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WEEKLY EDITION

Chinese Cities Rise with Innovative Hubs

By Staff Reporters

Chinese cities have performed well in the number and growth rate of researchers and scholarly outputs, according to a report jointly issued by the Administrative Center of Shanghai R&D Public Service Platforms and the global publishing company Elsevier on February 28.

With most data collected between 2016 and 2020, the report selected 20 cities from Asia, North America and Europe, and evaluated them with indicators like researcher population and output, researcher mobility, international collaboration, patent related activities and commercialization.

Data shows the outstanding performance of Chinese cities in attracting and reserving researchers. Beijing, one of the 20 cities, has the largest researcher population, followed by Shanghai, London, Boston and New York. Chinese cities (Beijing, Shanghai, Shenzhen and Hong Kong) are in the top five in the compound annual growth rate (CAGR) of number of researchers, with Shenzhen taking the lead.

In terms of research mobility (data from 1996-2020), Shenzhen was only second to Seoul concerning the inflow of researchers. Shanghai and Beijing

ranked second and third, when it comes to the proportion of sedentary researchers who have not published papers with affiliations outside of their city.

Scholarly outputs from Chinese cities have been rocketing as well, with Beijing and Shanghai leading the total publication count. Shenzhen ranked first in terms of CAGR of total publications, and the three other Chinese cities all make top five in this category.

The quality of the scholarly output also matters. Beijing ranked top regarding number of the top one percent highly cited publications. Shenzhen, Shanghai and Hong Kong claim the top three for the CAGR of top one percent highly cited publications with Shenzhen at 29.3 percent, far ahead of the other cities. Shenzhen also tops the CAGR of papers published on *Cell*, *Nature*, or *Science*, all well acknowledged scientific journals, with an astonishing 67.4 percent.

Beijing ranked first for the number of total international collaboration publications, and Hong Kong leads in the share of international collaboration publications of the city's total publications. All four Chinese cities ranked top five for the CAGR of international collaboration publications, with Shenzhen leading at 32.7 percent.



A berthed ship, filled with liquefied natural gas (LNG) at an LNG filling station in Macun port of Chengmai county, south China's Hainan province. (PHOTO: XINHUA)

Editor's Pick

LNG Storage Helps Energy Efficiency

By TANG Zhexiao

It is treated as a fuel for the energy transition, is incredibly dense, and is a colourless fossil fuel that can be conveniently transported in ships around the world like crude oil, yet produces half as much carbon as coal when it burns.

Liquefied natural gas (LNG), is a kind of natural gas that has been cooled down to liquid form for ease and safety of non-pressurized storage or transport.

Chinese state-run energy firm CNOOC announced on February 20 that it has completed pouring concrete for the platforms of six LNG storage tanks in Yancheng Binhai Port Industrial Park, Jiangsu province.

As the largest of its kind in the world, the tanks are designed and built to have a total designed storage capacity of 270,000 cubic meters.

Innovation during the construction

China's first industrialized LNG plant was completed and put into operation in November 2001. To date, more than 230 LNG plants have been built, widely distributed in Inner Mongolia Autonomous Region, Xinjiang Uygur Autonomous Region, Shaanxi and Sichuan provinces.

After years of scientific research, CNOOC has successfully solved the design problems and realized a number of technological breakthroughs in the field of LNG storage tanks.

The six completed tank main bodies have a total pouring volume of 70,860 cubic meters, equivalent to 30 standard Olympic size swimming pools. Each storage tank is 60 meters high, equivalent to the height of the National Stadium (the Bird's Nest), and can stack three Boeing 747 at the same time.

For mass concrete pouring, the concrete expands with heat if effective temperature control measures are not taken, said Ren Jianxun, deputy manager of the Yancheng LNG Terminal project extension department.

To deal with this problem, the project team made innovations. Four groups of 16 temperature sensors were assembled on the upper, middle, lower and surface of each pouring area. With accuracy as low as 0.1 °C and data stored in the cloud, technicians can monitor temperature in real time to realize intelligent and precise temperature control.

Meanwhile, the pouring area was adjusted to a 45-degree symmetrical arrangement, reducing the length of the construction joints, effectively preventing cracks and improving the construction quality.

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China-Uzbekistan Freight Train Debuts

By TANG Zhexiao

China has been Uzbekistan's largest trade partner since the establishment of the China-Uzbekistan comprehensive strategic partnership in 2016.

On February 27, a fully loaded freight train set off from Alashankou Port in northwest China's Xinjiang Uygur Autonomous Region bound for Uzbekistan. This is the first cross-border e-commerce train launched after Alashankou city was approved as a comprehensive pilot zone for cross-border e-commerce.

The commodities aboard included solar energy components, steel accessories, clothes, textile supplies and other goods manufactured in Jiangsu and Zhejiang provinces and other regions, with a total product value of 5.59 million RMB (about 884,354 USD).

In order to ensure the rapid customs clearance of cross-border e-commerce trains, Alashankou Customs established a green channel, providing clearance services 24/7 throughout the process.

He Bin, assistant general manager of the freight company for this cross-border e-commerce train, said they will continue to increase investment in the construction of the core area, to build an international logistics channel along the Silk Road and the new Silk Road Economic Belt.

Official data shows Alashankou Port, also known as Alataw Pass, has exported a total cross-border e-commerce trade volume of about 1.6 billion RMB as of February 26.

As a new form of foreign trade with great potential, cross-border e-commerce is developing rapidly. According

to the Ministry of Commerce (MOFCOM), China's cross-border e-commerce imports and exports climbed 15 percent year-on-year to 1.98 trillion RMB (about 311 billion USD) in 2021, with pilot zones playing a significant role in spurring the growth.

Wang Kaixuan, director of the department of Eurasian affairs at MOFCOM, said China-Uzbekistan e-commerce has broad prospects and is expected to become a new growth point for practical bilateral cooperation in the future.

Trade between China and Central Asian nations has grown more than 100-fold in the past 30 years. China is willing to work with the five countries in Central Asia to enhance cooperation and bring the economic and trade cooperation to a new level, according to Minister of Commerce Wang Wentao.

The Hunt for Planets Like Home

By TANG Zhexiao

Is there a "wandering Earth" in the distant depths of the universe?

To try to find an answer to this question, more than 100 researchers from various Chinese institutes have participated in the Earth 2.0 project of the Chinese Academy of Sciences (CAS). They plan to conduct a "census" to search for Earth-like planets in the Milky Way.

Ge Jian, director of Earth 2.0 project of CAS, said the project aims to discover Earth-like planets in different orbits, including searching for another Earth-sized (0.8-1.25 times of the Earth's radius) planet in the habitable zone of sun-like stars.

In the past twenty years, the exoplanet research and relevant key technologies have become more developed.

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WEEKLY REVIEW

China's First Low-Earth Orbit Broadband Communication Test Constellation to Be Formed

Six satellites produced by Beijing-based company GalaxySpace were launched from the Xichang Satellite Launch Center in southwest China's Sichuan province on March 4 and have entered their planned orbit. These satellites will form China's first low-Earth orbit broadband communication test constellation together with the first satellite of GalaxySpace.

Sci-tech Cooperation Plan between Eastern and Western China Set up

Together with eight other ministries, the Ministry of Science and Technology issued an implementation plan on sci-tech cooperation between eastern and western China on March 4. The plan pointed out that by 2025 the sci-tech innovation capability of western China will be greatly uplifted and the spillover effect of sci-tech innovation in eastern China will be more obvious.

Producing Gasoline from CO₂, Hydrogenation Completes Trial Operation

The world's first demonstration device for 1,000 tons per year production of gasoline from carbon dioxide (CO₂) hydrogenation located in Zoucheng Industrial Park, Shandong province, completed its trial operation and technology assessment on March 4.

QLEDs with Ultrahigh Pixel Resolution Invented

Chinese scientists managed to create quantum-dot light-emitting diodes (QLEDs) with an ultrahigh pixel resolution of 9,072 - 25,400 pixels per inch via transfer printing combined with the Langmuir-Blodgett film technology. The research was recently published in *Nature Photonics* online.

WECHAT ACCOUNT

E-PAPER



2022 Ten Trends of China's Digital Economy

- Market-based allocation of data factors will be accelerated.
- New infrastructure will stimulate digital transformation of enterprises.
- Interaction between digital science with natural sciences and social sciences will pace up.
- New innovation mechanisms are emerging.
- The underlying technologies that help to capitalize data are starting to permeate industries.
- Third-party data service industries will emerge.
- Digital industrialization will forge new modes of e-commerce.
- The traditional industrial chain will start digital transformation.
- Digital transformation of agricultural industry will be accelerated.
- Digital governance system will be further improved.

Presented by Science and Technology Daily
Source: Tsinghua University's Institute of Internet Industry

FOCUS

Buzzwords in Two Sessions

By LI Linxu

Each year, the Two Sessions offer a perfect portal through which to understand China's politics, as well as its social and economic agenda.

The buzzwords that emerge from the Two Sessions, particularly in the government work report, are watched closely by the international community.

Here are some of the buzzwords of particular attention:

GDP goals

At the Two Sessions each year, the annual economic development goals of the world's second-largest economy are among the most-watched topics.

The development goals for 2022, unveiled on March 5 in the government work report, include the country's targets on GDP growth, inflation, the ratio of deficit to GDP, employment, consumption and foreign trade, among others.

The GDP growth rate will be maintained at 5.5 percent for 2022, and economic stability is made to be top priority in the government's work, according to the government work report.

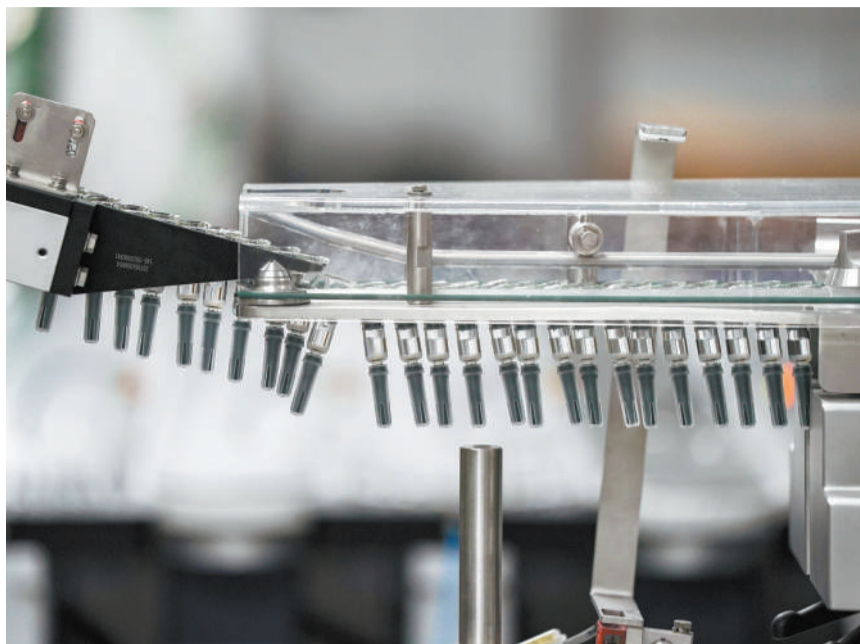
In 2021, China's GDP exceeded 114 trillion RMB, registering an increase of 8.1 percent over the previous year and an average growth of 5.1 percent over the preceding two years.

Sci-tech innovation

Innovation is a big buzzword in this year's Two Sessions, particularly among those from the sci-tech sectors.

This year's government work report said China will further implement the innovation-driven development strategy and raise its capacity for sci-tech innovation.

National legislators and political advisors discussed ways to reinforce the



COVID-19 vaccine production line of Sinovac in Beijing. (PHOTO: XINHUA)

country's strength in the sci-tech field and its innovation capability.

In 2021, the country's total R&D investment reached 2.79 trillion RMB, up 14.2 percent year-on-year.

China's overall innovation capacity ranking rose to 12th in the world, with outstanding scores in hi-tech exports, patents, and industrial designs.

Basic research

China will implement a 10-year action plan on basic research to ensure stable support for sci-tech innovation over the long term, according to the government work report.

In 2021, the country's spending on basic research rose 15.6 percent to 169.6 billion RMB, 1.4 percentage points more than the overall R&D spending.

The proportion of basic research to total R&D expenditure stood at 6.09 per-

cent in 2021, an increase of 0.08 percentage point over the previous year.

China vows to boost basic research spending to a record 8 percent of R&D expenditure during the 14th Five-Year Plan period.

Rural vitalization

As China is at a historical juncture of moving toward its second centenary goal, rural vitalization is high on the country's list of priorities.

Agricultural production will be boosted and rural vitalization will be promoted, said the government work report.

Last year, China secured a complete victory in its fight against poverty. The country has met the poverty eradication target set out in the *United Nations' 2030 Agenda for Sustainable Development* 10 years ahead of schedule.

Building on its victory in eradicating poverty, China is moving on to push for a comprehensive rural vitalization in its rural areas.

A number of once-impoverished counties in western regions will be chosen for rural vitalization assistance.

Green development

Green development is high on the agenda of this year's Two Sessions as the country is on course to fulfilling its carbon peaking and carbon neutrality goals.

This year's government work report includes a series of policy tools to enhance the county's climate actions.

While cutting carbon emissions, efforts will be made to safeguard energy security, industrial and supply-chain security, and food security, as well as to ensure people's normal daily lives.

The proportion of the Chinese economy taken up by the green and low-carbon sector will be further increased, as high-quality growth gains momentum through expanding the hi-tech sector and promoting the digital and smart transformation of industry.

International cooperation

Promoting higher standard opening up and international cooperation is also greatly emphasized at this year's Two Sessions.

In the spirit of building a community with a shared future for humankind, China's circle of friends is continuing to expand, as it pledges to do more to attract foreign investment and promote global cooperation.

It will actively take part in global governance system, and deeply integrate into the global innovation network, while collectively addressing the global challenges.

Policy Watch

Expanding the Role and Rights of Research Institutions

By CHEN Chunyou

The scientific research and technological development institutions (research institutions) are important components of the national sci-tech force, which reflects the national will, serves the national needs, and represents the national sci-tech ability.

The role and rights of research institutions are expanded in the revised *Law on Progress of Science and Technology*, which was enacted on January 1, 2022.

According to Wen Ke, professor at the University of Chinese Academy of Sciences, the improved revision related to research institutions further lays a legal foundation for the modern research institution system.

In article 56 of the law, it specifies the identity of research institutions, namely the new-type innovation agent, explicitly supporting their innovative development modes in terms of investment, management, operation and employment and granting them the legal status as agents. A clear identity removes the barriers that institutions may encounter in future development, helping them focus on scientific research and technological innovation, said Wen in an article published in *Guangming Daily*.

In the 2007 version of the law, article 44 stipulates that research institutions should carry out sci-tech R&D activities based on their stipulated articles. However, this clause ignores a fact that some research institutions don't have their own articles, said Wen.

For those institutions having articles of associations, they could abide by the regulation to conduct sci-tech R&D activities. However, for those without articles, there was no standard to abide by. Hence a disparity in the implementation of this article appeared, according to Wen.

In the revised law, it is added in article 51 that a research institution should formulate their articles of association, in which the function and business scope should be clarified. Thus, the fundamental status of articles of association in the management and operation of a research institution is legally established.

Compared with the 2007 version, the revised law has further reinforced and highlighted the strategic role of research institutions as the core carrier of national strategic sci-tech strength, empowering the research institutions with more rights, including the rights of performance appraisal, salary distribution, professional title evaluation, commercialization of sci-tech achievements and income distribution, and post setting.

The rights of cooperation between a research institution and other counterparts have also been expanded, with technical consultation and technical services added, in addition to the existing right of joint research and development.

Actually, in recent years, China has attached continuous attention to the self-reform of the research institutions and issued a series of policies and documents, which laid a solid foundation for the revision.

For example, the *Action Plan to Promote the Commercialization of Sci-tech Achievements* was rolled out by the State Council in 2016, which stipulated that the rights of using and disposing of commercialization of sci-tech achievements and the right of income earned from the commercialization, were delegated to research institutions and universities.

The revised law puts the policy documents into the articles of legislation, which is a positive response to the sci-tech voice of the times. Wen said this amendment offers legal protection for the operations of the research institutions.

Tribunal Safeguards Development of Intellectual Property

By LI Linxu

Thanks to the successful pilot running of a national level appeal hearing mechanism, China has increasingly become a preferred litigation location for international intellectual property (IP) cases.

During its 3 years pilot running period, the IP tribunal of China's Supreme People's Court has accepted 9,458 cases on appeal and concluded 7,680 of them, according to a report delivered by Zhou Qiang, president of the Supreme People's Court, on February 27.

Among the cases, more than one fifth involved strategic emerging industries, such as the new-generation information technology, bio-medicine, high-end equipment manufacturing, energy conservation and environmental protection, new materials, and new energy, as

per the report.

And, more than one tenth of the cases handled by the tribunal are foreign related cases, according to the report. In some cases, all of the interested parties are foreign entities.

Established in 2019, the tribunal is empowered to hear appeals on patents and other technology-related IP cases, as well as anti-monopoly cases, as part of the country's efforts to strengthen the protection of intellectual property rights and foster a world-class business environment.

Since establishment, the tribunal has aroused great interest both at home and abroad, making a batch of benchmark rulings with international influence.

In 2021, the tribunal accepted 4,335 new cases and closed 3,460 cases, up 36.4 percent and 24.1 percent over the

previous year respectively, according to the statistics.

The quality and efficiency of trials have been further elevated, said Zhou, citing a survey concluding that more than 80 percent of scientific and technological personnel acknowledged the country's IP protection efforts have been strengthened and the judicial environment for innovation has been improved over the past three years.

The performance of the tribunal has also won high appraisal from the World Intellectual Property Organization (WIPO), International Court of Justice, and International Association for the Protection of Intellectual Property.

Of note is that China has participated in the compilation project of the WIPO International Patent Case Management Judicial Guide, and hosted the EU-China/Singapore-China Conference on

IPR Protection, injecting Chinese experience into the global IP governance system.

Chinese courts will also be strengthening the protection of sci-tech innovations and enhance the judicial protection of intellectual property rights for core technologies in key fields and emerging industries, said Zhou, adding that more concrete measures will be taken to maintain fair market competition.

Foreign-related IP cases will be lawfully and impartially handled, and both domestic and foreign right holders will be equally protected, said Zhou.

Meanwhile, he said the country will actively take part in global governance of intellectual property, so as to drive development of the global IP governance system in a more just and equitable direction.



Foreign Trade Reports Sound Growth in First 2 Months

China's foreign trade sustained growth momentum in the first two months of the year amid unchanged fundamentals for long-term growth.

In the January-February period, China's total imports and exports expanded 13.3 percent year on year to 6.2 trillion RMB. Both exports and imports continued double-digit growth during the period, surging 13.6 percent and 12.9 percent from the same period of last year respectively, according to the General Administration of Customs on March 7.

Photo shows containers at Lianyungang Port in east China's Jiangsu province. (PHOTO: XINHUA)



Haixi Institutes of Chinese Academy of Sciences in Fuzhou, Fujian province. (PHOTO: VCG)

LNG Storage Helps Energy Efficiency

From page 1

Clean energy helps carbon neutrality

Against the background of energy transition and upgrading, natural gas is recognized clean and environmentally friendly worldwide, because of its lower emissions than coal of carbon dioxide, sulfide, soot and nitrogen oxides, with the same power generation. In addition, the gas-fired units of natural gas power generation have fast start-stop speed, strong load adaptability, and flexible operation, which is conducive to improving the security of the power grid.

Upon completion at the end of 2023, the project will include ten tanks, including six new ultra-large tanks with an annual LNG processing capacity of

six million tons each year, according to CNOOC.

Based on the residents' daily gas consumption, such capacity can be used for people's livelihood in Jiangsu province for about 28 months. The project can also achieve emission reduction of 28.5 million tons of carbon dioxide and 232,500 tons of sulfur dioxide, equivalent to planting 60 million trees, accelerating the green development of the Yangtze River Economic Belt.

Li Feng, general manager of the project, said LNG is set to be a green and clean energy supply station, featuring facilities for power generation and hydrogen production with gas. It is of great importance for optimizing the energy structure and achieving carbon peaking and carbon neutrality.

U.S. Govt Should Make Amends to Academia

Voice of the World

Edited by QI Liming

The U.S. Department of Justice (DOJ) announced on February 23 that it will effectively terminate the controversial China Initiative.

Scientists who spoke to *Nature* are relieved to see the initiative end. But they fear that the damage to collaborations with researchers in China will be long-lasting, and hope the U.S. government makes amends for the harm that the initiative caused.

Welcomed by scientists and professionals

"These changes are long overdue and certainly welcome," said Jenny Lee, a social scientist at the University of Arizona in Tucson, who studies research collaborations and geopolitics. In partic-

ular, she was glad to see that, during DOJ's announcement, "It seemed there was an acknowledgment that the China Initiative failed in some respects."

But even with the end of the initiative, there is a "palpable fear" in the academic community, said Rory Truex, a Princeton University professor who has written about the initiative's effect on American science.

It's notable that hundreds of people in the academic community have come together to push back against the government's actions, including many researchers who are not ethnically Chinese. "Scientists and academics in general rarely act collectively," said Truex.

"The China Initiative and the broader rhetoric around it has harmed our nation's competitiveness, ruined the careers of innocent scholars, and severely damaged the government's relationship with Asian American communities," Lin-

da Ng, national president of OCA-Asian Pacific American Advocates said after the DOJ's announcement.

The termination of the initiative may not fully address the concerns in the Asian American community. And for the scientists who have been prosecuted by the government, the ordeal also continues, sometimes for years after they are exonerated.

Gang Chen, a mechanical engineer at the Massachusetts Institute of Technology in Cambridge, told *Nature* that he applauds the changes, but also thinks that the U.S. Congress should hold the DOJ and FBI to account for the "harassment" of academic researchers. "The chilling effect will have a long-lasting damaging effect to U.S. higher education and America's ability to attract and retain world talent unless the government acknowledges its own wrongdoings," he said.

Opinions from American institutes
The volunteer group APA Justice,

which has been advocating on behalf of researchers of Asian descent, welcomes "the end of the ill-conceived initiative and the DOJ's openness to listen and respond to community concerns."

In December, an analysis by the *MIT Technology Review* magazine, found that nearly 90 percent of all China Initiative defendants were of Chinese origin. The fact as Lee pointed out is indisputable evidence of racial profiling.

An October report co-authored by Lee surveyed nearly 2,000 scientists in the United States. About half of respondents of Chinese descent reported experiencing "considerable" fear, anxiety or a mixture of both that they are being surveilled by U.S. government. Only 12 percent of non-Chinese scientists reported the same concern. The survey also found that many U.S. scientists of Chinese heritage had become less inclined to communicate with scholars in China. "All of those impacts combined means that there's damage that's already been done," said Lee.

OSTP's new guidelines

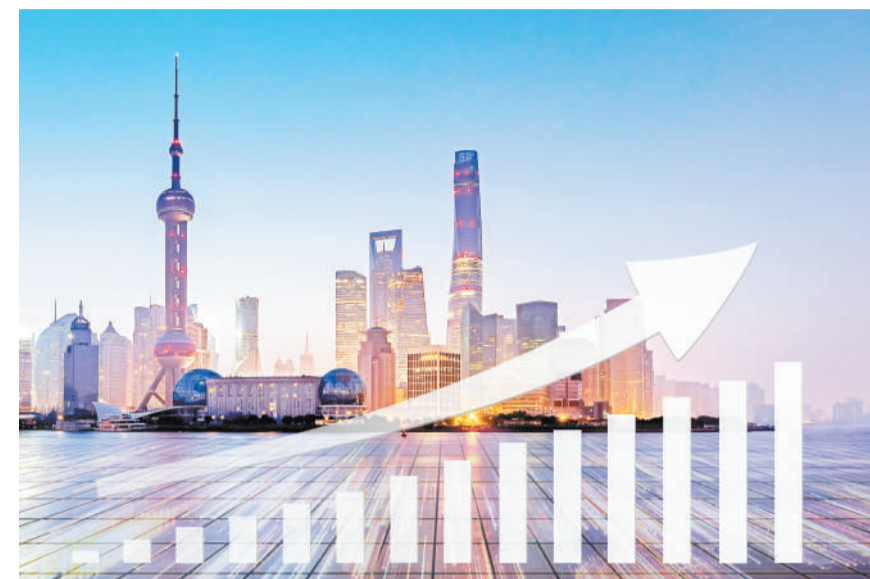
According to *MIT Technology Review*, collaboration with researchers at foreign institutions has long been an accepted and encouraged part of academic life. The White House Office of Science and Technology Policy's (OSTP) new guidelines on strengthening U.S. research security, released in early January, provided some new clarity on what kind of international collaboration is allowed.

The guidelines are meant to clarify requirements for federally funded researchers and develop best practices for federal research agencies. The OSTP explicitly denounced xenophobia and called for the guidance to be implemented without negatively impacting scientific collaboration and recruitment.

While the guidelines do create more clarity, it's unclear exactly what impact they will have.

Comment

China's Share in Global GDP Increases — 1% Seems Small, but Huge



China's Two Sessions have been guiding the country's dramatic economic growth and social development. (PHOTO: VCG)

By Staff Reporters

As is customary, China's Two Sessions were convened on schedule in early March 2022, attracting worldwide attention. The Chinese government announced numerous achievements made in 2021, which have shown that China has made a significant contribution to the world's economy, anti-pandemic efforts, and science innovation.

With the help of scientific and effective containment measures along with great efforts to produce COVID-19 vaccines, people's daily lives and China's economic growth have rapidly normalized. According to the latest data, China's GDP in 2021 accounts for 18 percent of the global economy, one percent higher than that of 2020. The number increase may seem small, but in reality is significant.

Furthermore, China has the world's largest middle-income group of more than 400 million people, which helped preserve the purchasing power during the pandemic. The total retail sales of social consumer goods in 2021 exceeded 44 trillion RMB, which increased by 12.5 percent compared with that of the previous year.

In addition to the economy, China has also contributed to the world in other areas.

Firstly, in the field of anti-pandemic efforts, China has kept its promise of assisting other countries. Over the past two years, China has become the biggest COVID vaccine producer globally, and up to now, the country has provided more than 2.1 billion doses of finished and bulk vaccines to more than 120 countries and international organizations.

Secondly, China is also leading the world in promoting regional free trade. The country has successfully pushed forward the Regional Comprehensive Economic Partnership Agreement (RCEP). RCEP means more than 90 percent of the goods trade among approved members will eventually achieve zero tariffs.

Thirdly, China has actively responded to keeping its promise on achieving carbon peaking and carbon neutrality goals. Compared with 2020, China's energy consumption per unit of GDP reduced by 2.7 percent. The area of clean heating in northern China is about 15.6 billion square meters, with a clean heating rate of 73.6 percent.

All of these achievements or contributions are inseparable from enhancing China's overall strength, especially its innovation capacity.

The world has witnessed China's rapid growth in emerging industries in 2021. Compared with the previous year, the value of the high-tech and equipment manufacturing industries increased by 18.2 percent and 12.9 percent respectively, and the output of new energy vehicles and integrated circuits increased by 152.5 percent and 37.5 percent.

Much money also flowed into R&D investment. Total social R&D investment in 2021 was 2.79 trillion RMB, which means a year-on-year increase of 14.2 percent. The intensity of R&D investment is 2.44 percent, while expenditure on basic research at the central level increased by 15.3 percent. However, increasing investment was not enough. The government also reduced tax for R&D. A total of 320,000 enterprises benefited from preferential policies for R&D expenses, with an additional tax deduction in advance and tax relief of 333.3 billion RMB. Meanwhile, policy support was an additional benefit along with the tax relief.

After the global spread of COVID-19, some nations have chosen to unconditionally surrender to the virus, which has resulted in millions of deaths. China, however, keeps insisting on its own policy to coordinate pandemic control and social-economic development. As a result, China has overcome many difficulties and is the only country in the world with positive annual GDP growth every year since the outbreak began.



Brainstorming together. (PHOTO: VCG)

Hi! Tech

Will Your Dreams Be New Promotion Channel?

By Staff Reporters



The technology "dream incubation" has shown the potential to advertise products. (PHOTO: VCG)

What happened in Christopher Nolan's movie *Inception* is fast becoming reality. U.S. soft drink company Molson Coors has successfully planted commercials into human dreams.

In late 2021, Molson Coors designed an experiment, inviting 18 participants to watch a specific movie repeatedly before sleeping. The film's content is mainly natural scenes of mountains and rivers, but interspersed with introductions to their own products. In addition, the company also created custom BGM to guide dreams, and even asked a Harvard psychologist to collaborate throughout.

Although the result was not a total success, it still surprised the company. Five people claimed that they could collectively see visions of Molson Coors' beer or soda in their dreams. In

other words, their dreams had been hacked.

The technology used in Molson Coors' experiment was named "dream incubation," and people have tried extensively to improve on it. Earlier, Burger King and Microsoft's Xbox made similar attempts. Undoubtedly, more and more companies will be involved in similar trials, especially when it has shown the potential to advertise products.

However, not everyone wants this experiment to be more successful. Just after Molson Coors' experiment, 40 researchers signed a joint letter appealing to the U.S. government to regulate the commercialization of dreams. After all, nobody wants to be forced to watch advertisements that they cannot skip, especially in their dreams.

Electronic Tattoos as Health Monitors

By Staff Reporters

Chaotic Moon, a creative technology studio in the U.S., has developed the "Tech Tat," which uses electro-conductive ink to create a temporary tattoo that can also act as a health tracker.

Tech Tat is a high-tech tattoo made of components and conductive paint to create circuitry to basically turn you into a cyborg, by collecting health and other biometric data from your body.

According to Chaotic Moon, the tech tattoo will have an ability to moni-

tor body temperature and detect if someone is stressed based on sweat, heart rate and hydration levels information loaded via Bluetooth.

Tech tattoos have the power to replace a physical exam because they can routinely send health data to doctors, who can quickly review the results and have the patient come in for an appointment if they see something unusual. They can also send the data to the wearer's smartphone, so the user can have instant access to the same health data that their doctor can

see.

This technology could allow people to easily spot early signs of illness or disease, which is vital because early detection is one of the most important ways to prevent disease. All too often, many serious or even fatal conditions could have easily been cured if they had been caught sooner.

In addition, the tech tattoo can also be used to track children when they get lost in a crowd and support the payment function of a credit card.



Tech tattoos in work. (PHOTO: SCREENSHOT)

The Hunt for Planets Like Home

From page 1

Through combining transit methods and gravitational microlensing, the Earth 2.0 project will independently develop six 30cm telescopes of 500 square degrees and one 30cm telescope of 4 square degrees. By carrying these telescopes on satellites and using ultra-high-precision photometry, a large-scale searching of Earth-like planets is to be carried out.

According to Ge, the satellite team consisting of more than 200 astronomers from over 30 universities and research institutes at home and abroad has already completed the scientific objective research. Meanwhile, the team has also completed payload and ultra-

high-precision guide star and satellite platform designs.

Two key technical problems of ultra-high stability control of satellite attitude and an ultra-high-precision CMOS photometric camera are still being tackled. The team has completed the ground test of the satellite flywheel isolation system and will carry out in-orbit verification in April.

Experts believe that the largest ever database of Earth-like planets will be obtained via Earth 2.0 project. Through in-depth analysis, researchers are expected to unveil the origin of Earth-like planets and other "wandering planets" in the Milky Way galaxy, pushing exoplanet science leap to the "Earth Age."



NPC & CPPCC

Dialogue with Foreign Expert

Editor's Note:

The Two Sessions, the annual gathering of the nation's top legislature and political advisory body of China, have started on March 4 this year. The events provide an excellent opportunity for people to witness democracy and the rule of law at work in China's political system. Several thoughtful foreign experts accepted S&T Daily's interviews to discuss some related topics around the Two Sessions. Their perspectives highlighted a more open and inclusive China as well as the accomplishments China has made in recent years.

Hoping for Environmental Advances



James Elroy Edginton. (COURTESY PHOTO)

James Elroy Edginton is a British English teacher at Hunan University of Arts and Science. He has been living in China for about 13 years and has developed a deep understanding of the country. He has high expectations for this year's Two Sessions.

"I sincerely hope that this year's

Two Sessions will discuss, highlight and promote further advances in areas concerning the environment," said Edginton, adding that he expected to see tougher laws on wasteful over-packaging.

It is often seen in China that packages of individually purchased items are wrapped in larger plastic wrapped covers to make items seem more valuable, but this practice should now be banned, he proposed.

The impact that industrial-scale animal farming has had on the environment both in terms of greenhouse gas production and sewage run-off, as well as resource over-consumption should not be ignored, said Edginton.

This year, he would like to see an increased effort made into finding sustainable alternatives in food manufacturing, such as insect protein, vertical farming and lab-grown meat alternatives.

"I know that China has already

made advances into these areas, but I'd like to see this work continued and accelerated as a priority measure," said Edginton.

In terms of the changes that have taken place in the last decade in China, Edginton said he was deeply impressed by the rapid development of Chinese infrastructure projects, which connect Chinese people across the country.

He witnessed the greening of China, such as the ecological restoration of Mu Us Desert in the north of China.

He pointed out that the most impressive thing of all, however, has to be China's never failing sheer ability to just get things done. The willpower of the CPC, coupled with the people of China and world-class leadership, have set a strong foundation for technological, environmentally-friendly, sustainable, and inclusive development, said Edginton.

Sharing at the Core of Development



Misbahul Ferdous. (COURTESY PHOTO)

After receiving his doctor degree in 2017, Misbahul Ferdous joined Beijing Fuwai Hospital, an eminent institution in the field of cardiovascular disease treatment.

He is proud of his reputation as a truth-teller. "I just convey the truth about China to the rest of the world," he said in the face-to-face interview with S&T Daily.

Ferdous is also the vice president of the Asian Society of Cardiology and has long advocated for exchanges and collaboration between China and other countries participating in the Belt and Road Initiative. He applauded China's open gesture of sharing medical knowledge and experiences with the world, based on his two-year anti-pandemic experiences, further highlighting that sharing is a symbol of China.

In addition, Ferdous emphasized the use of big data, newly built ICU devices and software in China to combat COVID-19, boosting the efficiency in containing the spread of the coronavirus.

He hoped that the Two Sessions would focus on sharing healthcare and strategies to maintain a safe and normal life unaffected by the COVID-19.

According to Ferdous, the Two Sessions serve as a channel for people all over the world to gain insight into China's democracy and well-protected human rights. "In China, people from many fields all have the opportunity to speak [from] their [own] perspective, which provides actual benefits to tackle real-life problems," he said.

Ferdous recalls how in his days of conducting medical research in China. "Advanced applied technology, supporting freedom of thought, and supervisors' goodwill were the three factors that helped him navigate his often difficult academic road," he said.

Academic Environment Driving Progress



Pavel Neuzil. (COURTESY PHOTO)

Professor Pavel Neuzil, a Czech scientist, has spent decades working in the field of mechanical engineering. He is currently a distinguished professor at Northwestern Polytechnical University (NPU) at Xi'an, Shaanxi province.

Neuzil has rich experience on study in a variety of countries, which serves as an excellent example of the critical role of international cooperation. He holds China's readiness to conduct international cooperation in high regard.

Among the several initiatives China has taken to enhance international collaboration, Neuzil is most impressed with the Belt and Road Initiative. He expects that this historic move would result in more practical advantages for people all over the world.

Neuzil joined the NPU in October 2015. He praised the academic performance of Chinese universities, and attributes the "fast-growing" academic progress to China's stellar academic environment.

At the same time, he was drawn to the working environment diversity. "It is

a pleasure to collaborate with my Chinese colleagues. Furthermore, the hardworking students are passionate about their studies," he said, adding that China's talent cultivation system is highly efficient and provides young people with more opportunities.

During the 2022 New Year holiday, he chose to celebrate the occasion in a unique way by volunteering for the city's epidemic control and prevention efforts with his wife Xu Ying. When asked what motivated him to be a volunteer, he replied that it was the "Chinese spirit of helping one another." Neuzil is particularly impressed by China's prompt response to the COVID-19 pandemic. He specially mentioned the miracle of Huoshenshan, a makeshift hospital established in Wuhan in 10 days to combat COVID-19.

Where There's a Will, There's a Way



Asad Khalil. (COURTESY PHOTO)

Asad Khalil is a professor of South-west University of Political Science and Law. In 2010, he travelled to China to further his studies at the age of 25. His twelve-year stay in China has shaped him into an objective storyteller about China's development.

Khalil shared his professional perspective on China's newly revised Law on the Progress of Science and Technology based on his legal expertise. From his perspective, the current law revisions and additions reflect China's sci-tech development over the past years and are

considered a response to the new challenges facing the world.

"Many articles in this new law provide detailed descriptions of the modern vision and short- and long-term plans for sci-tech progress. Actually, they are well designed and more appropriate for China's current economic ambitions, considering that China seeks to advance not only the quantity, but also the quality and efficiency of its innovation in the fields of science and technology," said Khalil, further highlighting that the promotion of gender equality and the overall development of women is not only of great significance for China's development, it also has a remarkable influence on the efforts for the advancement of humankind.

Khalil comes from a family of expats whose personal experiences exemplify China's open and inclusive culture. His background makes him pay special attention to education and talent management in China.

He believes that China's efforts to promote education and talent management policies for both Chinese and foreigners provide a solid ground for re-

cruiting, developing, and retaining talent.

"I admire the Chinese openness and flexibility to work with international allies and partners to work together in a win-win situation," he said, adding that he is willing to build bridges of law and get Arab and Chinese nations closer through cooperation on academic levels.

Khalil is also a big fan of the Olympic Games, and regarded the Olympic Winter Games Beijing 2022 as a chance to show and share the host countries' best values and life morals with the world.

In addition, according to Khalil, high-tech elements used at Beijing 2022 have maximized the values of sport and the Olympic spirit, by achieving a green and safe event with 212 various technologies.

He was impressed by many technologies first introduced at Beijing 2022 such as 8K broadcasting, ice-making technology and hydrogen-powered buses.

"With these high technologies, it helped athletes become better, faster, and stronger, and also taught us when a country has a will, there will be a way," said Khalil.

Witness of Gansu's Poverty Eradication



Pronkina Olga. (COURTESY PHOTO)

Since coming to China in 2010, Pronkina Olga, a Russian lecturer at Gansu University of Political Science and Law, has witnessed the strong rise of Gansu province out of poverty and the rapid development of China's economy. Over the years she has seen a range of motions related to poverty alleviation, higher education, international cooperation and exchanges, discussed and passed during China's annual Two Ses-

sions.

As the country's biggest annual political meetings and a window into the central government's priorities and plans, the Two Sessions are always a highly anticipated event, garnering wide attention at home and abroad. Olga, who has established strong ties with China for the past decade, believes that the issues discussed at the sessions concern every single person living in the country.

At the 2020 Two Sessions, Olga could still remember how impressed she was by President Xi Jinping's remarks concerning the goal of achieving poverty alleviation across China by the end of 2020. This reflected China's unwavering determination to secure a comprehensive victory in the battle against poverty, she said.

For such a populous nation, she couldn't believe this goal could really be achieved within such a short time, especially under even tougher times of a worldwide pandemic. However, to her

surprise, she was excited to hear the news that poverty eradication was fully achieved on December 30, 2020. "I live in Gansu, which was an underdeveloped area and had been a focus of poverty alleviation. Now, people's living standards have been improved a lot and I'm happy to witness Gansu's rapid development," said Olga.

When talking about her expectations for this year's Two Sessions, Olga emphasized the significance of foreign language teaching and learning reform in enhancing international cooperation and exchanges. "I suggest contemporary college students master more than one foreign language, since language is a carrier of a culture. Only when the future main workforce learn more about other cultures and become more inclusive, can they better tell Chinese stories to the world," said Olga, adding that she overcame many stiff challenges while learning Chinese in Lanzhou, but eventually her hard work paid off and she is now fluent in the language.

China's Approach Against COVID-19 Works



Zuzana Pavlonova. (COURTESY PHOTO)

Zuzana Pavlonova is a consultant at the Xiamen Foreign Professionals Service Center (XFSPSC), helping foreign experts in Xiamen with the challenges of their work and life in China. As a Czech expat who has both studied and worked in China, Pavlonova has her own views on international cooperation in higher

education, China's contribution to the prevention and control of COVID-19, and the Olympic Winter Games Beijing 2022.

Pavlonova first came to China as an exchange student to Shanghai, before later going on to study at Xiamen University. Being a beneficiary of cooperation between Chinese and Czech universities, she felt honored to have such opportunities to experience a different culture and language, which she also thought was crucial to her career development.

"It's very important for any country to send their young people to different places to understand how people in different cultures and countries understand this world," said Pavlonova.

When a COVID-19 wave hit Xiamen last summer, Pavlonova contributed to its prevention and control. In August 2021, she appeared as a presenter in a

video that show how foreigners can get vaccinated in Xiamen, which generated very positive response from other expats. In the Guanren community where she worked as a consultant, Pavlonova also helped to organize local expats as volunteers for nucleic acid testing. She said although China has taken a different approach in prevention and control of the pandemic, it works because she can live her life very normally.

As a person interested in environmental protection, Pavlonova was happy to find out that a natural carbon dioxide refrigeration system was adopted in the venues of Beijing 2022, which was done for the first time in the history of the Winter Olympics. "And this technology has no impact on the environment. So it's helping to decrease the overall carbon footprint of the Games," she said, adding that, "This is something very meaningful, I believe."