

# New Productive Forces for High-quality Development

## Policy

By LIU Yin, CAO Xiuying & CHEN Chunyou

Sci-tech innovation should lead the construction of a modern industrial system, and disruptive and cutting-edge technologies should be used to produce new industries and develop new productive forces. This was the consensus of the Central Economic Work Conference held in Beijing on December 11 and 12.

"This highlights the pivotal role of sci-tech innovation, and takes sci-tech innovation as the logical starting point for high-quality development," said Ding Minglei, a research fellow at the Chinese Academy of Science and Technology for Development.

Wan Jingbo, a research fellow at the Institutes of Science and Development, Chinese Academy of Sciences, explained the combination of sci-tech innovation and production practice to form a new level of productive forces characterized by an intergenerational leap.

"The re-emphasis on new productive forces indicates a lack of effective demand in economic development and an overcapacity in some industries,"



A robot serves coffee to a visitor at the 7th World Intelligence Congress held in north China's Tianjin municipality in May 2023. (PHOTO: XINHUA)

Wan said. He suggested leveraging sci-tech innovation to spur industrial innovation in order to open up new areas of development and shape new advantages and drivers for growth.

The technological achievements nurtured by the new wave of global sci-tech revolution have reached a breaking point, said Mi Lei, founding partner of Casstar, a Shaanxi province-based high-tech venture capital firm. Mi said disruptive technologies like AI, con-

trolled nuclear fusion, quantum science, life science and commercial aerospace have entered their window period to accelerate the transformation into real productivity.

The key to accelerating the formation of new productive forces lies in harnessing the leading role of sci-tech innovation. It is intrinsically a process of generating new industries and new drivers through disruptive and cutting-edge technologies and other hard technolo-

gies, Mi added.

In order to create new economic growth drivers, Ding suggested accelerating a number of major sci-tech and new infrastructure projects that will lead to economic growth. China should prioritize mission-oriented and strategically significant frontier and future technologies and invest in them. It should focus on key sci-tech issues in major application scenarios, and form a new mode of scenario-driven research, transformation of research results and industrial cultivation.

Wan emphasized the importance of nurturing innovative talents as "they are the most active factor in driving productivity and fostering talent-driven innovation."

Experts also stress establishing a unified national market with high standards to provide the basic institutional environment for the development of new productive forces.

To unlock the potential of data elements, Ding proposed accelerating marketized flow technology and data elements, promoting legislation in emerging frontier areas such as AI, gene technology, automated driving, big data and blockchain, and improving the system for rights protection, trade circulation, security authentication and benefit distribution.

# China's Regional Sci-tech Innovation Levels up

By LIU Yin & ZHONG Jianli

China's comprehensive sci-tech innovation capacity soared in 2023, showing a meteoric rise since 2012. That's according to the *China Regional Science and Technology Innovation Evaluation Report 2023* recently published by the Chinese Academy of Science and Technology for Development (CASTED), showing a score of 77.13 points in 2023 and marking 16.85 points increase since 2012.

The report showcases a further rise in China's comprehensive sci-tech innovation capacity, a significant increase in the output of sci-tech activities and the development of high-tech industrialization, along with a sustained improvement in the environment for sci-tech innovation.

Through evaluating the comprehen-

sive sci-tech innovation levels of 31 provinces, autonomous regions, and municipalities (not including Hong Kong, Macao and Taiwan), the report analyzed the development trends of sci-tech innovation in each region from the perspectives of sci-tech innovation environment, input and output of sci-tech activities, high-tech industrialization, and contribution of sci-tech to economic and social development.

"Shanghai, Beijing, Guangdong, Tianjin, Jiangsu and Zhejiang lead the nation in comprehensive sci-tech innovation capacity," said Xuan Zhaohui, director of the Institute of Science and Technology Foresight and Statistics at CASTED, adding that the comprehensive strength of technological innovation in regions such as Anhui and Hubei has shown rapid improvement, further demonstrating the effectiveness of regional

collaborative innovation.

The report also revealed the development of the Beijing-Tianjin-Hebei collaborative innovation community has accelerated. According to the report, Beijing ranked 2nd in comprehensive sci-tech innovation, Tianjin 4th, and Hebei 21st. The posture of research being done in Beijing and Tianjin while transformation of research results being carried out in Hebei has been accelerated.

Meanwhile, building of the Yangtze River Delta Sci-Tech Innovation Cluster has steadily advanced. Shanghai maintained its top position according to the report, with Jiangsu and Zhejiang following at 5th and 6th place, respectively.

"The Yangtze River Delta has become the most competitive regional sci-tech cluster," said Xuan. He highlighted that this region's 13 indicators in R&D activities, total number of R&D person-

nel, enterprise R&D personnel and local financial expenditure on sci-tech innovation all accounted for over 30 percent of the national total, while its international technology transfer income constituted nearly 50 percent of the national total.

In addition, the innovation strength along the Yangtze River Economic Belt has increased. Regions along this belt have established 10 national demonstration zones for original innovation, with sci-tech innovation levels in the 11 provinces and municipalities continuously advancing.

With the implementation of the ecological protection and high-quality development strategy of the Yellow River basin, nine provinces and regions in this area have continually increased their input in technological innovation, in the process providing new engines for economic development.

## Tech for Better Life in China

# Xinjiang Harnesses Sci-tech for Prosperity

By LI Linxu

From rural revitalization to industry modernization, Xinjiang Uygur Autonomous Region is unleashing the power of sci-tech innovation to spur its high-quality development.

### Beefing up R&D investment

In recent years, Xinjiang has continuously increased its spending on R&D. Latest statistics show that in 2022, Xinjiang's R&D investment reached 9.1 billion RMB, up 16.2 percent year on year, registering double-digit growth for two consecutive years.

Wumanjiang Elly, president of Xinjiang Normal University, is one of the beneficiaries of such investment. Last year, he was listed as one of Xinjiang's leading talents and received fund support.

"Only through sci-tech innovation can we make the cake of industries bigger," Elly told *S&T Daily*, adding that he is doing his own bit in the field of fine chemicals.

Focusing on eight industrial clusters, including renewables, new materials and green mining, Xinjiang is rolling out a series of major sci-

tech projects.

### Empowering rural revitalization

Enterprises are playing a leading role in beefing up R&D investment.

Zhongtuo Biotechnology, a high-tech company in Yiwu county of Xinjiang, is stepping up the transformation efforts of R&D achievements.

"We have joined hands with relevant institutes for R&D of camel milk," said Zhao Junli, noting that through innovation, the company could increase the income of more than 10,000 herdsmen in the camel industrial chain each year.

"Scientific breeding of camels has made our wallets fatter," said Nuruli Kasimu. Now, his camel farming cooperative raises about 900 camels a year and sells raw milk to Zhongtuo Biotechnology.

Ximen village, located in Tulufan city, is charging ahead on the road of rural revitalization. In recent years, the village has made great progress in improving grape varieties and planting techniques.

"Sci-tech support is indispensable for achieving rural revitalization," said Nie Zhaoyu, first secretary of the village's CPC branch.

Xinxing Hi-tech Agricultural Demo Zone, located in Xinxing city, is making a foray into high-end agricultural products, through introducing new varieties, new technology, and new modes.

### Invigorating intangible cultural heritages

Modern technologies have also been widely applied to invigorate Xinjiang's intangible cultural heritage.

"Through modern technologies, visitors can experience the charm of intangible cultural heritage in a more tangible way," said Ranagul Gayit, narrator in Hami Intangible Cultural Heritage Protection Center.

Aixianmuhun Rouzi, the center's deputy director, said that the center is leveraging different kinds of modern technology, so that more people know about Xinjiang's intangible cultural heritages.

"Modern media has broken the inheritance barriers of intangible cultural heritages," said Mao Qiaohui, research fellow of the Chinese Academy of Social Sciences, forecasting that in the future, modern technologies will play a bigger role in the protection and inheritance of such heritages.

## Global Journal Observatory

### Editor's Note:

International academic journals are an important platform for publishing scientific research results. They disseminate information on innovation and development, and preserve the human civilization. China has always attached great importance to openness and collaboration, stressing that sci-tech development should align with frontier domains and explore the mysteries of the universe for the good of humanity.

Science and Technology Daily has launched a new column, *Global Journal Observatory*, with the National Science Library of the Chinese Academy of Sciences. Esteemed editors-in-chief of renowned academic journals and experienced professionals in the field are invited to share how their journal was established, its development prospects, and their insights into the discipline construction to promote scientific exchanges and sharing of research results.

# China's Growing Contribution to Journal of Applied Physics

By Andre Anders

The *Journal of Applied Physics* was started in 1931, from the realization that physics has profound implications for everyone's real life. When physics made incredible strides from the classical basics of Newton and Maxwell to the quantum and relativistic world of Planck and Einstein, it increasingly affected everyone's life through its applications such as the electric light, radio and radar.

At this juncture, the *Journal of Applied Physics* was established and has been the journal of choice for over 90 years. The *Journal of Applied Physics* is not an engineering journal. Namely, it publishes research that bridges the world of fundamental science (addressing what I call the "Why?" question) with the engineering world (the "How-to?" question). For decades, the *Journal of Applied Physics* has represented the standard of peer-reviewed knowledge in applied physics, and it continues to do so despite many other journals appearing in recent years.

Indeed, both broad-range journals and a plethora of highly specialized journals are available to today's researchers. Still, the work of well-known experts including Nobel Prize-winning researchers is published in the *Journal of Applied Physics*.

The number of authors from China has steadily and remarkably increased over the last years. Not only has the absolute number of authors and papers increased, but also the fraction of contributions from China. Specifically, 36 percent of submissions and 30 percent of our publications originate from China.

I attribute this to two main factors. For one, China is a large and important country that has greatly invested in its education and research, thus increasing its research output. But perhaps more importantly, the quality of work done by China has increased very notably, leading not only to an increase in submissions but also to a much-increased acceptance rate, which today rivals that of other most advanced nations.

In recent years, realizing the growing importance of China for all sciences, including the various subfields of ap-



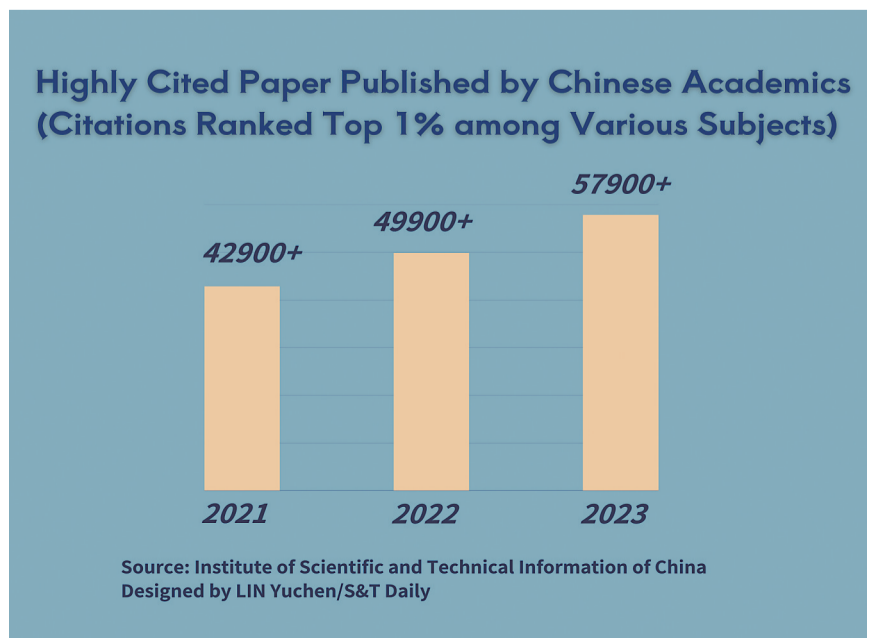
Andre Anders. (COURTESY PHOTO)

plied physics, the publisher and the journal connected with Chinese colleagues through AIP Publishing's Beijing office, amplifying the opportunities open to Chinese researchers through invited papers as well as Guest Editorships and contributions to Special Topic issues. The journal appreciates the great effort by Chinese authors to present their work in a foreign language, English.

Publishing is — like all things in modern life — subject to accelerating changes. We, as a team of active researchers and editors supported by a team of professionals in publishing, embrace change. For example, we look for ways to reduce the publishing time while ensuring high standards of peer review. Going all-electronic was a revolution a couple of decades ago. Now, the next revolution is in full swing. Correctly using AI is one, and publishing various models for publishing "open access" is another. For those and other topics, engaging with the Chinese research community is critical and we look forward to many more years of collaboration with our Chinese friends.

Another change is that 2023 marks my 10th and final year as editor-in-chief. I look forward to handing it over to the next editor-in-chief whose name will be announced in the new year, and seeing the journal succeed under this new leadership, and in particular, celebrating the success of the Chinese applied physics community.

Andre Anders has served as the editor-in-chief of the *Journal of Applied Physics* since July 2014.



Artists perform Muqam in Hami Intangible Cultural Heritage Protection Center. (PHOTO: Li Linxu / S&T Daily)