantages and conditions for continued development.

These include institutional advantages, improved governance efficiency, long-term economic momentum, and overall social stability. However, the tasks for reform in some fields remain arduous, and the current innovation capacity doesn't match the requirement for high-quality development.

In order to facilitate innovation through science popularization across society, the *Guideline on Further Strengthening the Popularization of Science and Technology in the New Era* was released by the General Office of the Communist Party of China Central Committee and the State Council on September 4, setting specific targets and measures.

According to the guideline, the function of science popularization to boost sci-tech innovation will see a notable improvement, and more than 15 percent of citizens will be science literate by 2025.

The guideline stresses strengthening the responsibility of the whole society in the quest to increase public science knowledge. Enterprises, research institutions, public organizations, sci-tech workers and individuals are all included in this process.

International cooperation on science popularization is highlighted. China plans to build platforms for cross-regional cooperation and promote joint construction and sharing of



Shanghai Astronomy Museum, which covers an area of approximately 58,600 square meters, is located at the Lin'gang Special Area of China (Shanghai) Pilot Free Trade Zone. (PHOTO: XINHUA)

high-quality resources, said the guideline. Meanwhile, the country would join or take the lead in establishing international science popularization organizations and hold activities to strengthen exchanges in key fields.

Wang Zhigang, minister of science and technology, elaborated on the importance of the necessity of science popularization exchanges. He said the international environment is increasingly complicated, while the world pattern in economy, science and technology, culture, security and politics is seeing a profound adjustment, most notably from the impact of the COVID-19 pandemic.

To address global issues such as climate change, energy resources and pub-

lic health, Wang said it is urgent to reach an international consensus on sci-tech governance. This requires science popularization to better play the role of a bridge to deepen the technological and cultural exchanges, and promote mutual learning of advanced experience among countries. He added that China would share research achievements with the world, and make more contributions to tackling common challenges.

The new round of sci-tech revolution and industrial revolution is advancing rapidly, and the social function of science and the relation between science and liberal arts has changed greatly.

Under these circumstances, Wang said that science popularization is need-

ed to promote mutual integration between science and individuals, economy, society and culture, and build an atmosphere that advocates science, reason, civilization, and harmony, which will serve the modernization of national governance, and promote all-round human development and social progress.

For the balanced development between sci-tech innovation and science popularization, the key direction of national sci-tech development and sci-tech policies should be communicated to the public through science popularization, so as to guide society to understand and support innovation, and create a favorable atmosphere for scientific research and technological application, said Wang.

China's R&D Expenditure Hits New High in 2021

Policy

By ZHONG Jianli & LIU Yin

China's R&D expenditure continued to grow rapidly in 2021, and its R&D in basic research reached a new record, according to government figures.

On August 31, the National Bureau of Statistics, Ministry of Science and Technology, and Ministry of Finance released the *Communiqué on National Expenditures on Science and Technology in 2021*, showing that a total of 2.8 trillion RMB was invested in R&D across the country, an increase of 14.6 percent over the previous year, and an actual increase of 9.8 percent, after deducting price factors.

"In 2021, in the face of more complex and severe domestic and international situations, the R&D investment of the whole society maintained a rapid growth, which supported the country's high-quality economic and social development," said Liu Huifeng, a researcher at the Chinese Academy of Science and Technology for Development.

As the world's second largest spender in R&D, China has maintained double-digit growth for six consecutive years, making an important contribution to the growth of global R&D spending.

According to the Communiqué, the ratio of R&D expenditure to GDP reached 2.44 percent in 2021, an increase of 0.03 percentage point over the previous year.

Liu explained that the ratio of R&D spending to GDP, or the R&D input intensity, is not only an important indica-

tor of a country's financial support for R&D activities, but also reflects its process of economic transformation and upgrading.

China's 2021 R&D input intensity is the highest level among developing countries, higher than the EU average (2.20 percent) and slightly lower than the average (2.68 percent) of countries of the Organisation for Economic Cooperation and Development (OECD).

The most obvious change in the structure of R&D expenditures in 2021 was that the investment in basic research increased significantly, according to Liu.

Accounting for 6.5 percent of the total R&D spending, the basic research fund was 181.7 billion RMB in 2021, up 23.9 percent from the previous year, the highest growth rate in nearly a decade.

It is worth noting that in 2021, enterprises invested more than 2 trillion RMB in R&D, accounting for 76.9 percent of the country's total R&D spending, 0.3 percentage points higher than the previous year. Chinese enterprises ranked second in the world in terms of R&D spending.

Although China's R&D expenditure has been the second largest in the world for many years, there is still a certain gap of input intensity between China and developed countries, such as the U.S., Germany, Japan and South Korea.

If China wants to be among the leading innovative countries, it should continue to increase investment in R&D, and especially invest more into basic research, said Liu.

This article is in cooperation with the Chinese Academy of Science and Technology for Development.

Beijing Making Metaverse Experience into Reality

Case Study

By CHEN Chunyou

Metaverse has become a focus of attention since 2021. Currently, it is integrating with multiple industries, and has become an important force to reshape the global industrial structure and pro-

vide industrial development.

In order to achieve a systematic development in the metaverse industry and advance the integrated development between digital technology and real economy, a three-year action plan on metaverse was jointly issued by Beijing's Tongzhou district, which is also known as Beijing Municipal Administrative Center, and Beijing's three other government departments this August.



Visitors at the metaverse exhibition area of the 2022 China International Fair for Trade in Services in Beijing. (PHOTO: VCG)

According to this plan, within three years, Tongzhou will be developed into a metaverse application demonstration area featuring culture and tourism. More than 100 metaverse industry chain enterprises and about 30 typical "metaverse+" application scenario projects are to be introduced and cultivated.

Research institutes and related enterprises at home and abroad are encouraged to set up joint branches in Tongzhou, which are engaged in research of the basic theory, technology development and the popularization of research achievements concerning metaverse, said the plan, adding that these branches are expected to introduce innovation resources of virtual reality, artificial intelligence, blockchain, Internet of Things, cloud computing, 5G technology and information security.

Tongzhou district will build a metaverse application innovation center and plan a batch of thematic parks featuring metaverse demonstration applications, exhibitions and experiences.

Enterprises located at the metaverse application innovation center will get rental subsidies. The financial organizations in Tongzhou district are also

encouraged to offer financing services for qualified enterprises. For talented individuals, who work in the area, public rental housing and children's schooling endorsement will be available.

Research teams owning internationally leading technologies or independent intellectual property rights are also welcome. They will get support in the commercialization of their research achievements.

The plan promotes implementation of brand upgrades to create characteristic scenes such as cultural tourism, urban construction, and virtual life.

Universities, institutions, enterprises and think tanks will be united as an alliance to advance the formulation and implementation of related standards on the Next Generation Internet, technologies and products. Meanwhile, metaverse forums, summits, and exhibitions will help the regional brand popularization.

In addition, the connection will be strengthened between Tongzhou district and three other county-level regions of Hebei province, including Sanhe, Dachang and Xianghe, in metaverse industry and urban digital scenarios, according to the plan.

First Batch of Innovative Counties Passes Muster

By LI Linxu

The first batch of innovative counties (cities) has passed acceptance check, marking an important milestone in the construction of innovative counties.

The list of these counties has been released recently by the Ministry of Science and Technology (MOST), with a total of 47 counties.

They are from 20 provinces, three autonomous regions, Chongqing Municipality, and Xinjiang Production and Construction Corps.

Of particular note is that about a third of these innovative counties are from the Yangtze River Delta, such as Kunshan city, Changxing county, and Jiashou city.

In 2018, MOST initiated construction of the first batch of innovative counties, with 52 counties on the list.

The construction of innovative counties mainly focuses on leveraging sci-tech to support industrial development, ecological civilization, and life improvement.

After three years, their perfor-

mance was reviewed and evaluated by experts, according to a notification released by MOST.

The pass of acceptance check is an important phased achievement for the construction of innovative counties, as well as a new starting point for the innovation-driven high-quality development of counties in the new era, said the notification.

It urges these innovative counties to further improve their development quality, develop replicable and applicable experience, and play a guiding role in the innovation-driven high-quality development of counties.

Next, these innovative counties are required to compile their work plan for 2022-2024 to be evaluated in three years time.

The evaluation will be based on five primary indicators such as innovation investment, enterprise innovation, innovation environment, and 24 secondary indicators such as sci-tech budget, R&D-to-sales of industrial enterprises and the number of hi-tech enterprises.

Establishing Standards System for Digital Village Construction

By LI Linxu

A guideline on building a standards system for digital village construction was recently released by four government bodies, including the Cyberspace Administration of China (CAC).

The guideline puts forward a relevant framework, as well as goals and tasks, during the 14th Five-Year Plan period.

By 2025, a standards system that can basically meet the requirements of digital village construction will be initial-

ly established, according to the guideline.

A batch of pilot projects are expected to be carried out for the application of these standards, said the guideline.

Digital village is a strategic direction for rural revitalization, said an official from CAC, noting that standardization plays a guiding role in advancing digital village construction.

It is of great significance to address the issue of interconnection in infrastructure, agricultural equipment and data resources, and to support the digital transformation of production, living

and governance in rural areas.

In recent years, China's digital village construction has sped into the fast lane. By now, all of the country's administrative villages have been connected to broadband Internet services.

The standards system framework consists of seven parts, including basic and general standards, digital infrastructure standards, agricultural and rural data standards, agricultural informatization standards, and village digitalization standards.

The guideline also lays out stan-

dardization pathways for digital village construction from the aspect of standards application, compilation, revision and transformation.

Standards concerning agricultural Internet of Things, agricultural and rural big data, agricultural informatization, and rural e-commerce are in urgent need, as per the guideline.

Statistics show that in the first half of 2022, online retail sales in rural areas and of agricultural products grew 2.5 percent and 11.2 percent respectively, indicating a strong growth momentum.



Kunshan Economic and Technological Development Zone. (PHOTO: VCG)