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China-ASEAN Cooperation Boosts Vitality

By Staff Reporters

China and the Association of Southeast Asian Nations (ASEAN) have established a comprehensive strategic partnership, President Xi Jinping declared on November 22 while chairing the ASEAN-China Special Summit to Commemorate the 30th Anniversary of ASEAN- China Dialogue Relations via video link. Xi said the valuable experience of China-ASEAN cooperation over the past 30 years should be cherished and upheld over the long term.

Over the past three decades, China and ASEAN have remained committed to amity and good faith, mutual benefit and win-win results.

Since the outbreak of the pandemic, China and ASEAN members have fostered cooperation on curbing the spread of COVID-19. To date, China has provided ASEAN member states, including Cambodia, Laos and Myanmar, with more than 300 million doses of COVID- 19 vaccines and a great number of emergency medical supplies, and has also sent medical expert teams to help build virus - testing labs and work on vaccine trials with several ASEAN countries.

Chinese Foreign Minister Wang Yi said that China will continue to provide vaccine support to ASEAN countries until the pandemic is completely defeated.

Bilateral trade between China and ASEAN, its largest trading partner, reached 2.66 trillion RMB (about 412 billion USD) in the first half of 2021, up 27.8 percent year on year, according to data from China Customs.

At the forefront of China's opening-up to ASEAN, Guangxi Zhuang Autonomous Region, which borders Vietnam, has seen its trade boom with imports and exports in cross-border e-commerce surging 446.3 percent year on year from January to July this year.

In addition, under the guidance of the Ministry of Science and Technology, Guangxi has pioneered a new mode of technology transfer, establishing a China-ASEAN technology transfer cooperation network covering 10 ASEAN countries, giving a strong boost to the cooperation between China and ASEAN countries in scientific and technological innovation.

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Construction workers checking the installation of floating solar panels at Sirindhorn Dam in Thailand's northeastern province of Ubon Ratchathani. The project is jointly constructed by China and Thailand. (PHOTO: XINHUA)

Editor's Pick

Better Online Environment for Internet Civilization

By Staff Reporters

Internet civilization is a new form of civilization that has emerged as the Internet evolves. China has made great progress in building the country into a cyberpower by strengthening the construction of Internet civilization.

Laws and regulations have been created to ensure the safety and better quality of the Internet. For the past few years, the country has issued a Cybersecurity Law, Data Security Law, Personal Information Protection Law and other regulations to provide a safer cyberspace for netizens.

Regulations concerning the actions of netizens were also created as a deterrence, sending a firm message that the Internet is a space that is governed by laws.

China has taken concrete actions as well.

In response to the problems raised by the public, the Cyberspace Administration of China (CAC) and other government departments have been continually launching specific campaigns to solve the problems, such as Operation Qinglang, the "Humiao" campaign for protecting teenagers online and the "Jingwang" campaign against hackers and telecoms fraud.

A platform for squashing rumors on the Internet was also set up.

President Xi Jinping called for extensively pooling positive forces and the strength of kindness and making joint efforts to create a better cyberspace in his congratulatory letter to the first China Internet Civilization Conference, which opened in Beijing on November 19.

Two months ago, CAC launched a proposal on boycotting rumors from the Internet together with several other counterparts, calling on society as a whole to join hands and tackle online rumors.

There have also been activities that promoted positive ethical values and a better online environment. Specific activities for teenagers were conducted, including a TV program and open classes, which helped them to maintain good mental health.

The first China Internet Civilization Conference opened in Beijing on November 19, 2021. (PHOTO: VCG)

CSNS Makes Neutron Advances

By TANG Zhexiao

The China Spallation Neutron Source (CSNS) put into use in August 2018, is the nation's first research facility providing the most intense pulsed neutron beams for 345 scientific research projects. More than 90 percent of the equipment of CSNS is based on independent research and domestically produced.

Neutrons are small particles with no charge. By examining the route of the neutrons via a spectrometer, researchers can deduce the internal structure of the material, thus conducting scientific research in fields of life science, material science and new energy.

As one of the largest scientific and technological facility projects in China, CSNS is expected to make a contribution to many areas of scientific research and applications.

Probing microworld through super microscope

Considered as a "super microscope," a spallation neutron source can probe the microscopic world. But unlike X - rays, neutrons are not sensitive to the number of electrons and are easier to probe when materials containing light elements with fewer electrons, such as carbon, hydrogen and oxygen, are studied.

Chen Hesheng, the CSNS project manager and director of the Institute of High Energy Physics (IHEP) at the Chinese Academy of Sciences, explained neutron scattering technology as marbles shot at a net and bouncing off it at different angles. If the movement path of these marbles is recorded, then the shape and material of the net can be deduced. The more marbles are used, the more accurate the net calculations will be.

However, is the facility safe from radiation? Chen Hesheng said that CSNS's power comes from electricity. "According to test results, the amount of radiation received by residents who live near the spallation neutron source for one year is equivalent to taking a long-haul flight," said Chen.

Challenges of first neutron beam output

Obtaining spallation neutrons can be technically complex and expensive. CSNS is the world's fourth spallation neutron source. The other three are in Britain, the U.S. and Japan.

Construction of the CSNS project in China started in 2011, under the direction of IHEP, with a total budget of 2.3 billion RMB. To build China's first spallation neutron source facility, the CSNS team took up the challenge with an efficient approach.

Chen, who has undergone heart surgeries before, was nevertheless on hand to lead his team through the technological and engineering difficulties.

CSNS successfully made their target and the first neutron beam was realized in 2017. The world's fourth pulsed spallation neutron source declared a success.

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Three Approaches on the Way: Development of COVID-19 Drugs in China

By Staff Reporters

A variety of medicinal applications developed by China have been successfully used in clinical treatment in the ongoing battle against COVID-19. With a 78 percent reduction of hospitalization and deaths, the neutralizing monoclonal antibody combination therapy, BRII - 196/ BRII-198, developed by Tsinghua University, Third People's Hospital of Shenzhen and Brii Biosciences has made the most rapid progress.

The therapy has already been adopted in the treatment of around 700 patients in China.

Phase 3 clinical trials of the therapy, which is sponsored by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH), are being conducted in seven countries including the U.S., Brazil and the Philippines. It is also likely to be the first intervention to get emergency use authorization in developed countries such as the U.S.

By neutralizing the virus, the therapy prevents the virus from entering the cells, which is one of the three technical approaches used in the research and development (R&D) of COVID- 19 medications. The other two are restraining the virus from duplicating and adjusting the immune system of the human body, which are also being researched in China.

China started the R&D of COVID-19 drugs as early as January 21, 2020. The Ministry of Science and Technology (MOST) organized the medication R&D as a special project in response to the pandemic. Less than a month later, a special working group on medication R&D was set up by MOST and several other departments. The working group included experts in relevant fields across China.

There have been 53 R&D emergency projects concerning clinical treatment and medication, and about 315 million RMB in funds provided by the government.

Recently, a new neutralizing antibody DXP-604 has been approved at the Beijing Ditan Hospital for compassionate use.

BRI: Eight Years of Concrete Achievements

By Staff Reporters

President Xi Jinping raised the initiative of jointly building the Silk Road Economic Belt and the 21st Century Maritime Silk Road in the autumn of 2013, aiming to build a platform for openness and cooperation, providing new impetus for the cooperative development of participating countries.

China has been planning and working on the high-quality development of the Belt and Road Initiative (BRI) for the past 8 years, and concrete achievements have been made.

Actually, the BRI has enhanced the degree of openness domestically and allowed for the opening of more avenues for international cooperation. China signed more than 200 documents concerning BRI cooperation with 140 countries and 32 international organizations.

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WEEKLY REVIEW

CAS and CAE Announce New Academicians

The Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE), the country's top academic institutions, announced 65 and 84 newly elected academicians respectively on November 18.

2021 China 5G + Industrial Internet Conference Kicks off

Starting from November 20 in central China's Wuhan, the conference attracted scholars, entrepreneurs and industry association representatives to discuss the wider integration and innovation of 5G and the industrial internet.

New Satellite Launched

Gaofen-11 03 was launched by a Long March-4B rocket at 9:51 a.m. (Beijing Time) on November 20 and entered the planned orbit successfully. The satellite will be mainly used for land surveys, city planning, land rights confirmation, road network design, crop yield estimation and disaster prevention.

New Technology to Support the Search of Dark Matter

A novel ultra - sensitive quantum precision measurement technology was developed for the experimental search of dark matter, and the test results were at least five orders of magnitude better than the previous international best, breaking the limit of the strongest cosmic astronomy for the first time. The study was published online at *Nature Physics* by scientists from China and Germany.

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Two Million Highly Skilled Personnel to be Available by 2025

By ZHONG Jianli

China aims to keep the number of students at technical schools above 3.6 million and to train more than two million highly skilled personnel during the 2021- 2025 period, according to a five-year plan issued by the Ministry of Human Resources and Social Security.

Titled the *14th Five-Year Plan (2021-2025) for Education of Skilled Personnel*, the plan also sets the goal to provide more than 20 million vocational training sessions to enterprise employees and key employment groups by 2025.

The 46th WorldSkills Competition will take place in 2022 in Shanghai. (PHOTO: VCG)

To reach these goals, the plan proposes a series of measures in the following aspects:

● Select about 300 high- quality technical schools and 500 majors to give full play to their exemplary role to build distinctive brands of technical education.

● Encourage all sectors of society to establish schools for technical education. Leading and large enterprises should play their essential role in running these schools. Privately run technical schools will be encouraged and supported.

● Explore the formation of regional, industrial and other types of technical education alliances, and build about 100 of them.

The plan said the country will support and guide technical schools in building a group of special majors that are in line with the national strategic needs and the development of local leading industries. Priority will be given to develop a number of emerging majors that are needed in advanced manufacturing, new energy, new materials, modern agriculture, modern information technology, biotechnology, and artificial intelligence.

It also proposes to speed up the development of much- needed majors, such as nursing, health care and housekeeping, upgrade traditional majors in iron and steel metallurgy, chemical medicine, construction and textile manufacture, and remove or combine majors where graduates have low employment rates. Technical schools are encouraged to develop more majors that are market-oriented and form a system that closely connects industrial and innovation chains.

As of the end of 2020, China had 2,423 technical schools. Apart from developing technical and vocational education at home, China has also provided vocational training programs in other developing countries.

The Luban Workshop is a typical example. Vocational schools from Tianjin have set up Luban Workshops in 18 countries to offer technical skills training to local college students. Eleven such workshops have been set up in 10 African countries, which have helped those countries develop their technical capacities.

Inner Mongolia Science and Technology Museum. (PHOTO: VCG)

R&D Breakthrough Campaign Kicks Off in Inner Mongolia

By LI Linxu

Inner Mongolia, a heavyweight in hydrogen energy production, is striving to make more research and development (R&D) breakthroughs.

Here born China's first civil liquid hydrogen plant last year. It is also the place where the country's first hydrogen fuel cell hybrid locomotive started a trial run last month.

Before the plant, the country's production capacity of liquid hydrogen only had four tons per day, mainly used for rocket launches, while the plant can produce 30,000 tons liquid hydrogen and 20,000 tons of high pressure gaseous hydrogen per year once reaching target output.

Compared with traditional diesel locomotives, the hydrogen fuel cell hybrid locomotive is expected to cut carbon emissions by about 96,000 tons a year running on a 627-kilometer railway.

These are prime examples of Inner Mongolia's huge progress in science and technology in recent years, and more achievements are expected as a new round of R&D investment breakthrough campaign is on the way for Inner Mongolia.

In 2020, it spent 16.11 billion RMB on R&D. During the period of 2021-2025, the R&D expenditure of the whole society in Inner Mongolia is expected to grow by more than 12 percent annually, according to a document newly released by Inner Mongolia.

The document, titled the *14th Five-Year Plan for Inner Mongolia Autonomous Region's Science and Technology Innovation*, details an ambitious blueprint for its next phase of work.

According to the plan, by the end of 2025, the number of high-tech enterprises per 10,000 enterprises will increase to 50. In 2020, the figure stood at 33.37.

The number of high value utility patents per 10,000 people will reach 1.80, almost double that of 2020.

In addition, the full-time equivalent of R&D personnel per 10, 000 employees will rise to 30 in 2025, up 60 percent from 2020.

The plan focuses on an array of important industries, such as modern energy economy, modern chemical industry, modern farming and stock breeding industries, and strategic emerging industries.

A series of key technologies in these fields are highlighted, including wind and solar power hydrogen production, large scale energy storage, green metallurgy, green farming and breeding, and carbon capture, utilization and storage.

To create an innovation hub, the region is making all efforts to improve its R&D infrastructure and services.

Talent from home and abroad are greatly welcomed, says the plan. Foreign experts introduction system will be improved so as to create a more convenient work environment in the region.

China's Installed Capacity of Renewable Power Breaks New Milestone

By LI Linxu

Thanks to policy and sci-tech support, China keeps leading the world in renewable energy power generation.

The country's installed capacity of renewable- energy power generation reached 1.002 billion kilowatts by the end of October, ranking first in the world, according to the latest data from the National Energy Administration (NEA) released on November 20.

Compared with the year end of 2015, the figure has doubled, reflecting the fast growth of China's renewable energy sector.

By the end of October, renewable energy has accounted for 43.5 percent of the country's total installed power generation capacity, up 10.2 percentage points from the end of 2015.

Of the total, the installed capacity of hydro power generation reached 385 million kilowatts, while that of wind, solar and biomass power generation stood at 299 million, 282 million and 35.34 million kilowatts, continuing to rank first globally, said NEA.

Aiming to achieve carbon peaking by 2030 and carbon neutrality by 2060, China is promoting green and clean energy amid its transition to a low-carbon economy.

Recently, the country has rolled out an action plan for carbon peaking, unveiling a series of major actions for green and low-carbon energy transition.

According to the action plan, approximately 40 gigawatts of additional hydro power capacity will be installed during both the 14th and 15th Five-Year Plan periods. And by 2030, total installed generation capacity of wind and solar power will reach above 1,200 gigawatts.

Sino-Japanese Cooperation in Global Innovation Network

By CHEN Chunyou
ZHANG Junjie

Next year marks the 50th anniversary of the normalization of diplomatic relations between China and Japan. "It is hoped that both parties work together to implement the consensus reached by the leaders of the two countries and push for new progress in sci- tech relations," said Dai Gang, director general of department of international cooperation of the Ministry of Science and Technology.

In a conference a week ago, themed the Second China- Japan Science and Technology Innovation Cooperation held in Weihai, Shandong province, Dai suggested that the two sides should make good use of science and technology to cope with major challenges and epidemics, deepen sci-tech innovation and cooperation, jointly safeguard common development interests and actively respond to the common challenges of mankind.

"China attaches great importance to international cooperation in science and technology, accelerates the building of an open and innovative ecosystem, and actively integrates itself into the global innovation network," Dai said, noting that Japanese companies are welcome to participate in China's innovation- driven development, and share development dividends.

Cheng Yonghua, executive vice president of China-Japan Friendship Association, said at the conference the two countries have set goals for carbon neutrality. There is broad space for cooperation in green and low- carbon areas, such as energy conservation and emission reduction, clean energy and new energy vehicles.

China is speeding up the building of a "digital China," with the digital economy accounting for more than a third of its GDP. Japan is also promoting digital transformation. The digital economy can become an important pillar of the two countries' cooperation in the post-epidemic era, said Cheng.

Okimura Kazuki, honorary president of the Japan Science and Technology Agency, said that a high- level researchers' exchange program between China and Japan was launched in 2019. This July, the China-Japan High-level Scientists Seminar centering on marine environment was held in Qingdao. Nearly 30 scientists from countries participated in the event and more than 10,700 people attended online.

It is hoped that the COVID-19 pandemic can be controlled and the Sakura Science Exchange Program, launched in 2014 to invite young people from across the globe to Japan for a short period of time, can resume in the near future.

"Young talented people from across the world are welcome to visit and study in Japan," said Okimura.

Shandong province and Japan are in close proximity across the sea and their industry and supply chains are highly complementary, with huge space for cooperation and close economic and trade exchanges.

Tang Bo, director of Department of Science and Technology of Shandong province, awarded appointment letters to 10 strategic experts in international sci-tech cooperation in Shandong at the conference.

Focusing on the fields of smart ocean industry, medical care and health, and modern high- efficiency agriculture, the conference further expanded innovation cooperation with Japan in technology, projects, exchange platforms and talented personnel. More branded sci-tech cooperation activities will be created to attract Japanese enterprises and professional talents to Shandong for future development.

Source: Department of Science and Technology of Shandong Province

Prizes are awarded to the outstanding projects during the conference. (PHOTO: Department of Science and Technology of Shandong Province)

CSNS Makes Neutron Advances

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CSNS's advanced research platform

The "super microscope" is ideal for studying the microstructure of materials and can be used for research in high-speed trains and aircraft, tumor radiotherapy research and green energy development of flammable ice, according to Chen.

Since its official operation, CSNS has served more than 2,600 users worldwide and completed more than 500 scientific projects, including new lithium- ion battery material structures and solar cells, and also launched preliminary research in fields of aviation materials, flammable ice, shale gas and catalysts.

The construction of CSNS will also strengthen the international exchanges and cooperation between the domestic neutron scattering science and application circles, and provide a good opportunity for neutron scattering technology and applications.

Currently, CSNS is planning a second phase of construction and upgrades, aiming to accelerate its output to five times its current ability, and providing a more advanced research platform for frontier scientific research, national needs and economic development.

BRI: Eight Years of Concrete Achievements

From page 1

The total trade in goods between China and countries along the Belt and Road hit 10.4 trillion USD, and China's non-financial direct investment amounted to more than 130 billion USD.

The BRI also realized a win-win situation for participating countries. According to a World Bank report in 2019, trade is estimated to grow from between 2.8 and 9.7 percent for BRI corridor economies, and between 1.7 and 6.2 percent for the world. Increased trade is expected to increase global real income by 0.7 to 2.9 percent. The BRI could help lift 7.6 million people out of extreme poverty and 32 million people from moderate poverty.

In terms of making the globe a greener place, the BRI has exerted efforts through cooperative projects in participating countries. The hydro- floating solar hybrid project at Sirindhorn Dam in Thailand, which was constructed by China and Thailand, realizes power generation from floating photovoltaic and water resources simultaneously or alternately. This project manages to generate electricity free from the uncertainty of weather and reduce about 47,000 tons of greenhouse gas emissions per year.

Though the BRI was initiated by China, the benefits of the initiative belong to the whole world. Faced with the unprecedented challenges of COVID- 19 and climate change, the BRI also embraces opportunities. The high-quality development of the BRI will make more contributions to a shared future for mankind.

China-ASEAN Cooperation Boosts Vitality

From page 1

Green development has become the consensus of China and ASEAN since the official inauguration of the China-ASEAN Environmental Cooperation Centre this year.

The Year of Sustainable Development Cooperation between two sides was initiated in May 2021, noting collaboration on biodiversity, climate change and protection of marine environments. The two sides agreed to implement the *Framework of China- ASEAN Environmental Cooperation Strategy and Action Plan (2021- 2025)*, to promote cooperation in priority areas such as environmental policy dialogue, climate change and air quality improvement, sustainable cities and marine plastic reduction, biodiversity conservation and ecosystem management.

To scale up new energy investment, China's relevant departments join hands with the ASEAN Centre for Energy to implement the ASEAN- China Clean Energy Capacity Building Programme, jointly build platforms for clean energy technological cooperation and facilitate technology transference in new energy.

The Metaverse: Creating a New Reality

Voice of the World

By YU Haoyuan

The metaverse is causing a sensation online and is the current buzzword for cyber trendsetters. Some people believe that it will start an entirely new reality, while others consider it a new technical and conceptual strategic move to be competetive in the future.

What is the metaverse?

As a metaphor for the real world, the term first appeared in Neal Stephenson's science fiction novel *Snow Crash*. In the novel, the metaverse is a place where humans can inhabit as avatars to interact with each other and software agents. It is a term that Stephenson used to describe a virtual reality - based successor to the Internet.

Up to now, it has to be said that the metaverse has not yet been clearly defined. However, *USA Today* defines it as a "combination of multiple elements of technology, including virtual reality (VR), augmented reality (AR) and video where users 'live' within a digital universe."

The metaverse related industries are considering it as a new economic growth point. According to an article *The Metaverse Takes Shape as Several Themes Converge*, if it is successfully set up, trillions of dollars could flow into areas such as social media, video games, e-commerce and blockchain.

NVIDIA CEO Jensen Huang said, "I'm fairly sure at this point that the metaverse is going to be a new economy that is larger than our current economy."

Who is competing in the metaverse?

After renaming Facebook as Meta, Mark Zuckerberg also announced plans to spend at least 10 billion USD this year on Facebook Reality Labs, its metaverse division tasked with creating AR and VR hardware, software and content, according to a U.S. tech blog *The Verge*.

Many information technology giants also announced their own interventions. Microsoft, for example in early November, unveiled its plan on operating a metaverse product - Mesh for Teams, which is due for release in 2022.

Sports giant Nike has also jumped on the metaverse band wagon, collaborating with Roblox to create Nikeland, a virtual playspace.

According to *The Wall Street Journal*, more than 400 Chinese companies have filed applications to register trademarks related to the metaverse. Baidu applied for the trademark "Xirang" app just one day after Meta's announcement. Tencent and NetEase also took actions to get involved in the metaverse.

Besides big enterprises getting involved, the Seoul Metropolitan government recently announced that Seoul would develop as a metaverse platform, which will provide multiple services, such as health care and central infrastructure to the public.

What challenges will the metaverse face in the future?

Although the metaverse may lead the future development of society, some critics warn that information security may be considered as a priority.

In an AP interview, Frances Haugen, a Facebook whistleblower, warned that, "The metaverse will be addictive and rob people of yet more personal information, while giving the embattled company [Facebook] another monopoly online."

According to the official website of the Russian president, Vladimir Putin gave his view of the metaverse at the AI Journey 2021 conference in early November. "Now, it concerns not only ensuring the cybersecurity of a person, but also that of the virtual double — the avatar that will live within the metaverses being established now." He thinks it will be a great challenge for tech companies, creative industries, virtual and mixed reality device makers, and regulators.

Putin also addressed another concern related to living outside of reality. As a suggestion, he said, "We must use the metaverse opportunities for people to be able to mix, co-work, co-study and pursue joint creative and business projects, regardless of the distances between them, no matter how big."

At what stage is the metaverse in China?

How China deals with the metaverse is becoming a hot topic with foreign media and think - tanks.

Tech Crunch writes that the Chinese government is planning to invest billions of USD and make great efforts to help China take the lead in AI, which is a big part of the metaverse, and AI can entirely change all aspects of social life. Moreover, China has "the capacity to build and ultimately become the preeminent force in the metaverse, [which] starts with China's long-standing and unrivaled dominance of consumer device manufacturing."

Maybe in the future, everyone can immerse in the metaverse throughout the day. (PHOTO: VCG)

According to *Barrons*, a leading source of financial news, Marko Papic, chief strategist at the Clocktower Group, said Tencent has a big start over Meta through its huge online gamer base as the main portal for metaverse users. "Chinese interactive mobile platforms, and Tencent in particular, have innovated beyond the U.S. or anyone else," said Papic.

High-Speed Rail Expansion with Green Vision

By QI Liming

According to statistics released by the Ministry of Transport, by the end of 2020, the length of China's high- speed railways (HSR) in operation had reached 37,900 km, nearly double that of 19,800 km at the end of 2015, ranking first in the world. More than 70 percent of the "eight vertical and eight horizontal" skeleton has been built.

The rapid extension of railways promotes more exchanges, and also does a great job cutting greenhouse gas (GHG) emissions.

Domestic high - speed railway progress

With a total length of 14.7 km, the Fuxia HSR's Meizhou Bay Cross - sea Bridge once again broke records. The bridge on a sea - crossing HSR, which connects the cities of Fuzhou and Xiamen in Fujian province, was completed on November 13.

Fuxia HSR's Meizhou Bay Cross-sea Bridge. (PHOTO: XINHUA)

Featuring 32 national patents obtained for the construction of the bridge, it is also China's first cross - sea HSR cable-stayed bridge with low towers.

The Meizhou Bay cross- sea bridge is one of the major parts of the 277 - km Fuzhou - Xiamen HSR which is under construction. With a designed speed of 350 km per hour, the HSR is expected to slash the travel time from the province's capital Fuzhou to the tourism city of Xiamen to under an hour.

Laos line testing

According to the *International Railway Journal*, testing is underway on the first China Railway Rolling Stock Corporation electric multiple units and electric locomotives in Laos on the new line linking Laos' capital Vientiane to Yuxi, China. Track laying on the 1024 km, the line was completed on October 12 with opening date planned for December 2 for both freight and passengers.

The new 1024 -km railway will also help Laos move away from being a landlocked country.

Reduction in greenhouse gas emissions

According to TechStartups.com, China's HSR network covers newly built rail lines with a designed speed of 120 – 220 mph. To put it in perspective, China accounts for two - thirds of the world's total HSR networks, with HSR trains, tracks, and services owned and operated by the China Railway Corporation under the brand China Railway High - speed .

According to *South China Morning Post*, a new study shows that China's rapid expansion of high- speed rail has indirectly cut GHG emissions by creating capacity for freight on conventional trains.

The network's massive growth between 2008 and 2016 has led to an annual reduction in GHG equal to about 11 million tons of carbon dioxide, or 1.33 percent of China's total transport sector emissions, compared with the pre -high-speed rail era.

When passengers opted out of the slower conventional trains in favor of high- speed rail, road freight moved to fill the much greener conventional trains, causing a drop in emissions, according to the researchers.

"Since HSRs are not designed for freight transportation, one likely explanation is that the opening of HSRs has helped relieve some of the capacity on conventional rail lines, which serves a mixture of both passenger and freight transportation," the researchers wrote in the peer - reviewed journal *Nature Climate Change*.

2021 Most Influential Researchers Identified

By QI Liming

Chinese mainland has nearly doubled its share of highly cited researchers in four years, according to Clarivate Plc, a global leader in providing solutions to accelerate the life cycle of innovation.

The 2021 list of Highly Cited Researcher was unveiled by Clarivate in London, on November 16. The methodology that determines the "who's who" of influential researchers draws on the data and analysis performed by bibliometric experts and data scientists at the Institute for Scientific Information at Clarivate.

The annual list identifies 6,600 researchers from across the globe who demonstrated significant influence in their chosen areas of expertise through the publication of multiple highly cited papers during the last decade.

The Highly Cited Researchers' names are drawn after rigorous selection from publications that rank in the top one percent by citations for field and publication year in the Web of Science citation index, and the list identifies the research institutions and countries where they are based.

Researchers from more than 70 countries and regions have been recognized this year, including 3,774 in specific fields and 2,828 for cross-field impact. Chinese mainland ranked the second this year, with 935 Highly Cited Researchers, or 14.2percent,upfrom7.9percentin2018.

There is a 1.8 percent loss in Highly Cited Researchers for the U.S. since last year and 3.6 percent since 2018. This contrasts with an increase of 6.3 percent for Chinese mainland since 2018.

The Chinese Academy of Sciences has 194 highly cited researchers, and ranked second highest among research institutions or organizations. In addition, with 58 highly cited researchers, Tsinghua University ranked the eighth highest among research institutions or organizations.

David Pendlebury, senior citation analyst at the Institute for Scientific Information, said, "The headline story is one of sizeable gains for the Chinese mainland and a decline for the U.S., particularly when you look at the trends over the last four years, which reflect a transformational rebalancing of scientific and scholarly contributions at the top level through the globalization of the research enterprise."

Diplomats Building Innovative Platforms for Tech Exchange

By QI Liming

In a different kind of matchmaking, international experts and envoys gathered at the Technology Diplomats' Innovation Resources Matching Action 2021 (Matching Action 2021) on November 18 in Beijing.

The conference aimed to create an environment to promote the commercialization of scientific and technological achievements and international scientific and technological cooperation, pooling global innovation resources, and helping to build Beijing into an international sci-tech innovation center.

"The world today is facing the overlapping effects both from the great changes not seen for a century and the COVID - 19 pandemic. The acceleration of a new phase of scientific and technological revolution and industrial transformation is happening. Never before has human development and social progress called for sci-tech innovation so eagerly as today," said Hou Yun, deputy director of Administrative Commission of Zhongguancun Science Park.

Using the theme, Pooling Global Biomedical Innovation Resources and Jointly Promoting the Construction of International Sci - tech Innovation Center, Matching Action 2021 took active actions to build platforms and expand innovative channels during the online event.

Andrea Heyn, counselor for science and technology at the German Embassy to Beijing, said that China and Germany signed the *Bilateral Agreement on Science and Technology* as early as 1978.

"The cooperation in the field of applied sciences requires free market access and the prevention of one-way technology transfer," said Heyn.

Roger Germann, chief investment officer at the Embassy of Switzerland in China, introduced innovation in biotechnology, saying that innovation and competitiveness should rely on three combinations, namely tradition and invention, internationalization and unique characteristics, stability and openness.

"We put data science and medical science together, highlighting the advantages of R&D and advanced computer science, " he said.

Robert Emond, counsellor for science, technology and innovation, Embassy of Canada in China, said, "Key industry sectors in Canada include digital technology, advanced manufacturing, artificial intelligence and financial technology. Canadian clean - tech market was more than 29 billion CAD, with sales volume of 18 billion CAD. Canada is very focusing on incubators and accelerators to facilitate commercialization."

Meanwhile, Professor Alessandra Guidi, S&T Counselor of the Italian Embassy in Beijing, presented the five main technological trajectories and three bilateral collaboration measures between China and Italy.

Guidi said that life science is a fast growing yet dynamic industry. First, there are the four 'P's of medicine: preventive, predictive, personal and participatory medicine. "Then, we have six pillars in this industry, including education, lifestyle prevention and improvement, early diagnosis and treatment, and the management and empowerment of patient," he said.

Five projects were signed via video through Matching Action 2021, including a medicine and medical innovation platform, a digital ecosystem of pharmaceutical R&D and digital transformation of Beijing's health and medical systems and intelligent nursing system for Italy's elderly.

Matching Action 2021 is managed by the Beijing Municipal Science & Technology Commission, Administrative Commission of Zhongguancun Science Park. More than 200 participants joined the event online. The science and technology diplomats shared the development status and innovation resources of sci- tech and relevant preferential policies of each country, which was of great interest to delegates.

Hi! Tech

Inactivated KAT7 Gene Could Delay Aging

By Staff Reporters

Chinese scientists recently found that KAT7, a gene identified as a senescence driver, could partially "crack the human aging code."

A research team from the Institute of Zoology at the Chinese Academy of Sciences (CAS), is exploring the genetic information hidden in the human genome that induces cell senescence, hoping to suppress the acceleration of aging through corresponding interventions.

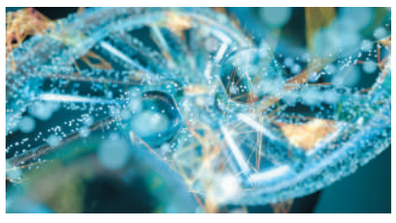
Their current study found that activation of endogenous viral elements in the human genome is a key factor in inducing cell and organ senescence.

"During the aging process, inactive repetitive sequences in genome, such as those of ancient viruses, are reactivated. In senescent cells, they provoke the human cellular response to viruses, leading to chronic inflammation and promoting cellular senescence," said Liu Guanghui, a research team member.

The team used the CRISPR/Cas9 method to culture and screen millions of human cells and then identified dozens of previously undiscovered genes that promote cellular aging from more than 20,000 human genes.

Through repeated screening, KAT7 was finally identified to promote aging. Its testing experiment confirmed that when the gene was partially inactivated in the livers of elderly mice, 81 percent of them could live for more than 130 weeks, which compares to about 80 human years.

Liu explained that KAT7 is an epigenetic enzyme. When the gene is inhibited or turned off its molecular switch, human stem cells age at a slower rate, even reversing some effects of aging to some extent.



Chinese scientists recently found a gene, which could partially "crack the human aging code." (PHOTO: VCG)

A Biologist's Never-ending Passion for New Discoveries

By LONG Yun

Eight years ago, Ben-David Yaacov, a renowned Canadian medical scientist, moved to China with the hope of discovering a cure for cancer using a combination of Western and traditional Chinese medical practices.

On September 30 of this year, Yaacov received the Chinese Government Friendship Award at the Great Hall of the People in Beijing.

Speaking of his feelings as a recipient of the highest award for foreigners in China, Yaacov said he felt more respected for his scientific contribution in China than other places he has worked in.

Professor Ben-David Yaacov. (COURTESY PHOTO)

Understanding TCM

Yaacov is not only notable for his achievements in anti-tumor pharmacology, but also for internationalizing traditional Chinese medicine (TCM).

Despite its time-honored history, TCM is still not widely accepted globally because few scientific studies have been done on it. He hopes to change the situation with his work and bridge the gap between TCM and Western medicine, to make more people fully aware of the working mechanism of Chinese herbal medicine.

"From my perspective, TCM has been mainly practical for thousands of years, but there is not enough understanding of its working principles," he told *Science and Technology Daily*.

After coming to China, Yaacov's understanding and appreciation of TCM has deepened.

"TCM as a precious part of Chinese culture, has not yet had enough influence in the world, and many people do not realize its excellence. For example, Western medicine has begun to emphasize 'personalized' treatment in recent years, but it has been valued in Chinese medicine for thousands of years. It seeks to restore balance through treatment specific to the individual," said Yaacov, adding that TCM's targeting function gives him more confidence for its international prospects.

The opportunity ahead

Since Yaacov put down roots in China's Guizhou province, he has been driven by his passion for new discoveries, especially TCM.

He is now the director of the cancer biology platform of the Laboratory for Chemistry of Natural Products, Chinese Academy of Sciences in Guizhou.

Yaacov's first visit to the laboratory was introduced by Yang Meili, one of his colleagues in Canada, who happened to be a former student of Hao Xiaojiang, director of the laboratory. In terms of his decision to choose Guizhou, Yaacov mentioned its ample resources of TCM and specialists with the knowledge of isolating pure compounds from natural herbal remedies.

"My original research in Canada was suspended because of a lack of funds. I planned to change my research direction to drug development for cancer treatment. It is exciting to conduct unexplored areas of study," he noted.

He said that experts here [in China] extract compounds from TCM and there has to be a biologist familiar with their functions, which is his area of expertise.

"Here I have access to everything new and locally sourced," he said, adding that Chinese scientist Tu Youyou, who won Nobel Prize in medicine for her research on an antimalarial substance, inspires him.

"I have been given sufficient support mentally and financially from my institution, and the people around me are quite nice," he said.

Connection with China

Yaacov applauded China's positive role in facilitating international cooperation in the sci-tech community. In recent years, China has taken measures to embrace more experts around the globe and accelerate international exchanges.

Currently living in Guiyang, he said he thoroughly enjoys the convenient life there. When talking about the high-tech applications in daily life, Yaacov said mobile payments in China are incredible and futuristic. He is also impressed by the changes happening in Guizhou and his institution.

Yaacov has taken advantage of his vast network of contacts to help Guizhou facilitate its international exchanges, including introducing top scientists to take part in conferences.

"I do want my friends to know the real China by telling them the stories [about what it's like] here all the time. I invite foreign scientists to attend the conferences here, and I have to bust the rumors about China on the Internet with more vivid examples," he said.

Letter to the Editor

Seeing is Believing

By Kim Roper

It has been over 4 years since my wife and I went to Xi'an to teach English at Xi'an International Studies University (XISU) as part of the Brigham Young University's Teachers in China program. There are very few days that go by that I don't ask myself the question, "What if we had never gone to China?" My experience in China changed my life. I am so much a better person for having had this experience. I see the world and humanity so differently now than before I went to China.

When we first arrived in China it was definitely a "Culture Shock!" Everything was different and foreign from what we knew and were accustomed to. The language was different both written and spoken. The food was different. The smells and sights were different. The crowds of people, the stores, the transportation were all different. It was hard to see anything that wasn't different to us.

At first, all I could see were the differences, but the longer I was in China, and the longer I worked with the wonderful students at XISU, all I could see were the similarities, not the differences. My eyes were opened, not to how different we were, but how similar we were to the Chinese people. I recognized the same personalities in my Chinese students as American students. They had the same humor, fears, dreams, talents and interests as we do. I learned that even though our politics may be different, our people are the same.

I learned to love the Chinese people, and even their food. I met so many wonderful, kind and helpful people. I still remember my students by name. I remember the kind lady we bought fruit from on the street. I remember the gentleman who cooked such delicious noodles for us in one of the narrow alleys near our home. Whenever we needed some help, there were always kind people willing to help us.

Our experience also gave us the opportunity to travel throughout China to see the natural beauties of this country. We have visited more beautiful sites in China than probably most Chinese have.

We have visited the deserts near Urumqi in the west, the freezing ice cities of Harbin in the north, and the beautiful warm beaches of Hainan in the south. We have seen the pandas in Chengdu, the massive Three Gorges Dam on the Yangtze River, the ancient city of Pingyao, the Great Wall and Forbidden City in Beijing, the natural beauty of Guilin and Zhangjiajie, and the great cities of Shanghai and Hong Kong. Most beautiful however was our Chinese home in Xi'an. What a beautiful city with its historical Terra Cotta Warriors, ancient towers and beautiful parks. Before this experience, I would have never thought of visiting China. Now I tell everyone I meet, "You must visit China! It is so beautiful."

I have had the privilege of having 5 of my former XISU students to visit me and my family in the United States. They feel like family to me. As they have been in my home and got to know my family, my family has discovered the same thing I learned. We have far more in common with the Chinese people than we have differences.

(Mr. Roper is a foreign teacher from Xi'an International Studies University.)

Mr. Kim Roper.
(COURTESY PHOTO)

Home Away From Home Essay Contest

By BI Weizi

On the evening of November 13, a unique award ceremony for the "Home Away from Home" Essay Contest was held in Xiamen, Fujian province. The contest gathers stories from foreigners living across China and reveal comprehensive and real life scenarios from across the country to the public at large.

Despite the different nationalities and backgrounds of the writers, they have made China their second home and become motivated by the innovation and entrepreneurial opportunities in the country. A total of 55 foreigners from 25 countries contributed to the contest. The articles were published on social media platforms in China and internationally receiving a positive response.

Based on the number of social media likes, views and website votes the contest received, five winners were selected: Smita and Roshan from India, Szabolcs from Hungary, Bong from the Philippines and Karla from the United States; five other contestants from South Africa, France, Spain, the Philippines and the Czech Republic won the additional Special Award.

With their personal experiences, the essays convey life in China from a perspective of an expat's eyes, making the country more understandable to a foreign audience. The award ceremony also gives foreign experts in Xiamen a new perception of the entrepreneurial environment and the future development direction Xiamen is taking.

At the award ceremony, the new local Foreign Talent Service Station and the recently launched facilitation policies were also introduced. These include a "one-stop" service platform for immigration affairs, and the first "joint window" for "tackling one-thing" in the province along with the evaluation policy of foreign experts. The director of the Xiamen Foreign Expert Affairs Bureau issued certificates to five locally based foreign employees who had passed the new experts evaluation system.

Source: Xiamen Municipal Bureau of Science and Technology

Young Scientists Contributing to Int'l Exchanges

By WANG Xiaoxia

A foundation and a federation for global young scientists were to be established at the World Young Scientists Summit (WYSS) 2021. Moreover, the summit plans to launch a summer school program, which will conduct academic visits and exchanges and research internships.

Peter Gluckman, president of the International Council for Science said via video that science needs to be better integrated into social systems and policy making, asking for more international exchanges and cooperation, in which Gluckman hopes that more young scientists and organizations will play a more important role.

WYSS 2021, co-sponsored by the China Association for Science and Technology, was held during November 13 and 14 in Wenzhou, East China's Zhejiang province. This year's summit focused on the United Nations 2030 Sustainable Development Goals and national key strategies, including the Belt and Road Initiative. In-depth discussions were held on cutting-edge scientific fields such as climate change, life and health, the digital economy, smart computing, future technologies, carbon neutrality and new materials.

Benefits of COVID-19 Vaccine Booster Shot

By Staff Reporters

China has expanded vaccine inoculation, with booster shots in particular, to combat COVID-19 and build an immune barrier as the novel coronavirus continues to spread worldwide. China is providing COVID-19 booster shots to its residents free of charge.

Wang Huaqing, chief expert on immunization planning at the Chinese Center for Disease Control and Prevention, said in a press conference on October 30 that based on domestic and foreign research results, antibody levels will decline after six months and the protective effect weakens with time. However, a booster shot is a quick way to raise antibody levels.

Moreover, since the antibody level after a booster shot was administered is still higher than the peak level after the first and second doses of vaccine, it can reinforce its protection function, said Wang.

At present, China has launched a nationwide COVID-19 campaign, which recommends that people who have completed a six-month vaccination period can be given the booster jab.

Regarding people's worries about the vaccination interval, Wang said on November 6 that based on past experience, if the interval between vaccinations is increased, its overall immune effect will not be significantly affected.

However, if the interval lasts longer, as the antibody level declines, the risk of infection will increase. He recommended that everyone get the booster shot as soon as possible following the guidelines.

Wang also noted that according to the needs of pandemic prevention and control, the priority groups of booster shots had been identified, including workers at airports, ports, border inspections, hospitals, people over 60 and individuals with weak immune systems.

In addition to these priority groups, localities can also expand the scope of the population for booster shots based on local conditions and needs for COVID-19 prevention and control, and provide enhanced immunization services to other eligible people who need booster shots.

He also said in the press conference held on November 6 that 37.973 million people in China have been offered booster shots up to now.

In terms of the elderly with weaker immune systems, National Health Commission official Zheng Zhongwei said on a CCTV interview on November 15 that, despite the high vaccination rate in China, the vaccination rate among the elderly is relatively low, as they are at a much higher risk of severe illness and death from COVID-19.

"Accelerating vaccination work among the elderly is key to promoting the health vaccination campaign well," he said, adding that only in this way will China be able to take the initiative and gain time to adjust the national strategy for the prevention and control of the pandemic.

Service Info

Qilian Mountain National Park

The Qilian Mountain National Park, which covers a total area of 50,200 km^2, is located at the junction area of Gansu province and Qinghai province. It is home to a variety of wild animals such as snow leopards, which are under first-class state protection in China. Thanks to the Qilian Mountain, a complex ecosystem of mountain forests, temperate desert grasslands, alpine meadows and glacial snow-capped mountains exists in the arid desert belt of northwest China. It is an important ecological security barrier in western China.

(PHOTO: XINHUA)